



Technical catalogue - Edition 2017.01

# SACE Emax 2

## New low voltage air circuit-breakers



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# SACE Emax 2

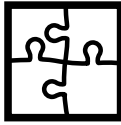
## Consultation guide



### Chapter 1

#### Main characteristics

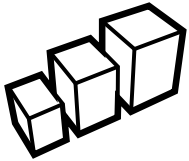
Overview of the SACE Emax 2 family, distinctive features of the series, product conformity and service.



### Chapter 5

#### Accessories

Accessories for SACE Emax 2 circuit-breakers (signaling, control, interlocks, etc..) and for Ekip protection trip units (connectivity, measurements, protection, etc).



### Chapter 2

#### The ranges

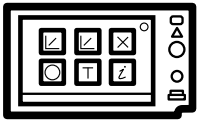
Electrical characteristics of automatic circuit-breakers, switch-disconnectors and derived versions.



### Chapter 6

#### Installation

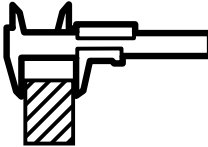
Installation and circuit-breaker performance in switchgear, installation environment, degree of protection and limiting curves.



### Chapter 3

#### Protection trip units

Latest generation Ekip protection trip units for power distribution, generator protection and power control.



### Chapter 7

#### Overall dimensions

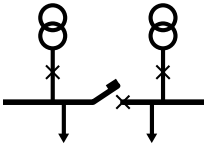
Overall dimensions for fixed circuit-breakers, withdrawable circuit-breakers and accessories.



### Chapter 4

#### Communication devices and systems

Supervision, Energy Management and complete integration in the systems with the possibility of communicating with all the main protocols used in the industrial sector.



### Chapter 8

#### Wiring diagrams

Circuit-breaker and accessories wiring diagrams.



### Chapter 9

#### Ordering codes

Ordering codes with configuration examples.

# Main characteristics

|                                           |             |
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# Overview of the SACE Emax 2 family

## 1 Guide to selection

### Ranges available

|                                                 | E1.2 | E2.2 | E4.2 | E6.2 |
|-------------------------------------------------|------|------|------|------|
| Automatic circuit-breakers @ 690-1150 V AC      | •    | •    | •    | •    |
| Switch-disconnectors @ 690-1150 V AC, 1000 V DC | •    | •    | •    | •    |
| Sectionalizing truck                            |      | •    | •    | •    |
| Earthing switch with making capacity            |      | •    | •    | •    |
| Earthing truck                                  |      | •    | •    | •    |

### Automatic circuit-breakers

| Icu (440Vac) | Versione | 630 | 800 | 1000 | 1250 | 1600 | 2000 | 2500 | 3200 | 4000 | 5000 | 6300 |
|--------------|----------|-----|-----|------|------|------|------|------|------|------|------|------|
| 150          | X        |     |     |      |      |      |      |      |      |      |      |      |
| 150          | V        |     |     |      |      |      |      |      |      |      |      |      |
| 100          | H        |     |     |      |      |      |      |      |      |      |      |      |
| 85           | S        |     |     |      |      |      |      |      |      |      |      |      |
| 66           | N        |     |     |      |      |      |      |      |      |      |      |      |
| 50           | C        |     |     |      |      |      |      |      |      |      |      |      |
| 42           | B        |     |     |      |      |      |      |      |      |      |      |      |

### Switch-disconnectors

| Icw (1s) | Version | 630 | 800 | 1000 | 1250 | 1600 | 2000 | 2500 | 3200 | 4000 | 5000 | 6300 |
|----------|---------|-----|-----|------|------|------|------|------|------|------|------|------|
| 120      | X       |     |     |      |      |      |      |      |      |      |      |      |
| 100      | V       |     |     |      |      |      |      |      |      |      |      |      |
| 85       | H       |     |     |      |      |      |      |      |      |      |      |      |
| 66       | N       |     |     |      |      |      |      |      |      |      |      |      |
| 50       | N       |     |     |      |      |      |      |      |      |      |      |      |
| 42       | B       |     |     |      |      |      |      |      |      |      |      |      |

### Protection trip units

| Version         | Application                                        |                                                    |                                                    |
|-----------------|----------------------------------------------------|----------------------------------------------------|----------------------------------------------------|
|                 | Distribution                                       | Power control                                      | Generators                                         |
| Ekip Dip        | Protection devices                                 | -                                                  | -                                                  |
| Ekip Touch      | Protection devices and Measurements                | Protection devices and Measurements                | -                                                  |
| Ekip Hi-Touch   | Protection devices, Measurements, Network Analyzer | Protection devices, Measurements, Network Analyzer | -                                                  |
| Ekip G Touch    |                                                    | Protection devices and Measurements                | Protection devices and Measurements                |
| Ekip G Hi-Touch |                                                    | Protection devices, Measurements, Network Analyzer | Protection devices, Measurements, Network Analyzer |

## Distinctive features

SACE Emax 2 is a new series of low voltage air circuit-breakers available up to 6300 A and with the ability to efficiently and simply control electrical installations – from the traditional to the more complex – with minimum impact, the new SACE Emax 2 circuit-breakers represent the evolution of a circuit-breaker into a Power Manager.

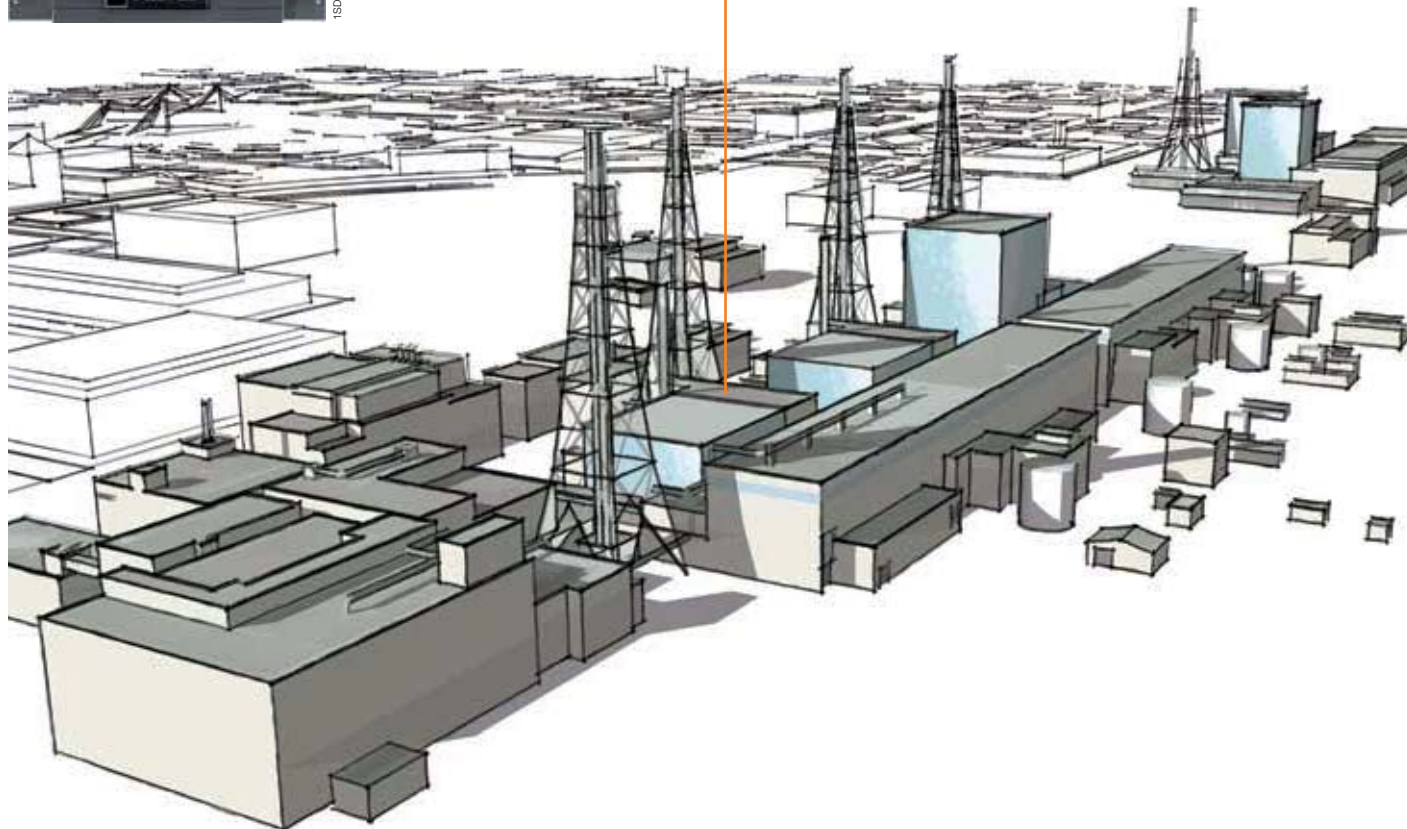
### Efficiency

SACE Emax 2 air circuit-breakers have been designed to manage, with maximum efficiency, all low voltage electrical installations: from industrial plants, naval applications, traditional and renewable power generation installations to buildings, shopping centres, data centres and communication networks.

Achieving maximum efficiency of an electrical installation in order to reduce consumption and waste requires intelligent management of power supplies and energy use. For this reason, the new technologies used in the SACE Emax 2 circuit-breakers allow the productivity and reliability of installations to be optimized, and at the same time, power consumption to be reduced while fully respecting the environment.



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# Distinctive features

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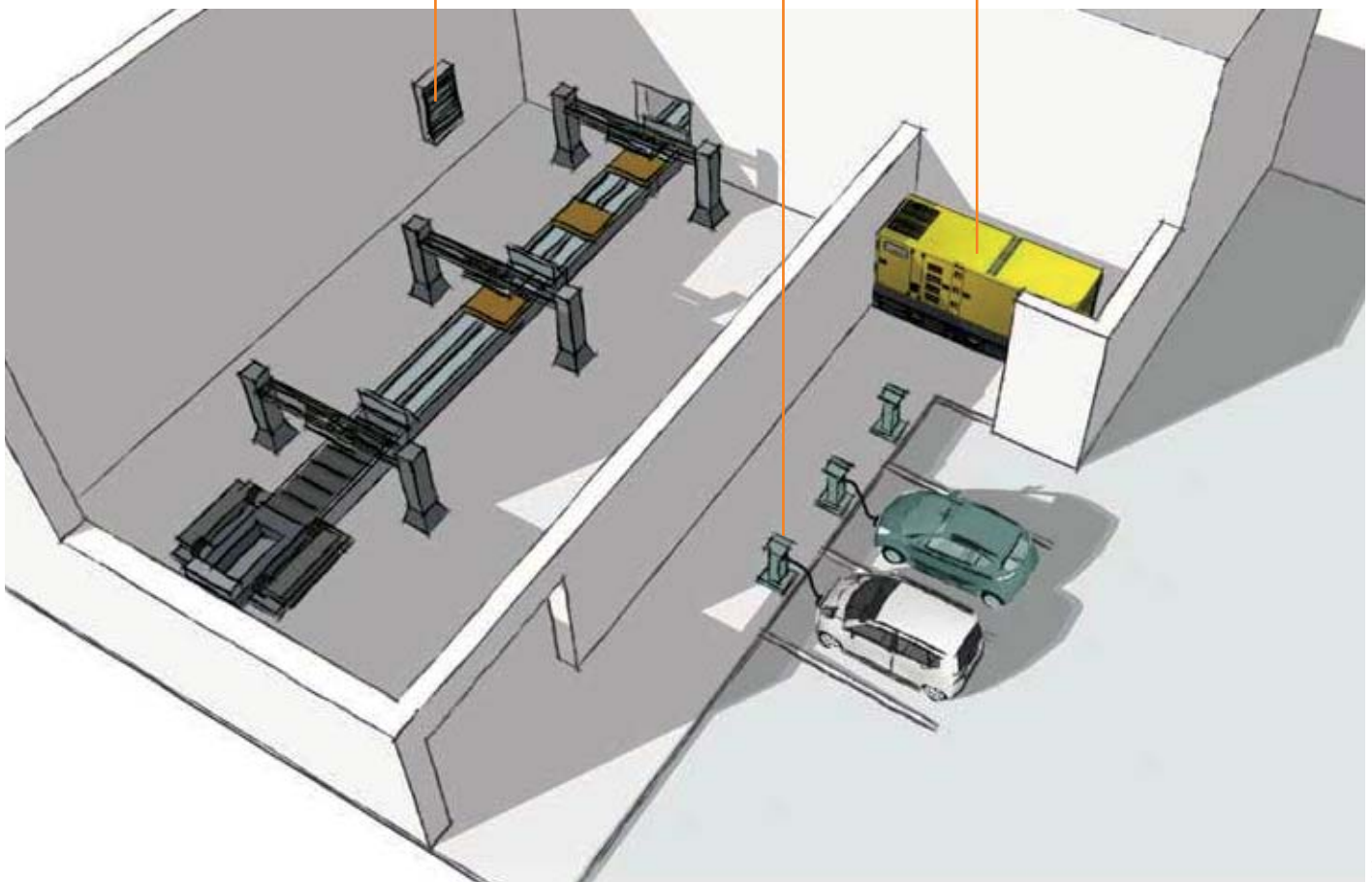
## Control

The exclusive **Power Controller** function available on the new SACE Emax 2 circuit-breakers monitors the power managed by the circuit-breaker, keeping it below the limit set by the user. As a result of this more effective use, the peak of power consumed can be limited allowing savings on electricity bills.

The Power Controller, patented by ABB, disconnects non-priority utilities, such as electric car charging stations, lighting or refrigeration units, during the times when consumption limits need to be respected, and connects them again as soon as it is appropriate. When required, it automatically activates auxiliary power supplies such as generator sets. No monitoring system is required: it is sufficient to set the required load limit on Emax 2, which can control any circuit-breaker located downstream, even if it is not equipped with a measurement function. In installations that are already equipped with energy management systems, the load limit can also be modified remotely.

SACE Emax 2 circuit-breakers are equipped with a new generation of protection trip units that are easy to programme and read. The Ekip Touch trip units measure power and energy with precision and store the most recent alarms, events and measurements in order to prevent faults to the installation or trip effectively when necessary. On request, the **Network Analyzer** function is also available, which controls the quality of absorbed power in real time and with extreme precision.

In addition, the innovative Ekip Touch and Hi-Touch trip units in the G version include all the functions of generator protection switchgear, offering a safe control solution that is ready to use. No external devices, wiring or inspections are required.



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## Connectivity

SACE Emax 2 series circuit-breakers can be integrated perfectly into all automation and energy management systems to improve productivity and energy consumption and to carry out remote service.

All circuit-breakers can be equipped with communication units available for use with Modbus, Profibus, and DeviceNet™ protocols as well as the modern Modbus TCP, Profinet and EtherNet/IP™ protocols. The cartridge-type modules can be easily installed directly on the terminal box, even at a later date.

Furthermore, the integrated IEC61850 communication module enables connection to automation systems widely used in medium voltage power distribution to create intelligent networks (Smart Grids).

Accurate measurements of current, voltage, power and energy are all available by means of the communication modules.

The trip units themselves can be used as multimeters that display the measurements available, or the Ekip Multimeter can be connected in the front of the switchgear without the need for external instruments and bulky transformers.

All circuit-breaker functions are also accessible via the Internet, in complete safety, through the Ekip Link switchgear supervision system and the Ekip Control Panel operator panel.

The power and auxiliary connections are optimized to simplify connection to the switchgear. The power terminals, which can be oriented horizontally or vertically, have been designed for the most common busbars, while the push-in connections of the auxiliaries ensure immediate and safe wiring.



# Distinctive features

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## Performance

The SACE Emax 2 range is made up of 4 sizes: E1.2, E2.2, E4.2 and E6.2 up to 6300A, which enable switchgear of compact dimensions and high ratings to be built with busbars of reduced length and cross-section.

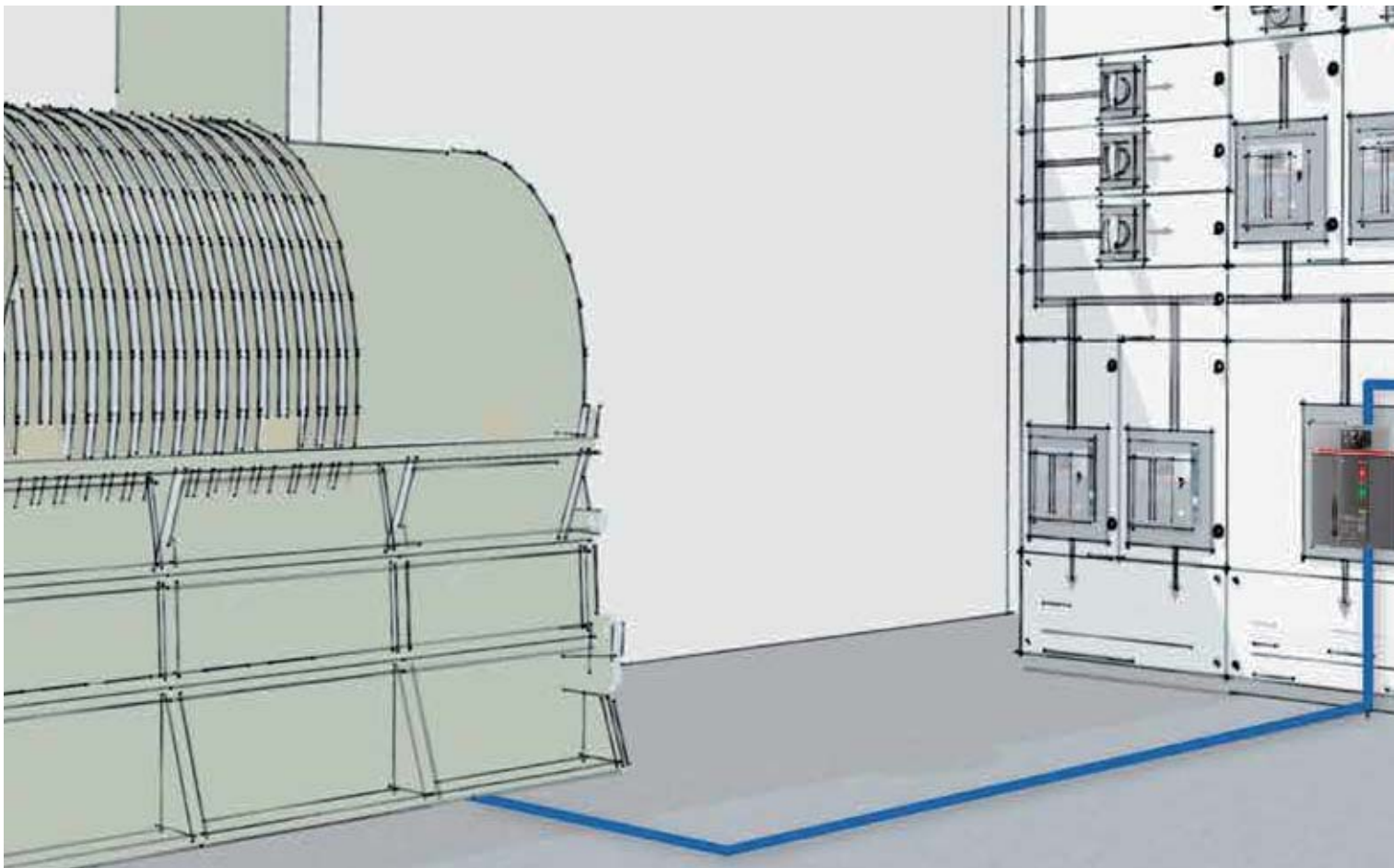
The protection trip units, auxiliary connections and main accessories are the same throughout the range to simplify design and installation. Furthermore, the sizes from E2.2 to E6.2 have the same height and depth.

The rating levels are updated and uniform throughout the sizes to meet the demands and needs of today's installations, from 42kA to 150kA, and to standardize switchgear projects.

High short-time currents, together with the efficiency of the protection functions, guarantee complete selectivity in all situations. Accurate design and choice of materials enable optimization of the overall dimensions of the circuit-breaker. In this way switchgear of compact dimensions can be built and outstanding savings at the same performance can be obtained.

In particular:

- **E1.2** offers 1,600A with an interrupting rating of up to 66kA and withstand current of 50kA for 1 second in an extremely compact structure. In the three and four pole version, it offers the sturdiness of SACE Emax with reduced dimensions and enables switchgear of 66kA to be built in units of 400mm, which is indispensable in places where reduced dimensions are essential, such as naval and offshore installations.
- **E2.2** enables in the three pole version ratings of up to 2,500A to be achieved in switchgear with a width of 400mm. In addition, it provides short-circuit currents up to 100kA and 85kA for 1 second.
- **E4.2** is the new 4,000A circuit-breakers designed to withstand high currents with a withstand rating of 100kA for 1 second without the need for particular precautions.
- **E6.2** is the top of the range, with an interrupting rating of 150kA and a structure that allows 6,300A to be reached, even in complex installation conditions.



## Ease of use and safety

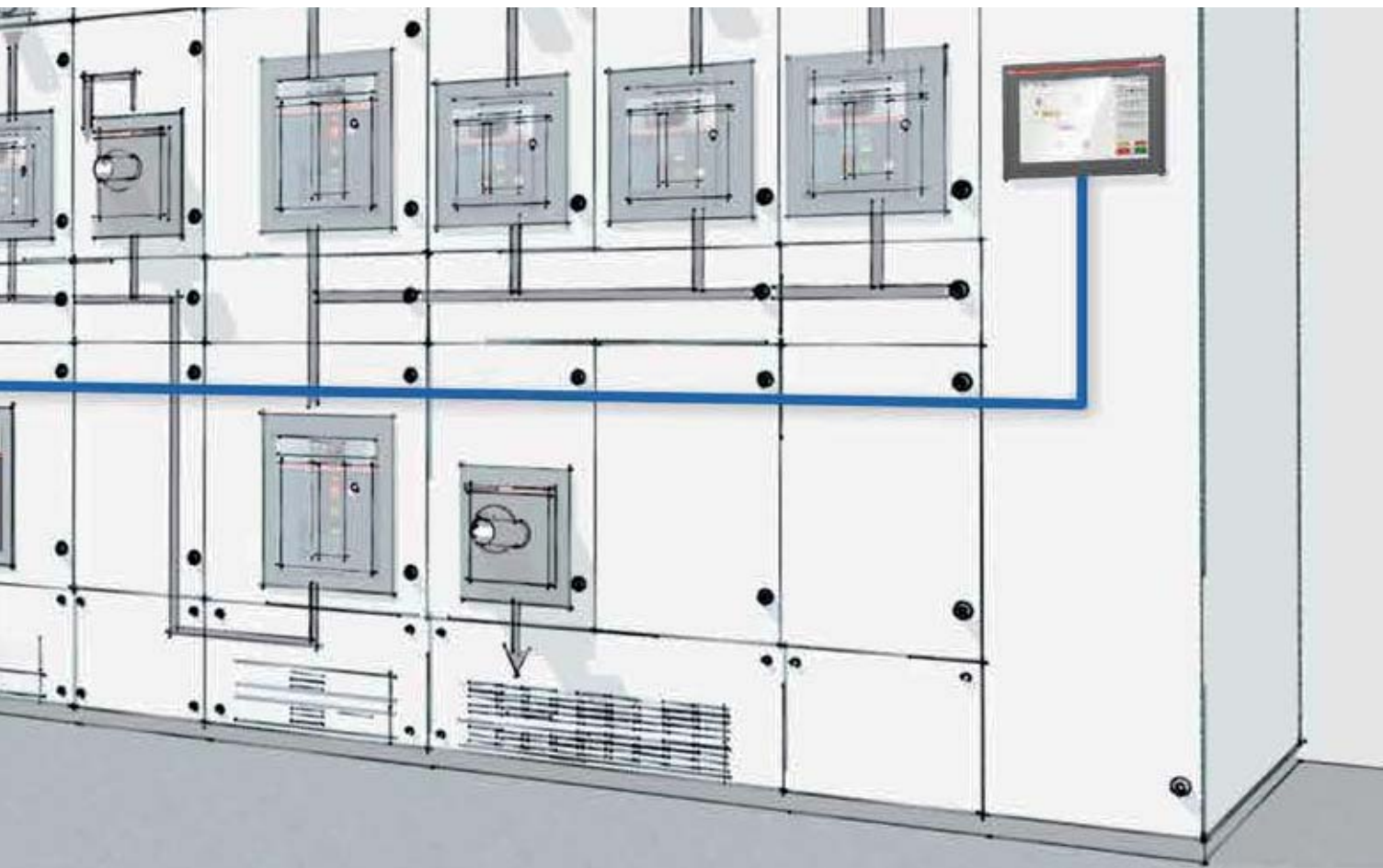
The entire range is available in fixed and withdrawable versions, with double insulation between the front of the switchgear and the live parts to ensure operation in complete safety. The circuit-breakers can be powered indifferently from above or below. All essential information is available in the central area of the front shield and enables immediate identification of the status of the circuit-breaker: open, closed, ready to close, charged and discharged springs.

Maintenance is simply and safe. Thanks to the new front shield, the main accessories can be frontally accessed without completely removing it.

The withdrawable circuit-breaker is inserted and removed via dedicated guide rails that simplify movement. The correct movement from racked-in, test isolated, to racked-out position is guaranteed by a lock in each position. As a further guarantee of safety, the shutters of the fixed part can be locked from the front when the circuit-breaker is removed. The shutters of the upper terminals are independent of those of the lower terminals to facilitate checking and maintenance operations.

The Ekip Touch protection trip units are equipped with a large colour touch-screen display which enables safe and intuitive operation. Furthermore the Ekip units can be programmed and consulted from a tablet, smart phone or portable PC via the Ekip Connect application, which allows the parameters of the safety devices calculated in the DOC software to be set automatically.

The trip units are easily interchangeable from the front of the circuit-breaker, and all communication units can be installed directly on the terminal box with a few simple operations.



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# Distinctive features



## Key

- 1 Trademark and size of circuit- breaker
- 2 SACE Ekip protection trip unit
- 3 Pushbutton for manual opening
- 4 Pushbutton for manual closing
- 5 Lever to manually charge closing springs
- 6 Electrical rating plate
- 7 Mechanical device to signal circuit-breaker open "O" and closed "I"
- 8 Signal for springs charged or discharged
- 9 Mechanical signalling of overcurrent release tripped
- 10 Size and serial number

# Product conformity

## SACE Emax 2 circuit-breakers and their accessories conform to IEC 60947, EN 60947 international Standard

1

### Approvals and certifications

SACE Emax 2 circuit-breakers and their accessories conform to the international IEC 60947, EN 60947 (harmonized in 30 CENELEC countries), CEI EN 60947 and IEC 61000 Standards and comply with the following EC directives:

- “Low Voltage Directives” (LVD) no. 2006/95/EC
- “Electromagnetic Compatibility Directive” (EMC) no. 2004/108/EC.

The ABB air circuit-breakers include a range that has been certified according to American UL 1066 Standards; it is also certified by the Russian certification body GOST (Russia Certificate of Conformity) and has achieved China CCC Certification (China Compulsory Certification).

Certification of conformity with the above-mentioned product Standards is carried out in compliance with the European EN 45011 Standard by the Italian certification body ACAE (Association for the Certification of Electrical Equipment), which is recognized by the European organization LOVAG (Low Voltage Agreement Group), and by the Swedish Intertek SEMKO certification organization Intertek Semko which is recognized by the international organization IECEE.

The main versions of the devices are about to be approved by the following shipping registers



1SDC2000408F001

Registro Italiano  
Navale (RINA):  
Italian



1SDC200411F001

Germanischer  
Lloyd (GL):  
Deutsch



1SDC200414F001

Russian Maritime  
Register of Shipping  
(RMRS): Russian



1SDC200409F001

Lloyd's Register  
of Shipping (LR):  
English



1SDC200412F001

Bureau Veritas (BV):  
French



1SDC200413F001

Nippon Kaiji Kyokai  
(NKK): Japan



1SDC200410F001

American Bureau  
Shipping (ABS):  
American



1SDC200413F001

Det Norske Veritas  
(DNV): Norway



Gost - Eac

For the types of certified circuit-breakers, certified ratings and corresponding validity, please contact ABB SACE.

# Product conformity

1

Quality and Sustainability: company efficiency and integrated management systems. Quality, Sustainability and Customer Satisfaction have always been ABB SACE's major commitment.

The involvement of all company departments and organization of processes have led the company to develop, implement and certify management systems in compliance with international Standards:

- ISO 9001 for quality management
- IRIS for the quality of supplies in the railway sector (International Railway Industry Standards)
- ISO 14001 for environmental management
- OHSAS 18001 for the management of the health and safety of employees in the workplace
- SA 8000 for the management of social responsibility.



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1SDC200417F001



1SDC200419F001



1SDC200419F001

The ABB SACE testing laboratory, accredited by ACCREDIA in compliance with ISO/IEC 17025 Standard, provides both ABB and external customers with a qualified service for performing certification tests on devices and electric equipment of low and medium voltage in accordance with the relevant product Standards.

Thanks to the implementation of systems and their integration (Integrated Management System), ABB SACE, with a view to continuous improvement, has implemented processes with a focus on:

- quality, preventing defects and faults along the entire supply chain
- environment, reviewing production processes in terms of ecology and waste reduction, rationalizing the consumption of raw materials and energy, preventing pollution, containing noise emissions and reducing the quantity of rejects in the production processes
- health and safety of employees, offering a healthy and safe workplace in all of the various stages of work with a “zero accident objective”
- social responsibility, guaranteeing the respect of human rights and the absence of any discrimination throughout the supply chain, and offering a favourable and transparent working atmosphere.

A further commitment aimed at safeguarding the environment has been achieved by assessing products' life cycles (LCA, Life Cycle Assessment): this includes the assessment and improvement of the environmental performance of products from the engineering stage throughout their entire life cycle. The materials, processes and packaging used are chosen with a view to optimising the actual environmental impact of each product, including its energy efficiency and recyclability.



# ABB SACE Global Service

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ABB's technical assistance service offers solutions aimed at supporting the customer in all stages of the lifespan of the circuit-breaker in service and covering the entire chain of value; ABB is present from the moment of selection to the end of the life of the product, thereby guaranteeing the investments of its customers.

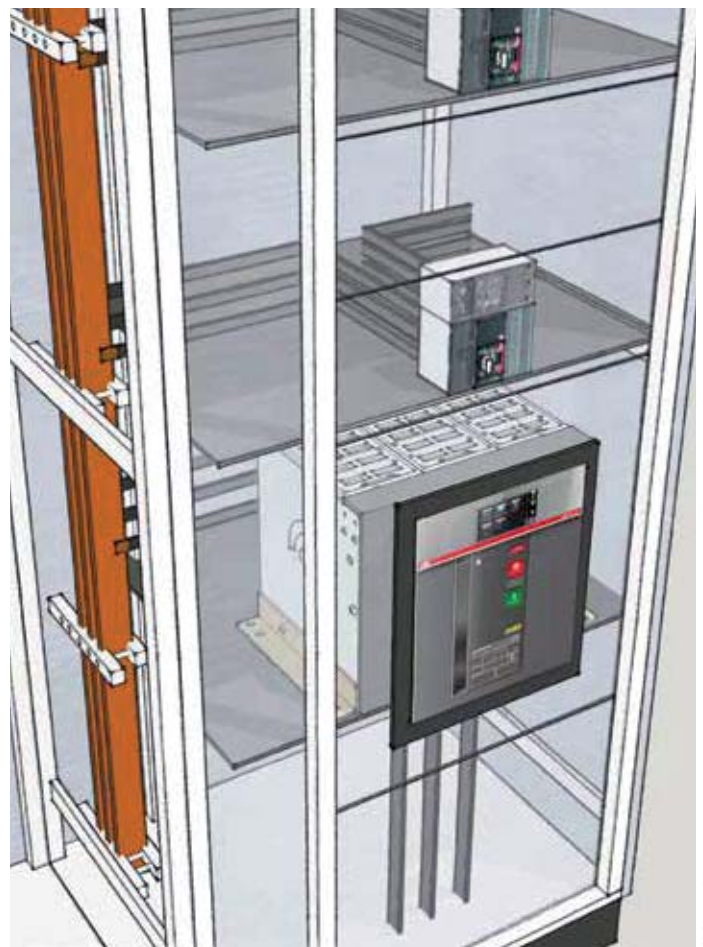
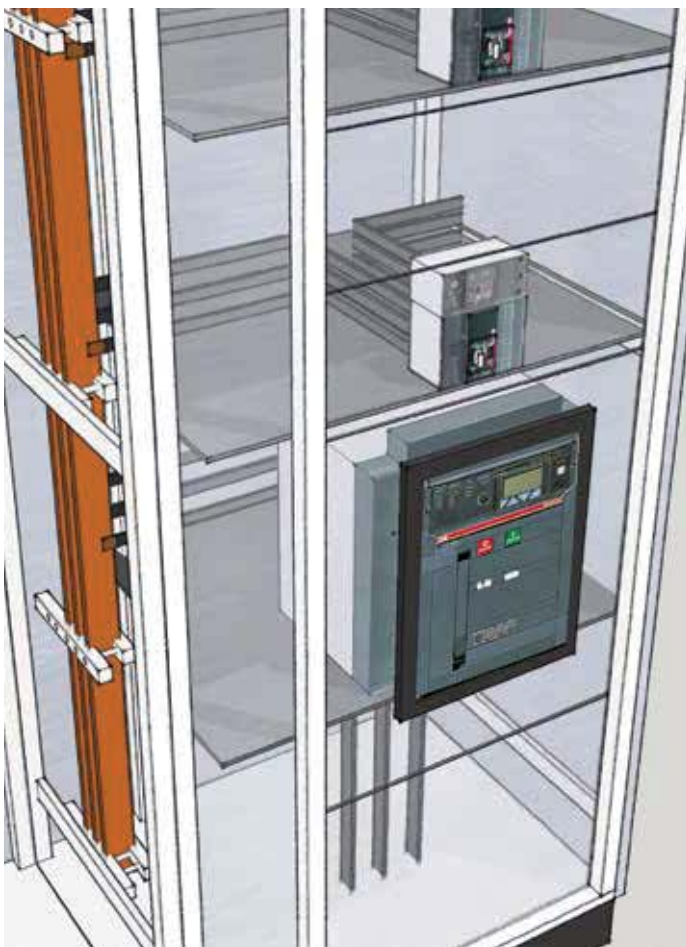
ABB supplies annual updates regarding the evolution of the circuit-breaker ranges (Life Cycle Management) and for each product it provides details of associated services and the level of support available, so that customers can choose the products and spare parts best suited to their needs.

ABB's organisation offers services that include installation and commissioning, technical training on the use and maintenance of products, the supply of original spare parts, corrective and preventive maintenance, equipment diagnostics, modernisation of systems with upgrades and retrofitting kits, consultancy services and personalised maintenance and service contracts. All this is supported by one of the most extensive global sales and service networks.

## Retrofitting kit

Through continuous research targeted at the needs of the customer, ABB SACE Service has developed innovative retrofitting kits in order to simplify and speed up installation of a new circuit-breaker, updating the customer's investment with the latest technology available and with very limited down times.

The retrofitting kit between Emax2 and Emax is a retrofit solution: it is therefore possible to replace the withdrawable version of Emax with an equivalent Emax2 model without changing the switchboard busbars, by simply removing the fixed part of Emax replacing it with a fixed part of Emax2 which has been suitably modified with dedicated terminals.



# The Ranges

|                                                                                            |                      |
|--------------------------------------------------------------------------------------------|----------------------|
| <a href="#">SACE Emax 2 automatic circuit-breakers</a>                                     | <a href="#">2/2</a>  |
| <a href="#">SACE Emax 2 switch-disconnectors</a>                                           | <a href="#">2/4</a>  |
| <a href="#">SACE Emax 2 automatic circuit-breakers<br/>for applications up to 1150V AC</a> | <a href="#">2/6</a>  |
| <a href="#">SACE Emax 2 switch-disconnectors<br/>for applications up to 1150V AC</a>       | <a href="#">2/8</a>  |
| <a href="#">SACE Emax 2 switch-disconnectors<br/>for applications up to 1000V DC</a>       | <a href="#">2/10</a> |
| <a href="#">SACE Emax 2 derived versions</a>                                               | <a href="#">2/12</a> |

# SACE Emax 2 automatic circuit-breakers

2

## Common data

|                                      |      |                      |
|--------------------------------------|------|----------------------|
| Rated service voltage Ue             | [V]  | 690                  |
| Rated insulation voltage Ui          | [V]  | 1000                 |
| Rated impulse withstand voltage Uimp | [kV] | 12                   |
| Frequency                            | [Hz] | 50 - 60              |
| Number of poles                      |      | 3 - 4                |
| Version                              |      | Fixed - Withdrawable |
| Suitable for isolation according to  |      | IEC 60947-2          |



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## SACE Emax 2

### Performance levels

|                                                       |                                               |        |           |           |                   |           |  |
|-------------------------------------------------------|-----------------------------------------------|--------|-----------|-----------|-------------------|-----------|--|
| Rated uninterrupted current Iu @ 40°C                 |                                               | [A]    | 630       | 630       | 250               | 630       |  |
|                                                       |                                               | [A]    | 800       | 800       | 630               | 800       |  |
|                                                       |                                               | [A]    | 1000      | 1000      | 800               | 1000      |  |
|                                                       |                                               | [A]    | 1250      | 1250      | 1000              | 1250      |  |
|                                                       |                                               | [A]    | 1600      | 1600      | 1250              |           |  |
|                                                       |                                               | [A]    |           |           | 1600              |           |  |
|                                                       |                                               | [A]    |           |           |                   |           |  |
| Neutral pole current-carrying capacity for 4-pole CBs |                                               | [%Iu]  | 100       | 100       | 100               | 100       |  |
| Rated ultimate short-circuit breaking capacity Icu    | 400-415 V                                     | [kA]   | 42        | 50        | 66                | 150       |  |
|                                                       | 440 V                                         | [kA]   | 42        | 50        | 66                | 130       |  |
|                                                       | 500-525 V                                     | [kA]   | 42        | 42        | 50                | 100       |  |
|                                                       | 690 V                                         | [kA]   | 42        | 42        | 50                | 60        |  |
| Rated service short-circuit breaking capacity Ics     |                                               | [%Icu] | 100       | 100       | 100 <sup>1)</sup> | 100       |  |
| Rated short-time withstand current Icw                | (1s)                                          | [kA]   | 42        | 42        | 50                | 15        |  |
|                                                       | (3s)                                          | [kA]   | 24        | 24        | 30                | -         |  |
| Rated short-circuit making capacity (peak value) Icm  | 400-415 V                                     | [kA]   | 88        | 105       | 145               | 330       |  |
|                                                       | 440 V                                         | [kA]   | 88        | 105       | 145               | 286       |  |
|                                                       | 500-525 V                                     | [kA]   | 88        | 88        | 105               | 220       |  |
|                                                       | 690 V                                         | [kA]   | 88        | 88        | 105               | 132       |  |
| Utilization category (according to IEC 60947-2)       |                                               |        | B         | B         | B                 | A         |  |
| Breaking                                              | Breaking time for I<Icw                       | [ms]   | 40        | 40        | 40                | 40        |  |
|                                                       | Breaking time for I>Icw                       | [ms]   | 25        | 25        | 25                | 10        |  |
| Dimensions                                            | H - Fixed/Withdrawable                        | [mm]   | 296/363.5 | 296/363.5 | 296/363.5         | 296/363.5 |  |
|                                                       | D - Fixed/Withdrawable                        | [mm]   | 183/271   | 183/271   | 183/271           | 183/271   |  |
|                                                       | W - Fixed 3p/4p/4p FS                         | [mm]   | 210/280   |           |                   |           |  |
|                                                       | W - Withdrawable 3p/4p/4p FS                  | [mm]   | 278/348   |           |                   |           |  |
| Weights (CB with trip unit and current sensor)        | Fixed 3p/4p                                   | kg     | 14/16     |           |                   |           |  |
|                                                       | Withdrawable 3p/4p/4p FS including fixed part | kg     | 38/43     |           |                   |           |  |

1) Ics : 50kA for 400V...440V voltage; 2) Ics: 125kA for 400V...440V voltage; 3) E4.2H 3200A: 66 Icw (3s)

## SACE Emax 2

|                                                                                                 |           |                     | E1.2   |      |      |        |
|-------------------------------------------------------------------------------------------------|-----------|---------------------|--------|------|------|--------|
| Mechanical and electrical life with regular ordinary maintenance prescribed by the manufacturer |           | [Iu]                | ≤ 1000 | 1250 | 1600 | 1250 L |
|                                                                                                 |           | [No. cycles x 1000] | 20     | 20   | 20   | 20     |
|                                                                                                 | Frequency | [Oper./Hour]        | 60     | 60   | 60   | 60     |
| Electrical life                                                                                 | 440 V     | [No. cycles x 1000] | 8      | 8    | 8    | 3      |
|                                                                                                 | 690 V     | [No. cycles x 1000] | 8      | 6,5  | 6,5  | 1      |
|                                                                                                 | Frequency | [Oper./Hour]        | 30     | 30   | 30   | 30     |



|  | E2.2    |         |         |         | E4.2    |         |                  |                   | E6.2         |         |         |
|--|---------|---------|---------|---------|---------|---------|------------------|-------------------|--------------|---------|---------|
|  | B       | N       | S       | H       | N       | S       | H                | V                 | H            | V       | X       |
|  | 1600    | 800     | 250     | 800     | 3200    | 3200    | 3200             | 2000              | 4000         | 4000    | 4000    |
|  | 2000    | 1000    | 800     | 1000    | 4000    | 4000    | 4000             | 2500              | 5000         | 5000    | 5000    |
|  |         | 1250    | 1000    | 1250    |         |         |                  | 3200              | 6300         | 6300    | 6300    |
|  |         | 1600    | 1250    | 1600    |         |         |                  | 4000              |              |         |         |
|  |         | 2000    | 1600    | 2000    |         |         |                  |                   |              |         |         |
|  |         | 2500    | 2000    | 2500    |         |         |                  |                   |              |         |         |
|  |         |         | 2500    |         |         |         |                  |                   |              |         |         |
|  | 100     | 100     | 100     | 100     | 100     | 100     | 100              | 100               | 50-100       | 50-100  | 50-100  |
|  | 42      | 66      | 85      | 100     | 66      | 85      | 100              | 150               | 100          | 150     | 150     |
|  | 42      | 66      | 85      | 100     | 66      | 85      | 100              | 150               | 100          | 150     | 150     |
|  | 42      | 66      | 66      | 85      | 66      | 66      | 85               | 100               | 100          | 130     | 130     |
|  | 42      | 66      | 66      | 85      | 66      | 66      | 85               | 100               | 100          | 100     | 100     |
|  | 100     | 100     | 100     | 100     | 100     | 100     | 100              | 100 <sup>2)</sup> | 100          | 100     | 100     |
|  | 42      | 66      | 66      | 85      | 66      | 66      | 85               | 100               | 100          | 100     | 120     |
|  | 42      | 50      | 50      | 66      | 50      | 66      | 75 <sup>3)</sup> | 75                | 100          | 100     | 100     |
|  | 88      | 145     | 187     | 220     | 145     | 187     | 220              | 330               | 220          | 330     | 440     |
|  | 88      | 145     | 187     | 220     | 145     | 187     | 220              | 330               | 220          | 330     | 440     |
|  | 88      | 145     | 145     | 187     | 145     | 145     | 187              | 220               | 220          | 286     | 286     |
|  | 88      | 145     | 145     | 187     | 145     | 145     | 187              | 220               | 220          | 220     | 264     |
|  | B       | B       | B       | B       | B       | B       | B                | B                 | B            | B       | B       |
|  | 40      | 40      | 40      | 40      | 40      | 40      | 40               | 40                | 40           | 40      | 40      |
|  | 25      | 25      | 25      | 25      | 25      | 25      | 25               | 25                | 25           | 25      | 25      |
|  | 371/425 | 371/425 | 371/425 | 371/425 | 371/425 | 371/425 | 371/425          | 371/425           | 371/425      | 371/425 | 371/425 |
|  | 270/383 | 270/383 | 270/383 | 270/383 | 270/383 | 270/383 | 270/383          | 270/383           | 270/383      | 270/383 | 270/383 |
|  | 276/366 |         |         |         | 384/510 |         |                  |                   | 762/888/1014 |         |         |
|  | 317/407 |         |         |         | 425/551 |         |                  |                   | 803/929/1069 |         |         |
|  | 41/53   |         |         |         | 56/70   |         |                  |                   | 109/125/140  |         |         |
|  | 84/99   |         |         |         | 110/136 |         |                  |                   | 207/234/260  |         |         |

|  | E2.2   |      |      |      | E4.2   |      |      |      | E6.2 |      |      |
|--|--------|------|------|------|--------|------|------|------|------|------|------|
|  | < 1600 | 1600 | 2000 | 2500 | < 2500 | 2500 | 3200 | 4000 | 4000 | 5000 | 6300 |
|  | 25     | 25   | 25   | 20   | 20     | 20   | 20   | 15   | 12   | 12   | 12   |
|  | 60     | 60   | 60   | 60   | 60     | 60   | 60   | 60   | 60   | 60   | 60   |
|  | 15     | 12   | 10   | 8    | 10     | 8    | 7    | 5    | 4    | 3    | 2    |
|  | 15     | 10   | 8    | 7    | 10     | 8    | 7    | 4    | 4    | 2    | 2    |
|  | 30     | 30   | 30   | 30   | 20     | 20   | 20   | 20   | 10   | 10   | 10   |

# SACE Emax 2 switch-disconnectors

Switch-disconnectors, identified with the abbreviation “/MS”, are devices that satisfy the isolating specifications provided by the IEC 60947-3 Standard. The switch-disconnectors are derived from the corresponding automatic circuit-breakers, and they have the same dimensions and accessory options. This version differs from the automatic circuit-breakers only because of the absence of protection trip units.

2

## Common data

|                                      |      |                      |
|--------------------------------------|------|----------------------|
| Rated service voltage Ue             | [V]  | 690                  |
| Rated insulation voltage Ui          | [V]  | 1000                 |
| Rated impulse withstand voltage Uimp | [kV] | 12                   |
| Frequency                            | [Hz] | 50 - 60              |
| Number of poles                      |      | 3- 4                 |
| Version                              |      | Fixed - Withdrawable |
| Suitable for isolation according to  |      | IEC 60947-3          |



## SACE Emax 2

### Performance levels

|                                                                  |                              |                    | E1.2        |             |
|------------------------------------------------------------------|------------------------------|--------------------|-------------|-------------|
|                                                                  |                              |                    | B/MS        | N/MS        |
| Rated uninterrupted current I <sub>u</sub> @ 40°C                |                              | [A]                | 630         | 250         |
|                                                                  |                              | [A]                | 800         | 630         |
|                                                                  |                              | [A]                | 1000        | 800         |
|                                                                  |                              | [A]                | 1250        | 1000        |
|                                                                  |                              | [A]                | 1600        | 1250        |
|                                                                  |                              | [A]                |             | 1600        |
| Neutral pole current-carrying capacity for 4-pole CBs            |                              | [%I <sub>u</sub> ] | 100         | 100         |
| Rated short-time withstand current I <sub>cw</sub>               | (1s)                         | [kA]               | 42          | 50          |
|                                                                  | (3s)                         | [kA]               | 24          | 30          |
| Rated short-circuit making capacity (peak value) I <sub>cm</sub> | 400-415 V                    | [kA]               | 88          | 105         |
|                                                                  | 440 V                        | [kA]               | 88          | 105         |
|                                                                  | 500-525 V                    | [kA]               | 88          | 105         |
|                                                                  | 690 V                        | [kA]               | 88          | 105         |
| Utilization category (according to IEC 60947-3)                  |                              |                    | AC-23A      | AC-23A      |
| Dimensions                                                       | H - Fixed / Withdrawable     | [mm]               | 296 / 363.5 | 296 / 363.5 |
|                                                                  | D - Fixed / Withdrawable     | [mm]               | 183 / 271   | 183 / 271   |
|                                                                  | W - Fixed 3p/4p/4p FS        | [mm]               | 210 / 280   |             |
|                                                                  | W - Withdrawable 3p/4p/4p FS | [mm]               | 278 / 348   |             |

1) E4.2H/MS 3200A: 66kA I<sub>cw</sub> (3s)

## SACE Emax 2

|                                                                                                 |           |                     | E1.2   |      |      |
|-------------------------------------------------------------------------------------------------|-----------|---------------------|--------|------|------|
| Mechanical and electrical life with regular ordinary maintenance prescribed by the manufacturer |           | [I <sub>u</sub> ]   | < 1000 | 1000 | 1600 |
|                                                                                                 |           | [No. cycles x 1000] | 20     | 20   | 20   |
|                                                                                                 | Frequency | [Oper./Hour]        | 60     | 60   | 60   |
| Electrical life                                                                                 | 440 V     | [No. cycles x 1000] | 8      | 8    | 8    |
|                                                                                                 | 690 V     | [No. cycles x 1000] | 8      | 6.5  | 6.5  |
|                                                                                                 | Frequency | [Oper./Hour]        | 30     | 30   | 30   |

The device, when in the open position, guarantees an isolating distance between the main contacts of the circuit-breaker that is sufficient to ensure that the installation downstream is not live.

Furthermore the switch-disconnectors, if used with an external protection relay with maximum delay of 500ms, enable a breaking capacity at a maximum rated operating voltage ( $U_e$ ) equal to the value of rated short-time withstand current ( $I_{cw}$ ) for one second.



1SDC200425F001



1SDC200430F001



1SDC200431F001

| E2.2      |           |           | E4.2      |                  |           | E6.2             |           |  |
|-----------|-----------|-----------|-----------|------------------|-----------|------------------|-----------|--|
| B/MS      | N/MS      | H/MS      | N/MS      | H/MS             | V/MS      | H/MS             | X/MS      |  |
| 1600      | 800       | 800       | 3200      | 3200             | 2000      | 4000             | 4000      |  |
| 2000      | 1000      | 1000      | 4000      | 4000             | 2500      | 5000             | 5000      |  |
|           | 1250      | 1250      |           |                  | 3200      | 6300             | 6300      |  |
|           | 1600      | 1600      |           |                  | 4000      |                  |           |  |
|           | 2000      | 2000      |           |                  |           |                  |           |  |
|           | 2500      | 2500      |           |                  |           |                  |           |  |
| 100       | 100       | 100       | 100       | 100              | 100       | 50-100           | 50-100    |  |
| 42        | 66        | 85        | 66        | 85               | 100       | 100              | 120       |  |
| 42        | 50        | 66        | 50        | 75 <sup>1)</sup> | 75        | 100              | 100       |  |
| 88        | 145       | 187       | 145       | 187              | 220       | 220              | 264       |  |
| 88        | 145       | 187       | 145       | 187              | 220       | 220              | 264       |  |
| 88        | 145       | 187       | 145       | 187              | 220       | 220              | 264       |  |
| 88        | 145       | 187       | 145       | 187              | 220       | 220              | 264       |  |
| AC-23A    | AC-23A    | AC-23A    | AC-23A    | AC-23A           | AC-23A    | AC-23A           | AC-23A    |  |
| 371 / 425 | 371 / 425 | 371 / 425 | 371 / 425 | 371 / 425        | 371 / 425 | 371 / 425        | 371 / 425 |  |
| 270 / 383 | 270 / 383 | 270 / 383 | 270 / 383 | 270 / 383        | 270 / 383 | 270 / 383        | 270 / 383 |  |
| 276 / 366 |           |           | 384 / 510 |                  |           | 762 / 888 / 1014 |           |  |
| 317 / 407 |           |           | 425 / 551 |                  |           | 803 / 929 / 1069 |           |  |

| E2.2   |      |      |      | E4.2   |      |      |      | E6.2 |      |      |  |
|--------|------|------|------|--------|------|------|------|------|------|------|--|
| < 1600 | 1600 | 2000 | 2500 | < 2500 | 2500 | 3200 | 4000 | 4000 | 5000 | 6300 |  |
| 25     | 25   | 25   | 20   | 20     | 20   | 20   | 15   | 12   | 12   | 12   |  |
| 60     | 60   | 60   | 60   | 60     | 60   | 60   | 60   | 60   | 60   | 60   |  |
| 15     | 12   | 10   | 8    | 10     | 8    | 7    | 5    | 4    | 3    | 2    |  |
| 15     | 10   | 8    | 7    | 10     | 8    | 7    | 4    | 4    | 2    | 2    |  |
| 30     | 30   | 30   | 30   | 20     | 20   | 20   | 20   | 10   | 10   | 10   |  |

# SACE Emax 2 automatic circuit-breakers for applications up to 1150V AC

ABB SACE offers a solution designed for electrical applications with voltages up to 1150V in alternating current. The 1150V AC range, which maintains the same dimensions and accessories as the standard 690V AC range, is identified by the letters “/E”.

2

## Common data

|                                           |      |                      |
|-------------------------------------------|------|----------------------|
| Rated service voltage $U_e$               | [V]  | 1150                 |
| Rated insulation voltage $U_i$            | [V]  | 1250                 |
| Rated impulse withstand voltage $U_{imp}$ | [kV] | 12                   |
| Frequency                                 | [Hz] | 50 - 60              |
| Number of poles                           |      | 3- 4                 |
| Version                                   |      | Fixed - Withdrawable |
| Suitable for isolation according to       |      | IEC 60947-2          |



## SACE Emax 2

## E1.2

### Performance levels

### N/E

|                                                           |        |               |      |  |
|-----------------------------------------------------------|--------|---------------|------|--|
| Rated uninterrupted current $I_u$ @ 40°C                  |        | [A]           | 630  |  |
|                                                           |        | [A]           | 800  |  |
|                                                           |        | [A]           | 1000 |  |
|                                                           |        | [A]           | 1250 |  |
|                                                           |        | [A]           | 1600 |  |
|                                                           |        | [A]           |      |  |
| Neutral pole current-carrying capacity for 4-pole CBs     |        | [% $I_u$ ]    | 100  |  |
| Rated ultimate short-circuit breaking capacity $I_{cu}$   | 1000 V | [kA]          | 30   |  |
|                                                           | 1150 V | [kA]          | 25   |  |
| Rated service short-circuit breaking capacity $I_{cs}$    |        | [% $I_{cu}$ ] | 100  |  |
| Rated short-time withstand current $I_{cw}$ (1s)          |        | [kA]          | 25   |  |
|                                                           | (3s)   | [kA]          | 25   |  |
| Rated short-circuit making capacity (peak value) $I_{cm}$ | 1000 V | [kA]          | 63   |  |
|                                                           | 1150 V | [kA]          | 53   |  |
| Utilization category (according to IEC 60947-3)           |        |               | B    |  |

## SACE Emax 2

## E1.2

|                                                                                                 |           |                        |        |      |      |  |
|-------------------------------------------------------------------------------------------------|-----------|------------------------|--------|------|------|--|
| Mechanical and electrical life with regular ordinary maintenance prescribed by the manufacturer |           | [ $I_u$ ]              | < 1000 | 1000 | 1600 |  |
|                                                                                                 |           | [No. cycles x 1000]    | 20     | 20   | 20   |  |
|                                                                                                 |           | Frequency [Oper./Hour] | 60     | 60   | 60   |  |
| Electrical life                                                                                 | 1150 V    | [No. cycles x 1000]    | 1      | 1    | 1    |  |
|                                                                                                 | Frequency | [Oper./Hour]           | 30     | 30   | 30   |  |



1SDC200425F001



1SDC200426F001



1SDC200427F001

| E2.2 |  |  | E4.2 |  |  | E6.2     |  |  |
|------|--|--|------|--|--|----------|--|--|
| H/E  |  |  | H/E  |  |  | X/E      |  |  |
| 800  |  |  | 3200 |  |  | 4000     |  |  |
| 1000 |  |  | 4000 |  |  | 5000     |  |  |
| 1250 |  |  |      |  |  | 6300     |  |  |
| 1600 |  |  |      |  |  |          |  |  |
| 2000 |  |  |      |  |  |          |  |  |
| 2500 |  |  |      |  |  |          |  |  |
| 100  |  |  | 100  |  |  | 50 - 100 |  |  |
| 30   |  |  | 50   |  |  | 65       |  |  |
| 30   |  |  | 30   |  |  | 65       |  |  |
| 100  |  |  | 100  |  |  | 100      |  |  |
| 30   |  |  | 50   |  |  | 65       |  |  |
| 30   |  |  | 30   |  |  | 65       |  |  |
| 63   |  |  | 105  |  |  | 143      |  |  |
| 53   |  |  | 105  |  |  | 143      |  |  |
| B    |  |  | B    |  |  | B        |  |  |

| E2.2   |      |      | E4.2   |      |      | E6.2 |      |      |
|--------|------|------|--------|------|------|------|------|------|
| < 2000 | 2000 | 2500 | < 3200 | 3200 | 4000 | 4000 | 5000 | 6300 |
| 25     | 25   | 20   | 20     | 20   | 15   | 12   | 12   | 12   |
| 60     | 60   | 60   | 60     | 60   | 60   | 60   | 60   | 60   |
| 2      | 2    | 2    | 1      | 1    | 1    | 1    | 1    | 1    |
| 30     | 30   | 30   | 20     | 20   | 20   | 10   | 10   | 10   |

# SACE Emax 2 switch-disconnectors for applications up to 1150V AC

The switch-disconnectors for applications at 1150V, identified by the letters “/E” and “/MS”, are derived from the corresponding standard automatic circuit-breakers, of which maintain the overall dimensions and the possibility of mounting accessories. The switch-disconnectors are not equipped with Ekip protection trip units. By means of external protection relay with 500 ms maximum timing, the Icu breaking capacity is equal to the value of Icw (1s).

2

### Common data

|                                      |      |                      |
|--------------------------------------|------|----------------------|
| Rated service voltage Ue             | [V]  | 1150                 |
| Rated insulation voltage Ui          | [V]  | 1250                 |
| Rated impulse withstand voltage Uimp | [kV] | 12                   |
| Frequency                            | [Hz] | 50 - 60              |
| Number of poles                      |      | 3- 4                 |
| Version                              |      | Fixed - Withdrawable |
| Suitable for isolation according to  |      | IEC 60947-3          |



### SACE Emax 2

### E1.2

#### Performance levels

#### N/E MS

|                                                       |        |       |      |  |
|-------------------------------------------------------|--------|-------|------|--|
| Rated uninterrupted current Iu @ 40°C                 |        | [A]   | 630  |  |
|                                                       |        | [A]   | 800  |  |
|                                                       |        | [A]   | 1000 |  |
|                                                       |        | [A]   | 1250 |  |
|                                                       |        | [A]   | 1600 |  |
|                                                       |        | [A]   |      |  |
| Neutral pole current-carrying capacity for 4-pole CBs |        | [%Iu] | 100  |  |
| Rated short-time withstand current Icw                | (1s)   | [kA]  | 25   |  |
|                                                       | (3s)   | [kA]  | 25   |  |
| Rated short-circuit making capacity (peak value) Icm  | 1000 V | [kA]  | 53   |  |
|                                                       | 1150 V | [kA]  | 53   |  |

### SACE Emax 2

### E1.2

|                                                                                                 |           |                     |        |      |      |  |
|-------------------------------------------------------------------------------------------------|-----------|---------------------|--------|------|------|--|
| Mechanical and electrical life with regular ordinary maintenance prescribed by the manufacturer |           | [Iu]                | < 1000 | 1000 | 1600 |  |
|                                                                                                 |           | [No. cycles x 1000] | 20     | 20   | 20   |  |
|                                                                                                 | Frequency | [Oper./Hour]        | 60     | 60   | 60   |  |
| Electrical life                                                                                 | 1150 V    | [No. cycles x 1000] | 1      | 1    | 1    |  |
|                                                                                                 | Frequency | [Oper./Hour]        | 30     | 30   | 30   |  |



1SDC200425F001



1SDC200430F001



1SDC200431F001

| E2.2   | E4.2   | E6.2     |
|--------|--------|----------|
| H/E MS | H/E MS | X/E MS   |
| 800    | 3200   | 4000     |
| 1000   | 4000   | 5000     |
| 1250   |        | 6300     |
| 1600   |        |          |
| 2000   |        |          |
| 2500   |        |          |
| 100    | 100    | 50 - 100 |
| 30     | 50     | 65       |
| 30     | 30     | 65       |
| 53     | 105    | 143      |
| 53     | 105    | 143      |

| E2.2   | E4.2   | E6.2 |
|--------|--------|------|
| < 2000 | < 3200 | 4000 |
| 2000   | 3200   | 5000 |
| 2500   | 4000   | 6300 |
| 25     | 20     | 12   |
| 60     | 60     | 60   |
| 2      | 1      | 1    |
| 30     | 20     | 10   |

# SACE Emax 2 Switch-disconnectors for applications up to 1000V DC

ABB SACE extends its solutions to applications in direct current with a range of switch-disconnectors for applications up to 1000V, which comply with the international IEC60947-3 standard.

For all applications in which integrated protection is requested in addition to isolation, ABB SACE offers SACE Emax automatic circuit-breakers with PR122/DC and PR123/DC. For further information, please refer to the technical catalogue "SACE Emax DC. Low voltage air circuit-breakers for direct current applications".

## Common data

|                                      |      |                      |
|--------------------------------------|------|----------------------|
| Rated service voltage Ue             | [V]  | 750 (3p) / 1000 (4p) |
| Rated insulation voltage Ui          | [V]  | 1000                 |
| Rated impulse withstand voltage Uimp | [kV] | 12                   |
| Number of poles                      |      | 3- 4                 |
| Version                              |      | Fixed - Withdrawable |
| Suitable for isolation according to  |      | IEC 60947-3          |



## SACE Emax 2

### E1.2

### Performance levels

### N/DC MS

|                                                      |        |      |      |      |      |
|------------------------------------------------------|--------|------|------|------|------|
| Rated uninterrupted current Iu @ 40°C                |        | [A]  | 800  |      |      |
|                                                      |        | [A]  | 1250 |      |      |
|                                                      |        | [A]  |      |      |      |
|                                                      |        | [A]  |      |      |      |
|                                                      |        | [A]  |      |      |      |
|                                                      |        | [A]  |      |      |      |
| Poles                                                |        |      | 3    | 4    | 4    |
| Rated service voltage Ue                             |        |      | 750  | 750  | 1000 |
| Rated insulation voltage Ui                          |        |      | 1000 | 1000 | 1000 |
| Rated short-time withstand current Icw               | (1s)   | [kA] | 20   | 25   | 20   |
| Rated short-circuit making capacity (peak value) Icm | 750 V  | [kA] | 40   | 53   | 40   |
|                                                      | 1000 V | [kA] |      |      | 40   |
| Utilization category (according to IEC 60947-3)      |        |      |      |      |      |

## SACE Emax 2

### E1.2

|                                                                                                 |           |                     |        |      |  |
|-------------------------------------------------------------------------------------------------|-----------|---------------------|--------|------|--|
| Mechanical and electrical life with regular ordinary maintenance prescribed by the manufacturer |           | [lu]                | < 1000 | 1250 |  |
|                                                                                                 |           | [No. cycles x 1000] | 20     | 20   |  |
|                                                                                                 | Frequency | [Oper./Hour]        | 60     | 60   |  |
| Electrical life                                                                                 | 1000 V    | [No. cycles x 1000] | 1      | 1    |  |
|                                                                                                 | Frequency | [Oper./Hour]        |        |      |  |

Note: by means of external protection relay with 500 ms maximum timing, the breaking capacity Icu at the maximum rated use voltage is equal to the value of Icw (1s).



1SDC200425F001



1SDC200430F001



1SDC200431F001

| E2.2    |      |      | E4.2    |      |      | E6.2    |      |      |
|---------|------|------|---------|------|------|---------|------|------|
| S/DC MS |      |      | H/DC MS |      |      | X/DC MS |      |      |
| 1250    |      |      | 1250    |      |      | 4000    |      |      |
| 1600    |      |      | 1600    |      |      | 5000    |      |      |
| 2000    |      |      | 2000    |      |      | 6300    |      |      |
| 2500    |      |      | 2500    |      |      |         |      |      |
|         |      |      | 3200    |      |      |         |      |      |
|         |      |      | 4000    |      |      |         |      |      |
| 3       | 4    | 4    | 3       | 4    | 4    | 3       | 4    | 4    |
| 750     | 750  | 1000 | 750     | 750  | 1000 | 750     | 750  | 1000 |
| 1000    | 1000 | 1000 | 1000    | 1000 | 1000 | 1000    | 1000 | 1000 |
| 25      | 40   | 25   | 40      | 50   | 40   | 65      | 65   | 65   |
| 53      | 84   | 53   | 84      | 105  | 84   | 143     | 143  | 143  |
|         |      | 53   |         |      | 84   |         |      | 143  |

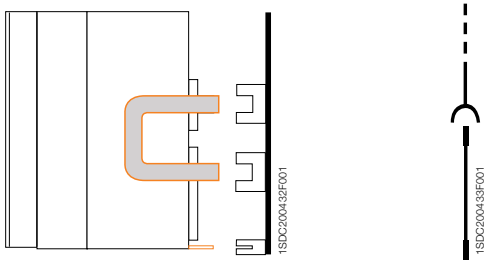
| E2.2   |      |      | E4.2   |      |      | E6.2 |      |      |
|--------|------|------|--------|------|------|------|------|------|
| < 2000 | 2000 | 2500 | < 3200 | 3200 | 4000 | 4000 | 5000 | 6300 |
| 25     | 25   | 20   | 20     | 20   | 15   | 12   | 12   | 12   |
| 60     | 60   | 60   | 60     | 60   | 60   | 60   | 60   | 60   |
| 2      | 2    | 2    | 1      | 1    | 1    | 1    | 1    | 1    |

# SACE Emax 2 derived versions

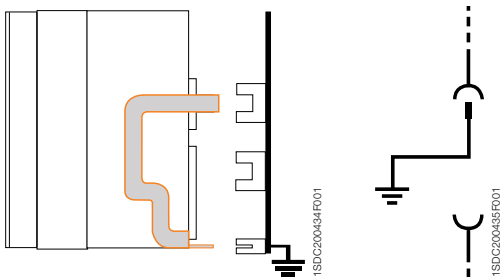
Safety is an indispensable requirement that must always be guaranteed in electrical installations. In this regard, ABB SACE offers devices developed to further increase safety standards during inspection and maintenance activities on electrical installations.

In particular, in a withdrawable version, ABB SACE Emax 2 offers:

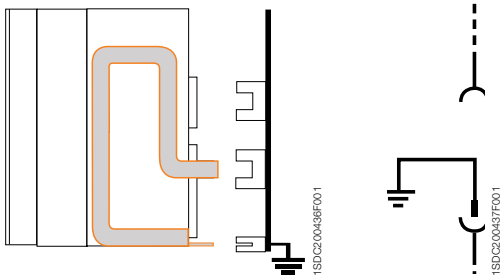
2



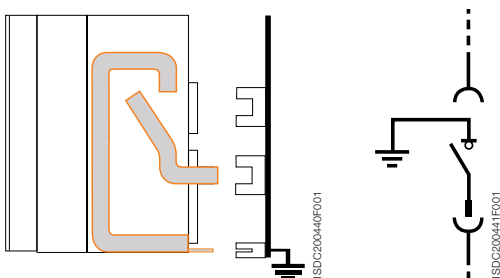
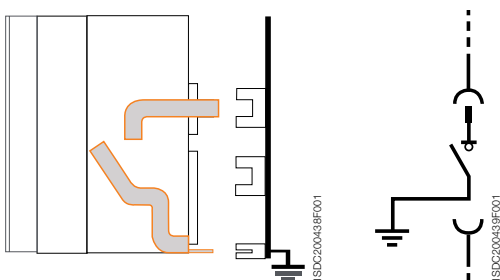
- **Sectionalizing truck CS:** in normal operating conditions of the electrical circuit, this device is inserted in the fixed part and short-circuits the upper and lower terminals of the power circuit. When maintenance activities need to be carried out, the sectionalizing truck is removed and the part of the system involved is isolated. The device can be accessorised with a keylock and padlocks for locking in the withdrawn position.



- **Earthing truck MT:** this device enables all phases of the electrical circuit in which maintenance needs to be performed to be earthed <sup>1)</sup>. The earthing truck is available in two versions: for earth connection from the upper or lower terminals.



- **Earthing switch with making capacity MTP:** similar to the MT device, this differs due to the presence of a mechanical stored energy control which allows the circuit to be opened and closed. Two versions of this earthing switch are also available: for earth connection from the upper or lower terminals. It can also be accessorised with a keylock or padlocks for locking in the open position.



<sup>1)</sup> The earthing circuit is dimensioned for a short-time current equal to 60% of the maximum Icw of the circuit-breaker from which it is derived (IEC 60439-1)

### Common data

|                                                  |      |              |
|--------------------------------------------------|------|--------------|
| Rated service voltage U <sub>e</sub>             | [V]  | 690          |
| Rated insulation voltage U <sub>i</sub>          | [V]  | 1000         |
| Rated impulse withstand voltage U <sub>imp</sub> | [kV] | 12           |
| Frequency                                        | [Hz] | 50 - 60      |
| Number of poles                                  |      | 3 - 4        |
| Version                                          |      | Withdrawable |

| SACE Emax 2                                                  | E2.2 |      |      | E4.2 |      |      | E6.2   |        |        |
|--------------------------------------------------------------|------|------|------|------|------|------|--------|--------|--------|
| Performance levels                                           | CS   | MT   | MTP  | CS   | MT   | MTP  | CS     | MT     | MTP    |
| Rated uninterrupted current I <sub>u</sub> @ 40°C            | 2500 | 2500 | 2500 | 4000 | 4000 | 4000 | 6300   | 6300   | 6300   |
| Neutral pole current-carrying capacity for 4-pole CBs        | 100  | 100  | 100  | 100  | 100  | 100  | 50-100 | 50-100 | 50-100 |
| Rated short-time withstand current I <sub>cw</sub> (1s) [kA] | -    | 30   | 30   | -    | 50   | 50   | -      | 50     | 50     |

### Other versions

Corrosive substances, vibrations, shocks or very low temperatures can be present in particular applications. In this regard, SACE Emax 2 circuit-breakers offer specific solutions developed precisely for:

- **Aggressive environments**, such as industrial processes for paper production, oil refining or water treatment, which are subject to high levels of sulphur dioxide (SO<sub>2</sub>) and hydrogen sulphide (H<sub>2</sub>S) contamination.
- **Antiseismic installations**, for areas with seismic risk where industrial and civil activities take place and where the continuity of critical processes must be guaranteed even in the case of particular natural events.

For further detail, please contact ABB SACE.



# Protection trip units

|                                                     |      |
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# Protection trip units

## Introduction

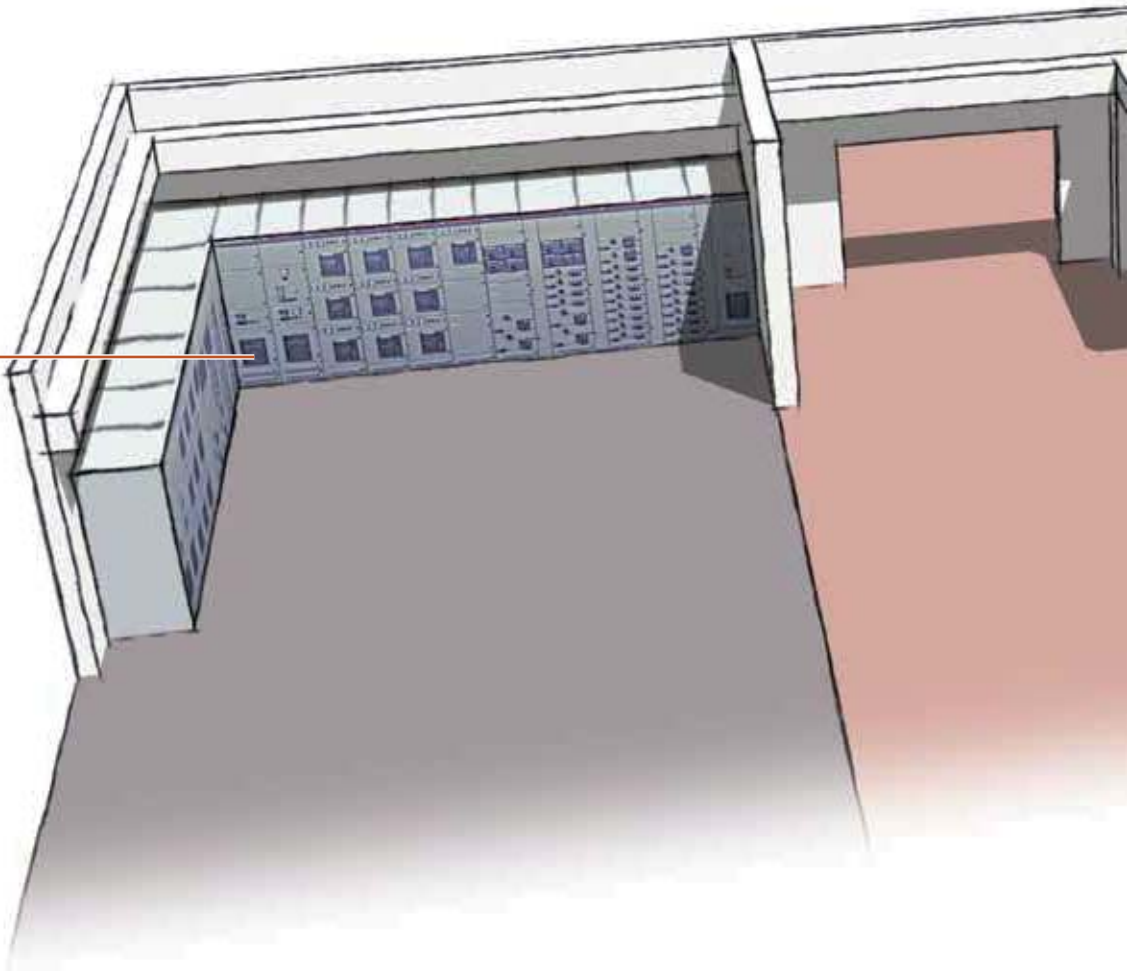
The SACE Emax 2 Ekip protection trip units are the new benchmark for the protection, measurement and control of low voltage electrical systems. The result of ABB SACE's experience and research, they make Emax 2 not only a circuit-breaker, but an actual Power Manager with all the functions necessary for optimal management of the system without the need for external devices.

3 The protection units are divided into two families: Ekip for distribution protection and Ekip G for generator protection. The range of trip units is available with three levels of performance, Dip, Touch and Hi-Touch, to satisfy simple to advanced applications. Exclusive functions such as the Ekip Power Controller and Network Analyzer complete the range, enabling power management and analysis of energy quality. The complete, flexible Ekip protection trip unit offering, which can be adapted to the actual level of protection required, is shown below:

|                 | Fields of applications | Measurement and Protection of Current | Measurement of Voltage, Power, Energy | Measurement and Protection of Voltage, Power, Energy | Network Analyzer | Power Control              |
|-----------------|------------------------|---------------------------------------|---------------------------------------|------------------------------------------------------|------------------|----------------------------|
| Ekip Dip        | Distribution           | with Ekip Multimeter                  | –                                     | –                                                    | –                | –                          |
| Ekip Touch      |                        | •                                     | with Ekip Measuring                   | with Ekip Measuring Pro                              | –                | with Ekip Power Controller |
| Ekip Hi-Touch   |                        | •                                     | •                                     | •                                                    | •                |                            |
| Ekip G Touch    | Generators             | •                                     | •                                     | •                                                    | –                | with Ekip Power Controller |
| Ekip G Hi-Touch |                        | •                                     | •                                     | •                                                    | •                |                            |



Ekip Power Controller function monitors installation loads and generators, permitting the power consumed to be limited and allowing savings on electricity bills.

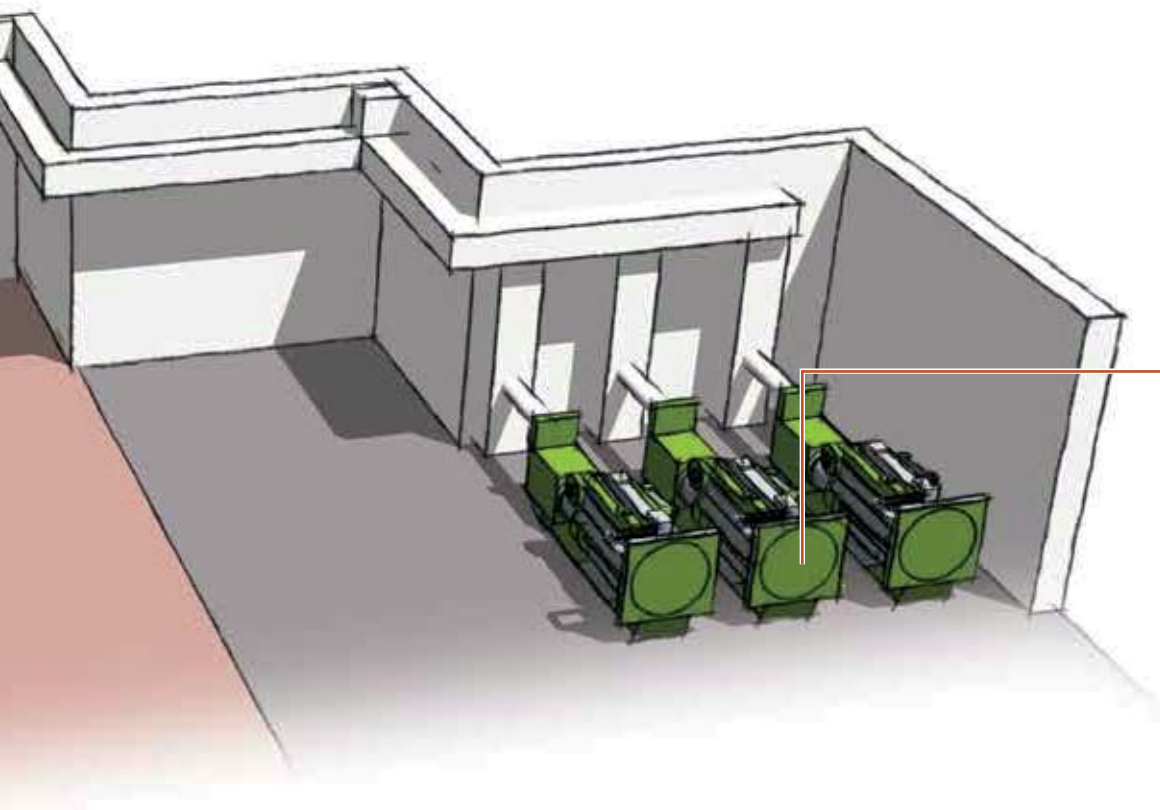


The **protection units for power distribution**, available in the LI, LSI and LSI G versions, are suited to all distribution systems. The Ekip trip units are designed to protect a vast range of applications, such as use with transformers, motors and drives. Ekip Dip, Ekip Touch or Ekip Hi-Touch can be selected, depending on the complexity of the system, the need to take voltage or energy measurements or to include control systems in switchgear.

Ekip G enables the **protection of generators** without the use of external devices that require dedicated relays and wiring. Ekip G increases efficiency from the design stage to installation, minimizing the time needed for realization and commissioning of the system, and ensuring high levels of accuracy and reliability of all protection devices required for running generators in applications such as naval, GenSet or cogeneration.

**Ekip Power Controller** is the new function that controls the power absorbed, thereby increasing the efficiency of the system. This ABB SACE patented function measures power and energy but also controls, without the use of complex external automation logic, loads and generators in order to optimize the power consumed.

Thanks to the **Network Analyzer** function integrated in all Hi-Touch versions, the quality of energy in terms of harmonics, micro-interruptions or voltage dips is monitored without the need for dedicated instrumentation. This allows effective preventive and corrective action to be implemented through accurate analysis of the faults, thereby improving the efficiency of the system.



Ekip G enables the protection of generators without the use of external devices that require dedicated relays and wiring.

# Protection trip units

## Architecture

All SACE Emax 2 circuit-breakers are equipped with protection trip units that are interchangeable from the front with just a few, simple operations by the customer. There is no need to dismantle the circuit-breaker or access any internal or sensitive parts.

3

This enables personalization of the functions available, even during commissioning or when the circuit-breaker has already been installed. In particular, SACE Ekip consists of:

- **Protection trip unit**, available with different interfaces and versions that range from basic to more complete; it contains a latest generation microprocessor that performs all the functions of protection and control.
- **Ekip Measuring Module**, connected internally to Emax 2, performs voltage, power and energy measurements with high accuracy without requiring any external connection or voltage transformer. The Ekip Measuring Pro version also performs all protection functions based on voltage and power without the need for external units, thereby simplifying design and construction of the system.
- **Interchangeable rating plug** enables all protection thresholds to be adjusted according to the rated current, increasing flexibility for the customer. It is useful in installations that are prepared for future development or in cases in which the power supplied may be limited temporarily.
- **Main board** is the mechanical housing of the trip unit, which includes a micro-controller for measuring currents and the self-protection functions. The separation of trip units ensures excellent reliability and immunity to conducted and radiated emissions. Integrated new generation Rogowski sensors, which are sensitive to the true r.m.s. value of the current, guarantee high accuracy of both measurements and protection.



All protection trip units of the SACE Emax 2 family are self-powered by current that crosses the circuit-breaker. They guarantee excellent reliability due to a system of self-control of internal connections. The setting, testing and downloading of reports can be carried out directly from a Smartphone, Tablet or PC.

In addition, the commissioning stage can be further accelerated, minimizing the possibility of errors, by directly configuring the protection trip unit with the DOC design software settings.

Cartridge-type modules that are easily installed on-board enable the units to be integrated into the most complex systems. Additional functions can be created, such as:

- **Synchrocheck**, to check the synchronization of the two half-busbars before enabling circuit-breaker closing;
- Communication with all **supervision systems** available in the Modbus, Profibus and DeviceNet™ protocols as well as the modern Modbus TCP, Profinet and EtherNet/IP™ protocols;
- **Integration into Smart Grids** thanks to the possibility of communicating without the assistance of any external converter, according to standards (IEC 61850) already in use in the automation systems of high and medium voltage substations;
- Multi-voltage **supply module**, which enables the protection trip unit and modules present to be supplied with any auxiliary voltage available in direct or alternating current;
- Programmable logic management with **Ekip Signalling** modules that make a high number of electrical input and output contacts;
- Logical interlocks between circuit-breakers, which can be made with the **Ekip Link** proprietary communication protocol, avoiding complex wiring thanks to the transmission of all signals via bus.



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# Protection trip units for power distribution

## Ekip Dip

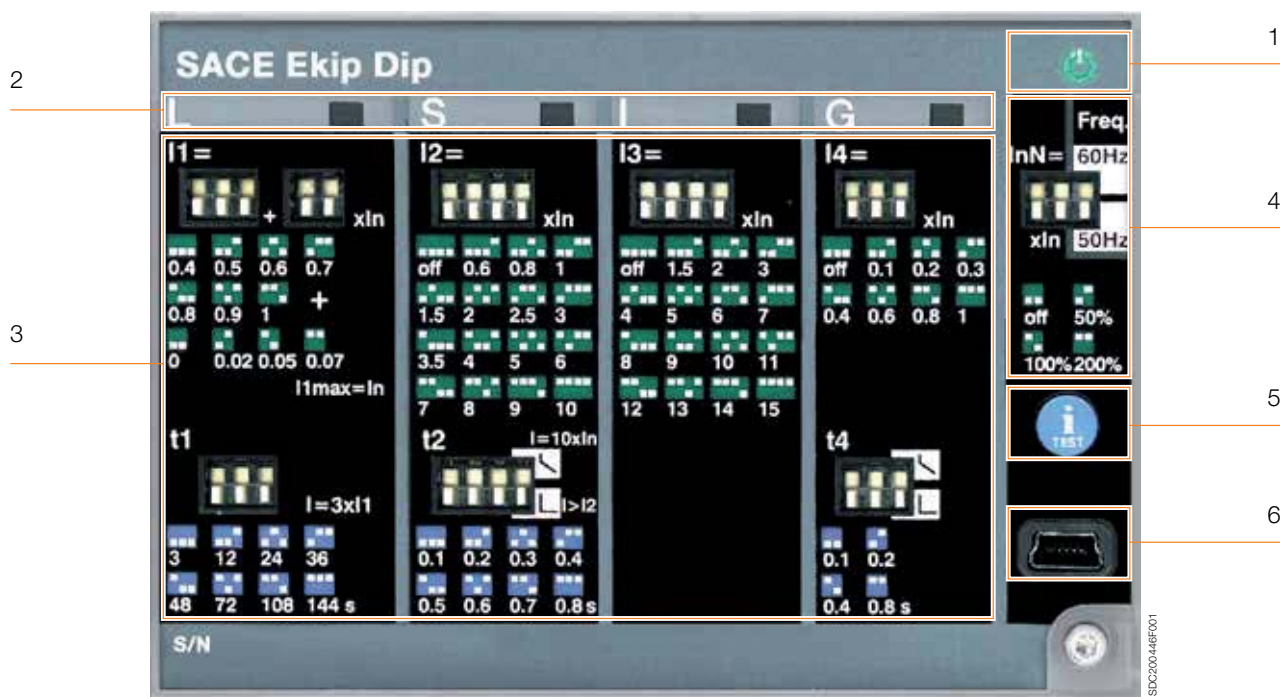
### Characteristics

Ekip Dip is the new protection trip unit of the SACE Emax 2 family for all applications in which high accuracy and reliable protection against overcurrent are required. Ekip Dip offers a complete set of standard protection functions. Dedicated LEDs allow the fault that caused tripping to be determined.

3

The unit is available in the following versions:

- Ekip Dip LI
- Ekip Dip LSI
- Ekip Dip LSIG

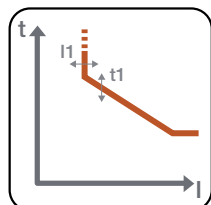


#### Key:

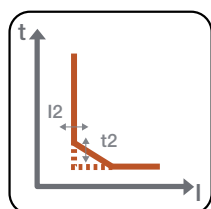
1. Power-on LED for signalling correct operation (watchdog)
2. LEDs for alarm signalling of L, S, I and G protection functions and diagnostics
3. Dip switches for setting the protection functions
4. Dip switches for setting the network frequency and neutral protection device
5. Pushbutton for test and for indicating the cause of tripping
6. Test and programming connector

## Protection functions

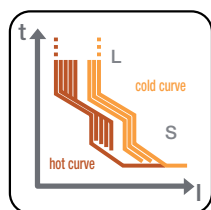
Ekip Dip offers overcurrent protection functions and, in the event of tripping, controls the opening of the circuit-breaker, preventing it from closing again unless it has been reset by the operator (lockout device – code ANSI 86).



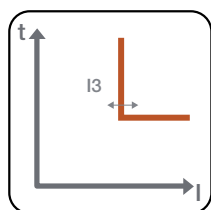
**Overload (L - ANSI 49):** with inverse long-time delay trip of the type  $t = k/I^2$  available with 25 current thresholds and 8 curves, it provides effective protection of all systems. A pre-alarm warning is also available on reaching 90% of the threshold set.



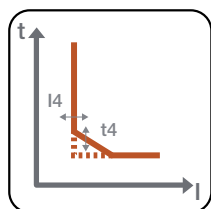
**Time-delayed overcurrent (S - ANSI 51 & 50TD):** with constant tripping time ( $t = k$ ), or with constant specific let-through energy ( $t = k/I^2$ ), it provides 15 current thresholds and 8 curves, for fine adjustment. The function can be excluded by setting the dip switch combination to "OFF".



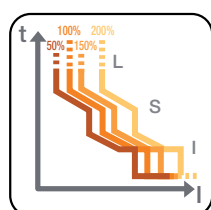
**Thermal memory:** for L and S protection functions, this is used to protect components, such as transformers, from overheating following an overload. The function, which can be enabled by the Ekip Connect software, adjusts the protection tripping time according to the length of time that has elapsed since the first overload, taking into account the amount of heat generated.



**Instantaneous overcurrent (I - ANSI 50):** with tripping curve without intentional delay, it offers 15 tripping thresholds and can be excluded by setting the dip switch combination to "OFF".



**Earth fault (G - ANSI 51N & 50NTD):** with tripping time independent of current ( $t = k$ ) or constant specific let-through energy ( $t = k/I^2$ ). The function can be excluded by setting the dip switch combination to "OFF".



**Neutral protection:** available at 50%, 100% or 200% of the phase currents, or disabled, it is applied to the overcurrent protections L, S and I.

# Protection trip units for power distribution

## Ekip Dip

### Measurements

The Ekip Dip unit measures phase and neutral current with great accuracy: 1% including the current transformers in the 0.2 ... 1.2 In range (class 1 in accordance with IEC 61557-12). Using the current sensors in the circuit-breaker and without the need to install an external measuring system, it is possible to view the measurements by the display on the front of the Ekip Multimeter and Ekip Control Panel.

Ekip Dip also records the characteristics of the circuit-breaker, to enable a rapid analysis in the event of maintenance:

- Maximum and average current values per phase;
- Date, time, fault current per phase and type of protection tripped over the last 30 trips;
- Date, time and type of operation of the last 200 events (for example: opening/closing of circuit-breaker, pre-alarms, editing settings);
- Number of mechanical and electric operations of the circuit-breaker;
- Total operating time;
- Contact wear;
- Date and time of the last maintenance carried out, in addition to the estimate of the next maintenance required;
- Circuit-breaker identifying data: type, serial number, firmware version, name of the device as assigned by the user.

The values can be displayed on the front of the Ekip Multimeter or Ekip Control Panel or by Ekip Connect software on a Smartphone, Tablet or PC by using the communication units Ekip T&P or Ekip Bluetooth.

### Watchdog

All the protection trip units of the SACE Emax 2 family ensure high reliability owing to an electronic circuit that periodically controls the continuity of the internal connections, such as trip coil, rating plug and each current sensor (Ansi 74). In the event of a malfunction, the LEDs indicate the corresponding alarm to enable the fault to be identified rapidly. Furthermore, Ekip Dip detects and indicates that the circuit-breaker has been opened because one of the protection functions has been tripped (Ansi BF code). In order to preserve the correct operation of the unit, Ekip Dip is also provided with self-protection against abnormal temperature (OT) inside the protection trip unit. The user can set it to open the circuit-breaker or to merely indicate an alarm.

### User interface

Ekip offers a great variety of thresholds and trip times, the protections can be set by dip-switches. Up to 5 LEDs are also available (depending on the version) to indicate correct operation or alarms. The interface always enables the status of the installation to be identified clearly and quickly:

- correct operation (green LED)
- overcurrent pre-alarms or alarms
- presence of self-control functions alarms
- maintenance interval expired
- indication of tripped protection after a fault

The protection tripped indication is activated by pressing the iTest key, and operates without the need of an external power supply because a battery is installed inside the unit.

### Communication

The Ekip Bluetooth wireless communication unit enables the operator to interact with the protection trip unit by computer, Smartphone or Tablet. In fact, the free Ekip Connect software for Smartphones, Tablets and PC, enables measurements and fault data to be read and alarm status and information on the circuit-breaker or maintenance to be displayed. It is also possible to set parameters such as date, time and thermal memory and for the records to be reset.

### Test function

The test port on the front of the protection trip unit can be used to run the circuit-breaker tests by connecting one of the following devices:

- Ekip TT supply the trip units to perform: trip test, the LEDs test and check absence of alarms detected by the watchdog function;
- Ekip T&P to permit not only the trip test and LEDs test but also to run the test of the individual protection functions and save the relative report;
- ITest key that is pressed to run the battery test when the circuit-breaker is disconnected.

### Supply

The Ekip Dip protection trip unit does not require an external supply for the protection functions or for the alarm indication functions because it is self-supplied by the current sensors installed on the circuit-breaker. A three-phase 100A current suffices to activate the LED indications.

The Ekip Supply module enables an auxiliary supply to be easily connected and is able to receive both a direct current supply (24-48V DC or 110-240V DC) and an alternating current (110-240V AC) to activate additional functions such as:

- G protection at values below 100A or below 0.2 In;
- connecting to external devices such as Ekip Multimeter and Ekip Control Panel;
- recording the number of operations.

The Ekip Dip protection trip unit also has a battery that enables the indication of the cause of the fault to be viewed for an unlimited time after tripping. In addition to that, the battery enables date and time to be maintained and updated, thus ensuring the chronology of the events. On the other hand, when the unit is switched off, the battery test can be run by simply pressing the iTest key.

| Supply                          | Ekip Supply    |                |
|---------------------------------|----------------|----------------|
| Nominal voltage                 | 24-48V DC      | 110-240V AC/DC |
| Voltage range                   | 21.5 - 53V DC  | 105-265V AC/DC |
| Rated power (including modules) | 10W max.       | 10W max.       |
| Inrush current                  | ~10 A for 5 ms | ~10 A for 5 ms |

Whenever cartridge modules are not used in the terminal box area, the trip unit can be supplied by means of a galvanically isolated 24V DC auxiliary voltage.

# Protection trip units for power distribution

## Ekip Touch

### Characteristics

Ekip Touch is the new protection trip unit for SACE Emax 2 that provides a complete series of protections and high accuracy measurements of all electric parameters and can be integrated perfectly with the most common automation and supervision systems.

3 The simple and intuitive interface enables the operator to access all the information and settings rapidly and easily by minimizing installation and commissioning time.

The unit is available in the versions:

- Ekip Touch LI
- Ekip Touch LSI
- Ekip Touch LSIG

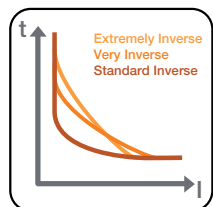


#### Key:

- |                                                          |                                                     |
|----------------------------------------------------------|-----------------------------------------------------|
| 1. Wide high-resolution colour touchscreen display       | 4. Alarm LED                                        |
| 2. Power-on LED to indicate correct operation (watchdog) | 5. Home pushbutton to return to home page           |
| 3. Pre-alarm LED                                         | 6. Pushbutton for test and indicating cause of trip |
|                                                          | 7. Test and programming connector                   |

## Protection functions

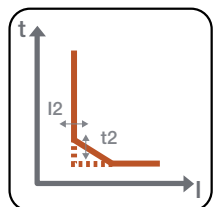
Ekip Touch enables all the protection functions to be set with a few simple steps directly from the wide touchscreen display. If the circuit breaker is tripped it must be reset manually or electrically by the operator (lockout relay – code ANSI 86).



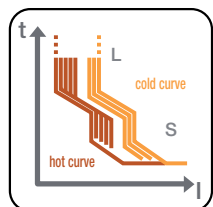
**Overload (L - ANSI 49):** available with three different types of trip curve:

1.  $t = k/I^2$  with inverse long time;
2. IDMT in accordance with 60255-151 for coordination with medium voltage protections, that are available according to the Standard Inverse (SI), Very Inverse (VI) and Extremely Inverse (EI) curves;
3. with  $t = k/I^4$  curve for better coordination with upstream circuit-breakers or with fuses.

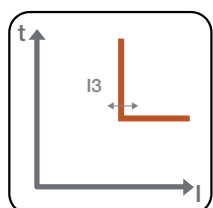
The thresholds can be fine tuned (for example 1A for circuit-breaker E1.2 1000A) and the timings to the second can be set directly from the display. The settable pre-alarm indicates the set threshold is reached before the protection is tripped. The protection can be disabled by rating plug L=off.



**Time-delayed overcurrent (S - ANSI 51 & 50TD):** with constant trip time ( $t = k$ ), or constant specific let-through energy ( $t = k/I^2$ ).

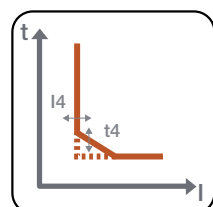


**Thermal memory:** for protections L and S it is used to protect the components, such as transformers, against overheating following overloads. The protection adjusts the trip time of the protection according to how much time has elapsed after the first overload, taking account of the overheating caused.

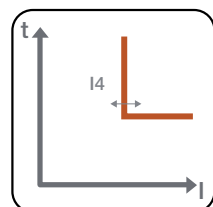


**Instantaneous overcurrent (I - ANSI 50):** with trip curve without intentional delay.

**Closing on short-circuit (MCR):** the protection uses the same algorithm of the protection I, limiting operation to a settable time window from the closing of the circuit-breaker. The protection can be disabled, also alternatively to protection I. The function is active with an auxiliary supply.



**Earth fault (G - ANSI 51N & 50NTD):** with trip time independent of the current ( $t = k$ ) or with constant specific let-through energy ( $t = k/I^2$ ). A pre-alarm indication is also available when 90% of the threshold is reached to activate corrective measures before the protection is tripped. The function also enables the trip to be excluded so that only the alarm is indicated, for use in installations where continuity of service is an essential requirement.

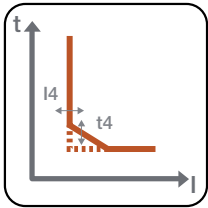


**Instantaneous Earth Fault (G-ANSI 50N):** with trip curve without instantaneous delay.

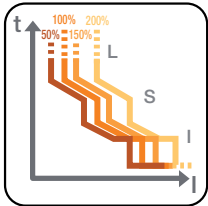
# Protection trip units for power distribution

## Ekip Touch

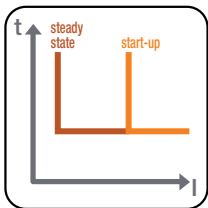
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**Earth fault on toroid (G ext - ANSI 51G & 50GTD):** with trip time independent of the current ( $t = k$ ) or with constant specific let-through energy ( $t = k/I^2$ ). Pre-alarm that 90% threshold has been reached permit the fault to be reported to supervision systems without interruption of continuity. The protection uses the external toroid installed, for example, on the star centre of the transformer, and is an alternative to the G and Rc functions. The function is active with an auxiliary supply.

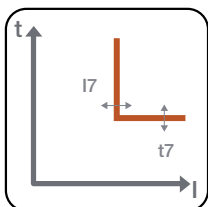


**Neutral protection:** available at 50%, 100%, 150% or 200% of the phase currents, or disabled, it is applied to the overcurrent protections L, S and I.

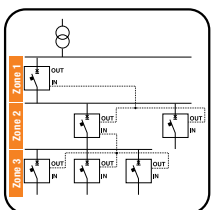


**Start-up function:** enables protections S, I and G to operate with higher trip thresholds during the starting phase, avoiding untimely trips due to high inrush currents of certain loads (motors, transformers, lamps). The starting phase lasts 100 ms to 30 s and is recognized automatically by the trip unit:

- at the closing of the circuit-breaker with a self-supplied trip unit;
- when the peak value of the maximum current exceeds the set threshold ( $0.1 \dots 10 \times I_n$ ) with an externally supplied trip unit; a new start-up is possible after the current falls below the threshold.



**Current unbalance (IU - ANSI 46):** with constant trip time ( $t = k$ ), protects from an unbalance between the currents of the single phases protected by the circuit-breaker.



**Zone selectivity for S and G protection (ANSI 68):** can be used to minimize circuit-breaker trip times closer to the fault. The protection is provided by connecting all the zone selectivity outputs of the trip units belonging to the same zone and taking this signal to the trip unit input that is immediately upstream. Each circuit-breaker that detects a fault reports it to the circuit-breaker upstream; the circuit-breaker thus detects the fault but does not receive any communication from those downstream and opens without waiting for the set delay to elapse. It is possible to enable zone selectivity if the fixed-time curve has been selected and the auxiliary supply is present.

**Current thresholds:** this function enables the realization of four independent thresholds to be indicated in order to enable corrective action implementation before the overload L protection trips the circuit-breaker. For example, by disconnecting loads located downstream of the circuit-breaker that are controlled by Ekip Signalling.

**Power Controller:** Power controller function (optional) with Ekip Measuring module.

## Protection functions with Ekip Measuring Pro

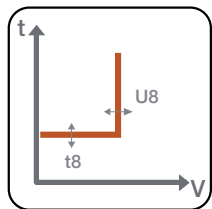


The Ekip Touch protection functions can be further increased by using the Ekip Measuring Pro measuring and protection module. With this module, all the protection functions linked to voltage, frequency and power can be enabled, thus making Ekip Touch a multifunction unit that can measure, control and protect even the most complex installation.

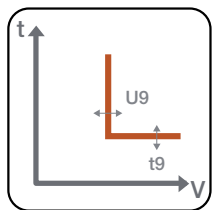
A different operating mode can be chosen for each protection function:

1. Active: protection enabled by opening of the circuit-breaker when the threshold is reached;
2. Only alarm: protection active, with only alarm indication when the threshold is reached;
3. Deactivated: protection disabled.

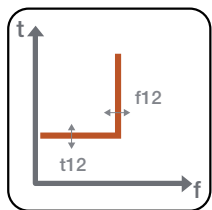
Furthermore, when the voltage and frequency protections are activated, they indicate an alarm status even when the circuit-breaker is open so that a fault can be identified before the circuit-breaker closes.



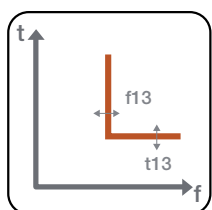
**Undervoltage (UV - ANSI 27):** with constant trip time ( $t = k$ ), function is tripped when phase voltage falls below set threshold.



**Overvoltage (OV - ANSI 59):** with constant trip time ( $t = k$ ), function is tripped when phase voltage exceeds the set threshold.



**Underfrequency (UF - ANSI 81L):** with constant trip time ( $t = k$ ), function is tripped when network frequency falls below set threshold.

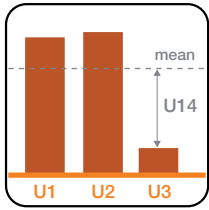


**Overfrequency (OF - ANSI 81H):** with constant trip time ( $t = k$ ), function is tripped when network frequency exceeds the set threshold.

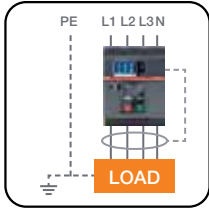
# Protection trip units for power distribution

## Ekip Touch

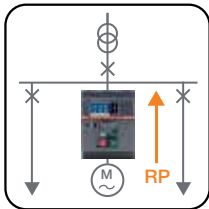
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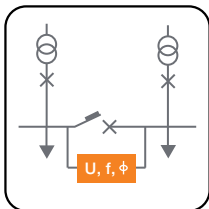
**Voltage unbalance (VU – ANSI 47):** with constant trip time ( $t = k$ ), protects against an unbalance between the voltages of the individual phases that are protected by the circuit-breaker.



**Residual current (Rc – ANSI 64 & 50NDT):** with constant temperature ( $t=k$ ) protects against indirect contacts and is integrated into Ekip Touch LSIG with Ekip Measuring Pro by a dedicated residual current rating plug and external toroid. The protection is an alternative to the functions G and Gext.



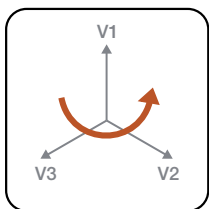
**Reverse active power (RP - ANSI 32R):** with constant trip time ( $t = k$ ), function is tripped when total active power – in the opposite direction of the current – exceeds the set threshold.



**Synchrocheck (SC - ANSI 25):** the synchronism control function compares the voltages in the module, the frequency and phase of the two circuits to which the circuit-breaker is connected. Ekip Touch indicates that conditions have been reached that enable the two lines to be made parallel. The function is available with two work modes:

- In systems with both busbars supplied, where synchronism is determined by:
  1. voltage of the two half-busbars above the  $U_{live}$  threshold for the set time
  2. difference of the module of the two voltages below the threshold  $\Delta U$
  3. difference of the frequency of the two voltages below the threshold  $\Delta f$
  4. difference of the phase of the two voltages below the threshold  $\Delta \Phi$
  5. desirable time for synchronism condition  $t_{syn}$
  6. circuit-breaker open
- In systems with an out-of-service line (dead busbar), where the synchronism condition is determined by the concurrence of the following conditions for the  $t_{ref}$  set time:
  1. voltage of the active half-busbar above threshold  $U_{live}$
  2. voltage of the dead half-busbar below threshold  $U_{dead}$
  3. circuit-breaker open

In both cases, synchronism consent is withdrawn when one of the above conditions is missing and it has not been less than 200ms from the change of the circuit-breaker condition (when the relationship has been set). The indication of reached synchronism is available directly as an electrical indication via a contact that is always supplied with the module. The function can be activated simply by connecting the Ekip Synchrocheck module to any Ekip Touch provided with an Ekip Measuring Pro module.



**Cyclical direction of the phases (ANSI 47):** indicates an alarm through inversion of the phases sequence.

**Power factor (ANSI 78):** available with a three-phase threshold, warns when the system operates with a power factor that is less than the set power factor.

## Measurements



### Measurements and meters

All versions of the Ekip Touch unit measure the RMS value of the currents of the three phases (L1, L2, L3) and of neutral (Ne) with 1% accuracy in the 0.2 to 1.2 In range (class 1 in accordance with IEC 61557-12). The complete range of measurement is from 0.03 to 16x In, where In is the value of the rating plug. The display shows the current of the most loaded phase both in numeric and analogue format on an ammeter with a 0-125% In scale for rapid identification of the load of the circuit-breaker.



Alternatively, bar graphs that show the currents of the three phases and of neutral on a 0-125% In scale in addition to the numeric value of the most loaded phase can be selected as the default page. The bar graphs are yellow in the event of a pre-alarm and red in the event of an overload to enable an irregular condition to be identified immediately.

Where applicable, the measurement of the earth fault current is shown on a dedicated page. The ammeter can operate both in self-supplied mode and with auxiliary voltage. In the latter case, the display always has back lighting and the ammeter is also active at currents below 100A.



Adding the Ekip Measuring or Ekip Measuring Pro module to Ekip Touch enables Ekip Touch to be used as a multimeter to measure the values of:

- Voltage: phase-phase, phase-neutral (accuracy 0.5%);
- Power: active, reactive, apparent (accuracy 2%);
- Energy: active, reactive, apparent (accuracy 2%);
- Frequency (accuracy 0.2%);
- Power factor by phase and total;
- Peak factor.

### Maximum values and values register

The Ekip Touch unit is able to supply the measurement trend of certain parameters over a settable period of time such as: average power, maximum power, maximum and minimum current, maximum and minimum voltage. The values of the last 24 time intervals are recorded in the unit with a relative timestamp and can be consulted directly from the display or remotely using one of the available communication protocols. The communication can also be used to synchronize the recording time interval.

### Data logger

Ekip Touch is always supplied with the exclusive Data Logger (register) function that stores with high sampling frequency the instantaneous values of all the measurements in two memory buffer registers. The data can be easily downloaded by the Ekip Connect unit and transferred to any personal computer. This enables the current and voltage waveforms to be analyzed for rapid fault analysis. The function continuously stores and stops recording, with a selectable delay, whenever the event set by the user occurs (e.g. trip or alarm). In this manner, it is possible to analyze the complete evolution of the fault: from the start to its complete elimination.

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### Information on trip and opening data

If a trip occurs, Ekip Touch stores all the information that is required for rapid identification and elimination of the causes:

- Protection tripped
- Opening data (current, voltage or frequency)
- Time-stamping (data, time and consecutive opening number)

If the iTest key is pressed, the trip unit displays all these data directly on the display. No auxiliary supply is required. The information is also available to the user with the circuit-breaker open or without current flow, due to the battery installed inside the unit.



### Maintenance indicators

A complete set of information about the circuit-breaker and its operation is available for effective fault analysis and preventive scheduling of maintenance. All the information can be seen from the display or from a PC using a communication unit. In particular:

- Date, time, fault current by phase and type of protection tripped over the last 30 trips;
- Date, time and type of operation of the last 200 events (example: opening/closing of circuit-breaker, pre-alarms, editing of settings, ect.);
- Number of operations of the circuit-breaker: divided into mechanical operations (no current), electrical operations (with current) and protection function (trip);
- Contact wear estimated in function of the number and type of openings;
- Total operating time of the circuit-breaker with circulating current;
- Date and time of the last maintenance session, scheduling of the next maintenance session;
- Circuit-breaker identifying data: type, serial number, firmware version, device name assigned by the user.

All the information can be viewed directly from the display and from a Smartphone, Tablet (with Ekip Bluetooth) or PC using the front port of the trip unit or the system communication.

### Watchdog

All of the trip units in the SACE Emax 2 family ensure high reliability because of an electronic circuit that periodically controls continuity of the internal connections, such as trip coil, rating plug and each current sensor (Ansi 74). In the event of an alarm, a message is shown on the display, and if it is set during the installation phase, the trip unit can command the opening of the circuit-breaker. If a protection function intervenes, Ekip Touch always checks that the circuit-breaker has been opened by auxiliary contacts that indicate the position of the main contacts. Otherwise, Ekip Touch indicates an alarm (ANSI BF code - Breaker Failure) to be used to command the opening of the circuit-breaker located upstream.

Ekip also contains self-protection that preserves the correct operation of the unit against abnormal temperatures (OT) inside the protection trip unit. The user disposes of the following indications or controls:

- “Warning” LED for temperature below  $-20^{\circ}\text{C}$  or above  $+70^{\circ}\text{C}$ , at which the trip unit operates correctly with the display switched off
- “Alarm” LED for temperature outside the operating range, at which the trip unit commands the opening of the circuit-breaker (if set during the configuration phase).

### User interface



All Ekip Touch operations are simple and intuitive due to the wide graphic colour touchscreen display. For example, all the main information is listed on one page (settable by default), thus enabling the state of the installation to be identified rapidly: maximum current, maximum voltage, active, reactive, apparent power and energy. In addition, the use of Ekip Touch is further simplified by the possibility of scrolling through the menu and reading the alarms in one of the languages that can be set directly from the display: Italian, English, German, French, Spanish, Portuguese, Chinese, Russian, Turkish and Thai.

The home pushbutton enables you to return, at any moment, to the main page and the iTest key enables the information to be viewed after a circuit-breaker trip and test.

As in the previous generation of trip units, a password system is used to manage “Read” or “Edit” modes. The default password, 00001, can be edited by the user. The protection parameters (curve and trip thresholds) are settable in “Edit” mode whereas it is always possible to consult the information in “Read” mode.



On the front of the trip unit there are also two LEDs: a pre-alarm LED (square yellow LED) and an alarm LED (red triangular LED); a message on the display always accompanies the flashing of the LEDs for clear identification of the type of event. The list of all the alarms active at that moment can be viewed by simply touching the display on the white strip in the bottom left of the alarms zone.

Ekip Touch is also supplied with a front port that permits a temporary connection to devices for test, supply or communication (for example Ekip T&P).

# Protection trip units for power distribution

## Ekip Touch

### Communication

Communication modules that can be installed inside the circuit-breaker enable Ekip Touch to be integrated into the most modern supervision systems with protocols:

- IEC 61850
- Modbus TCP
- Modbus RS-485
- Profibus
- Profinet
- DeviceNet™
- EtherNet/IP™

The integration into communication systems enables measurements, statuses and alarms to be programmed and viewed by remote functions. If the circuit-breaker has to be opened and closed remotely, the Ekip Com Actuator module can be installed in the circuit-breaker front, in the right-hand accessories chamber.

For each circuit-breaker, several communication modules with different protocols can be used simultaneously; for example, this enables the circuit-breaker to be connected to the Ekip link system to obtain local supervision from the front of the switchgear and to simultaneously integrate it into a communication network. In addition, for applications requiring very high reliability, up to two modules of the same protocol can be inserted by use of the redundant version that enables two different addresses to communicate on the same bus.

### Test function

For circuit-breaker testing it is possible to use the test port and the iTest key positioned on the front of the protection trip unit. The available functions are:

- trip test, test of the display and of the LEDs and check of absence of alarms detected by the watchdog function using Ekip TT (always supplied with Ekip Touch);
- test of the single protection functions and saving of the report, in addition to the trip test and test of the display, using Ekip T&P;
- test of the battery with the circuit-breaker switched off by pressing the iTest key.

## Supply

The Ekip Touch protection trip unit is self-supplied by the current sensors and does not require an external supply for the basic protection functions or for the alarm indication functions. All protection settings are stored in a non-volatile memory that maintains the information, even without a power supply. To activate the indication functions the ammeter and the display, a 100A three-phase current suffices.

An auxiliary supply can easily be connected. The Ekip Supply module can be connected to supplies of both direct current and alternating current to activate additional functions such as:

- using the unit with circuit-breaker open;
- using additional modules such as Ekip Signalling and Ekip Com;
- connection to external devices such as Ekip Multimeter and Ekip Control Panel;
- recording the number of operations;
- G protection with values below 100A or below 0.2 In;
- zone selectivity;
- Gext and MCR protection functions.

| Supply                          | Ekip Supply    |                |
|---------------------------------|----------------|----------------|
| Nominal voltage                 | 24-48V DC      | 110-240V AC/DC |
| Voltage range                   | 21.5-53V DC    | 105-265V AC/DC |
| Rated power (including modules) | 10W max.       | 10W max.       |
| Inrush current                  | ~10 A for 5 ms | ~10 A for 5 ms |

The Ekip Supply module allows the cartridge modules to be used in the terminal box area. Otherwise, the trip unit can be supplied by means of a galvanically isolated 24V DC auxiliary voltage.

The Ekip Measuring Pro module can supply the Ekip Touch trip unit with line voltage above 85V. In addition, if the module is installed with voltage pick-ups on the supply side, the trip unit can be used even if the circuit-breaker is open.

The Ekip Touch protection trip unit is also supplied with a battery that enables the cause of the fault to be indicated after a trip, without a time limit. In addition, the battery enables date and time to be updated, thus ensuring the chronology of the events. When Ekip Touch is operating, it uses an internal control circuit to indicate automatically that the battery is flat. On the other hand, when the unit is switched off the battery test can be run by simply pressing the iTest key.

# Protection trip units for power distribution

## Ekip Hi-Touch

### Characteristics

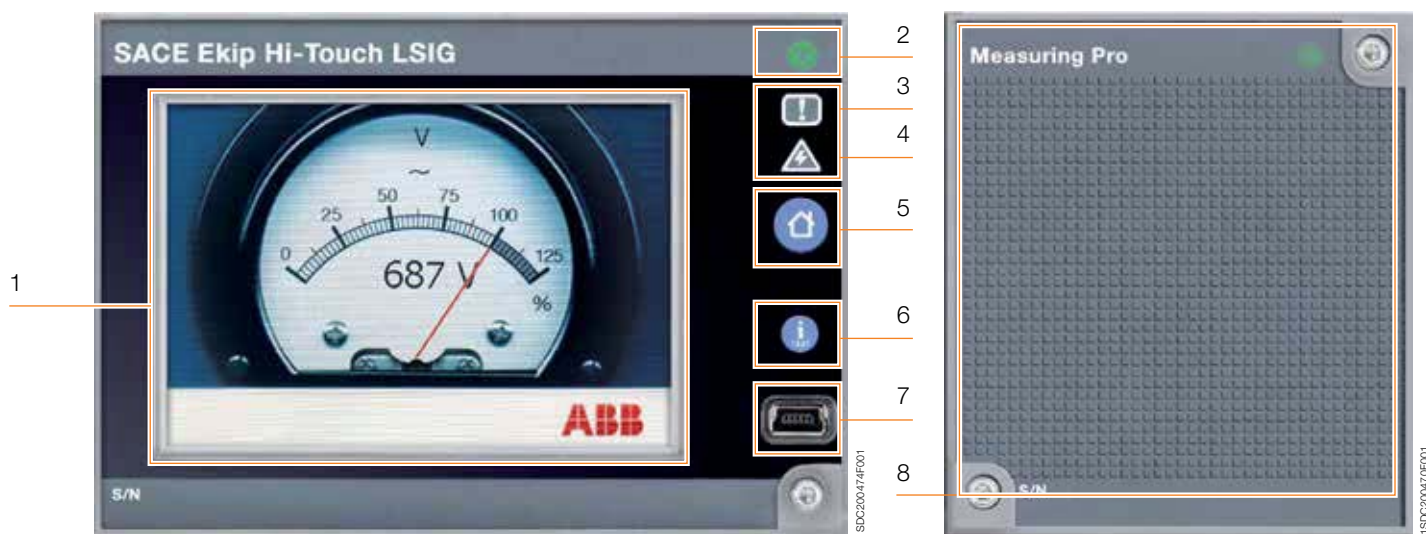
The Ekip Hi-Touch of SACE Emax 2 is a high-performance multifunction unit that is extraordinarily versatile and can be used in even the most complex installations. Ekip Hi-Touch, in fact, features exclusive functions such as: directional protection, restricted earth fault and dual setting of the protections. In addition, Ekip Hi-Touch is supplied with the exclusive Network Analyzer function that can monitor the quality of the power absorbed by the installation in accordance with existing standards.

Ekip Hi-Touch boasts all the features of Ekip Touch; as standard, it features the measuring and protection module Ekip Measuring Pro and can also be fitted, like Ekip Touch, with the additional features provided by the internal modules and by the external accessories.

The front interface of the unit, which is common to Ekip Touch, is extremely simply because of the touchscreen colour display; it is able to show measurements, bar graphs and sine curves of the different electrical values.

The unit is available in the versions:

- Ekip Hi-Touch LSI
- Ekip Hi-Touch LSIG



#### Key:

1. Wide high-resolution colour touchscreen display
2. Power-on LED indicating correct operation
3. Pre-alarm LED
4. Alarm LED
5. Home pushbutton to return to home page
6. Pushbutton for test and for indicating cause of the trip
7. Test and programming connector
8. Ekip Measuring Pro module, with relative LED power on

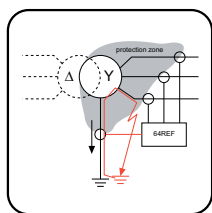
### Protection functions

The Ekip Hi-Touch trip unit has the following protection functions, which it shares with Ekip Touch:

- Overload (L – ANSI 49);
- Time-delayed overcurrent (S – ANSI 51 & 50TD);
- Thermal memory;
- Instantaneous overcurrent (I – ANSI 50);
- Closing on short-circuit (MCR);
- Earth fault (G – ANSI 51N & 50NTD);
- Instantaneous Earth Fault (G – ANSI 50N);
- Earth fault on toroid (G ext – ANSI 51G & 50GTD);
- Neutral protection;
- Start-up function;
- Zone selectivity for functions S and G (ANSI 68);
- Current unbalance (IU – ANSI 46);
- Undervoltage (UV – ANSI 27);
- Overvoltage (OV – ANSI 59);
- Underfrequency (UF – ANSI 81L);
- Overfrequency (OF – ANSI 81H);
- Voltage unbalance (VU – ANSI 47);
- Residual current (Rc – ANSI 64 & 50NTD);
- Reverse active power (RP – ANSI 32R);
- Synchrocheck (SC – ANSI 25, optional);
- Cyclical direction of the phases (ANSI 47);
- Power factor (ANSI 78);
- Current thresholds;
- Power Controller function (optional).

The following protections are also available:

**Second time-delayed overcurrent protection (S2 – ANSI 50TD):** in addition to the standard protection S, a second (excludible) time-constant protection is available that enables two independent thresholds to be set in order to ensure precise selectivity, especially in highly critical conditions.



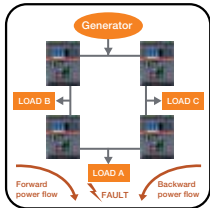
**Second protection against earth fault (ANSI 50GTD/51G & 64REF):** whereas with Ekip Touch the user has to choose between implementation of the protection G by internal current sensors (calculating the vector sum of the currents) or G ext external toroids (direct measurement of the earth fault current), Ekip Hi-Touch offers the exclusive feature of simultaneous management of both configurations by two independent earth fault protection curves. Owing to this characteristic, the trip unit is able to distinguish a non-restricted earth fault and then activate the opening of Emax 2, from a restricted earth fault, and to thus command the opening of the medium voltage circuit-breaker.

Another possible configuration is with the residual current protection replacing the Gext protection, whilst the G protection remains active. The residual current protection is activated in the presence of the residual current rating-plug and of the toroid.

# Protection trip units for power distribution

## Ekip Hi-Touch

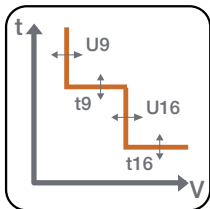
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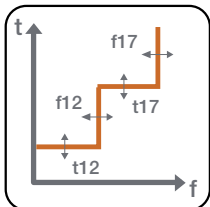
**Directional overcurrent (D – ANSI 67):** the protection is able to recognize the direction of the current during the fault period and thus detect if the fault is upstream or downstream of the circuit-breaker. The protection, with fixed time trip curve ( $t=k$ ), intervenes with two different time delays ( $t_{7bw}$  and  $t_{7fw}$ ), according to the current direction. In ring distribution systems, this enables the distribution portion to be identified in which the fault occurred and to disconnect it while maintaining the operation of the rest of the installation.

**Zone selectivity for protection D (ANSI 68):** enables the possibility to connect circuit-breakers among them, that in case of fault rapidly isolate the fault area, disconnecting the installation only at the level nearest to the fault, maintaining the operation of the rest of the installation. The function is particularly useful in ring and grid installations where, in addition to the zone, it is also essential to define the flow direction of the power that supplies the fault. It is possible to enable directional zone selectivity alternatively to the zone selectivity of the protections S and G, and in the presence of an auxiliary supply.

**Start-up function for protection D:** enables higher trip thresholds to be set at the outgoing point, as available for protections S, I and G.



**Second protection against undervoltage and overvoltage (UV2 and OV2 – ANSI 27 and 59):** enables two minimum and maximum voltage thresholds to be set with different delays in order to be able to discriminate, for example, between voltage dip transients due to the start-up of a motor and an actual fault.



**Second protection against underfrequency and overfrequency (UF2 and OF2 – ANSI 81L and 87H):** enables two minimum and maximum frequency thresholds to be set simultaneously. For example, only an alarm can be set to be tripped when the first threshold is reached, and the circuit-breaker can be set to be opened when the second threshold is reached.

**Dual setting of protections:** Ekip Hi-Touch can store a set of alternative parameters for all protections. This second series (set B) can replace, if necessary, the default series (set A) by an external control. The control can be given when the network configuration is edited, for example when an emergency source is activated in the system, changing the load capacity and the short-circuit levels. Another typical application is protecting the operator opposite the switchgear against the electric arc. In this case, protection delays are minimized to safeguard the operator (Set A), whereas in the absence of an operator the protections are set to ensure selectivity with the circuit-breakers downstream (Set B). It is possible to activate series B by:

- Digital input available with an Ekip Signalling module;
- Communication network, by means of one of the Ekip Com communication modules;
- Directly from the Ekip Hi-Touch display;
- By a settable internal time, after the circuit-breaker has closed.

## Measurements

The Ekip Hi-Touch trip unit offers a complete series of measurements, common to Ekip Touch:

- Measurements and counters: currents, voltage, power, energy;
- Maximum values and value log;
- Data logger;
- Information on the trip and opening data;
- Maintenance indicators.

Ekip Hi-Touch integrates the exclusive **Network Analyzer** function, which analyzes the quality of energy consumed by the installation, in accordance with the provisions of international standards EN50160 and IEC 61000-4-30, in terms of harmonic content, average value and long or short term changes in voltage. Changes in the quality energy can cause malfunctions in the switchgear and a reduction in their lifespan, as well as increasing losses and reducing the energy efficiency of the installation. It is therefore increasingly important to assess the quality of the energy and the economic impact it has on the productive process, so that the appropriate preventive and corrective actions can be taken. With Ekip Hi-Touch, the causes of an increase in power lost in transformers or motors, or a reduction in the lifespan of cables and capacitors, can be identified without the need to install any external instrumentation.

The Network Analyzer function performs continuous monitoring of the quality of energy, and shows all results through a display or communication module. In particular:

- **Hourly average voltage value:** in accordance with international standards, this must remain within 10% of the rated value, but different limits can be defined according to the needs of the installation. The positive sequence voltage is obtained from the three line voltages and compared with the limits. If the limits are exceeded, Ekip Hi-Touch generates a signalling event. The quantity of these events is stored in a suitable counter. The counter values are available for each of last 7 days, as well as the total. The measures available are the positive and negative sequence voltages and positive and negative sequence currents of the last interval monitored. The time of the calculation of the average values can be set between 5 minutes and 2 hours.
- **Interruptions / short dips in voltage** (voltage interruptions / voltage dip): if the voltage remains below the threshold for more than 40ms, Ekip Hi-Touch generates an event that is counted in a dedicated log. The voltage is monitored on all lines.
- **Short voltage spikes** (voltage transients, spikes): if the voltage exceeds the threshold for 40ms, set for a pre-determined time, Ekip Hi-Touch generates an event that is counted.
- **Slow voltage sags and swells** (voltage sag / voltage swell): when the voltage goes outside the range of acceptable limit values for a time greater than the one set, Ekip Hi-Touch generates an event that is counted. Three values can be configured for voltage sags and two for voltage swells, each of which associated to a time limit: this enables us to verify whether the voltage remains within a curve of values that are acceptable by equipment such as computers. The voltage is monitored on all lines.
- **Voltage unbalances:** if the voltages are not equal or the phase displacements between them are not exactly 120°, an unbalance occurs, which is manifested with a negative sequence voltage value. If this limit exceeds the threshold value set, an event is stored which is counted.
- **Harmonic analysis:** the harmonic content of voltages and currents, measured to the 50th harmonic, as well as the value of total harmonic distortion (THD), is available in real time on the display or through the communication modules. Ekip Hi-Touch also generates an alarm if the THD value or the magnitude of at least one of the harmonics exceeds the values set. The voltage is monitored on all lines and currents on all phases.

All information can be displayed directly on the screen or on a smartphone, tablet or PC using the front port of the trip unit (with Ekip Bluetooth) or installation communication.

## Other functions

Ekip Hi-Touch integrates all the features in terms of user interface, communication, test and supply described for Ekip Touch equipped with Ekip Measuring Pro.

# Protection trip units for generators

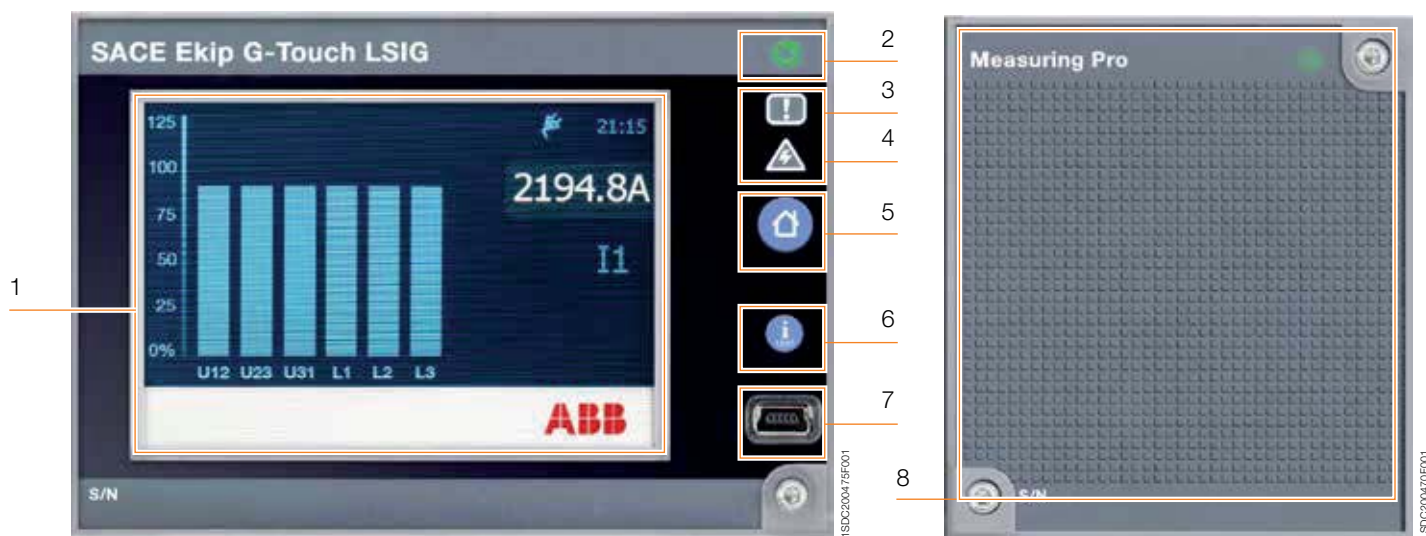
## Ekip G Touch

### Characteristics

Ekip G Touch by SACE Emax 2 is the new protection trip unit designed for use in applications with generators, such as Genset, cogeneration and marine applications, in conformity to international standards IEC 60034-1 and IEEE C37.102. Ekip G Touch has been approved by the main shipping registers and enables the number of components installed, such as external protection devices, current sensors, voltage transformers and the relative cabling, to be reduced. The reductions allow the installation to be significantly simplified. In addition, all the protection functions can be tested individually, using the Ekip T&P device that enables the function to be tested before commissioning.

The unit is available in the Ekip G Touch LSiG version and features all the characteristics provided by Ekip Touch. The Ekip Measuring Pro measuring and protection module is supplied as standard and, like Ekip Touch; the functions can be increased further using the internal modules and the external accessories.

The front interface of the unit, which is common to the Ekip Touch family, is characterised by a wide, high resolution touchscreen display that is simple to use and displays measurements and alarms clearly and accurately.



#### Key:

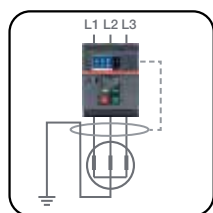
- 1. Wide, high resolution touchscreen display
- 2. Power-on LED indicating correct operation
- 3. Pre-alarm LED
- 4. Alarm LED
- 5. Home pushbutton to return to home page
- 6. Pushbutton for test and for indicating cause of the trip
- 7. Test and programming connector
- 8. Ekip Measuring Pro module with relative power-on LED

### Protection functions

The Ekip G Touch trip unit provides all the protection functions of Ekip Touch and, in addition, provides a series of dedicated generator protections. If Ekip is tripped, it opens the circuit-breaker and prevents it from closing again until it has been reset manually or electrically by the operator (lockout relay – code ANSI 86).

The trip unit is provided with the following protection functions:

- Overload (L – ANSI 49);
- Time-delayed overcurrent (S – ANSI 51 & 50TD);
- Thermal memory;
- Instantaneous overcurrent (I – ANSI 50);
- Closing on short circuit (MCR);
- Earth fault (G – ANSI 51N & 50NTD);
- Instantaneous Earth Fault (G – ANSI 50N);
- Earth fault on toroid (G ext – ANSI 51G & 50GTD)
- Neutral protection;
- Start-up function;
- Zone selectivity for functions S and G (ANSI 68);
- Current unbalance (IU – ANSI 46);
- Undervoltage (UV – ANSI 27);
- Overvoltage (OV – ANSI 59);
- Underfrequency (UF – ANSI 81L);
- Overfrequency (OF – ANSI 81H);
- Voltage unbalance (VU – ANSI 47);
- Differential ground fault (Rc – ANSI 87N);
- Reverse active power (RP – ANSI 32R);
- Synchrocheck (SC – ANSI 25, optional);
- Cyclical direction of phases (ANSI 47);
- Power factor (ANSI 78);
- Current thresholds;
- Power Controller function (optional).



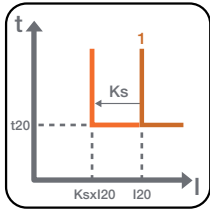
**Differential ground fault (Rc - ANSI 87N):** protects against internal earth fault on generator winding. It is required that the toroid hugs the active conductors and the ground conductor. Rc protection is integrated by a dedicated residual current rating plug and the external toroid.

# Protection trip units for generators

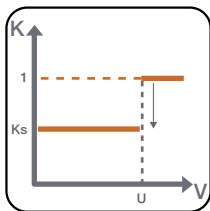
## Ekip G Touch

The specific functions for generator protections are described below, for each of which it is possible to choose the operating mode: active, only alarm or deactivated. All the voltage and frequency protections also operate when the circuit-breaker is open, enabling the fault to be identified before the closing of the circuit-breaker.

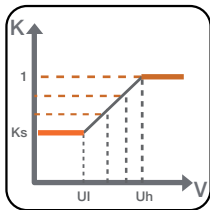
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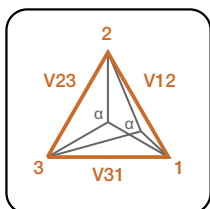
**Voltage controlled overcurrent protection (S(V) - ANSI 51V):** protection from maximum current with constant trip time ( $t = k$ ) that is sensitive to the voltage value. The set current threshold, following a voltage drop, decreases by steps or linearly.



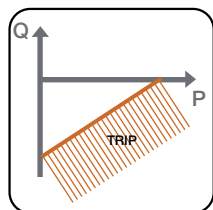
In step mode (controlled mode) the protection is tripped at the set threshold ( $I_{20}$ ) if the voltage is above  $U$ , whereas it is tripped at the lower threshold of the factor  $K_s$  ( $I_{20} * K_s$ ) if the voltage is below  $U$ .



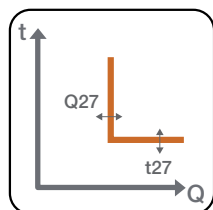
On the other hand, in linear mode (restrained mode) two voltage limits are selected within which the protection is tripped at the set threshold ( $I_{20}$ ) reduced by the factor  $K$  corresponding to the measured voltage. The variation of the factor  $K$  is proportional to the voltage, and for voltages greater than the upper threshold ( $U_h$ ) the threshold  $I_{20}$  works, whereas for voltages below the lower threshold ( $U_l$ ) the minimum threshold ( $I_{20} * K_s$ ) applies.



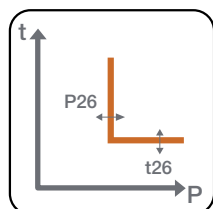
**Residual overvoltage (RV - ANSI 59N):** with constant trip time ( $t = k$ ), protects against insulation loss in systems with insulated neutral or with neutral earthed with impedance.



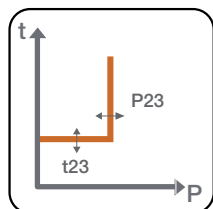
**Loss of field or reverse reactive power (RQ – ANSI 40 or 32RQ):** with constant trip time ( $t = k$ ), is tripped when the total reactive power absorbed by the generator exceeds the set threshold. It is possible to select the constant threshold ( $k=0$ ) or a function of the delivered active power of the generator ( $k \neq 0$ ).



**Reactive overpower (OQ – ANSI 32OF):** with constant trip time ( $t = k$ ), the function is tripped when reactive power exceeds the set threshold in the generator to network direction.



**Active overpower (OP – ANSI 32OF):** with constant trip time ( $t = k$ ), the function is tripped when the active power exceeds the threshold set in the delivering direction of the generator.



**Active underpower (UP – ANSI 32LF):** with constant trip time ( $t = k$ ), the function is tripped when the active power delivered by the generator is lower than the set threshold. It is possible to disable the protection temporarily, to manage the start-up phase, by setting a time window from the closing of the circuit-breaker, by using an electric signal or via incoming communication to a relay.

# Protection trip units for generators

## Ekip G Touch

### Measurements

The Ekip G Touch trip unit provides a complete series of measurements, which are common to Ekip Touch:

- Measurements and meters: currents, voltage, power, energy, frequency;
- Maximum values and values register;
- Data logger;
- Information on trip and opening data;
- Maintenance indicators.

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All the information can be viewed directly from the display of the trip-unit, by means of the external Ekip Multimeter display or by Smartphone, Tablet or PC using the front port of the trip unit (with Ekip Bluetooth) or the system communications.

### Other functions

Ekip G Touch provides the same characteristics in terms of user interface, communication, test and power supply described for Ekip Touch equipped with Ekip Measuring Pro.

# Protection trip units for generators

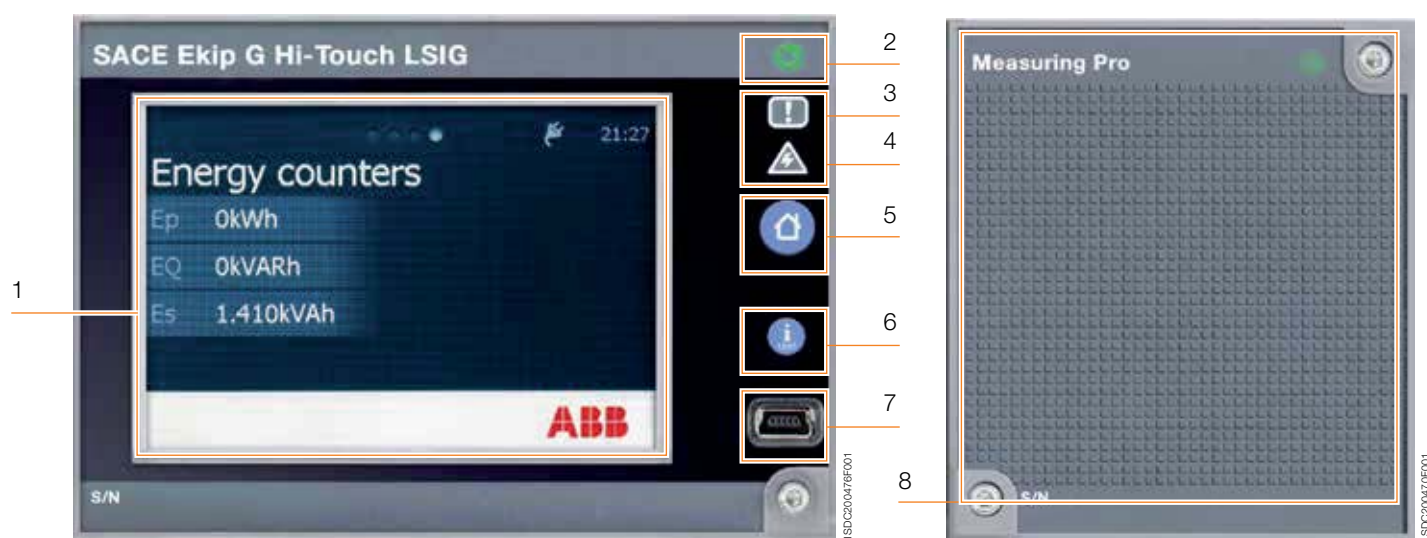
## Ekip G Hi-Touch

### Characteristics

SACE Emax 2's Ekip G Hi-Touch is the new benchmark for the protection of low voltage electric generators. It provides optimum protection, even in complex installations, due to exclusive functions such as protection against frequency creep and maximum directional current.

Ekip G Hi-Touch, like all Hi-Touch trip units, is supplied as standard with the Ekip Measuring Pro measuring and protection module and enables an independent second set of protections to be set. In addition, the Network Analyzer function enables it to monitor the quality of the power delivered by the generator.

Ekip G Hi-Touch is available in the LSIG version and ensures all the protection, measuring and control functions of Ekip Hi-Touch and the specific protections for Ekip G Touch generators. The user interface and the accessories are common to the rest of the family.



#### Key:

1. Wide, high resolution touchscreen display
2. Power-on LED indicating correct operation
3. Pre-alarm LED
4. Alarm LED
5. Home pushbutton to return to home page
6. Pushbutton for test and for indicating cause of the trip
7. Test and programming connector
8. Ekip Measuring Pro module with relative power-on LED

# Protection trip units for generators

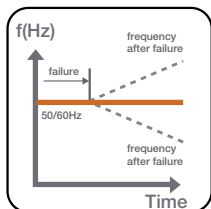
## Ekip G Hi-Touch

### Protection functions

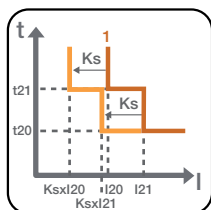
The Ekip G Hi-Touch trip unit is provided with the following protection functions, common to Ekip Hi-Touch:

- Overload (L – ANSI 49);
- Time-delayed overcurrent (S – ANSI 51 & 50TD);
- Time-delayed overcurrent, second threshold (S2 – ANSI 50TD);
- Thermal memory;
- Instantaneous overcurrent (I – ANSI 50);
- Directional overcurrent (D – ANSI 67);
- Voltage controlled overcurrent protection (S(V) – ANSI 51V);
- Closing on short circuit (MCR);
- Earth fault (G – ANSI 51N & 50NTD);
- Second protection against earth fault (ANSI 50GTD/51G & 64REF);
- Earth fault on toroid (Gext – ANSI 51G & 50GTD);
- Neutral protection;
- Start-up function;
- Zone selectivity for functions S and G (ANSI 68);
- Zone selectivity for directional protection D (ANSI 68)
- Start-up function for protection D;
- Current unbalance (IU – ANSI 46);
- Undervoltage (UV – ANSI 27);
- Undervoltage, second threshold (UV2 – ANSI 27);
- Overvoltage (OV – ANSI 59);
- Overvoltage, second threshold (OV2 – ANSI 59);
- Underfrequency (UF – ANSI 81L);
- Underfrequency, second threshold (UF2 – ANSI 81L);
- Overfrequency (OF – ANSI 81H);
- Overfrequency, second threshold (OF2 – ANSI 81H);
- Voltage unbalance (VU – ANSI 47);
- Residual overvoltage (RV – ANSI 59N);
- Differential ground fault (Rc – ANSI 87N);
- Loss of field or reverse reactive power (RQ – ANSI 40 or 32R);
- Reverse active power (RP – ANSI 32R);
- Reactive overpower (OQ – ANSI 32OF);
- Active overpower (OP – ANSI 32OF);
- Active underpower (UP - ANSI 32LF);
- Synchrocheck (SC – ANSI 25, optional);
- Cyclical direction of phases (ANSI 47);
- Power factor (ANSI 78);
- Current thresholds;
- Dual setting of protections;
- Power Controller function (optional).

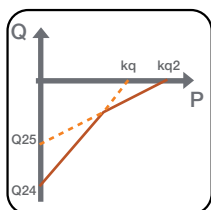
In addition, the following protections are also available:



**Rate of change of frequency (ROCOF – ANSI 81R):** enables both positive and negative frequency variations to be detected rapidly. The protection is constant and is tripped when the frequency variation in Hz/s is greater than the set threshold.



**Second protection against voltage controlled overcurrent protection (S2(V) - ANSI 51V):** available in addition to the protection S(V), enables total selectivity to be achieved in all installations.



**Second protection against loss of field or reverse reactive power (RQ – ANSI 40 or 32R):** enables the generator's de-energization curve to be followed very accurately, thereby avoiding any unnecessary disconnection.

### Measurements

The Ekip G Hi-Touch trip unit provides all the measurements available with Ekip Hi-Touch:

- Network Analyzer, in conformity to EN50160 and IEC 61000-4-30;
- Measurements and meters: currents, voltage, power, energy, frequency;
- Maximum values and values register;
- Data logger;
- Information on trip and opening data;
- Maintenance indicators.

### Other functions

Ekip G Hi-Touch has all the features of Ekip Touch equipped with Ekip Measuring Pro in terms of user interface, communication, test and power supply.

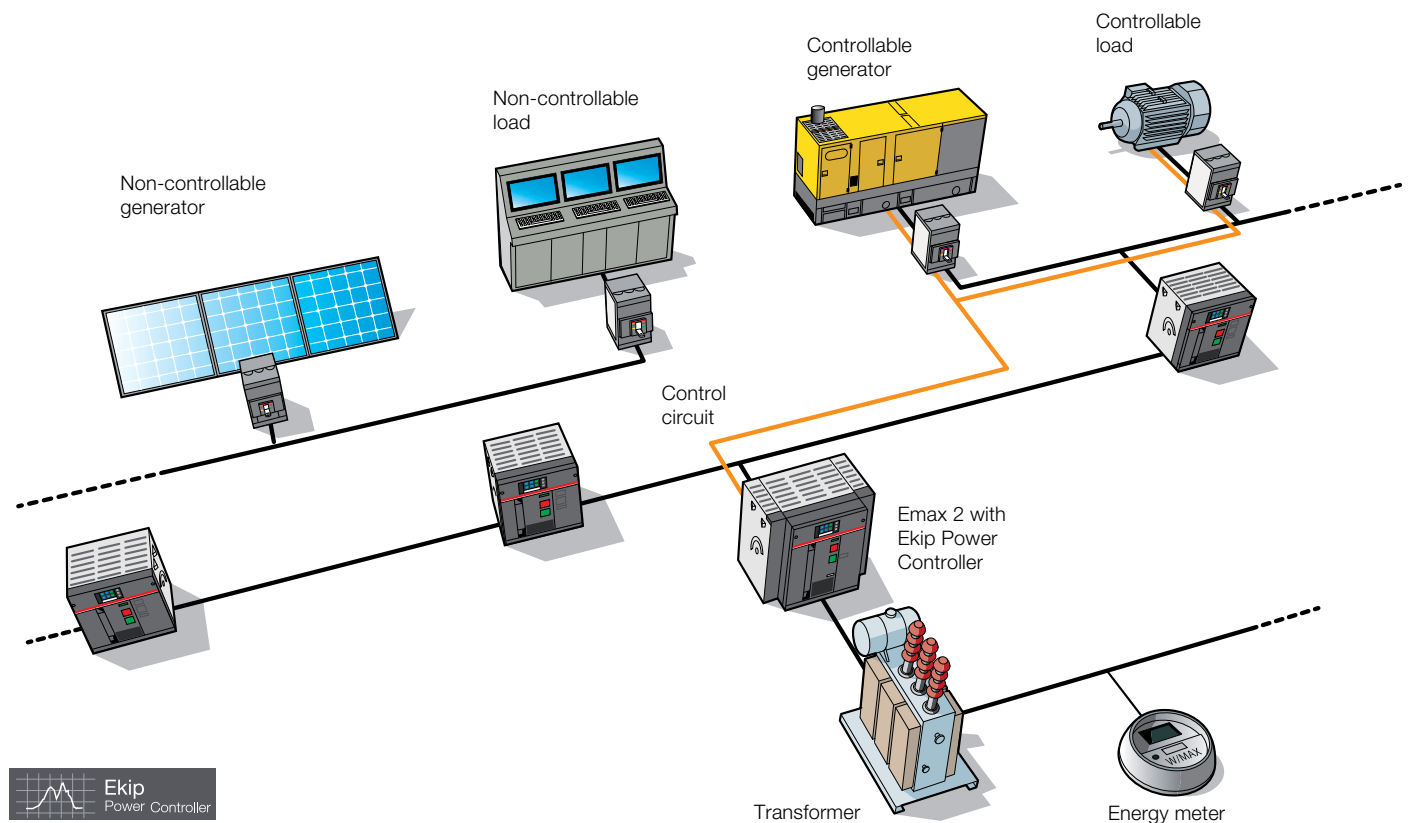
# Protection trip units for power control

## Ekip Power Controller

The exclusive Ekip Power Controller function, patented by ABB and available on new SACE Emax 2 circuit-breakers, monitors installation loads and generators, permitting the power consumed to be limited and allowing savings on electricity bills.

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Ekip Power Controller, which can be used with all Ekip Touch trip units of the Emax 2 series, effectively helps to improve energy efficiency by managing the entire low voltage electrical system. It is, in fact, able to adapt the demand for power according to the availability of the energy source, the time of day and the costs indicated in the current pricing plan. In this way Ekip Power Controller is able to maintain power consumption within the limits defined, thereby optimizing the costs of managing the installation and reducing emissions.



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## Distinctive features

**Reduction of energy costs with minimum impact.** The loads are disconnected from the power supply for short periods, in the minimum number necessary and in a fixed order of priority, enabling power consumption peaks to be limited. This allows the contract drawn up with the energy provider to be renegotiated, reducing the power allocated, with a consequent reduction in total energy costs.

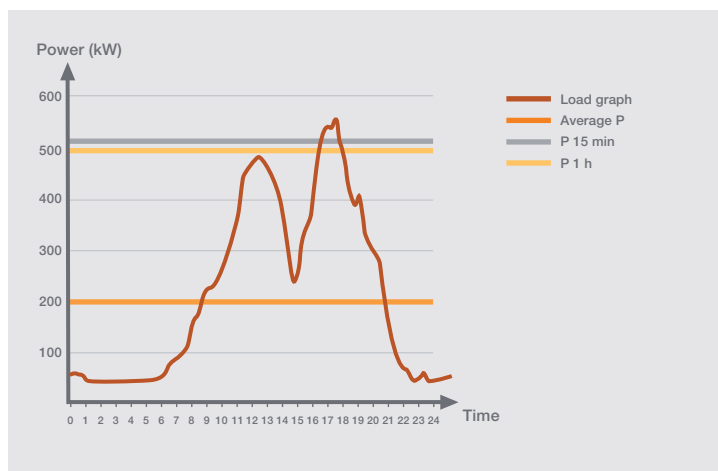
**Power limited only when necessary.** Ekip Power Controller manages up to four different time bands: it is therefore possible to respect a particular power limit according to whether it is during the day (peak) or night (off peak). In this way, consumption during the day when rates are at their highest can be limited.

**Simple to install.** Ekip Power Controller allows the installation to be managed efficiently with a simple architecture. Thanks to a patented design, it is sufficient to measure the total power of the installation without having to measure the power consumed by each load. Installation costs and times are thereby reduced to a minimum.

**Ready to use.** Ekip Power Controller does not require the writing, implementation and testing of complicated programmes for PLC or computer because the logic has already been implemented in the protection unit and is ready to use; it is sufficient to set the installation parameters from a smartphone or directly from the circuit-breaker display.

**Improvement of the efficiency of the electrical system.** Ekip Power Controller significantly helps to flatten the load curve, limiting the use of peaking power plants in favour of base load power plants with greater efficiency.

### Graph of daily load



**Perfect integration into intelligent networks.** Thanks to integrated communication modules, Ekip Power Controller can receive the maximum absorbable power directly from the medium voltage control system, determining consumption for the next 15 minutes. Ekip Power Controller, according to the information received, manages the switching off of non-priority loads or the switching on of reserve generators. Ekip Power Controller gives maximum priority to non-programmable preferred energy sources, such as wind and solar, and they are therefore considered uninterruptable. In the event the production of internal power to the controlled network is reduced, due, for example, to decreased production of solar power, Ekip Power Controller will disconnect the necessary loads to respect the consumption limit set.

**Perfect integration in self-generation systems.** This benefit is used, for example, in installations with a system of cogeneration. Ekip Power Controller controls the total consumption drawn from the electrical network, interrupting non-indispensable loads when production is reduced and reconnecting them when generator power is sufficient to not exceed limits. There are multiple advantages: reduction in energy costs, maximum use of local production and greater overall energy efficiency.

# Protection trip units for power control

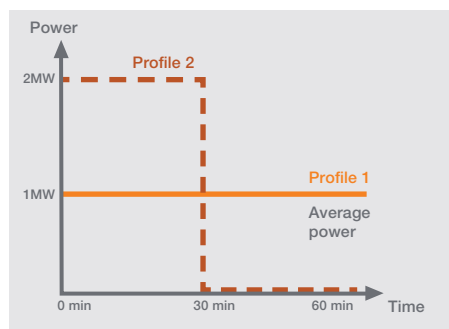
## Ekip Power Controller

### Operating principle

Ekip Power Controller is an advanced system of control in real time that limits the average power consumed in each time range to a maximum, pre-determined value. This is achieved by delaying, only when necessary, the operation of controllable loads, which are then put back into operation as soon as possible without exceeding the limits of power set. In each instance, Ekip Power Controller optimizes the number of deactivated loads on the basis of a determined order of priority, constantly seeking to supply the most extensive part possible of the installation. If controllable generators are present such as, for example, diesel generators, Ekip Power Controller controls their switching on and off to limit the peak of power consumed. The types of loads that can be interrupted for a few minutes with a limited impact are many and vary according to the application, for example:

- industrial ovens, fridges;
- ventilation or air compression systems;
- electric car charging systems;
- electrical air conditioning/heating of corridors, stairways and passageways;
- electric kitchens in hotels/hospitals;
- swimming pool heating systems and circulation pumps.

### The method of calculation



Ekip Power Controller controls the maximum power consumed by the installation, utilizing the same method as that used for fiscal metering, thereby achieving savings on the component connected to maximum power (\$/kW) on electricity bills. The power consumed is calculated by the energy meter as an average value over pre-determined time periods such as, for example, 15 minutes, or even 1 hour. The user therefore pays the same bill both in the event he consumes 1MW continuously (profile 1) or 2MW for 50% of the time and 0MW for the remaining 50% (profile 2), since the average power is the same.

### Estimation of consumption

Ekip Power Controller uses this principle together with a predictive algorithm that estimates, moment by moment, power at the end of the period in order to decide whether to disconnect or connect loads and generators. This enables brief transient requests for high power to be tolerated, such as, for example, the starting up of motors, without causing the disconnection of loads as soon as the power exceeds the threshold set.

The operations of connection and disconnection therefore depend on the consumption from the beginning of the period up to the present moment: for example, if during the first few minutes of the period of reference consumption was very high, Ekip Power Controller will disconnect a greater number of loads in the minutes after; if, on the other hand, the initial consumption was low, it will leave a greater number of loads in operation.

### Management of loads

According to the consumption estimate at the end of the period, Ekip Power Controller will take different actions:

- if the value estimated is greater than the power set as a target, Ekip Power Controller makes the decision to disconnect one of the loads controlled from the power supply, or to connect a generator;
- if the value estimated is equal or slightly less than the average power set as a target, Ekip Power Controller makes the decision to leave the conditions of the controlled loads and generators unchanged;
- if the value estimated is significantly lower than the average power set as a target, Ekip Power Controller makes the decision to reconnect one of the loads controlled to the power supply, or switch off a generator if one or more of these have been switched on previously.

This operation is carried out cyclically each time by calculating a new estimate: therefore, if the estimate of power consumed continues to be too high despite the fact that a load has been disconnected, Ekip Power Controller will proceed to disconnect another and so on, until the power limit is respected. In this way, the number of connected or disconnected loads varies dynamically, and always with the guarantee that only the minimum number needed to respect the power limit are disconnected.

### Priority of loads

If the decision made is to disconnect or re-connect one of the loads controlled, Ekip Power Controller proceeds according to an established order: the load indicated as the first will be that of least importance, or that for which a temporary period of deactivation is acceptable; the load indicated as the second will be the next one in order of importance, and so on. The loads that have been disconnected in that order will be later re-connected in the reverse order, beginning with the load that is most important for the installation. In this way, the impact on the production process can be minimized, limiting the disconnection time for loads of the highest priority. Furthermore, by gradually connecting and disconnecting the loads in order of priority, voltage imbalances and consumption peaks affecting the network are avoided.

### Protection of the installation

Ekip Power Controller can be integrated perfectly into the installation's protection devices. In fact, if one of the controlled circuit-breakers opens due to an overcurrent or by manual operation, Ekip Power Controller considers the load unavailable until the operator resets it, making it available again. In this way, safe operation of the installation is always guaranteed.

# Protection trip units for power control

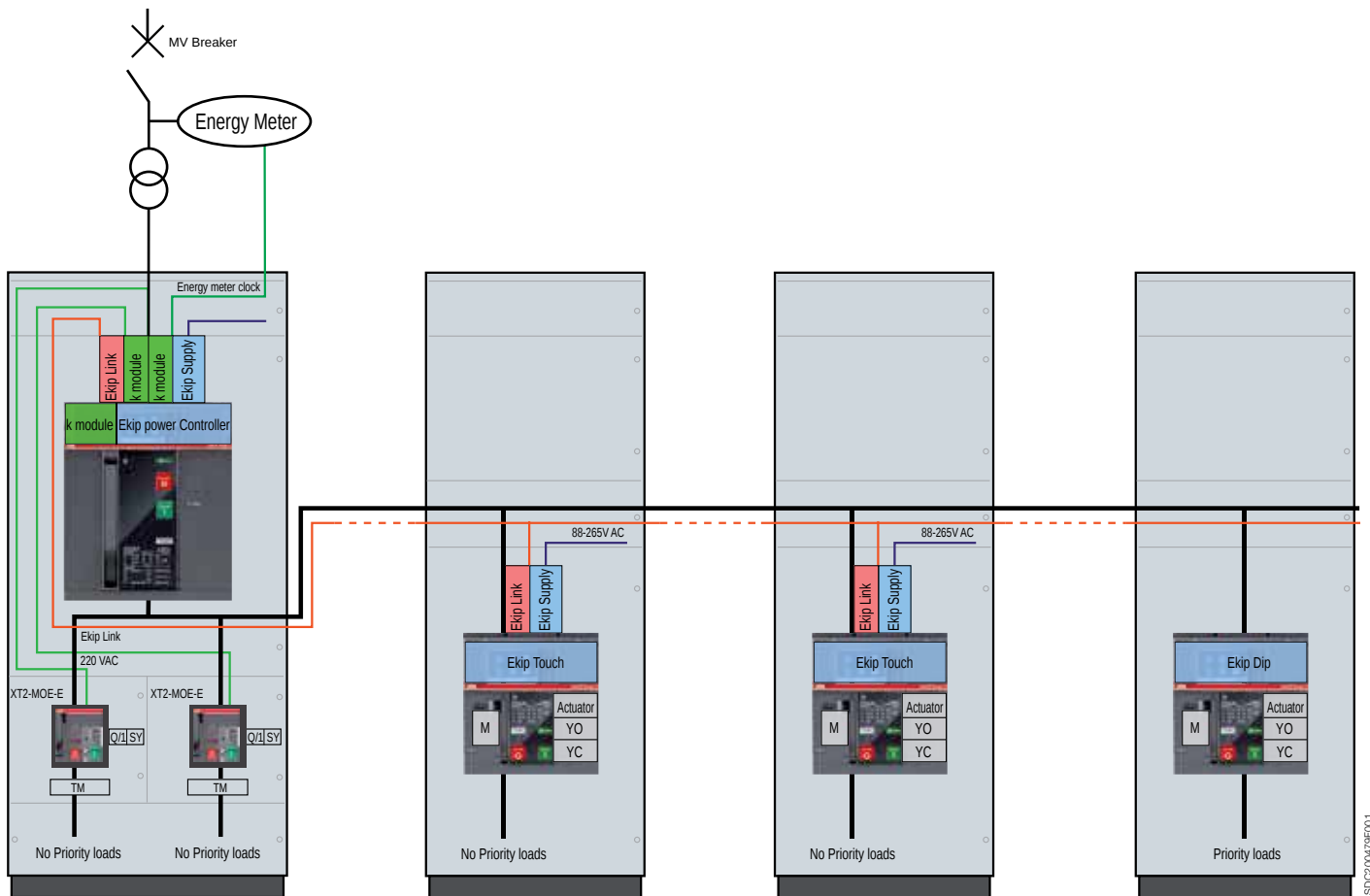
## Ekip Power Controller

### Architecture

Ekip Power Controller is installed on the main low voltage circuit-breaker, immediately downstream of the transformer and energy meter. By using the high precision current and voltage sensors located inside the SACE Emax 2, it is able to measure the average power consumed by the installation, using the same method as that used for fiscal metering, over an established time period. To control this average power, Ekip Power Controller performs controlled opening and closing of the switching devices.

A Power Controller system consists of:

- a SACE Emax 2 circuit-breaker with Ekip Touch protection trip unit equipped with Ekip Power Controller and Ekip Measuring. This circuit-breaker is the power controller and meter and implements the Power Controller function, determining the connection and disconnection of loads;
- up to 15 controlled loads and/or generators. The connection between Ekip Power Controller and users can be achieved:
  - with Ekip Signalling modules for connections inside the same switchboard. This allows circuit-breakers or contactors installed on the power circuit to be commanded directly through available outputs. The opening and closing operations are always carried out in safety due to an input that receives feedback on the state of the device.
  - with Ekip Signalling modules by acting on the generator starting circuit or on the control circuit of the loads. This allows, for example, the consumption of motors powered by drives to be reduced without interrupting the production cycle.
  - with Ekip Link communication modules for installations with circuit-breakers in different switchboards. This enables wiring between switchboards to be simplified to the use of only one EtherNet cable.



In the event that the installation is constructed with a single medium voltage delivery point and two or more transformers in parallel, Ekip Power Controller can acquire, via Ekip Link, the power measurement carried out by the other Emax 2 devices present. In this way the power limit can be respected at the medium voltage measuring point, without having to duplicate the control circuit of the loads.

## Installation

Ekip Power Controller is not only simple to implement and use, it is also very flexible because of parameters which have been specially developed to satisfy the needs of all applications.

### Installation parameters:

- Power limit: this is the average power that Ekip Power Controller respects, which can be selected in kW directly from the display.
- Evaluation window: this is the period in which the distributor of electrical energy evaluates the maximum power, which can be selected within a wide range to respect the local needs of each country.
- Synchronization input: this is used to synchronize the clock inside Ekip with that of the meter. It can also be used to signal a change in band.

### Parameters of the user:

- Type of user: can be selected from among load and generator.
- Minimum disconnection time (T off min): this is the minimum time for which a load or generator is not supplied with power following disconnection. This is useful when you wish to avoid frequent operations on users that are at the top of the priority list. Ekip Power Controller reconnects the load or generator only after the time set has passed.
- Maximum disconnection time (T off max): this is the maximum time for which no power is permitted. It is required, for example, in the case of an oven to keep the temperature within the established limits. When the time has passed, Ekip Power Controller reactivates it automatically, disconnecting, if necessary, a load of a higher priority.
- Minimum connection time (T on min): minimum time for which a load or generator is kept powered following reconnection. It is useful in the event the generator has a minimum time for which it must remain connected. Until the time set has passed, Ekip Power Controller will not disconnect the load, connecting, if necessary, loads of a higher priority.
- Time window: this is the hours in the day when a load or generator can be operated. It is useful, for example, in the case of a canteen that cannot be disconnected during meal times, or a diesel generator that can not be operated at night due to noise pollution.
- Temporary unavailability: a user can be temporarily deactivated, for example, because it is undergoing maintenance, through the circuit-breaker display or digital input connected to a manual/automatic selector. The digital input can also be used, for example, in the case of a fridge, to manage its interruptability: with active input the fridge cannot be disconnected as it is above the minimum temperature, with inactive input, on the other hand, it can be disconnected.

|                                |                                                                                                                             |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Power limit                    | can be set directly in kW                                                                                                   |
| Time bands                     | up to 4                                                                                                                     |
| Synchronization with contactor | •                                                                                                                           |
| Evaluation time                | 5...120 min                                                                                                                 |
| Number of loads/generators     | up to 15                                                                                                                    |
| Priority                       | from 1 to 15                                                                                                                |
| t on min                       | 1...360 min                                                                                                                 |
| t off min                      | 1...360 min                                                                                                                 |
| t off max                      | 1...360 min                                                                                                                 |
| Temporary disabling input      | 1 for each device                                                                                                           |
| Controllable devices           | load/generator                                                                                                              |
| Type of control                | - moulded-case and air circuit-breaker<br>- modular circuit-breakers<br>- contactors<br>- control circuit of load/generator |
| Type of connections            | - wired<br>- with Ekip Link communication for ACB                                                                           |

# Technical characteristics for protection trip units

## Protection functions

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| ABB Code | ANSI/IEEE C37.2 Code | Function                             | Threshold                                                                                                                                                                              |  |
|----------|----------------------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| L        | 49                   | Overload protection                  | $I_1 = 0.4 - 0.42 - 0.45 - 0.47 - 0.5 - 0.52 - 0.55 - 0.57 - 0.6 - 0.62 - 0.65 - 0.67 - 0.7 - 0.72 - 0.75 - 0.77 - 0.8 - 0.82 - 0.85 - 0.87 - 0.9 - 0.92 - 0.95 - 0.97 - 1 \times I_n$ |  |
|          |                      | Thermal memory                       |                                                                                                                                                                                        |  |
|          |                      | Tolerance                            | trip between 1.05 and 1.2 x I1                                                                                                                                                         |  |
| S        | 50TD                 | Time-delayed overcurrent protection  | $I_2 = 0.6 - 0.8 - 1 - 1.5 - 2 - 2.5 - 3 - 3.5 - 4 - 5 - 6 - 7 - 8 - 9 - 10 \times I_n$                                                                                                |  |
|          |                      | Tolerance                            | $\pm 7\% \text{ If } \leq 6 \times I_n$<br>$\pm 10\% \text{ If } > 6 \times I_n$                                                                                                       |  |
|          | 51                   | Time-delayed overcurrent protection  | $I_2 = 0.6 - 0.8 - 1 - 1.5 - 2 - 2.5 - 3 - 3.5 - 4 - 5 - 6 - 7 - 8 - 9 - 10 \times I_n$                                                                                                |  |
|          |                      | Thermal memory                       |                                                                                                                                                                                        |  |
| I        | 50                   | Instantaneous overcurrent protection | $I_3 = 1.5 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 \times I_n$                                                                                                   |  |
|          |                      | Tolerance                            | $\pm 10\%$                                                                                                                                                                             |  |
|          |                      |                                      |                                                                                                                                                                                        |  |
| G        | 50N TD               | Earth fault protection               | $I_4^{(1)} = 0.1 - 0.2 - 0.3 - 0.4 - 0.6 - 0.8 - 1 \times I_n$                                                                                                                         |  |
|          |                      | Tolerance                            | $\pm 7\%$                                                                                                                                                                              |  |
|          | 51N                  | Earth fault protection               | $I_4^{(1)} = 0.1 - 0.2 - 0.3 - 0.4 - 0.6 - 0.8 - 1 \times I_n$                                                                                                                         |  |
|          |                      | Tolerance                            | $\pm 7\%$                                                                                                                                                                              |  |

(1) With Vaux all thresholds are available. Without Vaux minimum threshold is limited to: 0.3In (with In = 100A), 0.25In (with In = 400A) or 0.2In (for all other ratings)  
 (2) The minimum trip time is 1s, regardless of the type of curve set (self-protection)

The tolerances above apply to trip units already powered by the main circuit with current flowing in at least two-phases or an auxiliary power supply. In all other cases the following tolerance values apply

| ABB Code | Trip threshold                 | Trip time          |
|----------|--------------------------------|--------------------|
| L        | Trip between 1.05 and 1.2 x I1 | $\pm 20\%$         |
| S        | $\pm 10\%$                     | $\pm 20\%$         |
| I        | $\pm 15\%$                     | $\leq 60\text{ms}$ |
| G        | $\pm 15\%$                     | $\pm 20\%$         |



|  | Trip time                                                                             | Excludibility | Pre Alarm                   | Trip curve    | Ekip Dip |
|--|---------------------------------------------------------------------------------------|---------------|-----------------------------|---------------|----------|
|  | with $I_f = 3 I_n$ , $t_1 = 3 - 12 - 24 - 36 - 48 - 72 - 108 - 144 \text{ s}^{(2)}$   | no            | 50 ... 90% $I_1$<br>Step 1% | $t = k / I^2$ | ●        |
|  | $\pm 10\% I_f \leq 6 \times I_n$<br>$\pm 20\% I_f > 6 \times I_n$                     | no            |                             |               | ●        |
|  | with $I_f > I_2$ , $t_2 = 0.1 - 0.2 - 0.3 - 0.4 - 0.5 - 0.6 - 0.7 - 0.8 \text{ s}$    | yes           | -                           | $t = k$       | ●        |
|  | The better of the two data:<br>$\pm 10\% t_2$ or $\pm 40 \text{ ms}$                  |               |                             |               |          |
|  | with $I_f = 10 I_n$ , $t_2 = 0.1 - 0.2 - 0.3 - 0.4 - 0.5 - 0.6 - 0.7 - 0.8 \text{ s}$ | yes           | -                           | $t = k / I^2$ | ●        |
|  | $\pm 15\% I_f \leq 6 \times I_n$<br>$\pm 20\% I_f > 6 \times I_n$                     | yes           | -                           |               |          |
|  | Instantaneous<br>$\leq 30 \text{ ms}$                                                 | yes           | -                           | $t = k$       | ●        |
|  | with $I_f > I_4$ , $t_4 = 0.1 - 0.2 - 0.4 - 0.8 \text{ s}$                            | yes           | 50 ... 90% $I_4$<br>Step 1% | $t = k$       | ●        |
|  | The better of the two data:<br>$\pm 10\% t_4$ or $\pm 40 \text{ ms}$                  |               |                             |               |          |
|  | with $I_f = 3 I_n$ , $t_4 = 0.1 - 0.2 - 0.4 - 0.8 \text{ s}$                          | yes           | 50 ... 90% $I_4$<br>Step 1% | $t = k / I^2$ | ●        |
|  | $\pm 15\%$                                                                            |               |                             |               |          |

# Technical characteristics for protection trip units

## Protection functions

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| ABB Code | ANSI Code        | Function                                          | Threshold                                                    | Threshold step            | Trip time                                                                                                                                                                                           | Time Step |
|----------|------------------|---------------------------------------------------|--------------------------------------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| L        | 49               | Overload Protection                               | $I_1 = 0.4 \dots 1 \times I_n$                               | $0.001 \times I_n$        | with $I = 3 I_1$ , $t_1 = 3 \dots 144$ s                                                                                                                                                            | 1s        |
|          |                  | Thermal Memory<br>Tolerance                       | trip between 1.05 and 1.2 x I1                               |                           | $\pm 10\% I \leq 6 \times I_n / \pm 20\% I > 6 \times I_n$                                                                                                                                          |           |
|          | 49               | Overload Protection                               | $I_1 = 0.4 \dots 1 \times I_n$                               | $0.001 \times I_n$        | with $I = 3 I_1$ , $t_1 = 3 \dots 144$ s<br>Standard inverse SI: $k=0.14 \alpha=0.02$<br>Very Inverse VI: $k=13.5 \alpha=1$<br>Extremely Inverse EI: $k=80 \alpha=2$<br>$t=k/I^4$ : $k=80 \alpha=4$ | 1s        |
|          |                  | Tolerance                                         | trip between 1.05 and 1.2 x I1                               |                           | $\pm 10\% I \leq 6 \times I_n / \pm 20\% I > 6 \times I_n$                                                                                                                                          |           |
| S        | 50TD             | Time-delayed overcurrent protection               | $I_2 = 0.6 \dots 10 \times I_n$                              | $0.1 \times I_n$          | With $I > I_2$ , $t_2 = 0.05 \dots 0.8$ s                                                                                                                                                           | 0.01s     |
|          | 68               | Zone selectivity                                  |                                                              |                           | $t_{2sel} = 0.04 \dots 0.2$ s                                                                                                                                                                       | 0.01s     |
|          |                  | Start up                                          | Activation: $0.6 \dots 10 \times I_n$                        | $0.1 \times I_n$          | Range: $0.1 \dots 30$ s                                                                                                                                                                             | 0.01s     |
|          |                  | Tolerance                                         | $\pm 7\% I \leq 6 \times I_n$<br>$\pm 10\% I > 6 \times I_n$ |                           | The better of the two data:<br>$\pm 10\%$ or $\pm 40$ ms                                                                                                                                            |           |
|          | 51               | Time-delayed overcurrent protection               | $I_2 = 0.6 \dots 10 \times I_n$                              | $0.1 \times I_n$          | with $I = 10 I_n$ , $t_2 = 0.05 \dots 0.8$ s                                                                                                                                                        | 0.01s     |
|          |                  | Thermal Memory<br>Tolerance                       | $\pm 7\% I \leq 6 \times I_n$<br>$\pm 10\% I > 6 \times I_n$ |                           | $\pm 15\% I \leq 6 \times I_n$<br>$\pm 20\% I > 6 \times I_n$                                                                                                                                       |           |
| I        | 50               | Instantaneous overcurrent protection              | $I_3 = 1.5 \dots 15 \times I_n$                              | $0.1 \times I_n$          | With $I > I_3$ , instantaneous                                                                                                                                                                      | -         |
|          |                  | Start up                                          | Activation: $1.5 \dots 15 \times I_n$                        | $0.1 \times I_n$          | Range: $0.1 \dots 30$ s                                                                                                                                                                             | 0.01s     |
|          |                  | Tolerance                                         | $\pm 10\%$                                                   |                           | $\leq 30$ ms                                                                                                                                                                                        |           |
| G        | 50N TD           | Earth fault protection                            | $I_4^{(1)} = 0.1 \dots 1 \times I_n$                         | $0.001 \times I_n$        | with $I > I_4$ , $t_4 =$ Instantaneous<br>(with Vaux) + $0.1 \dots 1$ s                                                                                                                             | 0.05s     |
|          | 68               | Zone selectivity                                  |                                                              |                           | $t_{4sel} = 0.04 \dots 0.2$ s                                                                                                                                                                       | 0.01s     |
|          |                  | Start up                                          | Activation: $0.2 \dots 1 \times I_n$                         | $0.02 \times I_n$         | range: $0.1 \dots 30$ s                                                                                                                                                                             | 0.01s     |
|          |                  | Tolerance                                         | $\pm 7\%$                                                    |                           | The better of the two data: $\pm 10\%$ or<br>$\pm 40$ ms or 50ms with $t_4 =$ instantaneous                                                                                                         |           |
|          | 51N              | Earth fault protection                            | $I_4^{(1)} = 0.1 \dots 1 \times I_n$                         | $0.001 \times I_n$        | with $I = 4 I_n$ , $t_4 = 0.1 \dots 1$ s                                                                                                                                                            | 0.05s     |
|          |                  | Tolerance                                         | $\pm 7\%$                                                    |                           | $\pm 15\%$                                                                                                                                                                                          |           |
| IU       | 46               | Current unbalance protection                      | $I_6 = 2 \dots 90\% I_n$ unbalance                           | $1\% I_n$                 | with unbalance $> I_6$ , $t_6 = 0.5 \dots 60$ s                                                                                                                                                     | 0.5s      |
|          |                  | Tolerance                                         | $\pm 10\%$                                                   |                           | The better of the two data: $\pm 10\%$ or $\pm 40$ ms<br>(for $t < 5$ s) / $\pm 100$ ms (for $t \geq 5$ s)                                                                                          |           |
| 2I       | 50               | Programmable instantaneous overcurrent protection | $I_{31} = 1.5 \dots 15 \times I_n$                           | $0.1 \times I_n$          | with $I > I_{31}$ , instantaneous                                                                                                                                                                   |           |
|          |                  | Tolerance                                         | $\pm 10\%$                                                   |                           | $\leq 30$ ms                                                                                                                                                                                        |           |
| MCR      |                  | Closing on short-circuit protection               | $I_3 = 1.5 \dots 15 \times I_n$                              | $0.1 \times I_n$          | With $I > I_3$ , instantaneous<br>Monitor time range: $40 \dots 500$ ms                                                                                                                             | 0.01s     |
|          |                  | Tolerance                                         | $\pm 10\%$                                                   |                           | $\leq 30$ ms                                                                                                                                                                                        |           |
| Gext     | 50G TD           | Earth fault protection                            | $I_{41}^{(1)} = 0.1 \dots 1 \times I_n$ Toroid               | $0.001 \times I_n$ Toroid | with $I > I_{41}$ , $t_{41} = 0.1 \dots 1$ s                                                                                                                                                        | 0.05s     |
|          | 68               | Zone selectivity                                  |                                                              |                           | $t_{41sel} = 0.04 \dots 0.2$ s                                                                                                                                                                      | 0.01s     |
|          |                  | Start up                                          | Activation: $0.1 \dots 1 \times I_n$                         | $0.02 \times I_n$         | range: $0.1 \dots 30$ s                                                                                                                                                                             | 0.01s     |
|          |                  | Tolerance                                         | $\pm 7\%$                                                    |                           | The better of the two data:<br>$\pm 10\%$ or $\pm 40$ ms                                                                                                                                            |           |
|          | 51G              | Earth fault protection                            | $I_{41}^{(1)} = 0.1 \dots 1 \times I_n$                      | $0.001 \times I_n$        | with $I = 4 I_n$ , $t_{41} = 0.1 \dots 1$ s                                                                                                                                                         | 0.05s     |
|          |                  | Tolerance                                         | $\pm 7\%$                                                    |                           | $\pm 15\%$                                                                                                                                                                                          |           |
| Rc       | 64 50N TD<br>87N | Residual current protection                       | $I_{\Delta n} = 3 - 5 - 7 - 10 - 20 - 30$ A                  |                           | with $I > I_{\Delta n}$ , $t_{\Delta n} = 0.06 - 0.1 - 0.2 - 0.3 - 0.4 - 0.5 - 0.8$ s                                                                                                               |           |
|          |                  | Differential ground fault protection              |                                                              |                           | 140ms @ 0.06s (max trip time)<br>950ms @ 0.80s (max trip time)                                                                                                                                      |           |
|          |                  | Tolerance                                         | $-20\% \div 0\%$                                             |                           |                                                                                                                                                                                                     |           |
| UV       | 27               | Undervoltage Protection                           | $U_8 = 0.5 \dots 0.98 \times U_n$                            | $0.001 \times U_n$        | with $U < U_8$ , $t_8 = 0.05 \dots 120$ s                                                                                                                                                           | 0.01s     |
|          |                  | Tolerance                                         | $\pm 2\%$                                                    |                           | The better of the two data: $\pm 10\%$ or<br>$\pm 40$ ms (for $t < 5$ s) / $\pm 100$ ms (for $t \geq 5$ s)                                                                                          |           |
| OV       | 59               | Overvoltage protection                            | $U_9 = 1.02 \dots 1.5 \times U_n$                            | $0.001 \times U_n$        | with $U > U_9$ , $t_9 = 0.05 \dots 120$ s                                                                                                                                                           | 0.01s     |
|          |                  | Tolerance                                         | $\pm 2\%$                                                    |                           | The better of the two data: $\pm 10\%$ or<br>$\pm 40$ ms (for $t < 5$ s) / $\pm 100$ ms (for $t \geq 5$ s)                                                                                          |           |



| Excludibility                     | Excludibility trip | Pre-alarm              | Trip curve                                                | Ekip Touch | Ekip Hi-Touch | Ekip G Touch | Ekip G Hi-Touch |
|-----------------------------------|--------------------|------------------------|-----------------------------------------------------------|------------|---------------|--------------|-----------------|
| yes, with rating plug<br>L=off    | no                 | 50...90% I1 step 1%    | $t = k / I^2$                                             | ●          | ●             | ●            | ●               |
| yes                               |                    |                        |                                                           | ●          | ●             | ●            | ●               |
| yes, with rating plug<br>L=off    | no                 | 50...90% I1<br>step 1% | $t = \frac{k t_1}{\left(\frac{I}{I_1}\right)^\alpha - 1}$ | ●          | ●             | ●            | ●               |
| yes                               | yes                | no                     | $t = k$                                                   | ●          | ●             | ●            | ●               |
| yes                               |                    |                        |                                                           | ●          | ●             | ●            | ●               |
| yes                               |                    |                        |                                                           | ●          | ●             | ●            | ●               |
| yes                               | yes                | no                     | $t = k / I^2$                                             | ●          | ●             | ●            | ●               |
| yes                               |                    |                        |                                                           | ●          | ●             | ●            | ●               |
| yes                               | no                 | no                     | $t = k$                                                   | ●          | ●             | ●            | ●               |
| yes                               |                    |                        |                                                           | ●          | ●             | ●            | ●               |
| yes                               | yes                | 50...90% I4 step 1%    | $t = k$                                                   | ●          | ●             | ●            | ●               |
| yes                               |                    |                        |                                                           | ●          | ●             | ●            | ●               |
| yes                               |                    |                        |                                                           | ●          | ●             | ●            | ●               |
| yes                               | yes                | 50...90% I4 step 1%    | $t = k / I^2$                                             | ●          | ●             | ●            | ●               |
| yes                               | yes                | no                     | $t = k$                                                   | ●          | ●             | ●            | ●               |
| yes                               | no                 | no                     | $t = k$                                                   | ●          | ●             | ●            | ●               |
| yes                               | no                 | no                     | $t = k$                                                   | ●          | ●             | ●            | ●               |
| yes                               | yes                | 50...90% I41 step 1%   | $t = k$                                                   | ●          | ●             | ●            | ●               |
| yes                               |                    |                        |                                                           | ●          | ●             | ●            | ●               |
| yes                               |                    |                        |                                                           | ●          | ●             | ●            | ●               |
| yes                               | yes                | 50...90% I41 step 1%   | $t = k / I^2$                                             | ●          | ●             | ●            | ●               |
| Attivabile with rating<br>plug Rc | no                 | no                     | $t = k$                                                   | ●          | ●             | ●            | ●               |
| yes                               | yes                | no                     | $t = k$                                                   | ○          | ●             | ●            | ●               |
| yes                               | yes                | no                     | $t = k$                                                   | ○          | ●             | ●            | ●               |

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# Technical characteristics for protection trip units

## Protection functions

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| ABB Code                | ANSI Code | Function                                                                           | Threshold                                                                                                                   | Threshold step                                                  | Trip time                                                                                                                 | Time Step |  |
|-------------------------|-----------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-----------|--|
| VU                      | 47        | Voltage unbalance protection<br>Tolerance                                          | U14 = 2...90% Un unbalance<br>± 5%                                                                                          | 1%Un                                                            | with unbalance > U14, t14 = 0.5...60s<br>The better of the two data: ± 10% or<br>± 40 ms (for t<5s) / ± 100 ms (for t≥5s) | 0.5s      |  |
| UF                      | 81L       | Underfrequency protection<br>Tolerance                                             | f12 = 0.9...0.999 x fn<br>± 1% (with fn ±2%)                                                                                | 0.001 x fn                                                      | with f < f12, t12 = 0.15...300s<br>The better of the two data: ± 10% or<br>± 40 ms (for t<5s) / ± 100 ms (for t≥5s)       | 0.01s     |  |
| OF                      | 81H       | Overfrequency protection<br>Tolerance                                              | f13 = 1.001...1.1 x fn<br>± 1% (with fn ±2%)                                                                                | 0.001 x fn                                                      | with f > f13, t13 = 0.15...300s<br>The better of the two data: ± 10% or<br>± 40 ms (for t<5s) / ± 100 ms (for t≥5s)       | 0.01s     |  |
| RP                      | 32R       | Reverse active power protection<br>Tolerance                                       | P11 = -1...-0.05 Sn<br>± 10%                                                                                                | 0.001 Sn                                                        | with P > P11, t11 = 0.5...100s<br>The better of the two data: ± 10% or<br>± 40 ms (for t<5s) / ± 100 ms (for t≥5s)        | 0.1s      |  |
| ABB: Cyclical direction | 47        | Cyclical direction of the phases                                                   | 1-2-3 or 3-2-1                                                                                                              |                                                                 |                                                                                                                           |           |  |
| ABB: Power factor       | 78        | 3phase Power factor                                                                | PF3 = 0.5...0.95                                                                                                            | 0.01                                                            |                                                                                                                           |           |  |
| LC1/2<br>lw1/2          |           | Current threshold<br>Tolerance                                                     | LC1 = 50%...100% I1<br>LC2 = 50%...100% I1<br>lw1 = 0.1...10 In<br>lw2 = 0.1...10 In<br>Activation: up/down<br>± 10%        | 1%<br>1%<br>0.01 x In                                           |                                                                                                                           |           |  |
| S2                      | 50TD      | Time-delayed overcurrent protection                                                | I5 = 0.6...10 x In                                                                                                          | 0.1 x In                                                        | With I > I5, t5 = 0.05...0.8s                                                                                             | 0.01s     |  |
|                         | 68        | Zone selectivity                                                                   |                                                                                                                             |                                                                 | t5sel = 0.04...0.2s                                                                                                       | 0.01s     |  |
|                         |           | Start up                                                                           | Activation: 0.6...10 x In                                                                                                   | 0.1 x In                                                        | Range: 0.1...30s                                                                                                          | 0.01s     |  |
|                         |           | Tolerance                                                                          | ± 7% I ≤ 6 x In<br>± 10% I > 6 x In                                                                                         |                                                                 | The better of the two data:<br>± 10% or ± 40 ms                                                                           |           |  |
| D                       | 67        | Directional overcurrent protection (forward &/or backward)                         | I7 = 0.6...10 x In                                                                                                          | 0.1 x In                                                        | with I > I7, t7 = 0.1...0.8s                                                                                              | 0.01s     |  |
|                         | 68        | Zone selectivity                                                                   |                                                                                                                             |                                                                 | t7sel = 0.1...0.8s                                                                                                        | 0.01s     |  |
|                         |           | Start up (forward &/or backward)                                                   | Activation: 0.6...10 x In                                                                                                   | 0.1 x In                                                        | Range: 0.1...30s                                                                                                          | 0.01s     |  |
|                         |           | Trip direction                                                                     | forward &/or backward                                                                                                       |                                                                 |                                                                                                                           |           |  |
|                         |           | Minimum angle direction (°)                                                        | 3.6, 7.2, 10.8, 14.5, 18.2, 22, 25.9, 30, 34.2, 38.7, 43.4, 48.6, 54.3, 61, 69.6                                            |                                                                 |                                                                                                                           |           |  |
|                         |           | Tolerance                                                                          | ± 7% I ≤ 6 x In<br>± 10% I > 6 x In                                                                                         |                                                                 | The better of the two data:<br>± 10% or ± 40 ms                                                                           |           |  |
| UV2                     | 27        | Undervoltage Protection<br>Tolerance                                               | U15 = 0.5...0.98 x Un<br>± 2%                                                                                               | 0.001 x Un                                                      | with U < U15, t15 = 0.05...120s<br>The better of the two data: ± 10% or<br>± 40 ms (for t<5s) / ± 100 ms (for t≥5s)       | 0.01s     |  |
| OV2                     | 59        | Overvoltage protection<br>Tolerance                                                | U16 = 1.02...1.5 x Un<br>± 2%                                                                                               | 0.001 x Un                                                      | with U > U16, t16 = 0.05...120s<br>The better of the two data: ± 10% or<br>± 40 ms (for t<5s) / ± 100 ms (for t≥5s)       | 0.01s     |  |
| UF2                     | 81L       | Underfrequency protection<br>Tolerance                                             | f17 = 0.9...0.999 x fn<br>± 1% (with fn ±2%)                                                                                | 0.001 x fn                                                      | with f < f17, t17 = 0.15...300s<br>The better of the two data: ± 10% or<br>± 40 ms (for t<5s) / ± 100 ms (for t≥5s)       | 0.01s     |  |
| OF2                     | 81H       | Overfrequency protection<br>Tolerance                                              | f18 = 1.001...1.1 x fn<br>± 1% (with fn ±2%)                                                                                | 0.001 x fn                                                      | with f > f18, t18 = 0.15...300s<br>The better of the two data: ± 10% or<br>± 40 ms (for t<5s) / ± 100 ms (for t≥5s)       | 0.01s     |  |
| S(V)                    | 51V       | Voltage controlled overcurrent protection<br>Step mode<br>Linear mode<br>Tolerance | I20 = 0.6...10 x In<br>UI = 0.2...1 x Un<br>Ks = 0.1...1<br>UI = 0.2...1 x Un<br>Uh = 0.2...1 x Un<br>Ks = 0.1...1<br>± 10% | 0.1 x In<br>0.01 x Un<br>0.01<br>0.01 x Un<br>0.01 x Un<br>0.01 | With I > I20, t20 = 0.05...30s                                                                                            | 0.01s     |  |
|                         |           |                                                                                    |                                                                                                                             |                                                                 | The better of the two data: ± 10% or<br>± 40 ms (for t<5s) / ± 100 ms (for t≥5s)                                          |           |  |

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# Technical characteristics for protection trip units

## Protection functions

3

| ABB Code        | ANSI Code | Function                                           | Threshold                                                                                                                                         | Threshold step                                                                                                           | Tripping time                                                                                             | Time Step             |
|-----------------|-----------|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-----------------------|
| RV              | 59N       | Residual overvoltage protection                    | $U_{22} = 0.05 \dots 0.5 \times U_n$                                                                                                              | $0.001 \times U_n$                                                                                                       | with $U > U_{22}$ , $t_{22} = 0.5 \dots 120s$                                                             | 0.01s                 |
|                 |           | Tolerance                                          | $\pm 5\%$                                                                                                                                         |                                                                                                                          | The better of the two data: $\pm 10\%$ or $\pm 40 ms$ (for $t < 5s$ ) / $\pm 100 ms$ (for $t \geq 5s$ )   |                       |
| OP              | 32OF      | Active overpower protection                        | $P_{26} = 0.4 \dots 2 S_n$                                                                                                                        | $0.001 S_n$                                                                                                              | with $P > P_{26}$ , $t_{26} = 0.5 \dots 100s$                                                             | 0.5s                  |
|                 |           | Tolerance                                          | $\pm 10\%$                                                                                                                                        |                                                                                                                          | The better of the two data: $\pm 10\%$ or $\pm 40 ms$ (for $t < 5s$ ) / $\pm 100 ms$ (for $t \geq 5s$ )   |                       |
| OQ              | 32OF      | Reactive overpower protection                      | $Q_{27} = 0.4 \dots 2 S_n$                                                                                                                        | $0.001 S_n$                                                                                                              | with $Q > Q_{27}$ , $t_{27} = 0.5 \dots 100s$                                                             | 0.5s                  |
|                 |           | Tolerance                                          | $\pm 10\%$                                                                                                                                        |                                                                                                                          | The better of the two data: $\pm 10\%$ or $\pm 40 ms$ (for $t < 5s$ ) / $\pm 100 ms$ (for $t \geq 5s$ )   |                       |
| UP              | 32LF      | Active underpower protection                       | $P_{23} = 0.1 \dots 1 \times S_n$                                                                                                                 | $0.001 \times S_n$                                                                                                       | with $P < P_{23}$ , $t_{23} = 0.5 \dots 100s$                                                             | 0.5s                  |
|                 |           | Start up                                           |                                                                                                                                                   |                                                                                                                          | range: $0.1 \dots 30s$                                                                                    | 0.01s                 |
|                 |           | Tolerance                                          | $\pm 10\%$                                                                                                                                        |                                                                                                                          | The better of the two data: $\pm 10\%$ or $\pm 40 ms$ (for $t < 5s$ ) / $\pm 100 ms$ (for $t \geq 5s$ )   |                       |
| RQ              | 40/32R    | Loss of field or reverse reactive power protection | $Q_{24} = -1 \dots -0.1 S_n$                                                                                                                      | $0.001 S_n$                                                                                                              | with $Q > Q_{24}$ , $t_{24} = 0.5 \dots 100s$                                                             | 0.1s                  |
|                 |           |                                                    | $K_q = -2 \dots 2$                                                                                                                                | 0.01                                                                                                                     |                                                                                                           |                       |
|                 |           | Loss of field or reverse reactive power protection | $Q_{25} = -1 \dots -0.1 S_n$                                                                                                                      | $0.001 S_n$                                                                                                              | with $Q > Q_{25}$ , $t_{25} = 0.5 \dots 100s$                                                             | 0.5s                  |
|                 |           |                                                    | $K_{q2} = -2 \dots 2$                                                                                                                             | 0.01                                                                                                                     |                                                                                                           |                       |
|                 |           | Voltage minimum threshold                          | $V_{min.} = 0.5 \dots 1.2$                                                                                                                        | 0.01                                                                                                                     |                                                                                                           |                       |
|                 |           | Tolerance                                          | $\pm 10\%$                                                                                                                                        |                                                                                                                          | The better of the two data: $\pm 10\%$ or $\pm 40 ms$ (for $t < 5s$ ) / $\pm 100 ms$ (for $t \geq 5s$ )   |                       |
|                 |           |                                                    |                                                                                                                                                   |                                                                                                                          |                                                                                                           |                       |
|                 |           |                                                    |                                                                                                                                                   |                                                                                                                          |                                                                                                           |                       |
| S2(V)           | 51V       | Voltage controlled overcurrent protection          | $I_{21} = 0.6 \dots 10 \times I_n$                                                                                                                | $0.1 \times I_n$                                                                                                         | With $I > I_{21}$ , $t_{21} = 0.05 \dots 30s$                                                             | 0.01s                 |
|                 |           | Step mode                                          | $U_{I2} = 0.2 \dots 1 \times U_n$                                                                                                                 | $0.01 \times U_n$                                                                                                        |                                                                                                           |                       |
|                 |           |                                                    | $K_{s2} = 0.1 \dots 1$                                                                                                                            | 0.01                                                                                                                     |                                                                                                           |                       |
|                 |           | Linear mode                                        | $U_{I2} = 0.2 \dots 1 \times U_n$                                                                                                                 | $0.01 \times U_n$                                                                                                        |                                                                                                           |                       |
|                 |           |                                                    | $U_{h2} = 0.2 \dots 1 \times U_n$                                                                                                                 | $0.01 \times U_n$                                                                                                        |                                                                                                           |                       |
|                 |           |                                                    | $K_{s2} = 0.1 \dots 1$                                                                                                                            | 0.01                                                                                                                     |                                                                                                           |                       |
|                 |           | Tolerance                                          | $\pm 10\%$                                                                                                                                        |                                                                                                                          | The better of the two data: $\pm 10\%$ or $\pm 40 ms$ (for $t < 5s$ ) / $\pm 100 ms$ (for $t \geq 5s$ )   |                       |
|                 |           |                                                    |                                                                                                                                                   |                                                                                                                          |                                                                                                           |                       |
|                 |           |                                                    |                                                                                                                                                   |                                                                                                                          |                                                                                                           |                       |
| ROCOF           | 81R       | Rate of change of frequency protection             | $f_{28} = 0.4 \dots 10 Hz/s$                                                                                                                      | $0.2 Hz/s$                                                                                                               | with $f > f_{28}$ , $t_{28} = 0.5 \dots 10s$                                                              | 0.01s                 |
|                 |           | Trip direction                                     | up &/or down                                                                                                                                      |                                                                                                                          |                                                                                                           |                       |
|                 |           | Tolerance                                          | $\pm 5\%$                                                                                                                                         |                                                                                                                          | The better of the two data: $\pm 20\%$ or $\pm 200 ms$                                                    |                       |
| Synchrocheck SC | 25        | Synchrocheck (Live busbars)                        | $U_{live} = 0.5 \dots 1.1 U_n$<br>$\Delta U = 0.02 \dots 0.12 U_n$<br>$\Delta f = 0.1 \dots 1 Hz$<br>$\Delta \Phi = 5 \dots 50^\circ \text{ elt}$ | $0.001 U_n$<br>$0.001 U_n$<br>$0.1 Hz$<br>$5^\circ \text{ elt}$                                                          | Stability voltage time for live state = $100 \dots 30000ms$<br>Minimum matching Time = $100 \dots 3000ms$ | $0.001 s$<br>$0.01 s$ |
|                 |           | Tolerance                                          | $\pm 10\%$                                                                                                                                        |                                                                                                                          |                                                                                                           |                       |
|                 |           | Synchrocheck (Live, Dead busbars)                  | $U_{live} = 0.5 \dots 1.1 U_n$<br>$U_{dead} = 0.02 \dots 0.2 U_n$                                                                                 | $0.001 U_n$<br>$0.001 U_n$                                                                                               | $t_{ref} = 0.1 \dots 30s$                                                                                 | 0.1s                  |
|                 |           | Frequency check off                                |                                                                                                                                                   |                                                                                                                          |                                                                                                           |                       |
|                 |           | Phase check off                                    |                                                                                                                                                   |                                                                                                                          |                                                                                                           |                       |
|                 |           | Dead bar configuration                             | Reverse/standard                                                                                                                                  |                                                                                                                          |                                                                                                           |                       |
|                 |           | Primary voltage                                    | $100 \dots 1150$                                                                                                                                  | 100, 115, 120, 190, 208, 220, 230, 240, 277, 347, 380, 400, 415, 440, 480, 500, 550, 600, 660, 690, 910, 950, 1000, 1150 |                                                                                                           |                       |
|                 |           | Secondary voltage                                  | $100 \dots 120$                                                                                                                                   | 100, 110, 115, 120                                                                                                       |                                                                                                           |                       |
|                 |           | Tolerance                                          | $\pm 10\%$                                                                                                                                        |                                                                                                                          |                                                                                                           |                       |
|                 |           |                                                    |                                                                                                                                                   |                                                                                                                          |                                                                                                           |                       |

(1) With Vaux all thresholds are available. Without Vaux minimum threshold is limited to:  $0.3I_n$  (with  $I_n = 100A$ ),  $0.25I_n$  (with  $I_n = 400A$ ) or  $0.2I_n$  (for all other ratings)  
The tolerances above apply to trip units already powered by the main circuit with current flowing in at least two-phases or an auxiliary power supply. In all other cases the following tolerance values apply:

| ABB Code         | Trip threshold                 | Trip time   |
|------------------|--------------------------------|-------------|
| L                | Trip between 1.05 and 1.2 x I1 | $\pm 20\%$  |
| S                | $\pm 10\%$                     | $\pm 20\%$  |
| I                | $\pm 15\%$                     | $\leq 60ms$ |
| G                | $\pm 15\%$                     | $\pm 20\%$  |
| Other protection | $\pm 15\%$                     | $\pm 20\%$  |



|  | Excludibility     | Excludibility trip | Pre-alarm | Trip curve | Ekip Touch | Ekip Hi-Touch | Ekip G Touch | Ekip G Hi-Touch |
|--|-------------------|--------------------|-----------|------------|------------|---------------|--------------|-----------------|
|  | yes               | yes                | no        | t = k      |            |               | ●            | ●               |
|  | yes               | yes                | no        | t = k      |            |               | ●            | ●               |
|  | yes               | yes                | no        | t = k      |            |               | ●            | ●               |
|  | yes<br>yes        | yes                | no        | t = k      |            |               | ●            | ●               |
|  | yes               | yes                | no        | t = k      |            |               | ●            | ●               |
|  | yes               | yes                | no        | t = k      |            |               |              | ●               |
|  | yes               |                    |           |            |            |               |              |                 |
|  | yes               | yes                | no        | t = k      |            |               |              | ●<br>●          |
|  |                   |                    |           |            |            |               |              | ●               |
|  | yes               | yes                | no        | t = k      |            |               |              | ●               |
|  | yes               | only signalling    | no        | -          | ○<br>○○    | ∞             | ∞            | ∞               |
|  | yes<br>yes<br>yes | only signalling    | no        | -          |            |               |              |                 |

**Key:**

- Key:**
- not available
  - available
  - available with Ekip Measuring and Ekip Measuring Pro
  - available with Ekip Synchrocheck

# Technical characteristics for protection trip units

## Measurement functions

3

| Instantaneous measurements                                                           |      | Displayed with Ekip Multimeter | Parameters                                                   |
|--------------------------------------------------------------------------------------|------|--------------------------------|--------------------------------------------------------------|
| Currents (RMS)                                                                       | [A]  | •                              | L1, L2, L3, Ne                                               |
| Earth fault current (RMS)                                                            | [A]  | •                              | I <sub>g</sub>                                               |
| Record of values: of the parameter for each interval with time-stamping              |      |                                | Parameters                                                   |
| Current: minimum and maximum                                                         | [A]  | •                              | I Min, I Max                                                 |
| Information on trip and opening data: after a fault with or without auxiliary supply |      |                                | Parameters                                                   |
| Type of protection tripped                                                           |      | •                              | eg. L, S, I, G                                               |
| Fault values per phase                                                               | [A]  | •                              | eg. I1, I2, I3, neutral for S protection                     |
| Time-stamping                                                                        |      | •                              | Date, time and progressive number                            |
| Maintenance indicators                                                               |      |                                | Parameters                                                   |
| Information on last 30 trips                                                         |      | •                              | Type of protection, fault values and time-stamping           |
| Information on last 200 events                                                       |      | •                              | Type of event, time-stamping                                 |
| Number of mechanical operations <sup>(1)</sup>                                       | [no] | •                              | Can be associated to alarm                                   |
| Total number of trips                                                                | [no] | •                              |                                                              |
| Total operating time                                                                 | [h]  | •                              |                                                              |
| Wear of contacts                                                                     | [%]  | •                              | Prealarm >80%, Alarm = 100%                                  |
| Date of maintenance operations performed                                             |      | •                              | Last                                                         |
| Indication of maintenance operation needed                                           |      | •                              |                                                              |
| Circuit-breaker I.D.                                                                 |      | •                              | Type of circuit-breaker, assigned device name, serial number |
| Self-diagnosis                                                                       |      |                                | Parameters                                                   |
| Check of continuity of internal connections                                          |      | •                              | Alarm due to disconnection: rating plug, sensors, trip coil  |
| Failure of circuit-breaker to open (ANSI 50BF)                                       |      | •                              | Alarm following non-tripping of protection functions         |
| Temperature (T)                                                                      |      | •                              | Pre-alarm and alarm for abnormal temperature                 |

<sup>(1)</sup> with auxiliary supply present



|  | Precision                                                         | Standard                                        | Ekip Dip |
|--|-------------------------------------------------------------------|-------------------------------------------------|----------|
|  | 1%                                                                | Class 1 IEC 61557-12                            | ●        |
|  | 2%                                                                |                                                 | ●        |
|  | Window                                                            | Intervals                                       |          |
|  | Fixed, synchronizable by remote                                   | Duration: 5...120min<br>Number of intervals: 24 | ●        |
|  |                                                                   |                                                 | ●        |
|  |                                                                   |                                                 | ●        |
|  |                                                                   |                                                 | ●        |
|  |                                                                   |                                                 | ●        |
|  |                                                                   |                                                 | ●        |
|  |                                                                   |                                                 | ●        |
|  |                                                                   |                                                 | ●        |
|  |                                                                   |                                                 | ●        |
|  |                                                                   |                                                 | ●        |
|  |                                                                   |                                                 | ●        |
|  |                                                                   |                                                 | ●        |
|  |                                                                   |                                                 | ●        |
|  |                                                                   |                                                 | ●        |
|  |                                                                   |                                                 | ●        |
|  | Note: Opening of circuit-breaker can be set in the event of alarm |                                                 | ●        |
|  |                                                                   |                                                 | ●        |
|  |                                                                   |                                                 | ●        |

# Technical characteristics for protection trip units

## Measurement functions

3

| Instantaneous measurements                                 |             | Parameters                                                                                                                                                                                                                                                    |
|------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Currents (RMS)                                             | [A]         | L1, L2, L3, Ne                                                                                                                                                                                                                                                |
| Earth fault current (RMS)                                  | [A]         | Ig                                                                                                                                                                                                                                                            |
| Phase-phase voltage (RMS)                                  | [V]         | U12, U23, U31                                                                                                                                                                                                                                                 |
| Phase-neutral voltage (RMS)                                | [V]         | U1, U2, U3                                                                                                                                                                                                                                                    |
| Phase sequence                                             |             |                                                                                                                                                                                                                                                               |
| Frequency                                                  | [Hz]        | f                                                                                                                                                                                                                                                             |
| Active power                                               | [kW]        | P1, P2, P3, Ptot                                                                                                                                                                                                                                              |
| Reactive power                                             | [kVAR]      | Q1, Q2, Q3, Qtot                                                                                                                                                                                                                                              |
| Apparent power                                             | [kVA]       | S1, S2, S3, Stot                                                                                                                                                                                                                                              |
| Power factor                                               |             | total                                                                                                                                                                                                                                                         |
| Peak factor                                                |             | L1, L2, L3, Ne                                                                                                                                                                                                                                                |
| Counters recorded from installation or from the last reset |             | Parameters                                                                                                                                                                                                                                                    |
| Active energy                                              | [kWh]       | Ep total, Ep positive, Ep negative                                                                                                                                                                                                                            |
| Reactive energy                                            | [kVARh]     | Eq total, Ep positive, Ep negative                                                                                                                                                                                                                            |
| Apparent energy                                            | [KVAh]      | Es total                                                                                                                                                                                                                                                      |
| Network Analyzer                                           |             | Parameters                                                                                                                                                                                                                                                    |
| Hourly average voltage value                               | [V]<br>[no] | - Umin= 0.75...0.95 x Un<br>- Umax= 1.05...1.25 x Un<br>- Events counter (nr. of events day by day in the last year plus the total events in the breaker's lifetime)                                                                                          |
| Short voltage interruptions                                | [no]        | - Umin= 0.75...0.95 x Un<br>- Events counter (nr. of events day by day in the last year plus the total events in the breaker's lifetime)                                                                                                                      |
| Short voltage spikes                                       | [no]        | - Umax= 1.05...1.25 x Un<br>- Events counter (nr. of events day by day in the last year plus the total events in the breaker's lifetime)                                                                                                                      |
| Slow voltage sags and swells                               | [no]        | - Umin1= 0.75...0.95 x Un<br>- Umin2= 0.75...0.95 x Un<br>- Umin3= 0.75...0.95 x Un<br>- Umax1= 1.05...1.25 x Un<br>- Umax2= 1.05...1.25 x Un<br>- Events counter (nr. of events day by day in the last year plus the total events in the breaker's lifetime) |
| Voltage unbalance                                          | [V]<br>[no] | - U neg. seq.= 0.02...0.10 x Un<br>- Events counter (nr. of events day by day in the last year plus the total events in the breaker's lifetime)                                                                                                               |
| Harmonic analysis                                          |             | Current and Voltage<br>- up to 50°<br>- Alarm THD: 5...20%<br>- Single harmonic alarm:<br>3...10% plus a count of minutes the harmonic has been exceeded                                                                                                      |



|  | Precision       | Ekip Touch | Ekip Hi-Touch | Ekip G Touch | Ekip G Hi-Touch |
|--|-----------------|------------|---------------|--------------|-----------------|
|  | 1%              | ●          | ●             | ●            | ●               |
|  | 2%              | ●          | ●             | ●            | ●               |
|  | 0.5%            | ○          | ●             | ●            | ●               |
|  | 0.5%            | ○          | ●             | ●            | ●               |
|  |                 | ○          | ●             | ●            | ●               |
|  | 0.2%            | ○          | ●             | ●            | ●               |
|  | 2%              | ○          | ●             | ●            | ●               |
|  | 2%              | ○          | ●             | ●            | ●               |
|  | 2%              | ○          | ●             | ●            | ●               |
|  | 2%              | ○          | ●             | ●            | ●               |
|  | 2%              | ○          | ●             | ●            | ●               |
|  |                 | ○          | ●             | ●            | ●               |
|  | Precision       |            |               |              |                 |
|  | 2%              | ○          | ●             | ●            | ●               |
|  | 2%              | ○          | ●             | ●            | ●               |
|  | 2%              | ○          | ●             | ●            | ●               |
|  | Intervals       |            |               |              |                 |
|  | t = 5...120min  | -          | ●             | -            | ●               |
|  |                 |            |               |              |                 |
|  | t <40ms         | -          | ●             | -            | ●               |
|  |                 |            |               |              |                 |
|  | t <40ms         | -          | ●             | -            | ●               |
|  |                 |            |               |              |                 |
|  | t = 0.02s...60s | -          | ●             | -            | ●               |
|  |                 |            |               |              |                 |
|  | t = 5...120min  | -          | ●             | -            | ●               |
|  |                 |            |               |              |                 |
|  |                 | -          | ●             | -            | ●               |

# Technical characteristics for protection trip units

## Measurement functions

3

|                                                                                     |                |                                                                             |
|-------------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------|
| <b>Record of values:</b> of the parameter for each interval with time-stamping      |                | <b>Parameters</b>                                                           |
| Current: minimum and maximum                                                        | [A]            | I Min, I Max                                                                |
| Phase-phase voltage: minimum and maximum                                            | [V]            | U Min, U max                                                                |
| Active power: average and maximum                                                   | [kW]           | P Mean, P Max                                                               |
| Reactive power: average and maximum                                                 | [kVAR]         | Q Mean, Q Max                                                               |
| Apparent power: average and maximum                                                 | [KVA]          | S Mean, S Max                                                               |
| <b>Data logger:</b> record of high sampling rate parameters                         |                | <b>Parameters</b>                                                           |
| Currents                                                                            | [A]            | L1, L2, L3, Ne, Ig                                                          |
| Voltages                                                                            | [V]            | U12, U23, U31                                                               |
| Sampling rate                                                                       | [Hz]           | 1200-2400-4800-9600                                                         |
| Maximum recording duration                                                          | [s]            | 16                                                                          |
| Recording stop delay                                                                | [s]            | 0-10s                                                                       |
| Number of registers                                                                 | [no]           | 2 independent                                                               |
| <b>Information on trip and opening data:</b> after a fault without auxiliary supply |                | <b>Parameters</b>                                                           |
| Type of protection tripped                                                          |                | eg. L, S, I, G, UV, OV                                                      |
| Fault values per phase                                                              | [A/V/Hz w/VAR] | eg. I1, I2, I3, neutral for S protection<br>V12, V23, V32 for UV protection |
| Time-stamping                                                                       |                | Date, time and progressive number                                           |
| <b>Maintenance indicators</b>                                                       |                | <b>Parameters</b>                                                           |
| Information on last 30 trips                                                        |                | Type of protection, fault values and time-stamping                          |
| Information on last 200 events                                                      |                | Type of event, time-stamping                                                |
| Number of mechanical operations <sup>(1)</sup>                                      | [no]           | Can be associated to alarm                                                  |
| Total number of trips                                                               | [no]           |                                                                             |
| Total operating time                                                                | [h]            |                                                                             |
| Wear of contacts                                                                    | [%]            | Prealarm >80%<br>Alarm = 100%                                               |
| Date of maintenance operations performed                                            |                | Last                                                                        |
| Indication of maintenance operation needed                                          |                |                                                                             |
| Circuit-breaker I.D.                                                                |                | Type of circuit-breaker, assigned device name, serial number                |
| <b>Self-diagnosis</b>                                                               |                | <b>Parameters</b>                                                           |
| Check of continuity of internal connections                                         |                | Alarm due to disconnection: rating plug, sensors, trip coil                 |
| Failure of circuit-breaker to open (ANSI 50BF)                                      |                | Alarm following non-tripping of protection functions                        |
| Temperature (OT)                                                                    |                | Prealarm and alarm for abnormal temperature                                 |

(1) with auxiliary supply present



|  | Window                                                            | Intervals                                       | Ekip Touch | Ekip Hi-Touch | Ekip G Touch | Ekip G Hi-Touch |
|--|-------------------------------------------------------------------|-------------------------------------------------|------------|---------------|--------------|-----------------|
|  | Fixed<br>synchronizable by remote                                 | Duration: 5...120min<br>Number of intervals: 24 | ●          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ●          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ○          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ○          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ○          | ●             | ●            | ●               |
|  |                                                                   |                                                 |            |               |              |                 |
|  |                                                                   |                                                 | ●          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ○          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ●          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ●          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ●          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ●          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ●          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ●          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ●          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ●          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ●          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ●          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ●          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ●          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ●          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ●          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ●          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ●          | ●             | ●            | ●               |
|  | Note: Opening of circuit-breaker can be set in the event of alarm |                                                 | ●          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ●          | ●             | ●            | ●               |
|  |                                                                   |                                                 | ●          | ●             | ●            | ●               |

**Key:**

- Key:
- not available
  - available
  - available with Ekip Measuring and Ekip Measuring Pro



# Communication devices and systems

|              |     |
|--------------|-----|
| Introduction | 4/2 |
|--------------|-----|

|                                            |     |
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| Supervision and control                    |     |
| Supervision of the switchgear compartment  | 4/4 |
| Switchgear supervision                     | 4/6 |
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|                    |      |
|--------------------|------|
| Software           |      |
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| Ekip T&P Interface | 4/14 |

# Communication devices and systems

## Introduction

SACE Emax 2 circuit-breakers provide a complete and flexible offering that can be adapted to the actual level of supervision and control required.

The rapid spread of systems for the supervision and control of low voltage electrical distribution plants is determined by the growing need to:

- optimize energy efficiency by analyzing energy consumption;
- ensure service continuity, minimizing the time needed to identify and rectify faults;
- guarantee efficient planning of maintenance activities.

4

| Typical sector                                          | Industrial                                                                                                                                    | Hospital                                                                            | OEMs                                                                                                                                                                 | Naval                                                                                |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                                                         |                                                             |  |                                                                                  |  |
| Level of supervision and control in low voltage systems | Switchgear compartment                                                                                                                        |                                                                                     |                                                                                                                                                                      |                                                                                      |
| Solution with SACE Emax 2                               | <ul style="list-style-type: none"> <li>- Ekip Touch trip units with high resolution display</li> </ul>                                        |                                                                                     | <ul style="list-style-type: none"> <li>- Ekip trip units</li> <li>- Ekip Multimeter display on the front of switchgear</li> </ul>                                    |                                                                                      |
| Benefit of the ABB solution                             | <ul style="list-style-type: none"> <li>- simple and intuitive use</li> <li>- does not require an auxiliary power supply for safety</li> </ul> |                                                                                     | <ul style="list-style-type: none"> <li>- reduced dimensions</li> <li>- flexible installation</li> <li>- simultaneous reading of various electrical values</li> </ul> |                                                                                      |

According to their complexity, the supervision of low voltage systems may involve different levels:

- **switchgear compartment:** for control of the main electrical values of the circuit-breaker. It provides a general but precise indication of the level of absorption of the system (main circuit-breaker) and the individual utilities (outgoing feeder circuit-breakers).
- **electrical switchgear:** to display the data of all circuit-breakers installed in the switchgear from a single point: in local mode via the operator panel on the front of the switchgear, or remotely via an Internet connection.
- **electrical system:** to manage complex systems in which devices must be integrated with automated industrial processes or in intelligent electrical networks, better known as smart grids.

| Industries of medium dimensions                                                                                                                                                                                                            | Shopping centres                                                                   | Office buildings                                                                   | Oil & gas                                                                                                                                                                                                                                                               | Automated industrial processes                                                      | Data centers                                                                         | Smart grids                                                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                                                                                                                                                          |  |  |                                                                                                                                                                                       |  |  |  |
| Electrical switchgear                                                                                                                                                                                                                      |                                                                                    |                                                                                    | Electrical installation                                                                                                                                                                                                                                                 |                                                                                     |                                                                                      |                                                                                      |
| <ul style="list-style-type: none"> <li>- Ekip trip units</li> <li>- Ekip Link module</li> <li>- Ekip Control Panel operator panel colour touch screen</li> <li>- Standardized EtherNet™ components</li> </ul>                              |                                                                                    |                                                                                    | <ul style="list-style-type: none"> <li>- Ekip Touch trip units</li> <li>- Ekip Com communication modules</li> <li>- Ekip View supervision software</li> </ul>                                                                                                           |                                                                                     |                                                                                      |                                                                                      |
| <ul style="list-style-type: none"> <li>- centralized control from the front of switchgear</li> <li>- access to the installation via the web</li> <li>- rapid installation</li> <li>- ease of use</li> <li>- system ready to use</li> </ul> |                                                                                    |                                                                                    | <ul style="list-style-type: none"> <li>- wide range of protocols supported</li> <li>- installation times reduced to a minimum</li> <li>- redundancy of communication</li> <li>- ready to smart grid circuit-breakers</li> <li>- complete network supervision</li> </ul> |                                                                                     |                                                                                      |                                                                                      |

# Communication devices and systems

## Supervision of the switchgear compartment

The SACE Emax 2 circuit-breakers equipped with Ekip electronic trip units enable electrical measurements and diagnostic data to be displayed on the front of the switchgear.

### Solution with Ekip Touch trip units

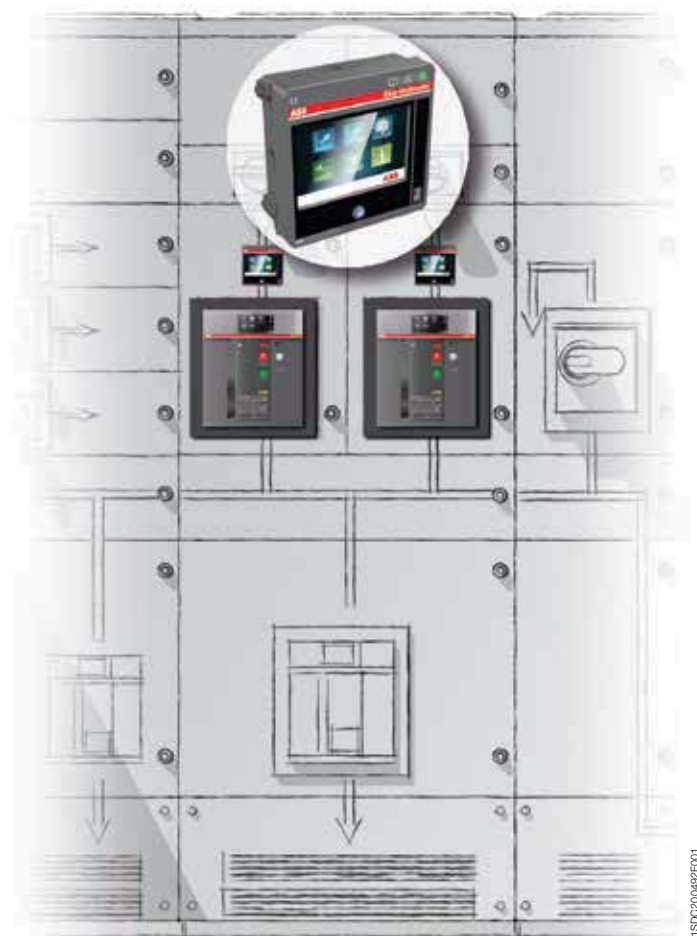
The Ekip Touch electronic trip units are the ideal solution for supervision and control of the compartments in switchgear. In particular:

- their use is simple and intuitive thanks to a large, high resolution, colour touch screen;
- they do not require an auxiliary power supply for safety; the Ekip Touch trip units are directly supplied by the current sensors integrated in the circuit-breaker, thereby avoiding the use of external power supplies.

Ekip Touch



Ekip Multimeter



For the list of information available for each trip unit, consult chapter 3.

### Solution with Ekip Multimeter Display on the front of the switchgear

The Ekip Multimeter is a display unit to be installed on the front of the switchgear for SACE Emax 2 air circuit-breakers equipped with Ekip electronic trip units.

This device remotely displays the information about the system that is available in the trip unit to which it is connected.

The main characteristics of the Ekip Multimeter unit are:

- **Graphical and functional uniformity with the Ekip Touch trip units;** Ekip Multimeter uses the same display as the trip unit to which it is connected, ensuring perfect continuity between the graphic display and the menu items.
- **Reduced dimensions;** the Ekip Multimeter guarantees the precision of the trip unit to which it is connected and performs the function of a measuring instrument without requiring the installation of external current and voltage transformers.
- **Flexible installation;** the Ekip Multimeter can be installed up to distance from the trip unit, enabling access to information from the most convenient point.
- **Simultaneous reading of the various electrical values;** the advanced connection system used allows several Ekip Multimeter devices to be connected to the same protection trip unit.

Furthermore, if connected to trip units equipped with display, the Ekip Multimeter enables adjustment of the parameters and protection thresholds.

|                                                     | Supervision of switchgear compartment |            |                                                    |                                  |
|-----------------------------------------------------|---------------------------------------|------------|----------------------------------------------------|----------------------------------|
| Electronic trip unit                                | Ekip Dip                              | Ekip Touch | Ekip Touch + Ekip measuring module<br>Ekip G Touch | Ekip Hi Touch<br>Ekip Hi-G Touch |
| Solution                                            | Ekip trip units + Ekip Multimeter     |            |                                                    |                                  |
| Type of trip units connectable to Ekip Multimeter   | Ekip trip units                       |            |                                                    |                                  |
| Number of trip units connectable to Ekip Multimeter | 1                                     |            |                                                    |                                  |
| Measurement functions                               |                                       |            |                                                    |                                  |
| Currents                                            | •                                     | •          | •                                                  | •                                |
| Voltages                                            | -                                     | -          | •                                                  | •                                |
| Powers                                              | -                                     | -          | •                                                  | •                                |
| Energies                                            | -                                     | -          | •                                                  | •                                |
| Harmonics                                           | -                                     | -          | -                                                  | •                                |
| Network analyzer                                    | -                                     | -          | -                                                  | •                                |
| Adjustment functions                                |                                       |            |                                                    |                                  |
| Setting of thresholds                               | -                                     | •          | •                                                  | •                                |
| Setting of thresholds second set                    | -                                     | -          | -                                                  | •                                |
| Resetting of alarms                                 | •                                     | •          | •                                                  | •                                |
| Diagnostics                                         |                                       |            |                                                    |                                  |
| Protection function alarms                          | •                                     | •          | •                                                  | •                                |
| Device alarms                                       | •                                     | •          | •                                                  | •                                |
| Protection unit tripping details                    | •                                     | •          | •                                                  | •                                |
| Events log                                          | •                                     | •          | •                                                  | •                                |
| Protection unit tripping log                        | •                                     | •          | •                                                  | •                                |
| Maintenance                                         |                                       |            |                                                    |                                  |
| Number of operations                                | •                                     | •          | •                                                  | •                                |
| Number of trips                                     | •                                     | •          | •                                                  | •                                |
| Wear of contacts                                    | •                                     | •          | •                                                  | •                                |
| Other data                                          |                                       |            |                                                    |                                  |
| Status of circuit-breaker                           | •                                     | •          | •                                                  | •                                |
| Circuit-breaker position <sup>1)</sup>              | •                                     | •          | •                                                  | •                                |
| Local/remote mode                                   | •                                     | •          | •                                                  | •                                |

1) Circuit-breakers equipped with auxiliary contacts to indicate position

# Communication devices and systems

## Switchgear supervision

Ekip Link is a flexible and efficient solution for controlling and supervising low voltage electrical switchgear; it is a system that enables SACE Emax 2 circuit-breakers to be connected to the Ekip Control Panel operator panel by means of Ekip Link interface modules.

### Ekip Link system

The main characteristics of the Ekip Link System are:

- **centralized control**; from the Ekip Control Panel operator panel, all the main values of the installation (electrical measurements, system diagnostics, trends...) can be monitored and controlled.
- **adaptation to real requirements**; when the electrical values to be monitored are limited to currents only, the Ekip Dip trip unit can be connected to the Ekip Link without having to use circuit-breakers equipped with communication modules.
- **access via the Internet** to the installation by any Internet browser using the web server function performed by the Ekip Control Panel.
- **rapid installation**, through the use of standardized EtherNet™ components such as STP cables and RJ45 type connectors.
- **ease of use**; due to the Ekip Control Panel operator panel in front of the switchgear with colour touch screen, the system mimic panel can be displayed so that the entire installation can be controlled rapidly and intuitively.
- **ready to use**; Ekip Control Panel is supplied with pre-configured software that requires no programming. It is only necessary to start scanning the Ekip Link system from the operator panel and in a few seconds communication with the connected devices is active.

Ekip Link enables supervision of electrical switchgear on which up to 30 ABB SACE circuit-breakers have been installed. Tmax T and Tmax XT series circuit-breakers equipped with Modbus RTU communication can also be easily integrated into the Ekip Link system using the multi-serial port fitted on the Ekip Control Panel.



|                                                          |                                                                                                                               |                 |                                                    |                                  |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------------------------------------|----------------------------------|
|                                                          | Switchgear supervision                                                                                                        |                 |                                                    |                                  |
| Electronic trip unit                                     | Ekip Dip                                                                                                                      | Ekip Touch      | Ekip Touch + Ekip measuring module<br>Ekip G Touch | Ekip Hi Touch<br>Ekip Hi-G Touch |
| Solution                                                 | Ekip protection trip units equipped with Ekip link module + Ekip Control Panel operator panel + standard EtherNet™ components |                 |                                                    |                                  |
| Type of trip units connectable                           | Ekip protection trip units                                                                                                    |                 |                                                    |                                  |
| Number of trip units connectable to the Ekip link system | up to 30 <sup>1)</sup>                                                                                                        |                 |                                                    |                                  |
| Data exchange rate of Ekip link system                   | 100 Mbit/sec                                                                                                                  |                 |                                                    |                                  |
| Supervision and control functions                        |                                                                                                                               |                 |                                                    |                                  |
| Opening and Closing of circuit-breakers <sup>2)</sup>    | •                                                                                                                             | •               | •                                                  | •                                |
| Electrical value trends                                  | I                                                                                                                             | I               | I,V,P                                              | I,V,P                            |
| Log of electrical value trends                           | I                                                                                                                             | I               | I,V,P                                              | I,V,P                            |
| Dynamic installation mimic panel                         | •                                                                                                                             | •               | •                                                  | •                                |
| Automatic scanning of the Ekip link system               | •                                                                                                                             | •               | •                                                  | •                                |
| Centralized synchronizing of time                        | •                                                                                                                             | •               | •                                                  | •                                |
| Web server function                                      | • <sup>3)</sup>                                                                                                               | • <sup>3)</sup> | • <sup>3)</sup>                                    | • <sup>3)</sup>                  |
| Measurement functions                                    |                                                                                                                               |                 |                                                    |                                  |
| Currents                                                 | •                                                                                                                             | •               | •                                                  | •                                |
| Voltages                                                 | -                                                                                                                             | -               | •                                                  | •                                |
| Powers                                                   | -                                                                                                                             | -               | •                                                  | •                                |
| Energies                                                 | -                                                                                                                             | -               | •                                                  | •                                |
| Harmonics                                                | -                                                                                                                             | -               | -                                                  | •                                |
| Network analyzer                                         | -                                                                                                                             | -               | -                                                  | •                                |
| Data logger                                              | -                                                                                                                             | •               | •                                                  | •                                |
| Adjustment functions                                     |                                                                                                                               |                 |                                                    |                                  |
| Setting of thresholds                                    | -                                                                                                                             | •               | •                                                  | •                                |
| Resetting of alarms                                      | •                                                                                                                             | •               | •                                                  | •                                |
| Diagnostics                                              |                                                                                                                               |                 |                                                    |                                  |
| Protection function alarms                               | •                                                                                                                             | •               | •                                                  | •                                |
| Device alarms                                            | •                                                                                                                             | •               | •                                                  | •                                |
| Protection unit tripping details                         | •                                                                                                                             | •               | •                                                  | •                                |
| Events log                                               | •                                                                                                                             | •               | •                                                  | •                                |
| Protection unit tripping log                             | •                                                                                                                             | •               | •                                                  | •                                |
| Transmission of alarms via SMS                           | optional                                                                                                                      | optional        | optional                                           | optional                         |
| Transmission of alarms via e-mail                        | optional                                                                                                                      | optional        | optional                                           | optional                         |
| Maintenance                                              |                                                                                                                               |                 |                                                    |                                  |
| Number of operations                                     | •                                                                                                                             | •               | •                                                  | •                                |
| Number of trips                                          | •                                                                                                                             | •               | •                                                  | •                                |
| Wear of contacts                                         | •                                                                                                                             | •               | •                                                  | •                                |
| Other data                                               |                                                                                                                               |                 |                                                    |                                  |
| Status of circuit-breaker                                | •                                                                                                                             | •               | •                                                  | •                                |
| Circuit-breaker position <sup>4)</sup>                   | •                                                                                                                             | •               | •                                                  | •                                |
| Local/remote mode                                        | •                                                                                                                             | •               | •                                                  | •                                |

1) Ekip Control Panel is available in two versions that can manage a maximum of 10 or 30 circuit-breakers. The number of circuit-breakers may vary depending on their type. For details, ask ABB SACE

2) Circuit-breakers equipped with actuation module, electric accessories, opening and closing releases and spring charging motor

3) Two client web accesses included in the licence

4) Circuit-breakers equipped with auxiliary contacts to indicate position

# Communication devices and systems

## Supervision of the electrical installation

The integration of low voltage devices in communication networks is required in particular for: automated industrial processes, industrial and petrochemical sites, modern data centres and intelligent electricity networks, better known as smart grids.

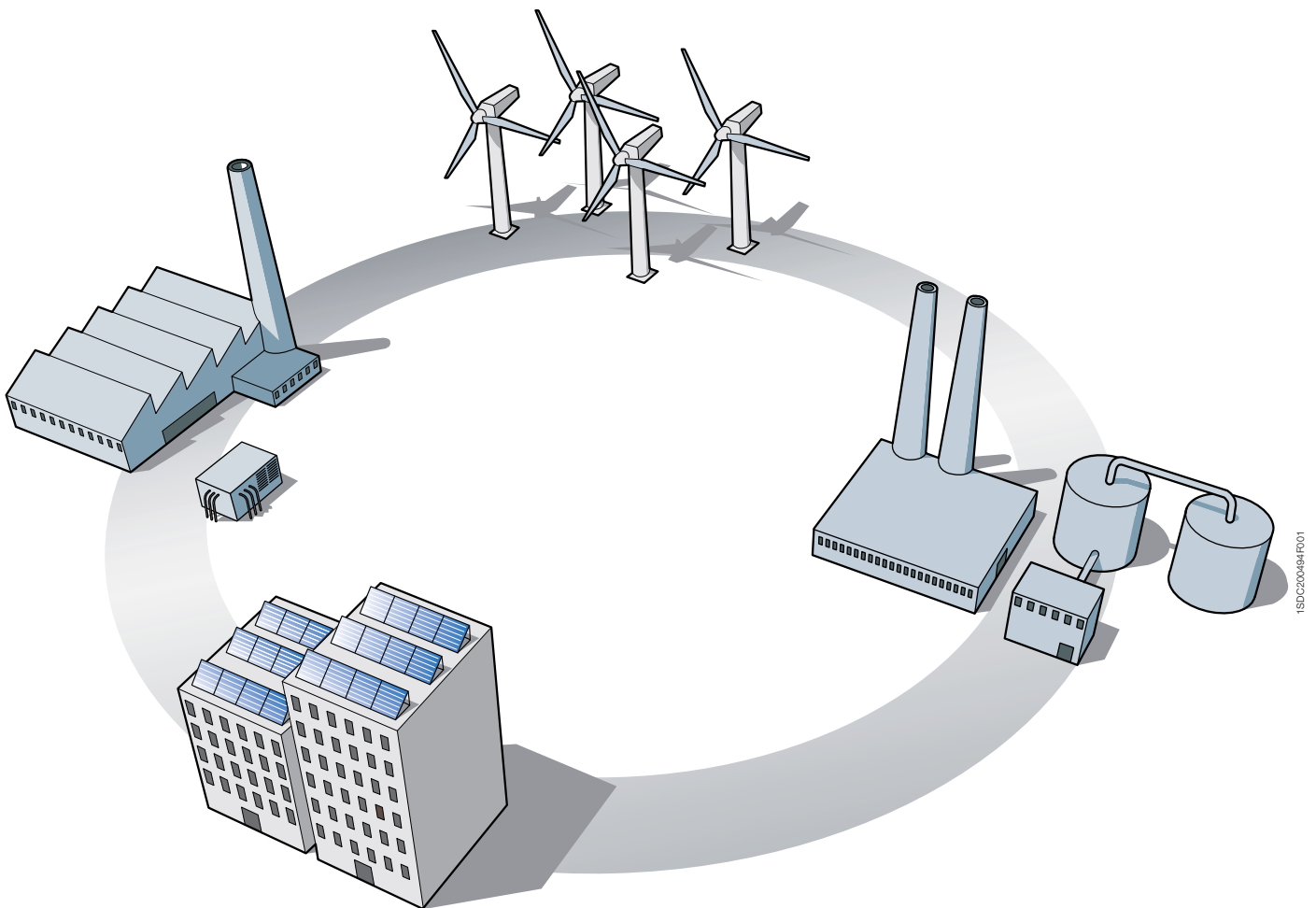
### Ekip Com Modules

Thanks to the wide range of communication protocols supported, SACE Emax 2 circuit-breakers equipped with Ekip Touch electronic trip units can be integrated into communication networks without the need for external interface devices.

4

The distinctive characteristics of the SACE Emax 2 circuit-breakers offering for industrial communication are:

- **Wide range of protocols supported;** the Ekip Com communication modules enable integration with the most common communication protocols based on RS485 serial lines and the most modern communication systems based on EtherNet™ infrastructures, which guarantee an exchange of data in the order of 100 Mbit/s.
- **Installation times reduced to a minimum** due to the plug & play technology of the communication modules, which are connected directly to the circuit-breaker terminal box without having to remove the electronic trip unit.
- **Repetition of communication for greater reliability of the system;** the circuit-breaker can be equipped with two communication modules at the same time, allowing the information on two buses to be exchanged simultaneously.
- **Ready to smart grid;** the Ekip Com 61850 module is the solution for integrating SACE Emax 2 circuit-breakers into the automated systems of electrical substations based on the IEC 61850 standard without the need for complex external devices.
- **Complete supervision** of Modbus RTU or Modbus TCP/IP networks via the software for PC Ekip View.



|                                                    |                                            |                                    |                 |
|----------------------------------------------------|--------------------------------------------|------------------------------------|-----------------|
|                                                    | Supervision of the electrical installation |                                    |                 |
| Electronic trip unit                               | Ekip Touch                                 | Ekip Touch + Ekip measuring module | Ekip Hi Touch   |
|                                                    |                                            | Ekip G Touch                       | Ekip Hi-G Touch |
| Solution                                           | Ekip Touch trip units + Ekip com modules   |                                    |                 |
| Protocols supported:                               |                                            |                                    |                 |
| Modbus RTU                                         | Ekip com Modbus RTU                        |                                    |                 |
| Profibus-DP                                        | Ekip com Profibus                          |                                    |                 |
| DeviceNet™                                         | Ekip com DeviceNet™                        |                                    |                 |
| Modbus TCP/IP                                      | Ekip com Modbus TCP                        |                                    |                 |
| Profinet                                           | Ekip com Profinet                          |                                    |                 |
| EtherNet/IP™                                       | Ekip com EtherNet™                         |                                    |                 |
| IEC61850                                           | Ekip com IEC61850                          |                                    |                 |
| Control functions                                  |                                            |                                    |                 |
| Circuit-breakers opening and closing <sup>1)</sup> | •                                          | •                                  | •               |
| Measurement functions                              |                                            |                                    |                 |
| Currents                                           | •                                          | •                                  | •               |
| Voltages                                           | -                                          | •                                  | •               |
| Powers                                             | -                                          | •                                  | •               |
| Energies                                           | -                                          | •                                  | •               |
| Harmonics                                          | -                                          | -                                  | •               |
| Network analyzer                                   | -                                          | -                                  | •               |
| Data logger                                        | •                                          | •                                  | •               |
| Adjustment functions                               |                                            |                                    |                 |
| Setting of thresholds                              | •                                          | •                                  | •               |
| Resetting of alarms                                | •                                          | •                                  | •               |
| Diagnostic                                         |                                            |                                    |                 |
| Protection function alarms                         | •                                          | •                                  | •               |
| Device alarms                                      | •                                          | •                                  | •               |
| Protection unit tripping details                   | •                                          | •                                  | •               |
| Events log                                         | •                                          | •                                  | •               |
| Protection unit tripping log                       | •                                          | •                                  | •               |
| Maintenance                                        |                                            |                                    |                 |
| Number of operations                               | •                                          | •                                  | •               |
| Number of trips                                    | •                                          | •                                  | •               |
| Wear of contacts                                   | •                                          | •                                  | •               |
| Other data                                         |                                            |                                    |                 |
| Status of circuit-breaker                          | •                                          | •                                  | •               |
| Circuit-breaker position <sup>2)</sup>             | •                                          | •                                  | •               |
| Local/remote mode                                  | •                                          | •                                  | •               |

1) Circuit-breakers equipped with Ekip Com Actuator module, electrical accessories, opening and closing releases and spring charging motor

2) Circuit-breakers equipped with auxiliary contacts to indicate position

# Communication devices and systems

## Supervision and control software

ABB SACE offers software applications that allow the potential of the Ekip electronic trip units to be utilized in the best possible way in terms of the management of power, acquisition and analysis of the electrical values, and testing of the protection, maintenance and diagnostic functions.

### Overview of the software

An overview of the software available and their main characteristics are given below:

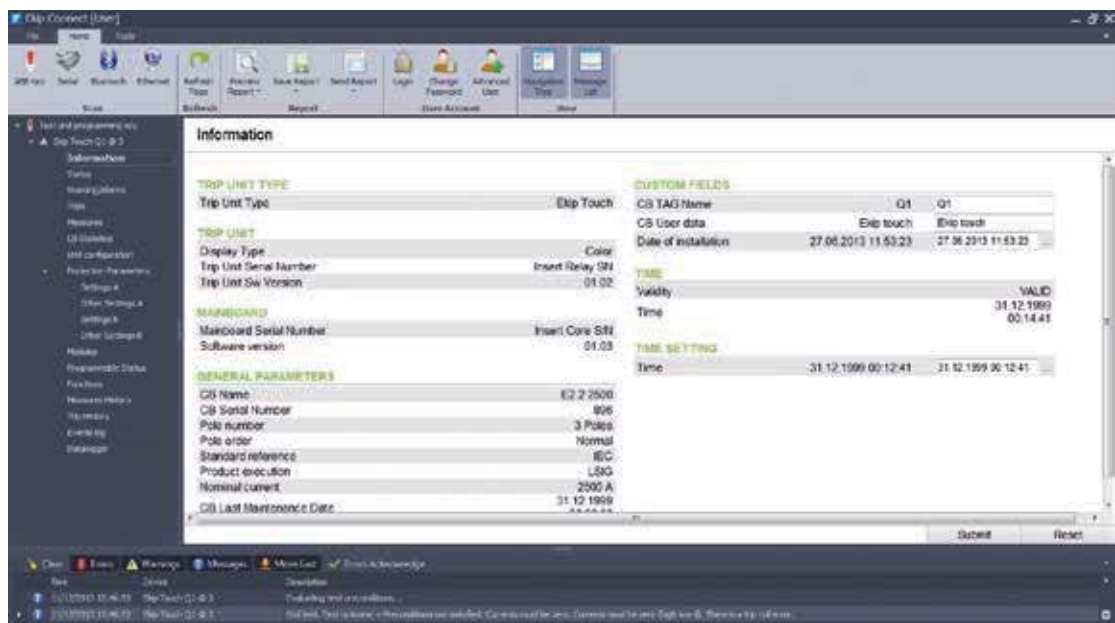
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| Software                      | Functions                                                                                                                                                                            | Distinctive characteristics                                                                                                                                                                                                                                                                     |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ekip Connect</b>           | <ul style="list-style-type: none"> <li>- commissioning of circuit-breakers</li> <li>- analysis of faults</li> <li>- testing of communication bus</li> </ul>                          | <ul style="list-style-type: none"> <li>- simple and intuitive use</li> <li>- integrated with DOC electrical design software</li> <li>- useable via EtherNet™</li> <li>- automatic updating from Internet</li> <li>- off-line mode</li> <li>- multi-media (smart phone, tablet or PC)</li> </ul> |
| <b>Ekip View</b>              | <ul style="list-style-type: none"> <li>- supervision and control of communication networks</li> <li>- analysis of electrical value trends</li> <li>- condition monitoring</li> </ul> | <ul style="list-style-type: none"> <li>- engineering free</li> <li>- analysis of past trends</li> <li>- customizable reports</li> <li>- access via Internet to the installation</li> <li>- possibility of integrating third party devices</li> </ul>                                            |
| <b>Ekip T&amp;P interface</b> | <ul style="list-style-type: none"> <li>- testing of protection functions</li> <li>- ordinary maintenance of trip units</li> </ul>                                                    | <ul style="list-style-type: none"> <li>- test signals can be pre-set or configured as desired</li> <li>- advanced graphical interface</li> <li>- generation of test reports</li> </ul>                                                                                                          |

### Ekip Connect

Ekip Connect enables data to be exchanged with one or more protection trip units, which:

- **Assists commissioning of the system;** all system parameters and the protection thresholds can be set rapidly in the Ekip trip units thanks to the easy and intuitive navigation pages of the software.
- **Permits rapid access to diagnostics;** it is possible to consult and download the records of events, alarms and the tripping of the trip units, thereby facilitating the identification and understanding of the anomalies.



- **Enables testing of the communication network;** Ekip Connect performs an automatic scan of the Modbus RS-485 or Modbus TCP network and determines whether the circuit-breakers have been correctly connected and, when necessary, signals incorrect configurations of the communication parameters (addresses, baud rate, parity).

The distinctive characteristics of the software are:

- **Integration with DOC electrical design software;** the adjustments and settings calculated by the DOC software can be downloaded directly into the protection trip units, thereby reducing commissioning times and the potential for errors.
- **Ease of connection:** the Ekip trip units equipped with Modbus TCP Ekip com modules can be controlled directly by the EtherNet™ network.
- **Multi-media;** Ekip Connect is designed to operate on a PC or on the more modern tablet PCs and smart phones.
- **Automatic updating from the Internet site;** if connected to an Internet site, the software is able to constantly control the availability of any updates.

The software is available free of charge on the ABB website [www.abb.com/lowvoltage](http://www.abb.com/lowvoltage).

| Media                                                 | Ekip Connect Software                |                   |                        |                        |                        |
|-------------------------------------------------------|--------------------------------------|-------------------|------------------------|------------------------|------------------------|
|                                                       | Personal PC                          |                   |                        | Smartphone/Tablet      | iPhone/iPad            |
| Operating system                                      | Windows XP, Windows 7, Windows Vista |                   |                        | Android                | iOS                    |
| Method of connection to the trip units                | Communication network                | Test connector    | Wireless communication | Wireless communication | Wireless communication |
| SACE Emax 2 trip units                                | Ekip com Modbus RS485 or TCP         | Ekip T&P          | Ekip Bluetooth         | Ekip Bluetooth         | Ekip Bluetooth         |
| SACE Tmax XT trip units                               | Ekip com                             | Ekip T&P          | Ekip Bluetooth         | -                      | -                      |
| SACE Emax, T7, X1, T8 trip units                      | PR120/D-M, PR330/D-M                 | Ekip T&P or BT030 | BT030                  | -                      | -                      |
| SACE Tmax T trip units                                | PR222DS/PD, PR223DS; PR223/EF        | Ekip T&P or BT030 | BT030                  | -                      | -                      |
| Functions of reading and control                      |                                      |                   |                        |                        |                        |
| Automatic network scan                                | •                                    | -                 | -                      | -                      | -                      |
| Opening and closing of circuit-breakers <sup>1)</sup> | •                                    | •                 | •                      | •                      | •                      |
| Setting of thresholds                                 | •                                    | •                 | •                      | •                      | •                      |
| Resetting of alarms                                   | •                                    | •                 | •                      | •                      | •                      |
| Reading of electrical measurements                    | •                                    | •                 | •                      | •                      | •                      |
| Displaying of time-current curve                      | •                                    | •                 | •                      | •                      | •                      |
| Reading of past records                               | •                                    | •                 | •                      | •                      | •                      |
| DataLogger download                                   | •                                    | •                 | •                      | -                      | -                      |
| Other functions                                       |                                      |                   |                        |                        |                        |
| Generating of Reports                                 | •                                    | •                 | •                      | •                      | •                      |
| Automatic updating from Internet                      | •                                    | •                 | •                      | •                      | •                      |
| Integration with DOC                                  | •                                    | •                 | •                      | •                      | •                      |
| Enabling of Ekip T&P Interface                        | •                                    | •                 | •                      | •                      | •                      |
| Use via EtherNet™                                     | • <sup>2)</sup>                      | -                 | -                      | -                      | -                      |

1) Circuit-breakers equipped with auxiliary contacts to indicate position

2) only in the presence of Modbus TCP Ekip Com modules

# Communication devices and systems

## Supervision and control software

### Ekip View

Ekip View is the software for supervising devices connected to a communication network that uses the Modbus RTU or Modbus TCP protocol.

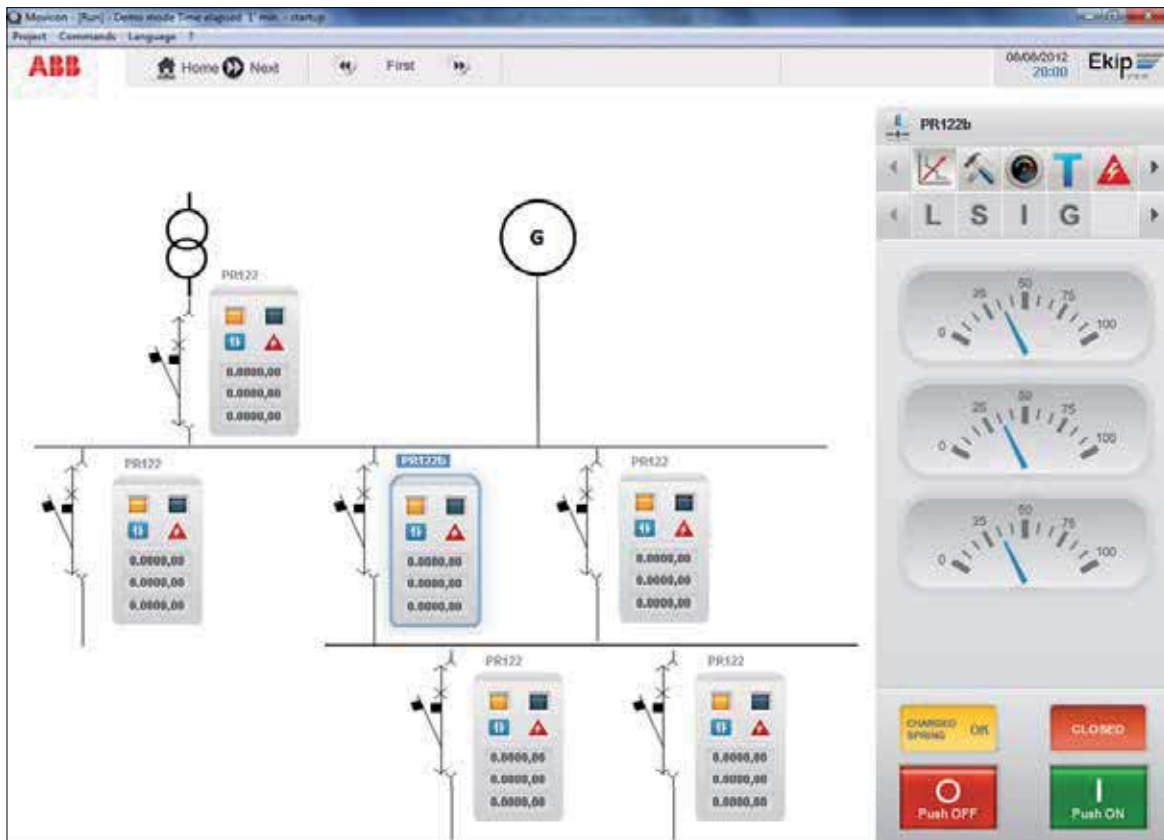
It is the ideal tool for all applications that require:

- remote control of the system,
- monitoring of power consumption,
- fault detection of the system,
- allocation of energy consumption to the different processes and departments,
- preventative planning of maintenance.

4

The main characteristics of Ekip View are:

- **Engineering free** and ready to use **software** which guides the user in the recognition and configuration of the protection units without the need for any supervision system engineering activities.
- **Dynamic mimic panel;** after automatic scanning of the network, for each of the devices found, Ekip View proposes a dynamic symbol that summarizes the most important information (status, electrical measurements, alarms). The extensive library of electrical symbols enables the entire electrical system to be depicted in detail.
- **Analysis of trends;** the instantaneous and past trends of currents, powers and power factors are represented graphically and can be exported into Microsoft Excel for detailed analysis.
- **Reports;** advanced reports can be created regarding system and communication network diagnostics. Using the Alarm Dispatcher option, the user can receive the most important indications via SMS or e-mail.
- **Access via web** to the installation, thanks to the Web Server function of Ekip View.



| Ekip View Software                                    |                                                                                                                                                         |                                                                                                                                                         |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Communication characteristics</b>                  |                                                                                                                                                         |                                                                                                                                                         |
| Protocol Supported                                    | Modbus RTU                                                                                                                                              | Modbus TCP                                                                                                                                              |
| Physical layer                                        | RS 485                                                                                                                                                  | EtherNet™                                                                                                                                               |
| Maximum data exchange rate                            | 19200 bps                                                                                                                                               | 100 Mbps                                                                                                                                                |
| Operating system                                      | Windows XP, Windows 7, Windows Vista                                                                                                                    |                                                                                                                                                         |
| <b>Devices supported</b>                              |                                                                                                                                                         |                                                                                                                                                         |
| SACE Emax 2 trip units                                | Ekip com Modbus RS485                                                                                                                                   | Ekip com Modbus TCP                                                                                                                                     |
| SACE Emax,T7,X1,T8 trip units                         | PR120/D-M, PR330/D-M                                                                                                                                    | -                                                                                                                                                       |
| SACE Tmax T trip units                                | PR222DS/PD, PR223DS                                                                                                                                     | -                                                                                                                                                       |
| SACE Tmax XT trip units                               | Ekip com                                                                                                                                                | -                                                                                                                                                       |
| Third party devices                                   | optional <sup>1)</sup>                                                                                                                                  | optional <sup>1)</sup>                                                                                                                                  |
| Licences available                                    | - up to 30 <sup>2)</sup> controllable devices<br>- up to 60 <sup>2)</sup> controllable devices<br>- unlimited number <sup>3)</sup> controllable devices | - up to 30 <sup>2)</sup> controllable devices<br>- up to 60 <sup>2)</sup> controllable devices<br>- unlimited number <sup>3)</sup> controllable devices |
| <b>Supervision and control functions</b>              |                                                                                                                                                         |                                                                                                                                                         |
| Opening and Closing of circuit-breakers <sup>4)</sup> | •                                                                                                                                                       | •                                                                                                                                                       |
| Electrical value trends                               | •                                                                                                                                                       | •                                                                                                                                                       |
| Log of electrical value trends                        | •                                                                                                                                                       | •                                                                                                                                                       |
| Dynamic installation mimic panel                      | •                                                                                                                                                       | •                                                                                                                                                       |
| Automatic scanning                                    | •                                                                                                                                                       | •                                                                                                                                                       |
| Centralized synchronizing of time                     | •                                                                                                                                                       | •                                                                                                                                                       |
| Web server function                                   | • <sup>5)</sup>                                                                                                                                         | • <sup>5)</sup>                                                                                                                                         |
| Redundancy                                            | optional                                                                                                                                                | optional                                                                                                                                                |
| OPC server-client                                     | optional                                                                                                                                                | optional                                                                                                                                                |
| <b>Measurement functions <sup>6)</sup></b>            |                                                                                                                                                         |                                                                                                                                                         |
| Currents                                              | •                                                                                                                                                       | •                                                                                                                                                       |
| Voltages                                              | •                                                                                                                                                       | •                                                                                                                                                       |
| Powers                                                | •                                                                                                                                                       | •                                                                                                                                                       |
| Energies                                              | •                                                                                                                                                       | •                                                                                                                                                       |
| Harmonics                                             | •                                                                                                                                                       | •                                                                                                                                                       |
| Network analyzer                                      | •                                                                                                                                                       | •                                                                                                                                                       |
| Data logger                                           | •                                                                                                                                                       | •                                                                                                                                                       |
| <b>Adjustment functions</b>                           |                                                                                                                                                         |                                                                                                                                                         |
| Setting of thresholds                                 | •                                                                                                                                                       | •                                                                                                                                                       |
| Resetting of alarms                                   | •                                                                                                                                                       | •                                                                                                                                                       |
| <b>Diagnostics</b>                                    |                                                                                                                                                         |                                                                                                                                                         |
| Protection function alarms                            | •                                                                                                                                                       | •                                                                                                                                                       |
| Device alarms                                         | •                                                                                                                                                       | •                                                                                                                                                       |
| Communication system alarms                           | •                                                                                                                                                       | •                                                                                                                                                       |
| Protection unit tripping details                      | •                                                                                                                                                       | •                                                                                                                                                       |
| Events log                                            | •                                                                                                                                                       | •                                                                                                                                                       |
| Protection unit tripping log                          | •                                                                                                                                                       | •                                                                                                                                                       |
| Generation of Reports                                 | •                                                                                                                                                       | •                                                                                                                                                       |
| Transmission of alarms via SMS                        | optional                                                                                                                                                | optional                                                                                                                                                |
| Transmission of alarms via e-mail                     | optional                                                                                                                                                | optional                                                                                                                                                |
| <b>Maintenance</b>                                    |                                                                                                                                                         |                                                                                                                                                         |
| Number of operations                                  | •                                                                                                                                                       | •                                                                                                                                                       |
| Number of trips                                       | •                                                                                                                                                       | •                                                                                                                                                       |
| Wear of contacts                                      | •                                                                                                                                                       | •                                                                                                                                                       |
| <b>Other data</b>                                     |                                                                                                                                                         |                                                                                                                                                         |
| Status of circuit-breaker                             | •                                                                                                                                                       | •                                                                                                                                                       |
| Circuit-breaker position <sup>7)</sup>                | •                                                                                                                                                       | •                                                                                                                                                       |
| local/remote mode                                     | •                                                                                                                                                       | •                                                                                                                                                       |

1) Contact ABB SACE to integrate other devices in the Ekip View software

2) can be increased

3) within the physical limit of the protocol used

4) circuit-breakers equipped with Ekip com Actuator module and electrical accessories

5) two client web accesses included in the licence

6) according to the values supported by the trip units

7) circuit-breakers equipped with auxiliary contacts for position indication

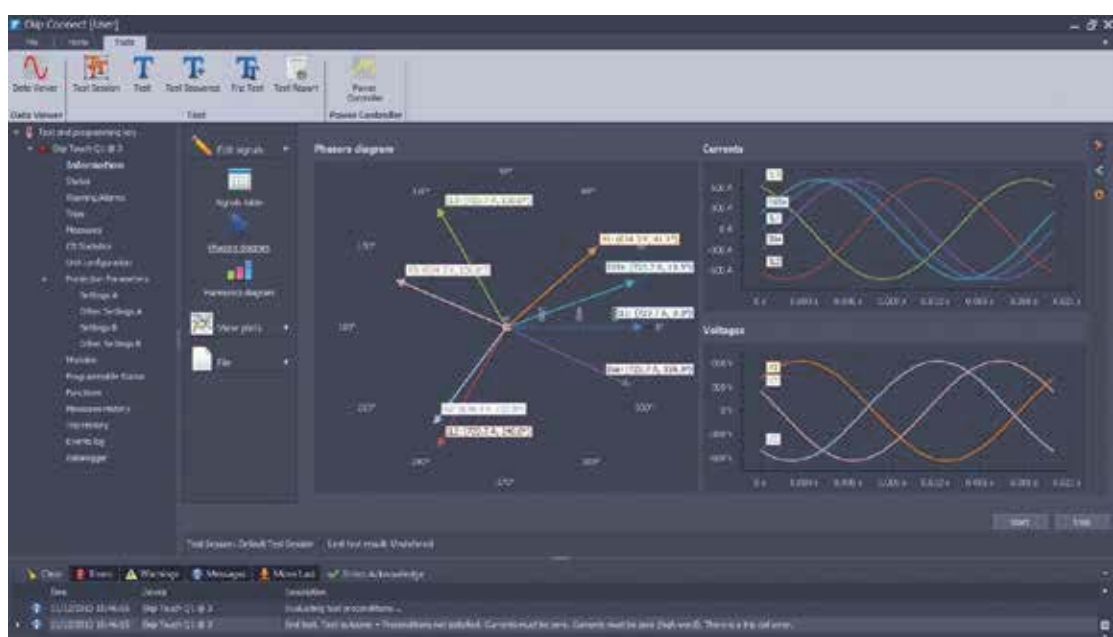
# Communication devices and systems

## Supervision and control software

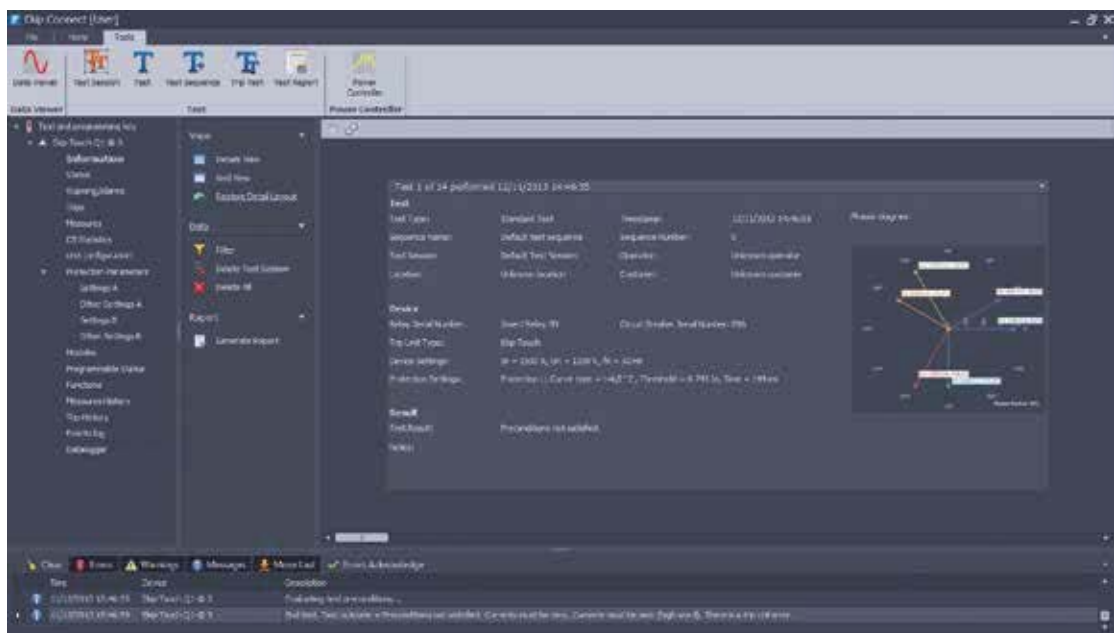
### Ekip T&P Interface

The Ekip T&P Interface software, used together with the Ekip T&P device, enables the electronic protection trip units to be tested for correct operation during the stages of commissioning and system maintenance.

As a result of advanced graphical interfaces, the user can simply select the test to perform: from simple current and voltage signals to more complex wave forms with the presence of harmonic distortion.



The software creates and stores all reports, keeping a record of the tests carried out and essential information such as the operator name, date, serial number of the circuit-breaker, type of test and the result.



1SDC200498F001



# Accessories

|                                  |      |
|----------------------------------|------|
| Functional areas                 | 5/2  |
| Standard supply                  | 5/4  |
| Accessories for circuit-breakers | 5/6  |
| Signalling                       | 5/7  |
| Control                          | 5/10 |
| Safety                           | 5/15 |
| Protection devices               | 5/16 |
| Connections                      | 5/18 |
| Interlocks and switching devices | 5/20 |
| Accessories for Ekip trip units  | 5/23 |
| Power supply                     | 5/25 |
| Connectivity                     | 5/25 |
| Signalling                       | 5/27 |
| Measurements and protection      | 5/28 |
| Displaying and supervision       | 5/32 |
| Testing and programming          | 5/33 |
| Spare parts                      | 5/34 |

## Accessories

### Functional areas

The new SACE Emax 2 circuit-breakers have been designed to optimize the installation and commissioning of accessories.

The front of the circuit-breaker features two functional areas, which are protected by separate covers:

- **Accessories area** for the installation of accessories inside the circuit-breaker and Ekip trip unit. The areas dedicated to accessories can be accessed by removing the flange and the accessories covers. On removal, the operating mechanism area remains segregated and protected, providing safety for operators.
- **Safety area**, which delimits the housing of the stored energy operating mechanism of the circuit-breaker. To carry out maintenance on the operating mechanism, the covers of the accessories and safety area must be removed.

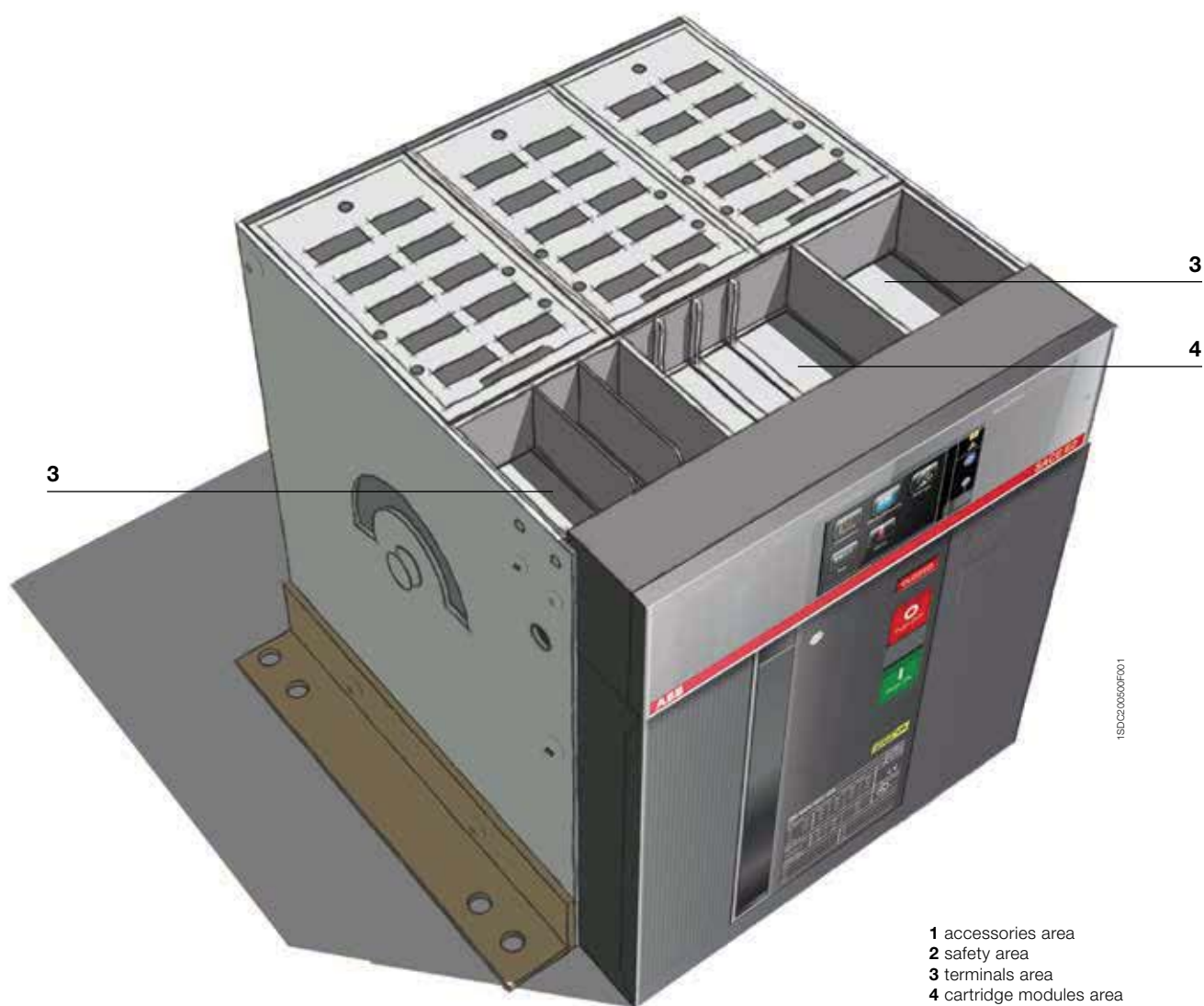
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As a result of two distinct functional areas that determine the operating spaces, the accessorizing logic of the circuit-breakers has been considerably simplified.

The auxiliary connection terminal box also features two areas:

- **Terminal area** for housing and inserting the terminals for wiring the auxiliary connections. The terminals can be wired first and then installed on the circuit-breaker terminal box, thereby facilitating cable connection for the operator.
- **Cartridge module area**, housing for the Ekip modules. These are installed directly on the upper part of the circuit-breaker or of the fixed part without having to remove the Ekip electronic trip unit, thereby minimizing the time required for the installation and commissioning of accessories.



## Accessories

### Standard supply

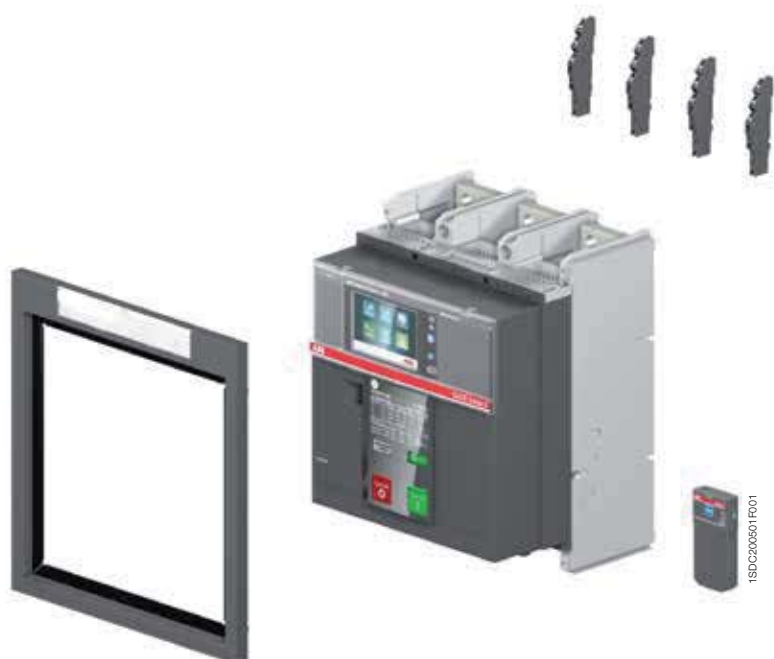
The fixed versions of SACE Emax 2 automatic circuit-breakers and switch-disconnectors are always supplied as standard with the following accessories:

- IP30 protection for switchgear door
- lifting plates for E2.2 ... E6.2 circuit-breaker
- front terminals for E1.2 circuit-breaker
- adjustable rear terminals for E2.2 ... E6.2 circuit-breaker, mounted in HR – HR configuration.

In addition, for fixed automatic circuit-breakers only:

- four standard open/closed auxiliary contacts - AUX 4Q 400V
- four terminals for auxiliary connections
- mechanical signalling of the tripping of the protection trip unit - TU Reset
- Ekip TT power supply and test unit, when a protection trip unit is present with display
- contact signalling tripping of Ekip protection trip unit S51 250V.

5



The withdrawable versions of automatic circuit-breakers and switch-disconnectors are always supplied as standard with the following accessories:

- closed circuit-breaker racked-out mechanism lock
- lifting plates for E2.2 ... E2.6 circuit-breakers
- lever for racking in and racking out
- anti-insertion lock.

In addition, for withdrawable automatic circuit-breakers only:

- four standard open/closed auxiliary contacts - AUX 4Q 400V
- four terminals for auxiliary connections
- mechanical signalling of the tripping of the protection trip unit - TU Reset
- Ekip TT power supply and test unit, when a protection trip unit is present with display
- contact signalling tripping of Ekip protection trip unit S51 250V.

The fixed parts feature:

- IP30 protection for switchgear door
- anti-insertion lock
- standard shutter lock – SL
- adjustable rear terminals, mounted in HR – HR configuration.



# Accessories

## Accessories for circuit-breakers

SACE Emax 2 circuit-breakers offer a wide range of accessories developed to satisfy the application and installation requirements of every customer.

|                                                                                         | Automatic circuit-breaker |                       | Switch-disconnector |                       | Derived versions         |    |      |
|-----------------------------------------------------------------------------------------|---------------------------|-----------------------|---------------------|-----------------------|--------------------------|----|------|
|                                                                                         | E1.2                      | E2.2 - E4.2<br>- E6.2 | E1.2                | E2.2 - E4.2<br>- E6.2 | CS<br>E2.2 - E4.2 - E6.2 | MT | MTP  |
| <b>Signalling</b>                                                                       |                           |                       |                     |                       |                          |    |      |
| Standard open/closed auxiliary contacts - AUX 4Q                                        | ● / ●●                    | ● / ●●                | ○ / ○○              | ○ / ○○                | -                        | -  | ●●   |
| Open/closed auxiliary contacts - AUX 6Q                                                 | -                         | ○ / ○○                | -                   | ○ / ○○                | -                        | -  | ○○   |
| Open/closed auxiliary contacts- AUX 15Q                                                 | ○ / △                     | ○ / △                 | ○ / △               | ○ / △                 | -                        | -  | ○○   |
| Auxiliary position contacts - AUP                                                       | △                         | △                     | △                   | △                     | △                        | △  | △    |
| Ready to close signalling contact - RTC                                                 | ○ / ○○                    | ○ / ○○                | ○ / ○○              | ○ / ○○                | -                        | -  | -    |
| TU Reset mechanical signalling of the tripping of protection trip unit - TU Reset       | ● / ●●                    | ● / ●●                | -                   | -                     | -                        | -  | -    |
| Contact signalling tripping of Ekip protection trip unit - S51                          | ● / ●●                    | ● / ●●                | -                   | -                     | -                        | -  | -    |
| Contact signalling loaded springs – S33 M/2 (supplied with Motor)                       | ○ / ○○                    | ○ / ○○                | ○ / ○○              | ○ / ○○                | -                        | -  | ○○   |
| <b>Control</b>                                                                          |                           |                       |                     |                       |                          |    |      |
| Opening and closing release - YO/YC                                                     | ○ / ○○                    | ○ / ○○                | ○ / ○○              | ○ / ○○                | -                        | -  | ○○ * |
| Second opening and closing release - YO2/YC2                                            | ○ / ○○                    | ○ / ○○                | ○ / ○○              | ○ / ○○                | -                        | -  | -    |
| Undervoltage release - YU                                                               | ○ / ○○                    | ○ / ○○                | ○ / ○○              | ○ / ○○                | -                        | -  | -    |
| Electronic time-delay device for undervoltage release - UVD                             | ○ / ○○                    | ○ / ○○                | ○ / ○○              | ○ / ○○                | -                        | -  | -    |
| Motor - M                                                                               | ○ / ○○                    | ○ / ○○                | ○ / ○○              | ○ / ○○                | -                        | -  | ○○   |
| Remote reset - YR                                                                       | ○ / ○○                    | ○ / ○○                | -                   | -                     | -                        | -  | -    |
| Opening and closing release test unit - YO/YC Test Unit                                 | ○ / △                     | ○ / △                 | ○ / △               | ○ / △                 | -                        | -  | △ *  |
| <b>Safety</b>                                                                           |                           |                       |                     |                       |                          |    |      |
| Key lock and padlock in open position - KLC and PLC                                     | ○ / ○○                    | ○ / ○○                | ○ / ○○              | ○ / ○○                | -                        | -  | ○○   |
| Key lock and padlock in racked-in / test / racked-out position - KLP and PLP            | △                         | ○○                    | △                   | ○○                    | ○○                       | ○○ | ○○   |
| Shutter lock - SL                                                                       | ▲                         | ▲                     | ▲                   | ▲                     | ▲                        | ▲  | ▲    |
| Lock for racking-out mechanism with circuit-breaker in closed position                  | ▲                         | ●●                    | ▲                   | ●●                    | ●●                       | ●● | ●●   |
| Lock for racking in / racking out the mobile part when the door is open - DLR           | -                         | △                     | -                   | △                     | -                        | -  | ○○   |
| Lock to prevent door opening when circuit-breaker is in racked-in / test position - DLP | -                         | △                     | -                   | △                     | △                        | △  | △    |
| Lock to prevent door opening when circuit-breaker is in closed position - DLC           | ○ / ○○                    | ○ / ○○                | ○ / ○○              | ○ / ○○                | -                        | -  | ○○   |
| Anti-insertion lock                                                                     | ● / ●●                    | ● / ●●                | ● / ●●              | ● / ●●                | ●●                       | ●● | ●●   |
| Mechanical operation counter - MOC                                                      | ○ / ○○                    | ○ / ○○                | ○ / ○○              | ○ / ○○                | -                        | -  | ○○   |
| <b>Protection devices</b>                                                               |                           |                       |                     |                       |                          |    |      |
| Protection device for opening and closing pushbuttons - PBC                             | ○ / ○○                    | ○ / ○○                | ○ / ○○              | ○ / ○○                | -                        | -  | ○○   |
| IP30 Protection                                                                         | ● / ▲                     | ● / ▲                 | ● / ▲               | ● / ▲                 | -                        | -  | ▲    |
| IP54 Protection                                                                         | ○ / △                     | ○ / △                 | ○ / △               | ○ / △                 | -                        | -  | △    |
| Terminal covers - HTC / LTC                                                             | ○ / ○○                    | -                     | -                   | -                     | -                        | -  | -    |
| Separators - PB                                                                         | ○ / △                     | ○ / △                 | ○ / △               | ○ / △                 | -                        | -  | -    |
| <b>Connections</b>                                                                      |                           |                       |                     |                       |                          |    |      |
| Orientable rear terminal - HR/VR                                                        | ○ / ▲                     | ● / ▲                 | ○ / ▲               | ● / ▲                 | -                        | -  | ●    |
| Front terminal - F                                                                      | ●                         | ○ / △                 | ●                   | ○ / △                 | -                        | -  | △    |
| Other configurations                                                                    | ○ / △                     | ○ / △                 | ○ / △               | ○ / △                 | -                        | -  | △    |
| <b>Interlocks and switching devices</b>                                                 |                           |                       |                     |                       |                          |    |      |
| Mechanical interlock - MI                                                               | ○ / ○○ / △                | ○ / ○○ / △            | ○ / ○○ / △          | ○ / ○○ / △            | -                        | -  | -    |
| Automatic transfer switches - ATS                                                       | ○ / ○○                    | ○ / ○○                | ○ / ○○              | ○ / ○○                | -                        | -  | -    |

- Standard accessory for fixed circuit-breaker
- Accessory on request for fixed circuit-breaker
- Standard accessory for mobile part
- Accessory on request for mobile part
- ▲ Standard accessory for fixed part
- △ Accessory on request for fixed part
- \* Only closing release YC



1SDC2000303F001



1SDC200504F001



1SDC200505F001

## Signalling

### Open / closed auxiliary contacts - AUX

SACE Emax 2 circuit-breakers can be equipped with auxiliary contacts that signal the open or closed status of the circuit-breaker. The first block of four standard contacts is always provided with the automatic circuit-breakers. The switching contacts are available in the following configurations:

| Open / closed auxiliary contacts (AUX 4Q)                                |                 | E1.2 | E2.2 ... E6.2 |
|--------------------------------------------------------------------------|-----------------|------|---------------|
| 4 auxiliary contacts                                                     | standard        | •    | •             |
|                                                                          | digital signals | •    | •             |
|                                                                          | mixed           | •    | •             |
| Open / closed supplementary auxiliary contacts (AUX 6Q)                  |                 |      |               |
| 6 auxiliary contacts                                                     | standard        | -    | •             |
|                                                                          | digital signals | -    | •             |
|                                                                          | mixed           | -    | •             |
| Open / closed external supplementary auxiliary contacts (AUX 15Q)        |                 |      |               |
| 15 auxiliary contacts                                                    | standard        | •    | •             |
|                                                                          | digital signals | •    | •             |
| Maximum number of open / closed auxiliary contacts that can be installed |                 | 19   | 25            |

|                   |      | Standard contact    | Contact for digital signals |
|-------------------|------|---------------------|-----------------------------|
| Type              |      | changeover contacts | changeover contacts         |
| Minimum load      |      | 100mA @ 24V         | 1mA @ 5V                    |
| Breaking capacity |      |                     |                             |
| DC                | 24V  | -                   | 0.1A                        |
|                   | 125V | 0.3A @ 10ms         | -                           |
|                   | 250V | 0.15A @ 10ms        | -                           |
| AC                | 250V | 5A @ cosφ 1         | -                           |
|                   |      | 5A @ cosφ 0.7       | -                           |
|                   |      | 5A @ cosφ 0.3       | -                           |
|                   | 400V | 3A @ cosφ 1         | -                           |
|                   |      | 2A @ cosφ 0.7       | -                           |
|                   |      | 1A @ cosφ 0.3       | -                           |

Electrical diagram reference: figure 1, 81, 91

Aux 6Q is an alternative to the Ekip Signalling 4K module. AUX 15Q is an alternative to the mechanical interlock (MI), the DLC for E1.2 lock or the DLP lock if mounted on the right side.

Accessories

Accessories for circuit-breakers

5



1SDC200508F001



1SDC200507F001

Auxiliary position contacts - AUP

When the circuit-breaker is a withdrawable version, the position of the mobile part can be signalled electrically by accessorizing the fixed part with one of the following signalling contact units:

| Auxiliary position contacts (AUP)                                   |                 | E1.2 | E2.2 ... E6.2 |
|---------------------------------------------------------------------|-----------------|------|---------------|
| 6 auxiliary contacts                                                | standard        | •    | -             |
|                                                                     | digital signals | •    | -             |
| 5 auxiliary contacts                                                | standard        | -    | •             |
|                                                                     | digital signals | -    | •             |
| 5 supplementary auxiliary contacts                                  | standard        | -    | •             |
|                                                                     | digital signals | -    | •             |
| Maximum number of auxiliary position contacts that can be installed |                 | 6    | 10            |

|                   |      | Standard contact    | Contact for digital signals |
|-------------------|------|---------------------|-----------------------------|
| Type              |      | changeover contacts | changeover contacts         |
| Minimum load      |      | 100mA @ 24V         | 1mA @ 5V                    |
| Breaking capacity |      |                     |                             |
| DC                | 24V  | -                   | 0.1A                        |
|                   | 125V | 0.3A @ 0ms          | -                           |
|                   | 250V | 0.15A @ 0ms         | -                           |
| AC                | 250V | 5A @ cosφ 1         | -                           |
|                   |      | 5A @ cosφ 0.7       | -                           |
|                   |      | 5A @ cosφ 0.3       | -                           |
|                   | 400V | 3A @ cosφ 1         | -                           |
|                   |      | 2A @ cosφ 0.7       | -                           |
|                   |      | 1A @ cosφ 0.3       | -                           |

Electrical diagram reference: figure 95, 96, 97



1SDC200508F001

Ready to close signalling contact - RTC

The ready to close signalling contact – RTC – indicates that the circuit-breaker is ready to receive the closing command. The circuit-breaker is ready to close when the following conditions have been met:

- circuit-breaker open
- springs loaded
- no opening command or locks on the opening command
- circuit-breaker reset following tripping of Ekip protection trip unit.

|                   |      | Standard contact       | Contact for digital signals |
|-------------------|------|------------------------|-----------------------------|
| Type              |      | Switching              |                             |
| Minimum load      |      | 100mA @ 24V            | 1mA @ 5V                    |
| Breaking capacity |      |                        |                             |
| DC                | 24V  | -                      | 0.1                         |
|                   | 250V | 0.5A @ 0ms / 0.2A 10ms | -                           |
| AC                | 250V | 3A @ cosφ 0.7          | -                           |

Electrical diagram reference: figure 71



1SDC200059F001



1SDC200059F001

### Mechanical signalling of the tripping of protection trip unit - TU Reset

The automatic circuit-breakers are always equipped with a mechanical device that signals the tripping status of the protection trip units. After the Ekip trip unit has tripped due to an electrical fault, the signalling device clearly indicates the tripping status on the front of the circuit-breaker. The circuit-breaker can be reset only after the signalling pushbutton has been restored to its normal operating position. The device conforms to the Ansi 86T standard.

### Contact signalling tripping of protection trip unit Ekip – S51

The contact signals the opening of the circuit-breaker after the Ekip protection trip unit has tripped. The circuit-breaker can only be closed after the “TU Reset” tripped trip unit mechanical signalling pushbutton has been restored to its normal operating position. The switching contact, which is always supplied with the standard version of the automatic circuit-breakers, is also available on request in a version for digital signals (for electrical characteristics, please refer to the RTC contact). It can also be associated with an optional accessory for resetting by remote control - YR. For electromechanical characteristics, please refer to the RTC contact.

Electrical diagram reference: figure 11

### Contact signalling loaded springs – S33 M/2

This contact is always supplied with a geared motor; it remotely signals the spring status of the circuit-breaker operating mechanism. It is available in both standard version and version for digital signals.

|                          |      | Standard contact    | Contact for digital signals |
|--------------------------|------|---------------------|-----------------------------|
| Type                     |      | changeover contacts | changeover contacts         |
| Minimum load             |      | 100mA @ 24V         | 1mA @ 5V                    |
| <b>Breaking capacity</b> |      |                     |                             |
| DC                       | 24V  | -                   | 0.1A                        |
|                          | 125V | 0.3A @ 0ms          | -                           |
|                          | 250V | 0.15A @ 0ms         | -                           |
| AC                       | 250V | 5A @ cosφ 1         | -                           |
|                          |      | 5A @ cosφ 0.7       | -                           |
|                          |      | 5A @ cosφ 0.3       | -                           |
|                          | 400V | 3A @ cosφ 1         | -                           |
|                          |      | 2A @ cosφ 0.7       | -                           |
|                          |      | 1A @ cosφ 0.3       | -                           |

Electrical diagram reference: figure 12

# Accessories

## Accessories for circuit-breakers



1SDC200510F001

### Control

#### Opening and closing release- YO/YC

The opening and closing releases enable the circuit-breaker to be controlled remotely. Opening is always possible, while closing is available only when the closing springs of the operating mechanism are loaded and the circuit-breakers is ready to close.

The releases operate by means of minimum impulse current duration time of 100 ms.

Furthermore, they can operate in permanent service. In this case, if opening command is given by means of the opening release, the circuit-breaker can be closed by de-energizing the opening release and, after a time of at least 30 ms, by controlling the closing.

Electrical diagram reference: figure 75, 77

#### Second opening and closing release - YO2/YC2

For certain installations the redundancy of mechanisms and circuit-breaker operating circuits is often requested. To answer these needs, the SACE Emax 2 circuit-breakers can be equipped with double opening release and double closing release. The technical characteristics of the second opening release remain the same as those of the first opening and closing release.

A double closing release can be used for E2.2, E4.2 and E6.2 circuit-breakers; a second open release in an alternative to undervoltage release.

Electrical diagram reference: figure 72, 79

#### General characteristics

| Power supply (Un)                       | AC                                             | DC   |
|-----------------------------------------|------------------------------------------------|------|
| 24V                                     | •                                              | •    |
| 30V                                     | •                                              | •    |
| 48V                                     | •                                              | •    |
| 60V                                     | •                                              | •    |
| 110V...120V                             | •                                              | •    |
| 120V...127V                             | •                                              | •    |
| 220V...240V                             | •                                              | •    |
| 240V...250V                             | •                                              | •    |
| 380V...400V                             | •                                              | -    |
| 415V...440V                             | •                                              | -    |
| 480V...500V                             | •                                              | -    |
| Operating limits (IEC60947-2 standards) | YO/YO2: 70%...110% Un<br>YC/YC2: 85%...110% Un |      |
| Inrush power (Ps)                       | 300VA                                          | 300W |
| Continuous power (Pc)                   | 3.5VA                                          | 3.5W |
| Opening time (YO/YO2)                   |                                                |      |
| E1.2                                    | 35 ms                                          |      |
| E2.2 ... E6.2                           | 35 ms                                          |      |
| Closing time (YC/YC2)                   |                                                |      |
| E1.2                                    | 50 ms                                          |      |
| E2.2 ... E6.2                           | 70 ms                                          |      |

### Opening and closing release test unit - YO/YC Test Unit

The opening and closing releases test unit helps ensure that the various version of releases are running smoothly, to guarantee a high level of reliability in controlling circuit-breaker opening. The test unit ensures the continuity of the opening and closing releases with a rated operating voltage between 24V and 250V (AC and DC), as well as verifies the functions of the opening and closing coil electronic circuit.

Continuity is checked cyclically with an interval of 30s between tests. The unit has optic signals via LEDs on the front, which provide the following information:

**POWER ON:** correct power supply of the YO/YC Test Unit

**OPEN ON:** coil switch absent, power supply absent or insufficient, interrupted cables

**SHORT ON:** coil switch failure, short-circuited cables

**OPEN and SHORT FLASHING:** faulty coil switch or incorrect supply

**OPEN and SHORT OFF:** correct operation of the coil switch.

Two relays with one change-over area also available on board the unit, to allow remote signalling of the following events:

**Failure of a test** - resetting takes place automatically when the alarm stops

**Failure of three tests** - resetting occurs only by pressing the manual RESET on the unit.

#### Characteristics of device

|                                        |                  |
|----------------------------------------|------------------|
| Auxiliary power supply                 | 24V...250V AC/DC |
| Specification of the signalling relays |                  |
| Maximum interrupted current            | 6A               |
| Maximum interrupted voltage            | 250V AC          |

# Accessories

## Accessories for circuit-breakers



1SDC2000310F001

### Undervoltage release – YU

The undervoltage release opens the circuit-breaker when there is a significant voltage drop or power failure. It can be used for safe remote tripping, for blocking closing or to control the voltage in the primary and secondary circuits. The power supply for the release is therefore obtained on the supply side of the circuit-breaker or from an independent source. Circuit-breaker closing is permitted only when the release is powered. The undervoltage release is an alternative to as second shunt trip or the anti-racking out device. The circuit-breaker is opened with trip unit power supply voltages of 35-70% Un. The circuit-breaker can be closed with a trip unit power supply voltage of 85-110% Un.

#### General characteristics

| Power supply (Un)     | AC    | DC   |
|-----------------------|-------|------|
| 24V                   | •     | •    |
| 30V                   | •     | •    |
| 48V                   | •     | •    |
| 60V                   | •     | •    |
| 110V...120V           | •     | •    |
| 120V...127V           | •     | •    |
| 220V...240V           | •     | •    |
| 240V...250V           | •     | -    |
| 380V...400V           | •     | -    |
| 415V...440V           | •     | -    |
| 480V...500V           | •     | -    |
| Inrush power (Ps)     | 300VA | 300W |
| Continuous power (Pc) | 3.5VA | 3.5W |
| Opening time (YU)     |       |      |
| E1.2                  | 30 ms |      |
| E2.2 ... E6.2         | 50 ms |      |

Electrical diagram reference: figure 73

### Time-delay device for undervoltage release (UVD)

The undervoltage release can be combined with an electronic time-delay device for the circuit-breaker, allowing for delayed external tripping with adjustable preset times. Use of the delayed undervoltage trip unit is recommended to prevent tripping when the power supply network for the trip unit is subject to brief voltage drops or power supply failures. Circuit-breaker closing is inhibited when it is not powered. The time-delay device must be used with an undervoltage release with the same voltage.

#### General characteristics

| Power supply (UVD)                       | AC              | DC |
|------------------------------------------|-----------------|----|
| 24-30V                                   | -               | •  |
| 48V                                      | •               | •  |
| 60V                                      | •               | •  |
| 110-127V                                 | •               | •  |
| 220-250V                                 | •               | •  |
| <b>Adjustable opening time (YU + D):</b> | 0.5-1-1.5-2-3 s |    |



### Resetting remotely- YR

The reset coil YR permits remote resetting of the circuit-breaker after a release has tripped due to an overcurrent condition.

It is available for all automatic circuit-breakers, in different voltage supply:

#### General characteristics

| Power supply (Un)       | AC            | DC |
|-------------------------|---------------|----|
| 24V                     | •             | •  |
| 110V                    | •             | •  |
| 220V                    | •             | •  |
| <b>Operating limits</b> | 90%...110% Un |    |

Electrical diagram reference: figure 14

# Accessories

## Accessories for circuit-breakers

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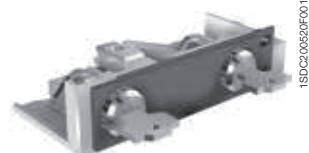


### Motor – M

The motor automatically loads the closing springs of the circuit-breaker. The device, which can be installed from the front, automatically reloads the springs of the operating device when they are unloaded and power is present. In the event no power is present, the springs can be manually loaded by a dedicated lever on the operating device. The motor is always supplied with the limit switch contact S33 M/2 which signals the status of the springs.

| General characteristics                 |                                   |                                 |
|-----------------------------------------|-----------------------------------|---------------------------------|
| Power supply (Un)                       | AC                                | DC                              |
| 24V-30V                                 | •                                 | •                               |
| 48V-60V                                 | •                                 | •                               |
| 100V...130V                             | •                                 | •                               |
| 220V...250V                             | •                                 | •                               |
| 380V...415V                             | •                                 | -                               |
| 440V...480V (E2.2 ... E6.2)             | •                                 | -                               |
| Operating limits (IEC60947-2 standards) | 85%...110% Un                     |                                 |
| Inrush power (Ps)                       | 300VA E1.2<br>500VA E2.2 ... E6.2 | 300W E1.2<br>500W E2.2 ... E6.2 |
| Inrush time                             | 200ms                             |                                 |
| Continuous power (Pc)                   | 100VA E1.2<br>150VA E2.2 ... E6.2 | 100W E1.2<br>150W E2.2 ... E6.2 |
| Charging time                           |                                   |                                 |
| E1.2                                    | 8 sec                             |                                 |
| E2.2 ... E6.2                           | 7 sec                             |                                 |

Electrical diagram reference: figure 13



## Safety

### Key lock in open position - KLC

Due to these safety devices, the SACE Emax 2 circuit-breaker can be locked in the open position. The lock can also be used during maintenance activities when the shield of the accessories area is removed. The device is available with lock with different keys – KLC-D (for only one circuit-breaker) or with the same keys – KLC-S (for several circuit-breakers). Four different key numbers are available for the KLC-S.

SACE Emax 2 also allows alternative key lock to be installed. The following key lock set-ups are also available:

- Ronis
- Profalux
- Kirk
- Castell

In this case, the key locks must be supplied by the customer.

### Padlocks - PLC

These padlock options allow the circuit-breaker to be kept open by acting directly on the mechanical operating device (opening pushbutton). Three different padlock versions are available:

- Locking device with plastic structure for up to a maximum of three padlocks of 4 mm
- Locking device with metal structure for up to a maximum of two padlocks of 8 mm
- Locking device with metal structure for one padlock of 7 mm or for padlock holders

The padlocks must be supplied by the customer. This device is an alternative to the PBC.

### Key lock in racked-in / test / racked-out position - KLP

This device enables the mobile part to be locked in one of the three positions: racked-in, test and racked-out.

This device can be supplied with locks with different keys – KLP-D or with the same keys – KLP-S. A second key lock option can be added for a maximum of two key locks per breaker. Locking in the racked-in, test and racked-out positions can be achieved by using other key locks – KLP-A. Adapters are offered for acceptance of Ronis, Profalux, Kirk and Castell locks, which are to be provided by the customer. With the exception of the Castell version, every circuit-breaker can accept up to two key locks. Moreover, it is possible to allow locking only when in the racked-out position with a supplementary accessory.

### Padlock in racked-in / test / racked-out position - PLP

This device can hold up to three padlocks of 8 mm in diameter. The structure housing the padlocks can also be used in combination with the 2 lock KLP keylock option. Furthermore, it enables the lock of the moving part in the racked-out position only by means of the supplementary lock in racked-out position.

### Shutter lock – SL

When the mobile part is in the test position, the shutters of the fixed part close, maintaining the insulation distance and physically segregating the live parts of the of the cradle from the internal breaker compartment of the cradle. Using two dedicated mechanisms, the upper and lower shutters can be locked independently of one another. The shutter lock is always supplied with the fixed part of the SACE Emax 2 circuit-breakers and locks the shutters, using a maximum of three padlocks of 4 mm, 6 mm or 8 mm.

## Accessories

### Accessories for circuit-breakers

#### Protection devices

##### **Lock for racking-out mechanism with circuit-breaker in closed position**

All SACE Emax 2 withdrawable circuit-breakers are always supplied with a lock that prevents the mobile part from being racked in and racked out when the circuit-breaker is in the closed position. To rack in the mobile part, the circuit-breaker must be in the open position.



##### **Lock for racking in / racking out the mobile part when the door is open - DLR**

This accessory, which is mounted on the fixed part, prevents the mobile part from being racked in or out when the switchgear door is open.



##### **Lock to prevent door opening when the circuit-breaker is in racked-in / test position - DLP**

This safety device prevents the switchgear door from being opened when the mobile part of the withdrawable version of the circuit-breaker is in the racked-in or test position.

The circuit-breaker can only be racked in when the door is open, which is then closed.

This accessory can be installed on either the right-hand or left-hand side of the fixed part.

It is available for circuit-breakers E2.2, E4.2 and E6.2. If mounted on the right side, it is an alternative to the mechanical interlock, the AUX 15Q or the DLC.



##### **Lock to prevent door opening when the circuit-breaker is in the closed position - DLC**

This prevents the compartment door from being opened when the circuit-breaker is in the closed position (and with the circuit-breaker racked in for withdrawable circuit-breakers).

It also blocks the circuit breaker from closing when the compartment door is open. DLC for E1.2 is an alternative to the mechanical interlock and the AUX 15Q. DLC direct door for E2.2...E6.2 is compatible with mechanical interlocks type A-B-D and the AUX 15Q. DLC cable door for E2.2...E6.2 is not compatible with mechanical interlock. DLC cable door for E2.2...E6.2 is compatible with the AUX 15Q.



##### **Anti-insertion lock**

The withdrawable circuit-breakers are equipped with special locks that allow the mobile part to be inserted only into the corresponding fixed part.

##### **Mechanical operation counter - MOC**

The number of mechanical operations is often one of the elements that determines the frequency of ordinary maintenance operations on circuit-breakers. With this mechanical operation counter, which is always visible on the front of the circuit-breaker, the user knows how many mechanical operations the device has performed.



### Protection device for opening and closing pushbuttons - PBC

This accessory is applied to the safety cover of the circuit-breaker and is available in two versions:

- Pushbutton protection device, which blocks operations on both the opening and closing pushbuttons unless the special key is used.
- Padlockable pushbutton protection device, which makes it possible to block either or both pushbuttons and lock the covers in place. It does not trip the breaker as a standard "Padlock device" would.
- PBC is an alternative to PLC padlocks.



### IP30 Protection

Supplied with every circuit-breaker, the cover frame is installed on the door of the switchgear to achieve IP30 degree of protection on the front part of the circuit-breaker.



### IP54 Protection

This transparent cover completely protects the front of the circuit-breaker, enabling an IP54 degree of protection to be achieved. This accessory is provided with double key lock (same or different keys).



### Terminal covers – HTC / LTC

These accessories are installed over in the terminal area, thereby reducing the risk of direct contact with the live parts of the circuit-breaker. Two versions are available for E1.2: HTC high terminal covers and LTC low terminal covers.



### Separators - PB

These protection devices increase the insulation distance between adjacent phases. They are available for all the frames.

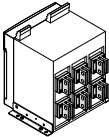
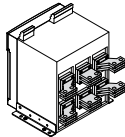
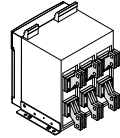
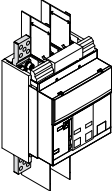
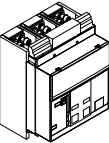
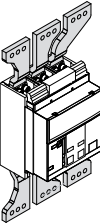
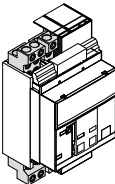
# Accessories

## Accessories for circuit-breakers

### Connections

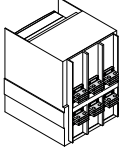
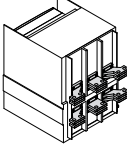
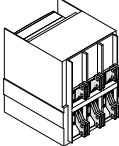
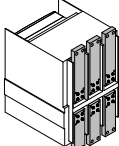
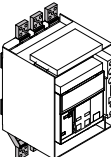
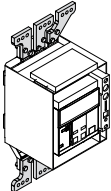
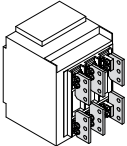
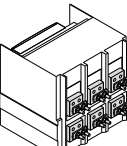
The SACE Emax 2 circuit-breakers offer a wide variety of terminals, thereby always guaranteeing an optimal solution for connection to the power circuit.

#### Solution for fixed circuit-breakers

| Type                                  | Abbreviation |                                                                                     | E1.2                 | E2.2         | E4.2         | E6.2         |
|---------------------------------------|--------------|-------------------------------------------------------------------------------------|----------------------|--------------|--------------|--------------|
| Rear adjustable terminal *            | HR<br>VR     |    | Single stab design   |              |              |              |
|                                       |              |                                                                                     | ○                    | ● lu = 2000A | ● lu = 3200A | ● lu = 5000A |
| Horizontal rear spread terminal       | SHR          |    | Multiple stab design |              |              |              |
|                                       |              |                                                                                     |                      | ● lu = 2500A | ● lu = 4000A | ● lu = 6300A |
| Vertical rear spread terminal         | SVR          |   | Single stab design   |              |              |              |
|                                       |              |                                                                                     |                      | ○ lu = 2000A | ○ lu = 3200A |              |
|                                       |              |                                                                                     | Multiple stab design |              |              |              |
|                                       |              |                                                                                     |                      | ○ lu = 2500A | ○ lu = 4000A |              |
| Extended front terminal               | EF           |  | Single stab design   |              |              |              |
|                                       |              |                                                                                     |                      | ○ lu = 2000A | ○ lu = 3200A |              |
|                                       |              |                                                                                     | Multiple stab design |              |              |              |
|                                       |              |                                                                                     |                      | ○ lu = 2500A | ○ lu = 4000A |              |
| Front terminal                        | F            |  | ○                    |              |              |              |
| Front spread terminal                 | ES           |  | ○                    |              |              |              |
| Terminal for cable<br>FcCuAl 4x240mm² | FcCuAl       |  | ○                    |              |              |              |

● Standard configuration  
 ○ Configuration on request  
 (\*) The adjustable terminals are supplied as standard in the HR – HR configuration.

## Solutions for fixed parts, withdrawable circuit-breakers

| Type                                              | Abbreviation |                                                                                     | E1.2                 | E2.2         | E4.2                           | E6.2                             |
|---------------------------------------------------|--------------|-------------------------------------------------------------------------------------|----------------------|--------------|--------------------------------|----------------------------------|
| Rear adjustable terminal *                        | HR<br>VR     |    | Single stab design   |              |                                |                                  |
|                                                   |              |                                                                                     | ●                    | ● lu = 2000A | ● lu = 3200A                   | ● lu = 5000A                     |
| Horizontal rear terminal                          | SHR          |    | Multiple stab design |              |                                |                                  |
|                                                   |              |                                                                                     |                      | ● lu = 2500A | ● lu = 4000A<br>○ lu = 3200A** | ● lu = 6300A<br>or X performance |
| Vertical rear spread terminal                     | SVR          |    | Single stab design   |              |                                |                                  |
|                                                   |              |                                                                                     |                      | ○ lu = 2000A | ○ lu = 3200A                   |                                  |
| Front terminal                                    | F            |   | Multiple stab design |              |                                |                                  |
|                                                   |              |                                                                                     |                      | ○ lu = 2500A | ○ lu = 4000A                   |                                  |
| Extended front terminal                           | EF           |  | Single stab design   |              |                                |                                  |
|                                                   |              |                                                                                     |                      | ○ lu = 2000A | ○ lu = 3200A                   |                                  |
| Front spread terminal                             | ES           |  | Multiple stab design |              |                                |                                  |
|                                                   |              |                                                                                     |                      | ○ lu = 2500A | ○ lu = 4000A                   |                                  |
| Terminal for cable<br>FcCuAl 4x240mm <sup>2</sup> | Fc CuAl      |  | Single stab design   |              |                                |                                  |
|                                                   |              |                                                                                     | ○                    |              |                                |                                  |
| Flat terminal                                     | FL           |  | Multiple stab design |              |                                |                                  |
|                                                   |              |                                                                                     |                      | ○            | ○                              | ○                                |

● Standard configuration

○ Configuration on request

(\*) The adjustable terminals are supplied as standard in the HR – HR configuration.

(\*\*) Fixed parts with lu 3200A accessorized with rear orientable terminals with multiple stabs guarantee higher performances in switchboard installations.

5

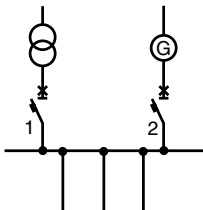
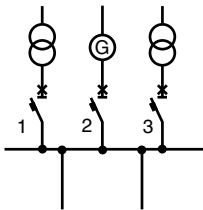
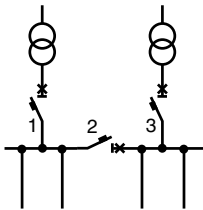
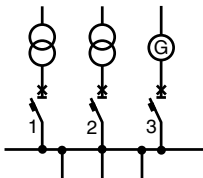
# Accessories

## Accessories for circuit-breakers

### Interlocks and switching devices

#### Mechanical interlocks

These interlock systems enable various opening and closing configurations to be obtained between two or three circuit-breakers. Four types of interlock configuration are available:

| Types of interlock                                                                                                                              | Possible application                                                                                                                                                                                        | Logic                                                                                                                                                                                                                                                                                                                                   | Circuit-breakers |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---|---|---|---|---|---|---|-------------------------------------------------------------------------------------------------|---|---|---|---|---|---|--------------------------------------------------------------------------------------------------|---|---|--------------------------------------------------------------------------------------------------|---|---|---|---|---|--------------------------------------------------------------------------------------------------|
| <b>Type A</b><br><br>Excludes the possibility of having two circuit-breakers in the closed position at the same time.                           | Main line power supply and emergency power supply.<br>                                                                     | <table><tr><th>1</th><th>2</th></tr><tr><td>O</td><td>O</td></tr><tr><td>I</td><td>O</td></tr><tr><td>O</td><td>I</td></tr></table>                                                                                                                                                                                                     | 1                | 2 | O | O | I | O | O | I | Available between circuit-breakers of different sizes and with any fixed / withdrawable version |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| 1                                                                                                                                               | 2                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                         |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| O                                                                                                                                               | O                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                         |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| I                                                                                                                                               | O                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                         |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| O                                                                                                                                               | I                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                         |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| <b>Type B</b><br><br>Permits a pair of circuit-breakers to be closed if the third is open. The latter can only be closed when the pair is open. | Two power supplies from transformers and one emergency power supply.<br>                                                 | <table><tr><th>1</th><th>2</th><th>3</th></tr><tr><td>O</td><td>O</td><td>O</td></tr><tr><td>I</td><td>O</td><td>O</td></tr><tr><td>O</td><td>O</td><td>I</td></tr><tr><td>I</td><td>O</td><td>I</td></tr><tr><td>O</td><td>I</td><td>O</td></tr></table>                                                                               | 1                | 2 | 3 | O | O | O | I | O | O                                                                                               | O | O | I | I | O | I | O                                                                                                | I | O | Available between E2.2, E4.2 and E6.2 circuit-breakers and with any fixed / withdrawable version |   |   |   |   |   |                                                                                                  |
| 1                                                                                                                                               | 2                                                                                                                                                                                                           | 3                                                                                                                                                                                                                                                                                                                                       |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| O                                                                                                                                               | O                                                                                                                                                                                                           | O                                                                                                                                                                                                                                                                                                                                       |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| I                                                                                                                                               | O                                                                                                                                                                                                           | O                                                                                                                                                                                                                                                                                                                                       |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| O                                                                                                                                               | O                                                                                                                                                                                                           | I                                                                                                                                                                                                                                                                                                                                       |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| I                                                                                                                                               | O                                                                                                                                                                                                           | I                                                                                                                                                                                                                                                                                                                                       |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| O                                                                                                                                               | I                                                                                                                                                                                                           | O                                                                                                                                                                                                                                                                                                                                       |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| <b>Type C</b><br><br>Permits two out of three circuit-breakers to be closed at the same time.                                                   | Two half-busbars can be powered by a single transformer (bus-tie closed) or by both at the same time (bus-tie open).<br> | <table><tr><th>1</th><th>2</th><th>3</th></tr><tr><td>O</td><td>O</td><td>O</td></tr><tr><td>I</td><td>O</td><td>O</td></tr><tr><td>O</td><td>I</td><td>O</td></tr><tr><td>O</td><td>O</td><td>I</td></tr><tr><td>O</td><td>I</td><td>I</td></tr><tr><td>I</td><td>I</td><td>O</td></tr><tr><td>I</td><td>O</td><td>I</td></tr></table> | 1                | 2 | 3 | O | O | O | I | O | O                                                                                               | O | I | O | O | O | I | O                                                                                                | I | I | I                                                                                                | I | O | I | O | I | Available between E2.2, E4.2 and E6.2 circuit-breakers and with any fixed / withdrawable version |
| 1                                                                                                                                               | 2                                                                                                                                                                                                           | 3                                                                                                                                                                                                                                                                                                                                       |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| O                                                                                                                                               | O                                                                                                                                                                                                           | O                                                                                                                                                                                                                                                                                                                                       |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| I                                                                                                                                               | O                                                                                                                                                                                                           | O                                                                                                                                                                                                                                                                                                                                       |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| O                                                                                                                                               | I                                                                                                                                                                                                           | O                                                                                                                                                                                                                                                                                                                                       |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| O                                                                                                                                               | O                                                                                                                                                                                                           | I                                                                                                                                                                                                                                                                                                                                       |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| O                                                                                                                                               | I                                                                                                                                                                                                           | I                                                                                                                                                                                                                                                                                                                                       |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| I                                                                                                                                               | I                                                                                                                                                                                                           | O                                                                                                                                                                                                                                                                                                                                       |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| I                                                                                                                                               | O                                                                                                                                                                                                           | I                                                                                                                                                                                                                                                                                                                                       |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| <b>Type D</b><br><br>Permits one out of three interlocked circuit-breakers to be closed.                                                        | Three power supplies on the same busbar that must not operate in parallel.<br>                                           | <table><tr><th>1</th><th>2</th><th>3</th></tr><tr><td>O</td><td>O</td><td>O</td></tr><tr><td>I</td><td>O</td><td>O</td></tr><tr><td>O</td><td>I</td><td>O</td></tr><tr><td>O</td><td>O</td><td>I</td></tr></table>                                                                                                                      | 1                | 2 | 3 | O | O | O | I | O | O                                                                                               | O | I | O | O | O | I | Available between E2.2, E4.2 and E6.2 circuit-breakers and with any fixed / withdrawable version |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| 1                                                                                                                                               | 2                                                                                                                                                                                                           | 3                                                                                                                                                                                                                                                                                                                                       |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| O                                                                                                                                               | O                                                                                                                                                                                                           | O                                                                                                                                                                                                                                                                                                                                       |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| I                                                                                                                                               | O                                                                                                                                                                                                           | O                                                                                                                                                                                                                                                                                                                                       |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| O                                                                                                                                               | I                                                                                                                                                                                                           | O                                                                                                                                                                                                                                                                                                                                       |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |
| O                                                                                                                                               | O                                                                                                                                                                                                           | I                                                                                                                                                                                                                                                                                                                                       |                  |   |   |   |   |   |   |   |                                                                                                 |   |   |   |   |   |   |                                                                                                  |   |   |                                                                                                  |   |   |   |   |   |                                                                                                  |

The mechanical interlocks offer multiple solutions for installation that simplify their integration into the switchgear. The interlocks can be mounted:

- vertically **VR**
- horizontally **HR**
- mixed **L**

Different types of interlocks can be supplied according to the maximum distance between two interlocked breakers:

| Configuration |      | Type A | Type B, C, D |
|---------------|------|--------|--------------|
| Horizontal    |      | 2750mm | 1600mm       |
| Vertical      |      | 1000mm | 1000mm       |
| Breakers      | E1.2 | •      | -            |
|               | E2.2 | •      | •            |
|               | E4.2 | •      | •            |
|               | E6.2 | •      | •            |

For B, C and D types, the maximum distance between the two furthest breakers is 3200mm for horizontal configurations and 2000mm for vertical configurations. It is possible to make the mechanical interlock among three circuit-breakers disposed in 'L position' by using the cables of three horizontal circuit-breakers interlock. Make sure the distance between the horizontal and vertical circuit-breakers respects the minimum and maximum distance. All cables can be cut to guarantee easy installation in switchboards. Mechanical interlocks are not compatible with AUX 15Q, the lock for preventing door opening when the circuit breaker is in the closed position (DLC) or when the circuit breaker is in the racked in or test position (DLP). if mounted on the right side.

Automatic Transfer Switches ATS

The ATS (Automatic Transfer Switch) is a network-unit transfer device used in installations where switching from the main power line to an emergency line is required in order to ensure that power is supplied to the loads in the case of power loss or abnormalities from the main line. These devices are able to control the entire transfer procedure automatically, but also offer commands for performing the procedure manually. In the event of loss of or anomalies in the main line voltage, the opening of the main line circuit-breaker, the starting of the generator set (if present) and the closing of the emergency line are activated according to the parameters set by the user. In the same way, when the main line returns to normal, the reverse transfer procedure is performed automatically.

The new generation of ATSs (ATS021 and ATS022) offers the most advanced and complete solution for ensuring service continuity. The ATS021 and ATS022 devices can also be used with all automatic circuit-breakers and switch-disconnectors of the Tmax XT family. The ATS021 and ATS022 devices have been designed to be self-powered. ATS022 is also designed for the connection of an auxiliary supply, which enables the use of further functions.

The ATS021 and ATS022 devices carry out control of both power supply lines and also analyze:

- phase imbalance;
- frequency imbalance;
- phase loss.

In addition to the standard control functions, the ATS022 unit also permits:

- the priority line to be selected;
- a third circuit-breaker to be controlled;
- the device to be integrated into a supervision system with Modbus communication (auxiliary supply needed);
- parameters to be read and set, and measurements and alarms to be displayed by means of a graphical display.

Typical applications are: supply of UPS (Uninterrupted Power Supply) units, operating rooms and primary hospital services, emergency power for civil buildings, airports, hotels, databases and telecommunication systems and power supply of industrial lines in continuous processes.

For correct configuration, each circuit-breaker connected to the ATS021 or ATS022 device must be fitted with the following accessories:

- mechanical interlock;
- motorized control of opening and closing;
- contact for signalling status (open / closed) and contact for signalling tripping;
- contact for signalling circuit-breaker racked in (for withdrawable circuit-breaker).

# Accessories

## Accessories for circuit-breakers



### Technical characteristics

|                                 |                                                          |                                                                                   | ATS021                                                          | ATS022                                                                                          |
|---------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| <b>General</b>                  | Auxiliary supply voltage                                 |                                                                                   | Not required                                                    | Not required<br>(24-110V DC is required only for Modbus communication and systems of 16 2/3 Hz) |
|                                 | Supply voltage, Un                                       |                                                                                   | Max 480V AC                                                     | Max 480V AC                                                                                     |
|                                 | Frequency, fn                                            |                                                                                   | 50, 60 Hz                                                       | 16 2/3, 50, 60, 400 Hz                                                                          |
|                                 | Dimensions                                               | H mm                                                                              | 96                                                              | 96                                                                                              |
|                                 |                                                          | W mm                                                                              | 144                                                             | 144                                                                                             |
|                                 |                                                          | D mm                                                                              | 170                                                             | 170                                                                                             |
|                                 |                                                          |  |                                                                 |                                                                                                 |
|                                 | Type of installation                                     |                                                                                   | Installation on front of switchgear<br>Installation on DIN rail | Installation on front of switchgear<br>Installation on DIN rail                                 |
|                                 | Operating mode                                           |                                                                                   | Automatic/Manual                                                | Automatic/Manual                                                                                |
| <b>Characteristics</b>          | Monitoring of normal and emergency line                  |                                                                                   | •                                                               | •                                                                                               |
|                                 | Control of circuit-breakers on normal and emergency line |                                                                                   | •                                                               | •                                                                                               |
|                                 | Setting start-up of generator                            |                                                                                   | •                                                               | •                                                                                               |
|                                 | Setting switch-off of generator with settable time delay |                                                                                   | •                                                               | •                                                                                               |
|                                 | Third circuit-breaker                                    |                                                                                   | -                                                               | •                                                                                               |
|                                 | Selection priority line                                  |                                                                                   | -                                                               | •                                                                                               |
|                                 | Modbus Rs485 communication                               |                                                                                   | -                                                               | •                                                                                               |
|                                 | Display                                                  |                                                                                   | -                                                               | •                                                                                               |
| <b>Environmental conditions</b> | Protection degree                                        |                                                                                   | IP20*                                                           | IP20*                                                                                           |
|                                 | Operating temperature                                    |                                                                                   | -20 ... +60 °C                                                  | -20 ... +60 °C                                                                                  |
|                                 | Humidity                                                 |                                                                                   | 5% - 90% without condensation                                   | 5% - 90% without condensation                                                                   |
| <b>Operating thresholds</b>     | Undervoltage                                             |                                                                                   | -30% ... -5% Un                                                 | -30% ... -5% Un                                                                                 |
|                                 | Overvoltage                                              |                                                                                   | +5% ... +30% Un                                                 | +5% ... +30% Un                                                                                 |
|                                 | Frequency thresholds                                     |                                                                                   | -10% / +10% fn                                                  | -10% ... +10% fn                                                                                |
| <b>Tests</b>                    | Test Mode                                                |                                                                                   | •                                                               | •                                                                                               |
|                                 | Mode Test Gen set                                        |                                                                                   | •                                                               | •                                                                                               |
| <b>Standards</b>                | Electronic devices for use in electrical installations   |                                                                                   | EN-IEC 50178                                                    | EN-IEC 50178                                                                                    |
|                                 | Electromagnetic compatibility                            |                                                                                   | EN 50081-2                                                      | EN 50081-2                                                                                      |
|                                 |                                                          |                                                                                   | EN 50082-2                                                      | EN 50082-2                                                                                      |
|                                 | Environmental conditions                                 |                                                                                   | IEC 68-2-1                                                      | IEC 68-2-1                                                                                      |
|                                 |                                                          |                                                                                   | IEC 68-2-2                                                      | IEC 68-2-2                                                                                      |
|                                 |                                                          |                                                                                   | IEC 68-2-3                                                      | IEC 68-2-3                                                                                      |

Electrical diagram reference: figures 100,101 and 102.

\* IP54 available with 1SCA101001R1001 accessory

# Accessories

## Accessories for Ekip trip units

The electronic trip unit accessories enable utilization of all the potential of Ekip protection trip units in terms of signalling, connectivity, protection functions and testing.

|                                                                  | Electronic trip unit |            |               |              |                 |
|------------------------------------------------------------------|----------------------|------------|---------------|--------------|-----------------|
|                                                                  | Ekip DIP             | Ekip Touch | Ekip Hi-Touch | Ekip G Touch | Ekip G Hi-Touch |
| <b>Power supply</b>                                              |                      |            |               |              |                 |
| Ekip Supply                                                      | ○                    | ○          | ○             | ○            | ○               |
| Battery for Ekip trip units                                      | ○                    | ○          | ○             | ○            | ○               |
| <b>Connectivity</b>                                              |                      |            |               |              |                 |
| Ekip Com                                                         |                      | ○          | ○             | ○            | ○               |
| Ekip Com Redundant                                               |                      | ○          | ○             | ○            | ○               |
| Ekip Com Actuator                                                | ○                    | ○          | ○             | ○            | ○               |
| Ekip Link                                                        | ○                    | ○          | ○             | ○            | ○               |
| Ekip Bluetooth                                                   | ○                    | ○          | ○             | ○            | ○               |
| <b>Signalling</b>                                                |                      |            |               |              |                 |
| Ekip Signalling 2K                                               |                      | ○          | ○             | ○            | ○               |
| Ekip Signalling 4K <sup>(1)</sup>                                |                      | ○          | ○             | ○            | ○               |
| Ekip Signalling 10K                                              | ○                    | ○          | ○             | ○            | ○               |
| Ekip Power Controller                                            |                      | ○          | ○             | ○            | ○               |
| <b>Measurement and Protection</b>                                |                      |            |               |              |                 |
| Ekip Measuring Pro                                               |                      | ○          | ●             | ●            | ●               |
| Ekip Measuring                                                   |                      | ○          |               |              |                 |
| Ekip AUP                                                         | ○                    | ○          | ○             | ○            | ○               |
| Ekip RTC                                                         | ○                    | ○          | ○             | ○            | ○               |
| Ekip Synchrocheck                                                |                      | ○          | ○             | ○            | ○               |
| Ekip LCD                                                         |                      | ○          | ○             | ○            | ○               |
| Rating Plug                                                      | ○                    | ○          | ○             | ○            | ○               |
| Homopolar toroid                                                 |                      | ○          | ○             | ○            | ○               |
| Toroid for differential protection                               |                      | ○          | ○             | ○            | ○               |
| Current sensor for neutral conductor outside the circuit-breaker | ○                    | ○          | ○             | ○            | ○               |
| <b>Displaying and Supervision</b>                                |                      |            |               |              |                 |
| Ekip Multimeter                                                  | ○                    | ○          | ○             | ○            | ○               |
| Ekip Control Panel                                               | ○                    | ○          | ○             | ○            | ○               |
| <b>Testing and Programming</b>                                   |                      |            |               |              |                 |
| Ekip TT                                                          | ○                    | ●          | ●             | ●            | ●               |
| Ekip T&P                                                         | ○                    | ○          | ○             | ○            | ○               |
| Ekip T&P: Ekip Programming                                       | ○                    | ○          | ○             | ○            | ○               |

● Standard accessory

○ Accessory on request

<sup>(1)</sup> not available for E1.2

# Accessories

## Accessories for Ekip trip units

All accessories are automatically recognized by the Ekip units without the need for any specific configuration. Based on the installation method and connection of the trip units, the electronic accessories can be divided into:

| Installation                          | Modules                                                                                                                          | Highlights                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Terminal box</b>                   | Cartridge modules:<br>Ekip Com<br>Ekip Link<br>Ekip 2K<br>Ekip Supply<br>Ekip Synchrocheck                                       | <ul style="list-style-type: none"> <li>- The Ekip Supply module enables the trip units to be supplied with a wide range of control voltages</li> <li>- The Ekip supply module must be present for the other modules to be used</li> <li>- The Ekip Supply module has a dedicated position in the installation area in the terminal box; the other modules can be installed as desired in the positions available</li> <li>- When fitted with the Ekip Supply module, up to 2 additional modules can be installed on E1.2, and up to 3 on E2.2, E4.2 and E6.2</li> </ul>                                                                                                                                                                                                                                                                |
| <b>5</b><br><b>Accessorizing area</b> | Ekip LCD<br>Ekip Com Actuator<br>Ekip RTC<br>Ekip AUP<br>Ekip Measuring<br>Ekip Signalling 4K<br>Rating Plug<br>Battery for Ekip | <ul style="list-style-type: none"> <li>- These are installed in specific housings from the front of the circuit-breaker</li> <li>- For all the trip units with a touch screen interface, an LCD version is available with any adjustment in the protection and measurements functions</li> <li>- Thanks to the optional modules Ekip RTC and Ekip AUP, all the Ekip trip units can acquire and monitor the ready to close state and the racked-in/ test isolated/racked-out position of the circuit-breaker. The module to acquire the open/closed position is supplied as standard for all Ekip trip units.</li> <li>- The Ekip Signalling 4k module increases the remote signalling possibilities for E2.2, E4.2 and E6.2 and can be installed if the Ekip Supply module or another 24V auxiliary power supply is present</li> </ul> |
| <b>Ekip trip unit test port</b>       | Ekip T&P<br>Ekip TT<br>Ekip Bluetooth                                                                                            | <ul style="list-style-type: none"> <li>- These can be connected to the front test port of the trip units even with the device in operation</li> <li>- Compatible also with the SACE Tmax XT range</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>External</b>                       | Ekip Multimeter<br>Ekip Control Panel<br>Ekip 10K<br><br>External neutral sensor<br>Homopolar toroid<br>Differential toroid      | <ul style="list-style-type: none"> <li>- Ekip Multimeter can supply a 24V DC output to the trip unit it is connected to</li> <li>- Several Ekip units and / or Ekip Signalling 10K can be connected at the same time to the same Ekip trip unit</li> <li>- These are connected to the trip unit by the terminal box of the circuit-breaker</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |



1SDC200539FC01

## Power supply

### Ekip Supply Power Supply module

The Ekip Supply module supplies all Ekip trip units and modules present on the terminal box and of the circuit-breaker with several auxiliary power (in AC or DC) available in the switchgear. The module is mounted in the terminal box and permits the installation of the other advanced modules. It can be field installed at any time.

Two versions are available according to the control voltage available:

- Ekip Supply 110-240V AC/DC
- Ekip Supply 24-48V DC

Electrical diagram reference: figures 31, 32



1SDC200549FC01

## Connectivity

The Ekip Com modules enable all SACE Emax 2 circuit-breakers to be integrated in an industrial communication network for remote supervision and control of the circuit-breaker. They are suitable for all distribution and generator protection versions of the Ekip Touch and Hi-Touch trip units.

Since they are mounted in the terminal box, communication can be maintained with withdrawable circuit-breakers, even while in the racked-out position.

Several Ekip Com modules can be installed at the same time, thereby enabling connection to communication systems that use different protocols.

The Ekip Com modules for Modbus RTU, Profibus-DP and DeviceNet™ contain a terminating resistor and dip switch for optional activation to terminate the serial network or bus. The Profibus-DP module also contains a polarization resistor and dip switch for its activation. The Ekip Com modules are supplied complete with auxiliary position contacts Ekip AUP and ready to close circuit-breaker contacts Ekip RTC.

For industrial applications where superior reliability of the communication network is required, the Ekip Com R communication modules, installed together with the corresponding Ekip Com modules, guarantee redundant connection to the network.

The Ekip Com modules enable Ekip trip units to be connected to networks that use the following protocols:

| Protocol            | Ekip Com Module        | Ekip Com Redundant Module |
|---------------------|------------------------|---------------------------|
| <b>Modbus RTU</b>   | Ekip Com Modbus RS-485 | Ekip Com R Modbus RS-485  |
| <b>Modbus TCP</b>   | Ekip Com Modbus TCP    | Ekip com R Modbus TCP     |
| <b>Profibus-DP</b>  | Ekip Com Profibus      | Ekip Com R Profibus       |
| <b>Profinet</b>     | Ekip Com Profinet      | Ekip Com R Profinet       |
| <b>EtherNet/IP™</b> | Ekip Com EtherNet/IP™  | Ekip Com R EtherNet/IP™   |
| <b>DeviceNet™</b>   | Ekip Com DeviceNet™    | Ekip Com R DeviceNet™     |
| <b>IEC61850</b>     | Ekip Com IEC61850      | Ekip Com R IEC61850       |

Electrical diagram reference: figures from 51 to 57. Redundant version from 61 to 66.

## Accessories

### Accessories for Ekip trip units



#### Ekip Link Module

The Ekip Link module enables the SACE Emax 2 circuit-breaker to be connected to ABB communication system for locally supervising switchgear by means of the Ekip Control Panel and to act as Power Controller. It is suitable for all Ekip trip units and can be factory or field installed in time to the circuit-breaker terminal box, even when Ekip Com communication modules are present. In this way, it is possible to have both local supervision of the control panel by means of the Ekip Control Panel and supervision of the system by means of the Ekip Com modules connected to the communication network.

The Ekip Link modules are supplied complete with auxiliary position contacts Ekip AUP and ready to close circuit-breaker contacts Ekip RTC.

Electrical diagram reference: figure 58

5



#### Ekip Com Hub

Ekip Com Hub is the new communication module for Emax 2 cloud-connectivity.

Emax 2 equipped with Ekip Com Hub can establish the connection to Ekip SmartVision for the whole low-voltage power distribution panel.

This dedicated cartridge-type communication module just needs to be inserted into the terminal box and connected to the internet.

For further information related to Ekip SmartVision, please visit the dedicated website

<http://new.abb.com/low-voltage/launches/ekip-smartvision>



#### Ekip Com Actuator module

The Ekip Com Actuator module enables the SACE Emax 2 circuit-breakers to be opened and closed remotely.

The Ekip com Actuator is optional and can be ordered for all Ekip trip units equipped with Ekip Com or Ekip Link modules; it is installed on the front of the circuit-breaker in the right-hand accessories area.

Electrical diagram reference: figure 76, 78



#### Ekip Bluetooth wireless communication unit

Ekip Bluetooth permits remote connection with the trip unit by portable PC, tablet or smart phone on which Ekip Connect software has been installed. The device is connected to the front test connector found on all Ekip trip units in SACE Emax 2 and SACE Tmax XT circuit-breakers and supplies power by means of a rechargeable Li-ion battery.



1SDC20054F001

## Signalling

### Ekip 2K Signalling modules

The Ekip 2K Signalling modules supply two input and two output contacts for control and remote signalling of alarms and circuit-breaker trips. They can be programmed from the trip unit's display or through the Ekip Connect software. Furthermore, when using Ekip Connect, combinations of events can be freely configured. They are suitable for all distribution and generator protection versions of the Ekip Touch and Hi-Touch trip units.

Three versions of the Ekip 2K Signalling modules are available: Ekip 2K-1, Ekip 2K-2, Ekip 2K-3. In this way, a maximum of three modules for E2.2, E4.2, E6.2, and two for E1.2 can be installed at the same time.

Electrical diagram reference: figures 41, 42, 43



1SDC20054F001

### Ekip 4K signalling module

The Ekip 4K Signalling module, available for E2.2 – E4.2 – E6.2, supplies four input contacts and four output contacts for control and remote signalling. It can be programmed from the trip unit's display or through the Ekip Connect software. Furthermore, when using Ekip Connect, combinations of events can be freely configured.

It is installed in the housing provided in the front left of distribution and generator protection versions of the Ekip Touch and Hi-Touch trip units, without having to remove the trip unit itself and is an alternative to the AUX 6Q auxiliary contacts unit.

Electrical diagram reference: figure 2



1SDC20054F001

### Ekip 10K signalling unit

Ekip 10K Signalling is an external signalling unit designed for DIN rail installation for SACE Emax 2 automatic circuit-breakers. The unit provides ten contacts for electrical signalling of timing and tripping of protection devices.

If connected via the Ekip Connect software, the contacts can be freely configured in association with any event and alarm or combination of both.

Several Ekip 10K Signalling (max 4) can be installed at the same time on the same Ekip trip unit. The Ekip 10K Signalling module can be powered either by direct or alternating current and can be connected to all the trip units via internal bus or Ekip Link modules.

Electrical diagram reference: figure 103

# Accessories

## Accessories for Ekip trip units

| Characteristics of output contacts |                        | Number of contacts          |                             |                               |
|------------------------------------|------------------------|-----------------------------|-----------------------------|-------------------------------|
| Type                               | Monostable             | Ekip 2K                     | Ekip 4K                     | Ekip 10K                      |
| Maximum switching voltage          | 150V DC / 250V AC      | 2<br>output<br>+ 2<br>input | 4<br>output<br>+ 4<br>input | 10<br>output<br>+ 11<br>input |
| Maximum switching current          |                        |                             |                             |                               |
| 30V DC                             | 2A                     |                             |                             |                               |
| 50V DC                             | 0.8A                   |                             |                             |                               |
| 150V DC                            | 0.2A                   |                             |                             |                               |
| 250V AC                            | 4A                     |                             |                             |                               |
| Contact/coil insulation            | 1000 Vrms (1min @50Hz) |                             |                             |                               |

### Ekip 10K signalling unit power supply

|                  |                             |
|------------------|-----------------------------|
| Auxiliary supply | 24-48V DC, 110-240V AC/DC   |
| Voltage range    | 21.5-53V DC, 105-265V AC/DC |
| Rated power      | 10VA/W                      |
| Inrush current   | 1A for 10ms                 |

### Signalling contacts for Ekip trip units (Ekip RTC and Ekip AUP)

Ekip trip units can acquire the status of circuit-breaker ready to close (RTC) and the racked-in, test, or racked-out position through the optional signalling contacts Ekip RTC and Ekip AUP. These contacts, housed in the accessories area of the circuit-breakers, are available with Ekip Dip, Ekip Touch and Ekip Hi-Touch.

Ekip COM communication modules and Ekip Link modules are always supplied with Ekip AUP and Ekip RTC contacts.



## Measurement and protection

### Ekip Measuring module

The Ekip Measuring module enables the trip unit to measure the phase and neutral voltages, powers and energy.

The Ekip Measuring module is installed on the front, right housing of the distribution protection versions of the Ekip Touch trip units, without having to remove the trip unit itself. The voltage connections are installed by default on the lower terminals, but can be altered to the upper terminals on request.

The measuring module requires no external connection since it is connected internally to the lower or upper terminals of Emax 2. If necessary, the voltage outlet connection can be moved outside the circuit-breaker by using voltmetric transformers and the alternative connection positioned in the terminal box. The use of external connections is obligatory for rated voltages that are higher than 690V. The module must be disconnected for dielectric strength tests on the main busbars.

Electrical diagram reference: figures 20, 21, 22, 23





### Ekip Measuring Pro module

The module has the same connection and installation characteristics as the Ekip Measuring module. In addition, the Ekip Measuring Pro version offers:

- Protection features voltage and power values
- Ekip trip unit power supply from busbar voltage (for line voltages greater than 85V)
- LED signalling when voltage is detected on the main busbars.

The Ekip Measurement Pro module comes standard with the Ekip Hi-Touch, Ekip G Touch and Ekip G-Hi Touch trip units.



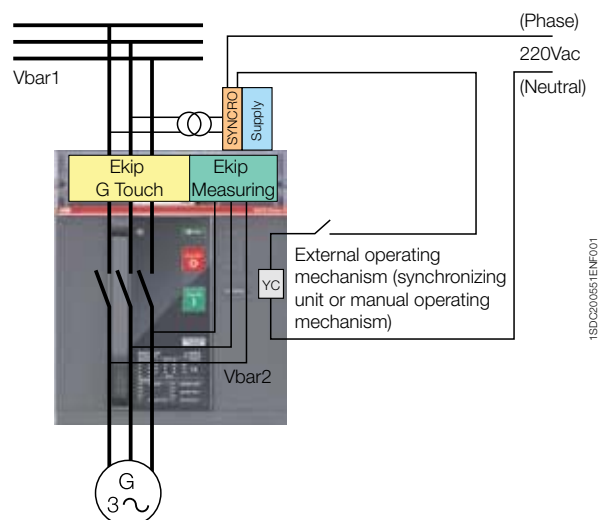
### Ekip Synchrocheck

This module enables the control of the synchronism condition when placing two lines in parallel. The module can be used with distribution and generator protection versions of the Ekip Touch and Hi-Touch trip units equipped with the Ekip Measuring Pro module.

Ekip Synchrocheck measures the voltages from two phases of one line through an external transformer and, compares them to the measured voltages at the breaker utilizing the Ekip Measuring Pro Module. An output contact is available, which is activated upon reaching synchronism, and enables the circuit-breaker to be closed by means of wiring with the closing coil.

5

| Characteristics of output contacts |                        | Number of contacts |
|------------------------------------|------------------------|--------------------|
| Type                               | Monostable             | Ekip Synchrocheck  |
| Maximum switching voltage          | 150V DC / 250V AC      | 1 output           |
| Maximum switching current          |                        |                    |
| 30V DC                             | 2A                     |                    |
| 50V DC                             | 0.8A                   |                    |
| 150V DC                            | 0.2A                   |                    |
| 250V AC                            | 4A                     |                    |
| Contact/coil insulation            | 1000 Vrms (1min @50Hz) |                    |



Electrical diagram reference: figure 48

# Accessories

## Accessories for Ekip trip units



### Ekip LCD display interface

For installations in particularly aggressive environments, as low temperatures, high humidity or presence of dust or chemical agents, the Ekip protection trip units can be requested with an LCD black and white display interface with pushbuttons for navigation. This version guarantees excellent immunity by integrating all functions, with regard to protection devices, measuring devices and the possibility of introducing accessories, available on the colour touch screen.

5



### Rating Plug

The rating plugs are field interchangeable from the front on all trip units and enable the protection thresholds to be adjusted according to the actual rated current of the system. This function is particularly advantageous in installations that may require future expansion or in cases in which the power supplied needs to be limited temporarily (e.g. mobile Gen Set). The Overload (L) protection function can be disabled at any time by using an L OFF version of the rating plug. There is a matching L OFF version for each standard version of rating plug.

| Circuit-breaker | Rating plugs available (both in standard and L OFF versions) |
|-----------------|--------------------------------------------------------------|
| E1.2            | 400-630-800-1000-1250-1600                                   |
| E1.2 250        | 100-200-250                                                  |
| E2.2            | 400-630-800-1000-1250-1600-2000-2500                         |
| E2.2 250        | 100-200-250                                                  |
| E4.2            | 400-630-800-1000-1250-1600-2000-2500-3200-4000               |
| E6.2            | 400-630-800-1000-1250-1600-2000-2500-3200-4000-5000-6300     |

Special rating plugs are also available for differential protection against earthing faults in combination with a suitable toroid to be installed externally.

| Circuit-breaker | Rating plug available for Rc protection |
|-----------------|-----------------------------------------|
| E1.2            | 400-630-800-1250                        |
| E1.2 250        | 100-200-250                             |
| E2.2            | 400-630-800-1250-2000                   |
| E2.2 250        | 100-200-250                             |
| E4.2            | 400-630-800-1250-2000-3200-3600-4000    |



#### Current sensor for neutral conductor outside the circuit-breaker

This is only for three-pole circuit-breakers; it enables protection of the neutral conductor to be achieved through connection to the Ekip trip unit. It is supplied on request.

Electrical diagram reference: figure 27



#### Homopolar toroid for the earthing conductor of main power supply

The distribution and generator protection versions of the Ekip Touch and Hi-Touch trip units can be used with an external toroid positioned, for example, on the conductor that connects the star centre of the MV/LV transformer to earth (homopolar transformer): in this case, the earth protection is called Source Ground Return. There are four sizes of the toroid: 100A, 250A, 400A, 800A. The homopolar toroid is an alternative to the toroid for differential protection.

Electrical diagram reference: figure 25



#### Toroid for differential protection

Connected to the Ekip Touch and Hi-Touch LSIG trip units equipped with a rating plug for differential protection, this toroid enables earth fault currents of 3...30A to be monitored. To be installed on the busbar system, it is an alternative to the homopolar toroid.

Electrical diagram reference: figure 24

# Accessories

## Accessories for Ekip trip units



### Displaying and supervision

#### Ekip Multimeter Display on front of switchgear

Ekip Multimeter is a display unit to be installed on the front of the switchgear for SACE Emax 2 circuit-breakers equipped with Ekip electronic trip units. The device, 96mmx96mm sized, is equipped with a large touch screen display and enables measurements to be displayed with the same levels of precision. If connected to trip units with a display, Ekip Multimeter enables the adjustment of parameters and protection thresholds.

Up to 4 Ekip Multimeter devices can be connected at the same time to the same Ekip protection trip unit to display currents, voltage, powers and energy.

Ekip Multimeter can be powered either in direct current (24-48V DC or 110-240V DC) or in alternating current (110-240V AC). It is equipped with a 24V DC output that supplies the trip unit to which it is connected.

|                |                             |
|----------------|-----------------------------|
| Power supply   | 24-48V DC, 110-240V AC/DC   |
| Tolerance      | 21.5-53V DC, 105-265V AC/DC |
| Rated Power    | 10VA/W                      |
| Inrush current | 2A for 20ms                 |



#### Ekip Control Panel on front of switchgear

The Ekip Control Panel enables the SACE Emax 2 circuit-breakers connected to the Ekip Link system to be controlled and monitored.

The panel is supplied already equipped with supervision software and requires no programming. Ekip Control Panel requires a 24V DC power supply and is equipped with:

- 2 RJ45 EtherNet ports for connection to the Ekip Link system and to the local network for remote control via web server option
- 1 RS485 serial port for integration of the Modbus network if it is to be used with circuit-breakers of the Tmax series
- 4 USB ports for downloading data.



1SDC20068BF001

## Testing and programming

### Ekip TT testing and power supply unit

It also allows a trip unit not provided with auxiliary power supply to be supplied with power so that the last protection device tripped can be displayed directly on the screen or by the lighting up of corresponding LEDs.

Ekip TT is a device that allows you to verify that the circuit-breaker trip mechanism is functioning correctly (trip test).

The device can be connected to the front test connector of any Ekip trip unit of SACE Emax 2; it is supplied as standard with the versions for distribution and generator protection of the Ekip Touch, Hi-Touch trip units to set protection functions setting.



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### Ekip T&P testing kit

Ekip T&P is a kit that includes different components for programming and testing the electronic protection trip units.

The kit includes:

- Ekip T&P unit;
- Ekip TT unit;
- adaptors for Emax and Tmax trip units;
- USB cable to connect the T&P unit to the Ekip trip units;
- installation CD for Ekip Connect and Ekip T&P interface software.

The Ekip T&P unit is easily connects from your PC (via USB) to the trip unit (via mini USB) with the cable provided.

The Ekip T&P unit can perform simple manual or automatic tests on the trip unit functions.

The Ekip T&P will also provide the ability to conduct more advanced function testing that allows the addition of harmonics and the shifting of phases to more accurately represent the real conditions of an application. Thus, leading to more concise protection function parameters that may be required for critical applications. It can also generate a test report as well as help you to monitor maintenance schedules.



1SDC200561F001

### Ekip Programming Module

The Ekip Programming module is used for programming Ekip trip units via USB to a PC using the Ekip Connect software that can be downloaded on-line. This can be useful for uploading/downloading entire sets of parameters for multiple breakers both for set-up as well as for maintenance (for periodic cataloging breaker parameters in case of a catastrophic situation).



## Extended warranty

For ABB Low Voltage circuit breakers, extending the 1-year standard factory warranty to up to 5 years has never been so simple.

Extended warranty activation can be requested after the online registration in the Extended Warranty tool. This web-tool verifies that the application of the circuit breaker is within the recommended guidelines, and grant the registration of the circuit breaker.

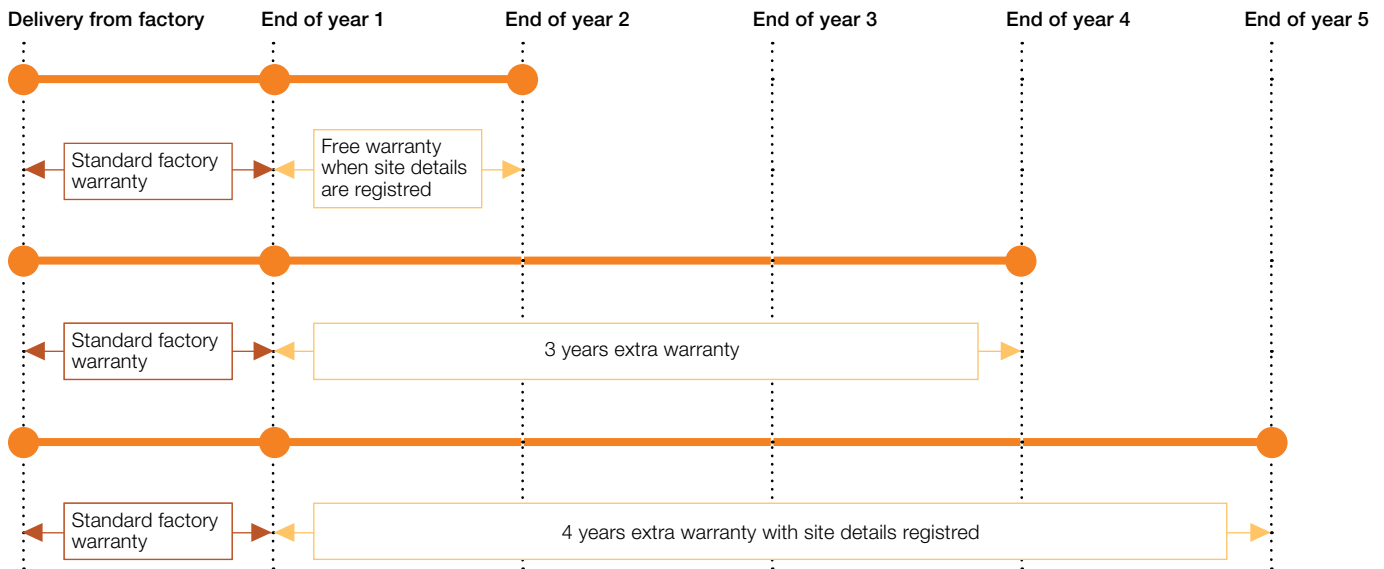
When end users details are registered, one year of extra warranty is offered free-of-charge.

Extended Warranty can be ordered by following the steps:

- 1) Registration in the online tool (Extended Warranty Tool) to verify the application.
- 2) Extended Warranty part number(s) and registration code received by email
- 3) Place the order of the circuit breaker(s) together with:
  - Extended warranty part number(s)
  - Unique registration code

Warranty coverage:

- Any possible issues related to circuit breaker quality for the complete extra warranty time
- Accessories mounted by the factory only.



## Spare parts

The following original and guaranteed spare parts are available:

- Accessories and Safety Covers
- Closed Door lock lever
- Closing Spring
- Conversion kit from Fixed to Moving part
- Conversion kit from Moving Part into Fixed version
- Conversion kit into Switch Disconnecter MS
- Earth sliding contacts
- Fixing screws kit
- Arching chambers
- Jaw contacts
- Moving part Terminals
- Poles
- Kit front cover plugs
- Lateral guides for Fixed and Moving part
- Left and Right plates for accessories (Left MID, Right MID)
- Main board
  
- Lifting plates
- Main board + Sensors + cables
- Operating mechanism
- Racked in and out device
- Racking in and out lever
- Safety shutters for fixed part
- Side walls
- Sliding contacts/ Terminal Box
- Transparent cover
- Trip coil
- Trip Unit Battery
- Tripping mechanism
- Spring charging device
- Spring Charging lever.

For further details, please refer to ABB SACE Spare Parts Catalogue (1SDC001007D0203).



|                         |     |
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# Installation

## Circuit-breaker

The new SACE Emax 2 family maintains the characteristics of strength and reliability that have always distinguished the tradition of ABB SACE air circuit-breakers.

The new SACE Emax 2 circuit-breakers, available in four sizes, are extremely compact due to their new dimensions: with reduced depths and heights, combined with rationalized widths, they provide the answer to the most stringent installation requirements.

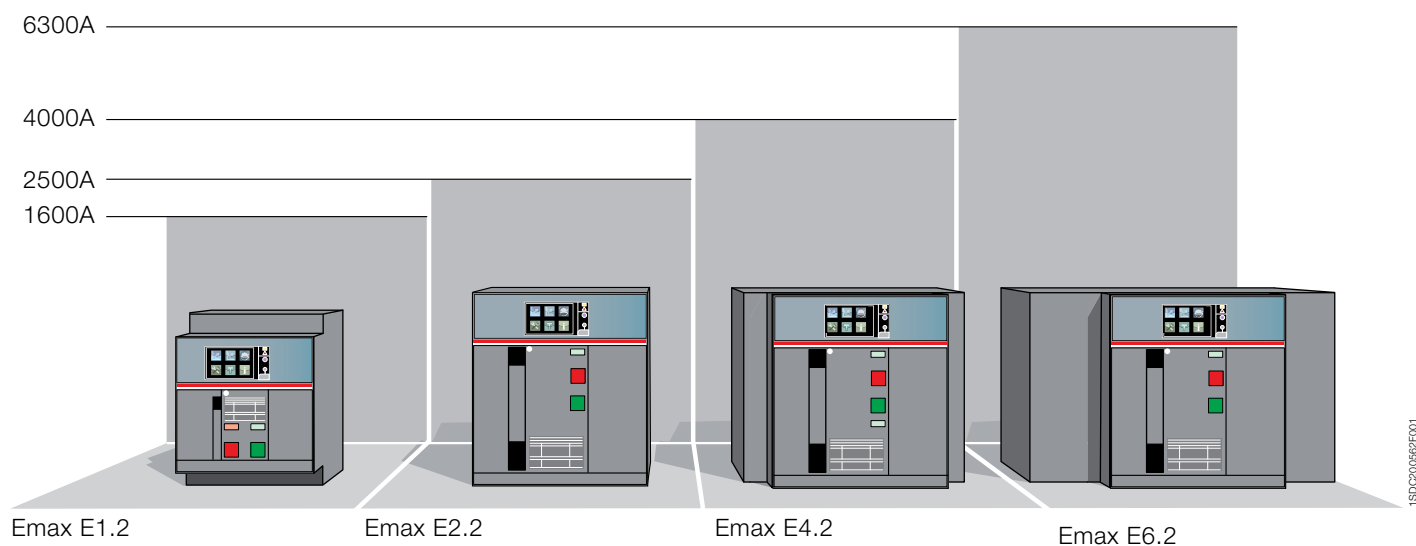
Safety is guaranteed thanks to the double insulation of the live parts and total segregation of the phases. Furthermore, the new functional design of the SACE Emax2 circuit-breakers has been developed with the purpose of improving installation operations and use of the devices and accessories; making them simple, intuitive and safe.

| Distinctive characteristics           |                                                                                                                        | Benefits                                                                                                                 |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| 6<br><br>Simplicity of use and safety | - Ekip protection trip units are interchangeable from front of circuit-breaker                                         | Reduced times during the stages of:<br>- installation<br>- wiring<br>- configuration<br>- commissioning<br>- maintenance |
|                                       | - Rapid configuration of the Ekip trip units                                                                           |                                                                                                                          |
|                                       | - Electronic modules can be installed on terminal box without removing the electronic trip units and protection shield |                                                                                                                          |
|                                       | - Electrical plug-in accessories can be installed from the front of circuit-breaker                                    |                                                                                                                          |
|                                       | - New push-in terminal box allows rapid auxiliary connections                                                          | Increased level of safety                                                                                                |
|                                       | - Horizontal or vertical rear connections can be modified on-site by turning 90°                                       |                                                                                                                          |
|                                       | - Accessorizing logic common to the entire family of circuit-breakers                                                  |                                                                                                                          |
|                                       | - Accessory cabinet and terminal box are stamped with accessory codes for easy identification                          |                                                                                                                          |
|                                       | - Accessories area is separated functionally from the safety area                                                      |                                                                                                                          |
|                                       | - Mechanical safety locks in open position are active when the shield is removed                                       |                                                                                                                          |
|                                       | - Guided racking in and out of the mobile part                                                                         |                                                                                                                          |

## Sizes

The SACE Emax2 circuit-breakers, available in 4 sizes up to 6300A, provide:

- **Versatility**, where installation space is a critical and influential factor, such as naval applications, wind turbine towers or switchgear
- **Opportunities**, optimization of the dimensions of the electrical switchgear results in a potential reduction in the consumption of the materials used.



# Installation

## Circuit-breaker

### Versions

The SACE Emax2 circuit-breakers are available in both fixed and withdrawable versions. The withdrawable version is recommended in applications in which service continuity is a fundamental requirement. Replacement of the moving part with a new device does not require any intervention on power connections or on auxiliary connections, thus permitting reset in the shortest time possible.

The fixed version, which is connected directly to power system through the circuit-breaker terminals, is recommended in applications in which the need for space means that compact products are required without compromising the performance and possibility of fitting accessories.

6

#### Fixed



1SDC200563F001

#### Withdrawable



1SDC200564F001

1. Moving part
2. Sliding contacts
3. Fixed part
4. Terminal box
5. Racking-out mechanism
6. Racking-out guide rails
7. Pushbuttons
8. Data label and accessories

Poles

SACE Emax 2 circuit-breakers are available in three-pole and four-pole versions and can be used in all types of distribution systems. Furthermore, with the possibility of connecting the external current sensor, three-pole circuit-breakers can be used efficiently even in systems in which the neutral conductor cannot be isolated.

The four-pole circuit-breakers E1.2, E2.2 and E4.2 are always provided with full-size neutral pole with rated uninterrupted current-carrying capacity identical to the phase poles. The E6.2 circuit-breakers, thanks to their construction modularity, are available with neutral set at 50% - normal supply – and with full-size neutral, so that the customer does not need to oversize the neutral unless strictly necessary.

The standard supplied circuit breakers are suitable for connection of phases in the sequence L1, L2, L3 for three-pole circuit-breakers, or N, L1, L2 and L3 for four-pole circuit-breakers with neutral on the left; a special optional kit enables the position of the circuit-breaker neutral to be changed to the right, making the sequence L1, L2, L3, N available (refer to page 9/53 for the commercial codes).

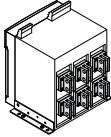
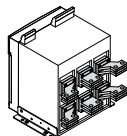
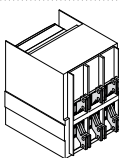
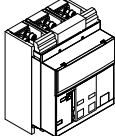
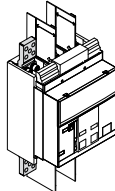
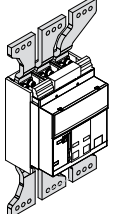
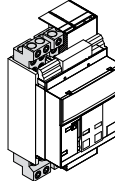
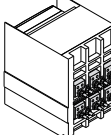
| Circuit-breaker | Standard version                                                                                                                                                                                  |                                                                                                                                                                                                               | Optional version with neutral on the right                                                                                                                                                                    |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | Three-pole                                                                                                                                                                                        | Four-pole                                                                                                                                                                                                     | Four-pole                                                                                                                                                                                                     |
| Emax E1.2       | <div><div>L1</div><div>L2</div><div>L3</div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div> | <div><div>N</div><div>L1</div><div>L2</div><div>L3</div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div> | <div><div>L1</div><div>L2</div><div>L3</div><div>N</div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div> |
| Emax E2.2       |                                                                                                                                                                                                   |                                                                                                                                                                                                               |                                                                                                                                                                                                               |
| Emax E4.2       |                                                                                                                                                                                                   |                                                                                                                                                                                                               |                                                                                                                                                                                                               |
| Emax E6.2       |                                                                                                                                                                                                   |                                                                                                                                                                                                               |                                                                                                                                                                                                               |

# Installation

## Circuit-breaker

### Terminals

The integration of the circuit-breaker in the electrical system is simplified because of the connection terminals of the circuit-breakers. The silver-plated copper terminals are designed to assist installation of connecting bars according to the change in the rated capacity of the circuit-breaker. Each terminal has been created to the standard width of busbar for that amperage and is equipped with one, two or three terminal stabs for easy connection to multiple bus runs that may be required for the application. For particular installation requirements, the circuit-breakers can be equipped with different combinations of terminals for the upper and lower part.

| Type                                    | Abbreviation |                                                                                     | E1.2 | E2.2 | E4.2 | E6.2 |
|-----------------------------------------|--------------|-------------------------------------------------------------------------------------|------|------|------|------|
| Rear adjustable terminal <sup>(1)</sup> | HR<br>VR     |    | F, W | F, W | F, W | F, W |
| Horizontal rear spread terminal         | SHR          |    | W    | F, W |      |      |
| Vertical rear spread terminal           | SVR          |   |      | F, W |      |      |
| Front terminal                          | F            |  | F    | F, W | F, W | F, W |
| Extended front terminal                 | EF           |  | F, W |      |      |      |
| Front spread terminal                   | ES           |  | F, W |      |      |      |
| Terminal for cable FcCuAl 4x240mm²      | Fc CuAl      |  | F, W |      |      |      |
| Flat terminal                           | FL           |  |      | W    | W    | W    |

(1) The reare adjustable terminals are supplied as sandard in the HR-HR configuration.

## Degree of protection

The SACE Emax2 circuit-breakers guarantee the following degrees of protection:

- IP20 for circuit-breakers in fixed or withdrawable versions, excluding the terminals.
- IP30 for the front parts of the circuit-breaker when installed in switchgear with IP30 flange mounted on the door.
- IP54 for circuit-breakers equipped with optional IP54 transparent flange fixed on the door in front of the switchgear.

## Power losses

To guarantee the performance of the electrical switchgear in terms of rated uninterrupted current-carrying capacity, the design of the electrical switchgear must take into consideration the power losses by the apparatus and by live parts installed.

These power losses are measured according to IEC60947 product standard, the values given in the table refer to total power for three and four pole circuit-breakers with balanced loads with a current flow equal to rated uninterrupted current "I<sub>u</sub>" at 50/60Hz.

| Circuit-breaker type |              | I <sub>u</sub> | 630A | 800A | 1000A | 1250A | 1600A | 2000A | 2500A | 3200A | 4000A | 5000A | 6300A |
|----------------------|--------------|----------------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Fixed                | E1.2 B/C/N   | [W]            | 31   | 50   | 78    | 122   | 201   | -     | -     | -     | -     | -     | -     |
|                      | E2.2 B/N/S/H | [W]            | -    | 34   | 53    | 83    | 136   | 212   | 267   | -     | -     | -     | -     |
|                      | E4.2 N/S/H/V | [W]            | -    | -    | -     | -     | -     | -     | -     | 425   | 465   | -     | -     |
|                      | E6.2 H/V/X   | [W]            | -    | -    | -     | -     | -     | -     | -     | -     | 309   | 483   | 767   |
| Withdrawable         | E1.2 B/C/N   | [W]            | 62   | 100  | 156   | 244   | 400   | -     | -     | -     | -     | -     | -     |
|                      | E2.2 B/N/S/H | [W]            | -    | 72   | 113   | 176   | 288   | 450   | 550   | -     | -     | -     | -     |
|                      | E4.2 N/S/H/V | [W]            | -    | -    | -     | -     | -     | -     | -     | 743   | 900   | -     | -     |
|                      | E6.2 H/V/X   | [W]            | -    | -    | -     | -     | -     | -     | -     | -     | 544   | 850   | 1550  |

# Installation

## Circuit-breaker

### Temperature derating

Under certain installation conditions, the circuit-breakers can operate at higher temperatures than the reference temperature of 40 °C. In this case the current-carrying capacity of the circuit-breaker may be lower than the rated current-carrying capacity at the reference temperature: therefore the derating coefficients shown in the table must be applied. Percentage values refer to withdrawable and fixed circuit breaker. If not specified, all data refer to a copper according to IEC60947.

| Emax 2 E1.2 |      | Cross section | Temperature [°C] |      |      |      |      |      |      |
|-------------|------|---------------|------------------|------|------|------|------|------|------|
|             |      |               | <40              | 45   | 50   | 55   | 60   | 65   | 70   |
| E1.2        | 250  |               | 100%             | 100% | 100% | 100% | 100% | 100% | 100% |
| E1.2        | 630  |               | 100%             | 100% | 100% | 100% | 100% | 100% | 100% |
| E1.2        | 800  |               | 100%             | 100% | 100% | 100% | 100% | 100% | 100% |
| E1.2        | 1000 |               | 100%             | 100% | 100% | 100% | 100% | 100% | 100% |
| E1.2        | 1250 |               | 100%             | 100% | 100% | 100% | 100% | 100% | 100% |
| E1.2        | 1600 |               | 100%             | 100% | 100% | 98%  | 95%  | 93%  | 90%  |
| E1.2        | 1600 | 1200 mm²      | 100%             | 100% | 100% | 100% | 97%  | 95%  | 92%  |

| Emax 2 E2.2 |      | Cross section | Temperature [°C] |      |      |      |      |      |      |
|-------------|------|---------------|------------------|------|------|------|------|------|------|
|             |      |               | <40              | 45   | 50   | 55   | 60   | 65   | 70   |
| E2.2        | 250  |               | 100%             | 100% | 100% | 100% | 100% | 100% | 100% |
| E2.2        | 800  |               | 100%             | 100% | 100% | 100% | 100% | 100% | 100% |
| E2.2        | 1000 |               | 100%             | 100% | 100% | 100% | 100% | 100% | 100% |
| E2.2        | 1250 |               | 100%             | 100% | 100% | 100% | 100% | 100% | 100% |
| E2.2        | 1600 |               | 100%             | 100% | 100% | 100% | 100% | 100% | 98%  |
| E2.2        | 2000 |               | 100%             | 100% | 100% | 100% | 95%  | 91%  | 87%  |
| E2.2        | 2500 |               | 100%             | 100% | 100% | 100% | 98%  | 94%  | 90%  |

| Emax 2 E4.2 |      | Cross section | Temperature [°C] |      |      |      |      |      |      |
|-------------|------|---------------|------------------|------|------|------|------|------|------|
|             |      |               | <40              | 45   | 50   | 55   | 60   | 65   | 70   |
| E4.2        | 2000 |               | 100%             | 100% | 100% | 100% | 100% | 100% | 100% |
| E4.2        | 2500 |               | 100%             | 100% | 100% | 100% | 100% | 100% | 100% |
| E4.2        | 3200 | 3000 mm²      | 100%             | 100% | 97%  | 93%  | 89%  | 86%  | 82%  |
| E4.2 (*)    | 3200 | 3000 mm²      | 100%             | 100% | 100% | 100% | 95%  | 93%  | 89%  |
| E4.2        | 4000 | 4000 mm²      | 100%             | 100% | 97%  | 93%  | 89%  | 86%  | 83%  |

(\*) Three stabs terminal kit

| Emax 2 E6.2 |      | Cross section | Temperature [°C] |      |      |      |      |      |      |
|-------------|------|---------------|------------------|------|------|------|------|------|------|
|             |      |               | <40              | 45   | 50   | 55   | 60   | 65   | 70   |
| E6.2        | 4000 | 4000 mm²      | 100%             | 100% | 100% | 100% | 100% | 100% | 100% |
| E6.2        | 5000 | 5000 mm²      | 100%             | 100% | 100% | 100% | 100% | 98%  | 95%  |
| E6.2        | 6300 | 6000 mm²      | 100%             | 100% | 95%  | 91%  | 87%  | 84%  | 81%  |

## Current-limiting curves

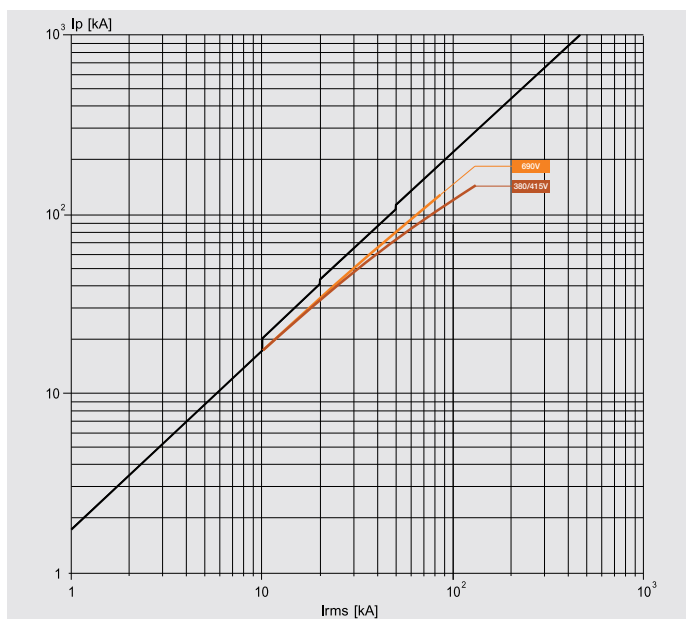
The SACE Emax2 series features a series of current-limiting circuit-breakers in sizes E1.2 up to 1600A. These circuit-breakers are distinguished constructively by:

- Dedicated stored energy operating mechanism, which reduces opening times.
- Specific main contacts which, utilizing the electrodynamic forces generated by the short-circuit current, accelerate opening of the main contacts.

These features ensure rapid interruption which consequently reduces electromechanical and thermal stress on the system during a short-circuit. The current-limiting circuit-breakers are distinguished by short-time withstand currents  $I_{cw}$  that are not particularly high and therefore not indicated for applications in which chronoamperometric selectivity is required with several downstream devices or in which devices are present with high inrush current in the start-up stage.

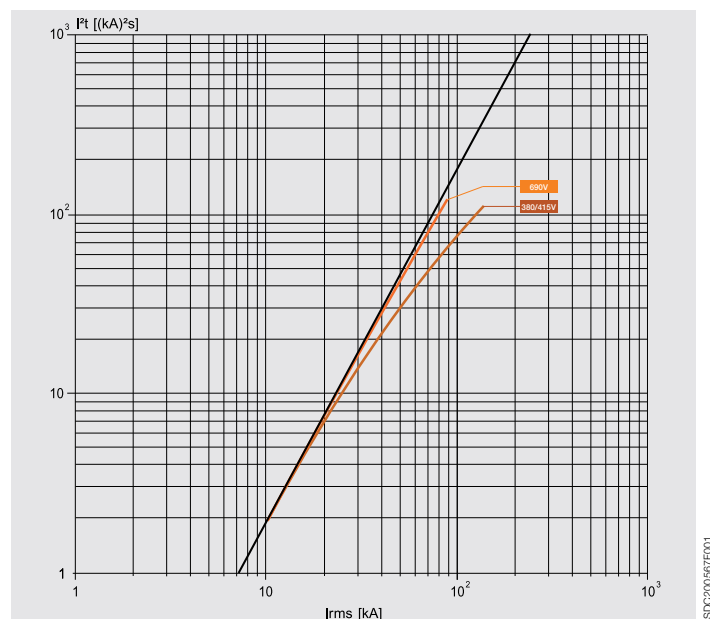
### Current-limiting curves

#### E1.2 L



### Current-limiting curves of specific let-through energy

#### E1.2 L



# Installation

## Installation environment

SACE Emax 2 circuit-breakers have been designed and tested in accordance with major international Standards to manage with maximum reliability the electrical plant. The installation requirements prescribed by the international Standards are listed below. In addition, ABB provides instructions for the use of circuit-breakers in nonstandard environments, as for example personalized maintenance program or installation solutions aimed at increasing performances and extending the lifecycle of the circuit-breaker.

### Temperature

SACE Emax2 circuit-breakers can operate in the following environmental conditions:

|                                    | Temperature (°C) |                 |                 |
|------------------------------------|------------------|-----------------|-----------------|
|                                    | Operating        | Active Display  | Storage         |
| <b>Emax 2 with Ekip DIP</b>        | -25°C ... +70°C  | -               | -40°C ... +70°C |
| <b>Emax 2 with Ekip Touch</b>      | -25°C ... +70°C  | -20°C ... +70°C | -30°C ... +70°C |
| <b>Emax 2 with LCD</b>             | -25°C ... +70°C  | -25°C ... +70°C | -40°C ... +70°C |
| <b>Emax 2 switch-disconnectors</b> | -25°C ... +70°C  | -               | -40°C ... +70°C |

### Environmental conditions

The devices can be installed in industrial environments with pollution level 3, IEC60947. SACE Emax 2 circuit-breakers also comply with:

- IEC60721-3-6 class 6C3
- IEC60721-3-3 class 3C2

### Altitude

SACE Emax 2 air circuit-breakers do not undergo changes in rated performance up to 2000 metres. Beyond this altitude, the properties of the atmosphere in terms of composition, dielectric capacitance, cooling power and pressure can vary and, therefore, the performance of the circuit-breakers is subject to derating, which can be measured by means of the variation in maximum rated service voltage and rated uninterrupted current.

| Altitude                          |                | [m]    | 2000 | 3000 | 4000 | 5000 |
|-----------------------------------|----------------|--------|------|------|------|------|
| <b>Rated service voltage - Ue</b> | Versions 690V  | [V]    | 690  | 607  | 538  | 470  |
|                                   | Versions 1150V | [V]    | 1150 | 1012 | 897  | 782  |
| <b>Rated current</b>              |                | [% In] | 100  | 98   | 93   | 90   |

An installation at 3000 m of a 690V AC rated service voltage can be an explicative example. The altitude, as shown in the table, may cause a derating which precludes the use of a standard automatic circuit-breaker. To grant the use of a circuit-breaker at 690V AC rated service voltage is therefore required a 1150V AC version that – despite the derating – fulfill the necessary rated service voltage. In addition, the selection of the circuit-breakers has to be based on the short -circuit performance required by the application.

### Vibration

The circuit-breakers have been tested according to:

- IEC60068-2-6
  - From 1 to 13 Hz with amplitude 1mm
  - From 13 to 100 Hz with constant acceleration 0.7g
- IEC60721-3-1
  - Storage: 1M3
- IEC60721-3-2
  - Transport: 2M2
- IEC60721-3-3
  - Operational conditions: 3M2
- Shipping registers or certifications

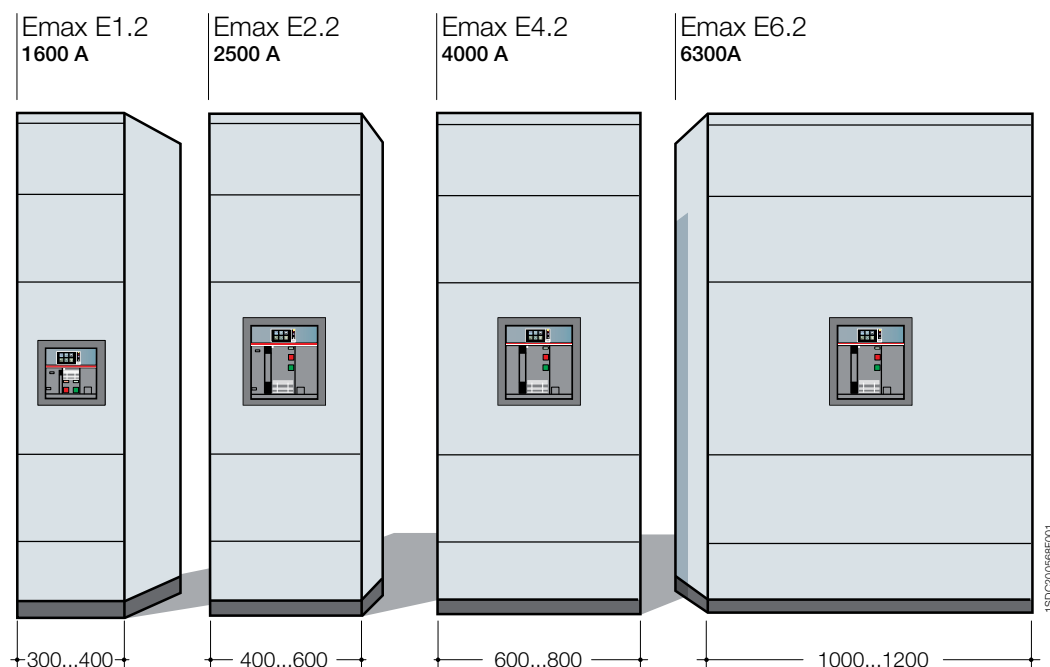
### Electromagnetic compatibility

The use of specific devices in industrial installations may cause electromagnetic interference in the electrical system. SACE Emax 2 circuit-breakers have been developed and tested for electromagnetic compatibility in accordance with IEC 60947-2, Appendices J and F.

# Installation

## Installation in switchgear

Due to the four construction sizes and the reduced insulation distances required, SACE Emax2 circuit-breakers optimize the installation spaces of the compartments of electrical switchgear, thereby providing a rational solution to the customers' application needs.

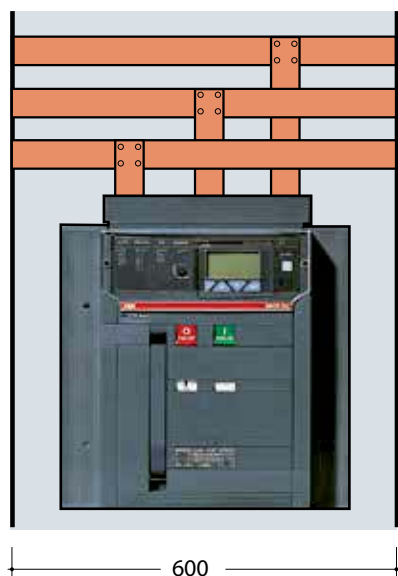


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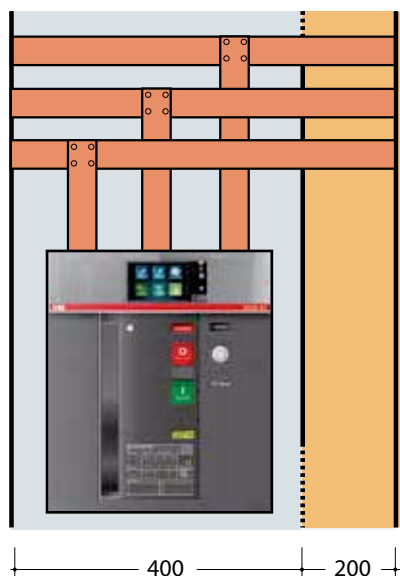
SACE Emax2 circuit-breakers enable the design of electrical switchgear to be improved, optimization in terms of performance and also in the use of the main materials:

- **Copper:** thanks to the possibility of developing compact units, the length of the distribution system / busbar can be minimized.
- **Metal frame and structure:** reduced volumes also mean less surface space is used for panels and internal structures.
- **Space:** the optimization of the individual units benefits the entire switchgear, which is more compact and can therefore be installed taking up less surface space.

Traditional circuit-breaker 3p lu 2500A



Emax E2.2 3p lu 2500A



Efficiencies with Emax 2:

- ▶ Possibility of saving in copper
- ▶ Possibility of saving in metal frame, segregation and plates
- ▶ Possibility of saving in the installation surface

# Installation

## Installation in switchgear

### Position

All SACE Emax 2 circuit-breakers can be floor mounted in a vertical position inside the switchgear compartment.

The E1.2 circuit-breaker can also be installed in a horizontal position and wall mounted. Conveniently, the screens of the Ekip Touch and Hi-Touch versions rotate to a horizontal view for key data when the E1.2 is installed horizontally.

### Power supply

The Emax 2 circuit-breakers can be supplied, indifferently, from either the upper or lower terminals. In the event a measurement module is present, in order to make use of all information when the circuit-breaker is in the open position, the voltage sockets must be installed on the power supply side.

### Insulation distances and connection

The circuit-breakers can be connected to the main power system using the most common configurations and dimensions of copper bars. Installation of live parts must ensure:

#### – Minimum insulation distances between the phases

| Rated insulation voltage Ui | Minimum distance [mm]                                                             |
|-----------------------------|-----------------------------------------------------------------------------------|
| 1000V                       | for voltages upper to 440V in fixed circuit-breakers, please use phase separators |

#### – Insulation distance of installation cubicle

##### Fixed circuit-breakers

|        | A   | B    | C      | D   |
|--------|-----|------|--------|-----|
| [mm]   | 3p  | 4P   |        |     |
| E1.2   | 250 | 322  | 382.5* | 130 |
| E2.2   | 400 | 490  | 500    | 221 |
| E4.2   | 500 | 600  | 500    | 221 |
| E6.2   | 900 | 1000 | 500    | 221 |
| E6.2/f | -   | 1200 | 500    | 221 |

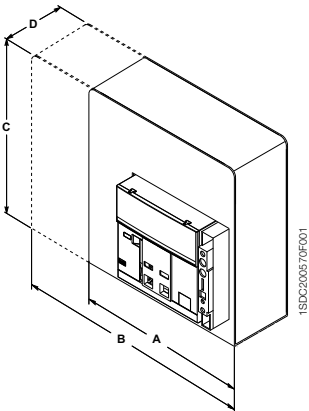
\* 332.5mm for voltage less ≤ 440V AC

##### Withdrawable circuit-breakers

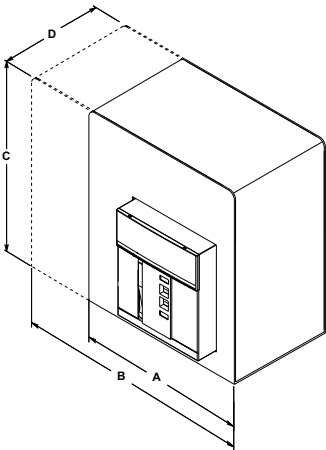
|        | A   | B    | C    | D   |
|--------|-----|------|------|-----|
| [mm]   | 3p  | 4P   |      |     |
| E1.2   | 280 | 350  | 440* | 252 |
| E2.2   | 400 | 490  | 500  | 355 |
| E4.2   | 500 | 600  | 500  | 355 |
| E6.2   | 900 | 1000 | 500  | 355 |
| E6.2/f | -   | 1200 | 500  | 355 |

\* 390mm for voltage less ≤ 440V AC

6



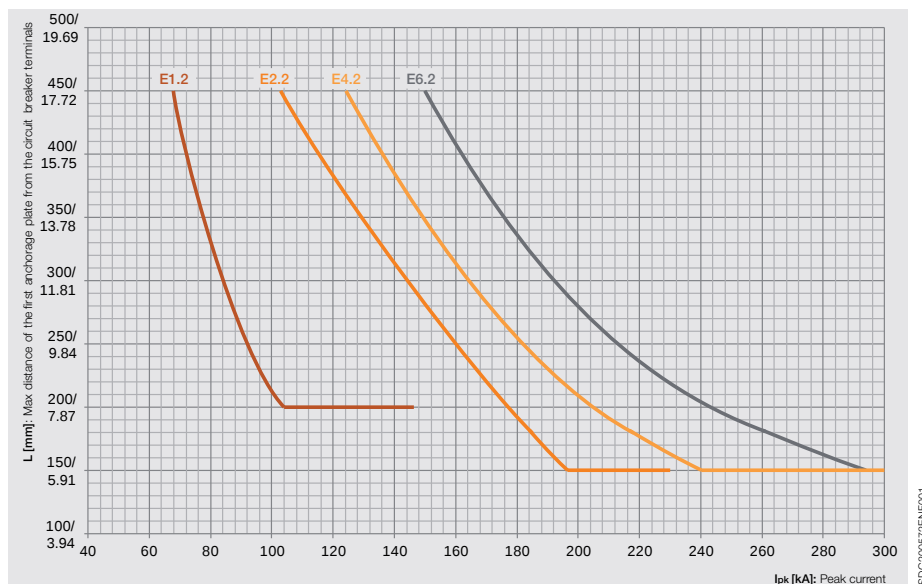
1SDC200571F001



1SDC200571F001

### – Anchorage plates

The electrodynamic force released during a short-circuit can cause high levels of mechanical stress to the devices and structures of the switchgear. To minimize this, fastening plates must be positioned near the circuit-breaker terminals.



### – Tightening torques

The following table indicates the values required for connecting the circuit-breaker terminal and the connecting bars.

| Terminals             | E1.2  | E2.2 / E4.2 / E6.2 |
|-----------------------|-------|--------------------|
| Modifiable HR/VR rear | 40 Nm | 70 Nm              |
| Spread rear           | 40 Nm | 70 Nm              |
| Front                 | 40 Nm | 70 Nm              |
| Extended front        | 40 Nm | 70 Nm              |
| Spread front          | 70 Nm | 70 Nm              |
| Front for cables      | 43 Nm | 70 Nm              |

### – Segregation plates and separator plates

The rear part of the circuit-breaker has been designed with specific slots in which insulating walls can be housed to facilitate segregation of live parts. In addition, phase separators are available as optional accessories.

## Earthing connection

To achieve continuity and equal potential of earthing between the Emax 2 circuit-breaker and the protection circuit of the switchboard, customers can do either of the options below:

- Connect the Emax 2 fixed circuit-breaker or the fixed part of the withdrawable circuit-breaker to the protective circuit by means of a cable with suitable cross-sectional area to fulfil the requirements of clause 10.5.2 to the Standard IEC 61439-1.
- If the continuity of the circuit-breaker frame with the switchboard earthing is guaranteed by the metal contact (support) between the circuit-breaker and the metal structure of the switchboard (which is a part of the protective circuit) no connection is necessary (provided that no panels of insulating material are interposed between the circuit-breaker and the metal frame of the switchboard). Emax E1.2, fixed version, does not require any earthing connection.

# Installation

## Installation in switchgear

### Busbar types

The circuit-breakers, via the terminals, can be connected to the main distribution system by busbars of different types: copper, silver-plated copper and tinned aluminium when the main distribution system is made of aluminium.

The circuit-breakers can be connected directly with copper or aluminium cables in the case of E1.2 circuit-breakers, or indirectly by cable-carrying bars in the case of E2.2, E4.2 e E6.2.

### Accessories

The SACE Emax 2 circuit-breakers offer a wide range of accessories that improve safety levels for technicians working on the switchgear and circuit-breakers. Furthermore, thanks to the different types of mechanical interlock available, pre-determined coordination strategies can be achieved between the circuit-breakers. In detail:

- Horizontal and vertical interlocks between circuit-breakers
- Door lock with circuit-breaker in closed position
- Switchgear door lock in racked-in/out position
- Lock of racked-out mechanism with door open
- External lock of shutters
- Flange for switchgear door IP30 and IP54

For further information of the operation of accessories, see chapter 5.



# Installation

## Performance in switchgear

The many types of switchgear that can be created and the installation and environmental conditions can considerably influence the performance of the circuit-breaker. In this regard, SACE Emax 2 circuit-breakers offer the best solution for improving the capacity in switchgear.

The following application situations have been assessed by taking into consideration the main factors that can influence the performance of the circuit-breaker in switchgear:

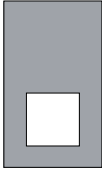
- Type of switchgear
- Switchgear degree of protection
- Segregation form 3
- Size of circuit-breaker
- Number of devices connected at the same time in the unit
- Type of terminal and connection
- Ambient temperature  $T_a$  (IEC61439-1 )
- Withdrawable circuit-breakers
- Maximum withstand temperature for the terminal 120° C

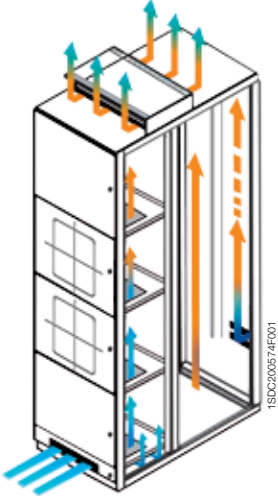
# Installation

## Performance in switchgear

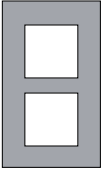
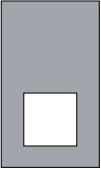
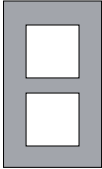
The following tables provide an indication of the performance of the apparatus inside the switchgear. The data shown are a summary of software model simulations and real tests.

SACE Emax 2 E1.2 B C N Circuit-breaker  
Switchgear dimensions 2200x400x600 (HxWxD)

|                                                                                     |  |
|-------------------------------------------------------------------------------------|--|
| HR Terminal                                                                         |  |
| One circuit-breaker in the column                                                   |  |
|  |  |
| Environment temperature                                                             |  |

| IP                                                                                                                                                                          | Iu   | Connection [mm] | Compartment | 35 °C | 45 °C | 55 °C |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------|-------------|-------|-------|-------|--|
| IP31                                                                                                                                                                        |      |                 |             |       |       |       |  |
| <div> <div>6</div> <div> <div>Compartment 2</div> <div>Compartment 1</div> </div> </div>  | 630  | 2x40x5          | 2<br>1      | 630   | 630   | 630   |  |
|                                                                                                                                                                             | 800  | 2x50x5          | 2<br>1      | 800   | 800   | 800   |  |
|                                                                                                                                                                             | 1000 | 2x50x10         | 2           |       |       |       |  |
|                                                                                                                                                                             |      | 2x50x8          | 1           | 1000  | 1000  | 1000  |  |
|                                                                                                                                                                             | 1250 | 2x50x10         | 2           |       |       |       |  |
|                                                                                                                                                                             |      |                 | 1           | 1250  | 1250  | 1200  |  |
|                                                                                                                                                                             |      | 2x50x8          | 2<br>1      |       |       |       |  |
|                                                                                                                                                                             | 1600 | 3x50x8          | 2           |       |       |       |  |
|                                                                                                                                                                             |      | 2x50x10         | 1           | 1440  | 1360  | 1290  |  |
|                                                                                                                                                                             |      |                 | 2           |       |       |       |  |
|                                                                                                                                                                             |      |                 | 1           |       |       |       |  |

Performances with EF, SHR and F terminals can be compared, with the same connection sections, to the performances of circuit-breaker with HR terminal.  
Performances with ES terminals can be compared to the VR terminals.  
Performances with FC CuAl terminals, with cables in the prescribed sections, can be compared to HR performances.

| HR Terminal<br>Two circuit-breakers in the column                                 |       |       | VR Terminal<br>One circuit-breaker in the column                                  |       |       | VR Terminal<br>Two circuit-breakers in the column                                   |       |       |
|-----------------------------------------------------------------------------------|-------|-------|-----------------------------------------------------------------------------------|-------|-------|-------------------------------------------------------------------------------------|-------|-------|
|  |       |       |  |       |       |  |       |       |
| Environment temperature                                                           |       |       | Environment temperature                                                           |       |       | Environment temperature                                                             |       |       |
| 35 °C                                                                             | 45 °C | 55 °C | 35 °C                                                                             | 45 °C | 55 °C | 35 °C                                                                               | 45 °C | 55 °C |
| 630                                                                               | 630   | 630   |                                                                                   |       |       | 630                                                                                 | 630   | 630   |
| 630                                                                               | 630   | 630   | 630                                                                               | 630   | 630   | 630                                                                                 | 630   | 630   |
| 800                                                                               | 800   | 800   |                                                                                   |       |       | 800                                                                                 | 800   | 800   |
| 800                                                                               | 800   | 800   | 800                                                                               | 800   | 800   | 800                                                                                 | 800   | 800   |
| 970                                                                               | 930   | 900   |                                                                                   |       |       |                                                                                     |       |       |
| 1000                                                                              | 960   | 920   |                                                                                   |       |       |                                                                                     |       |       |
|                                                                                   |       |       |                                                                                   |       |       | 1000                                                                                | 1000  | 950   |
|                                                                                   |       |       | 1000                                                                              | 1000  | 1000  | 1000                                                                                | 1000  | 970   |
| 1200                                                                              | 1150  | 1100  |                                                                                   |       |       |                                                                                     |       |       |
| 1250                                                                              | 1200  | 1140  |                                                                                   |       |       |                                                                                     |       |       |
|                                                                                   |       |       |                                                                                   |       |       | 1250                                                                                | 1250  | 1150  |
|                                                                                   |       |       | 1250                                                                              | 1250  | 1250  | 1250                                                                                | 1250  | 1200  |
| 1330                                                                              | 1260  | 1220  |                                                                                   |       |       |                                                                                     |       |       |
| 1370                                                                              | 1315  | 1262  |                                                                                   |       |       |                                                                                     |       |       |
|                                                                                   |       |       |                                                                                   |       |       | 1430                                                                                | 1355  | 1265  |
|                                                                                   |       |       | 1520                                                                              | 1440  | 1330  | 1475                                                                                | 1415  | 1310  |

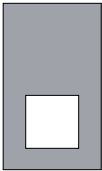
# Installation

## Performance in switchgear

The following tables provide an indication of the performance of the apparatus inside the switchgear. The data shown are a summary of software model simulations and real tests.

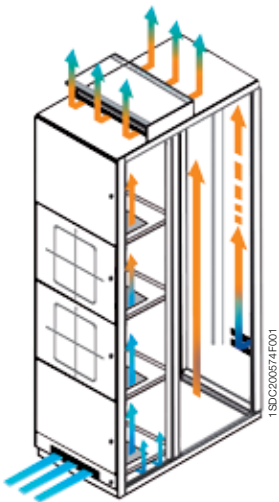
SACE Emax 2 E2.2 B N S H Circuit-breaker  
Switchgear dimensions 2200x600xx900 (HxWxD)

HR Terminal  
One circuit-breaker in the column

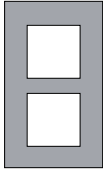
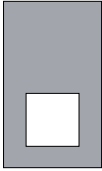
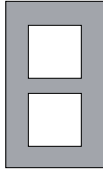


Environment temperature

| IP   | Iu   | Connection [mm] | Compartment | 35 °C | 45 °C | 55 °C |  |
|------|------|-----------------|-------------|-------|-------|-------|--|
| IP31 | 800  | 1x60x10         | 2           |       |       |       |  |
|      |      |                 | 1           | 800   | 800   | 800   |  |
|      | 1000 | 1x60x10         | 2           |       |       |       |  |
|      |      |                 | 1           | 1000  | 1000  | 1000  |  |
|      | 1250 | 2x60x10         | 2           |       |       |       |  |
|      |      |                 | 1           | 1250  | 1250  | 1250  |  |
|      | 1600 | 2x60x10         | 2           |       |       |       |  |
|      |      |                 | 1           | 1600  | 1540  | 1480  |  |
|      |      | 1x100x10        | 2           |       |       |       |  |
|      |      |                 | 1           |       |       |       |  |
|      | 2000 | 3x60x10         | 2           |       |       |       |  |
|      |      |                 | 1           | 2000  | 1940  | 1850  |  |
|      |      | 2x80x10         | 2           |       |       |       |  |
|      |      |                 | 1           |       |       |       |  |
|      |      | 3x60x10 *       | 2           |       |       |       |  |
|      |      |                 | 1           | 2000  | 2000  | 1940  |  |
|      | 2500 | 2x80x10 *       | 2           |       |       |       |  |
|      |      |                 | 1           |       |       |       |  |
|      |      | 3x60x10         | 2           |       |       |       |  |
|      |      |                 | 1           | 2500  | 2350  | 2200  |  |
|      |      | 4x100x5         | 2           |       |       |       |  |
|      |      |                 | 1           |       |       |       |  |
|      |      | 3x60x10 *       | 2           |       |       |       |  |
|      |      |                 | 1           | 2500  | 2460  | 2320  |  |
|      |      | 4x100x5 *       | 2           |       |       |       |  |
|      |      |                 | 1           |       |       |       |  |



\* Performances refer to SHR and SVR terminals.  
Performances with F and FL terminals can be compared to the performance of circuit-breakers with HR terminals.

| HR Terminal<br>Two circuit-breakers in the column                                 |       |       | VR Terminal<br>One circuit-breaker in the column                                  |       |       | VR Terminal<br>Two circuit-breakers in the column                                   |       |       |
|-----------------------------------------------------------------------------------|-------|-------|-----------------------------------------------------------------------------------|-------|-------|-------------------------------------------------------------------------------------|-------|-------|
|  |       |       |  |       |       |  |       |       |
| Environment temperature                                                           |       |       | Environment temperature                                                           |       |       | Environment temperature                                                             |       |       |
| 35 °C                                                                             | 45 °C | 55 °C | 35 °C                                                                             | 45 °C | 55 °C | 35 °C                                                                               | 45 °C | 55 °C |
| 800                                                                               | 800   | 800   |                                                                                   |       |       | 800                                                                                 | 800   | 800   |
| 800                                                                               | 800   | 800   | 800                                                                               | 800   | 800   | 800                                                                                 | 800   | 800   |
| 1000                                                                              | 1000  | 1000  |                                                                                   |       |       | 1000                                                                                | 1000  | 1000  |
| 1000                                                                              | 1000  | 1000  | 1000                                                                              | 1000  | 1000  | 1000                                                                                | 1000  | 1000  |
| 1250                                                                              | 1250  | 1250  |                                                                                   |       |       | 1250                                                                                | 1250  | 1250  |
| 1250                                                                              | 1250  | 1250  | 1250                                                                              | 1250  | 1250  | 1250                                                                                | 1250  | 1250  |
| 1470                                                                              | 1410  | 1360  |                                                                                   |       |       |                                                                                     |       |       |
| 1550                                                                              | 1490  | 1430  |                                                                                   |       |       |                                                                                     |       |       |
|                                                                                   |       |       |                                                                                   |       |       | 1500                                                                                | 1470  | 1400  |
|                                                                                   |       |       | 1600                                                                              | 1600  | 1520  | 1580                                                                                | 1550  | 1475  |
| 1920                                                                              | 1810  | 1720  |                                                                                   |       |       |                                                                                     |       |       |
| 1950                                                                              | 1850  | 1760  |                                                                                   |       |       |                                                                                     |       |       |
|                                                                                   |       |       |                                                                                   |       |       | 1950                                                                                | 1860  | 1760  |
|                                                                                   |       |       | 2000                                                                              | 2000  | 1920  | 2000                                                                                | 1920  | 1810  |
| 2000                                                                              | 1900  | 1810  |                                                                                   |       |       |                                                                                     |       |       |
| 2000                                                                              | 1945  | 1850  |                                                                                   |       |       |                                                                                     |       |       |
|                                                                                   |       |       |                                                                                   |       |       | 2000                                                                                | 1950  | 1850  |
|                                                                                   |       |       | 2000                                                                              | 2000  | 2000  | 2000                                                                                | 2000  | 1900  |
| 2280                                                                              | 2200  | 2100  |                                                                                   |       |       |                                                                                     |       |       |
| 2400                                                                              | 2310  | 2170  |                                                                                   |       |       |                                                                                     |       |       |
|                                                                                   |       |       |                                                                                   |       |       | 2400                                                                                | 2270  | 2160  |
|                                                                                   |       |       | 2500                                                                              | 2450  | 2350  | 2500                                                                                | 2380  | 2270  |
| 2394                                                                              | 2310  | 2205  |                                                                                   |       |       |                                                                                     |       |       |
| 2500                                                                              | 2430  | 2280  |                                                                                   |       |       |                                                                                     |       |       |
|                                                                                   |       |       |                                                                                   |       |       | 2500                                                                                | 2390  | 2270  |
|                                                                                   |       |       | 2500                                                                              | 2500  | 2460  | 2500                                                                                | 2500  | 2380  |

# Installation

## Performance in switchgear

The following tables provide an indication of the performance of the apparatus inside the switchgear. The data shown are a summary of software model simulations and real tests.

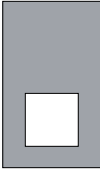
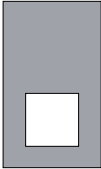
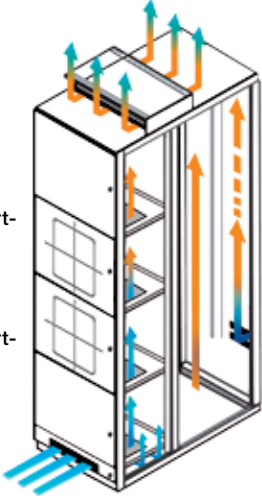
**SACE Emax 2 E4.2 N S H V Circuit-breaker**  
**Switchgear dimensions 2200x800xx900 (HxWxD)**

|      |      |                 |             | HR Terminal<br>One circuit-breaker in the column |       |       | VR Terminal<br>One circuit-breaker in the column |       |       |
|------|------|-----------------|-------------|--------------------------------------------------|-------|-------|--------------------------------------------------|-------|-------|
|      |      |                 |             | Environment temperature                          |       |       | Environment temperature                          |       |       |
| IP   | Iu   | Connection [mm] | Compartment | 35 °C                                            | 45 °C | 55 °C | 35 °C                                            | 45 °C | 55 °C |
| IP31 | 2000 | 2x80x10         | 1           | 2000                                             | 2000  | 2000  | 2000                                             | 2000  | 2000  |
|      | 2500 | 2x100x10        | 1           | 2500                                             | 2450  | 2400  | 2500                                             | 2500  | 2500  |
|      | 3200 | 3x100x10        | 1           | 3050                                             | 2900  | 2755  | 3200                                             | 3080  | 2920  |
|      | 3200 | 3x100x10*       | 1           | 3200                                             | 3050  | 2850  | 3200                                             | 3200  | 3020  |
|      | 4000 | 4x100x10        | 1           | 3450                                             | 3200  | 2970  | 3650                                             | 3400  | 3200  |

\* Performances refer to withdrawable circuit-breakers with a fixed part accessorized with three stab rear terminals for 4000A (Example: 1SDA074021R1 - KIT VR 4000A)  
Performances with F and FL terminals can be compared to the performances of circuit-breaker with HR terminal.

The following tables provide an indication of the performance of the apparatus inside the switchgear. The data shown are a summary of software model simulations and real tests.

SACE Emax 2 E6.2 H V X Circuit-breaker  
Switchgear dimensions 2200x1200xx900 (HxLxD)

|                                                                                                                                                                                                          |      |                 |             | HR Terminal<br>One circuit-breaker in the column                                   |       |       | VR Terminal<br>One circuit-breaker in the column                                    |       |       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------|-------------|------------------------------------------------------------------------------------|-------|-------|-------------------------------------------------------------------------------------|-------|-------|
|                                                                                                                                                                                                          |      |                 |             |  |       |       |  |       |       |
|                                                                                                                                                                                                          |      |                 |             | Environment temperature                                                            |       |       | Environment temperature                                                             |       |       |
| IP                                                                                                                                                                                                       | Iu   | Connection [mm] | Compartment | 35 °C                                                                              | 45 °C | 55 °C | 35 °C                                                                               | 45 °C | 55 °C |
| <div> <div>IP31</div>  <div>1SDC200574F001</div> </div> <div> <div>Compartment 2</div> <div>Compartment 1</div> </div> | 4000 | 4x100x10        | 1           | 4000                                                                               | 4000  | 4000  | 4000                                                                                | 4000  | 4000  |
|                                                                                                                                                                                                          | 5000 | 5x100x10        | 1           | 5000                                                                               | 5000  | 4900  | 5000                                                                                | 5000  | 5000  |
|                                                                                                                                                                                                          | 6300 | 6x100x10        | 1           | 5650                                                                               | 5350  | 5100  | 6000                                                                                | 5700  | 5250  |

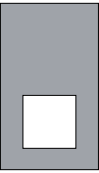
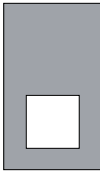
Performances with F and FL terminals can be compared to the performances of circuit-breaker with HR terminal.

# Installation

## Performance in switchgear

The following tables provide an indication of the performance of the apparatus inside the switchgear. The data shown are a summary of software model simulations and real tests.

SACE Emax 2 E1.2 L Circuit-breaker  
Switchgear dimensions 2200x400x600 (HxWxD)

|      |      |                 |             | HR Terminal<br>One circuit-breaker in the column                                   |       |       | VR Terminal<br>One circuit-breaker in the column                                    |       |       |
|------|------|-----------------|-------------|------------------------------------------------------------------------------------|-------|-------|-------------------------------------------------------------------------------------|-------|-------|
|      |      |                 |             |  |       |       |  |       |       |
|      |      |                 |             | Environment temperature                                                            |       |       | Environment temperature                                                             |       |       |
| IP   | Iu   | Connection [mm] | Compartment | 35 °C                                                                              | 45 °C | 55 °C | 35 °C                                                                               | 45 °C | 55 °C |
| IP31 | 630  | 2x40x5          | 1           | 630                                                                                | 630   | 630   | 630                                                                                 | 630   | 630   |
|      | 800  | 2x50x5          | 1           | 800                                                                                | 800   | 800   | 800                                                                                 | 800   | 800   |
|      | 1000 | 2x50x10         | 1           | 1000                                                                               | 1000  | 950   |                                                                                     |       |       |
|      |      | 2x50x8          |             |                                                                                    |       |       | 1000                                                                                | 1000  | 1000  |
|      | 1250 | 2x50x10         | 1           | 1250                                                                               | 1125  | 955   |                                                                                     |       |       |
|      |      | 2x50x8          | 1           |                                                                                    |       |       | 1250                                                                                | 1205  | 1050  |

Performances with EF, SHR and F terminals can be compared, with the same connection sections, to the performances of circuit-breaker with HR terminal.  
Performances with ES terminals can be compared to the VR terminals.  
Performances with FC CuAl terminals, with cables in the prescribed sections, can be compared to HR performances.

# Dimensions

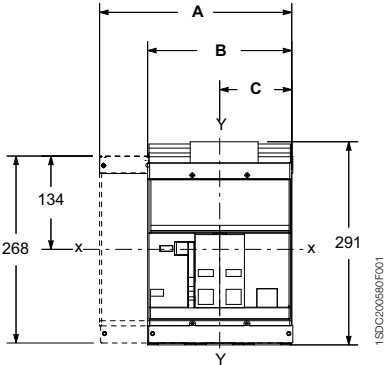
| Fixed circuit-breaker | 7/2  |
|-----------------------|------|
| E1.2                  | 7/4  |
| E2.2                  | 7/8  |
| E4.2                  | 7/12 |
| E6.2                  | 7/15 |

| Withdrawable circuit-breaker | 7/20 |
|------------------------------|------|
| E1.2                         | 7/22 |
| E2.2                         | 7/26 |
| E4.2                         | 7/36 |
| E6.2                         | 7/38 |

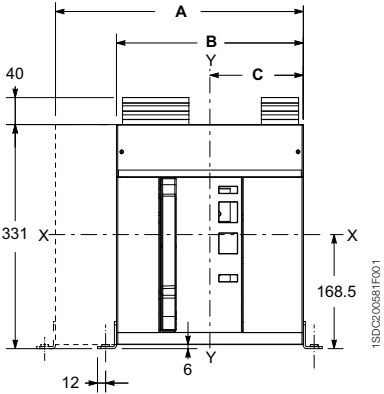
# Dimensions

## Fixed circuit-breaker

E1.2



E2.2 - E4.2 - E6.2

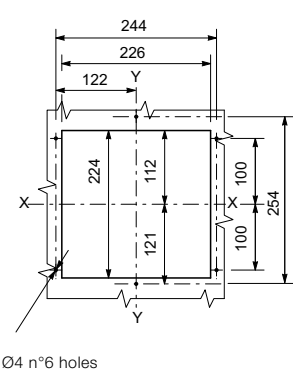


|        | A    | B   | C   |     |
|--------|------|-----|-----|-----|
| [mm]   | 4p   | 3p  | 3p  | 4p  |
| E1.2   | 284  | 214 | 107 | 107 |
| E2.2   | 366  | 276 | 138 | 138 |
| E4.2   | 510  | 384 | 192 | 192 |
| E6.2   | 888  | 762 | 318 | 444 |
| E6.2/f | 1014 | -   | -   | 444 |

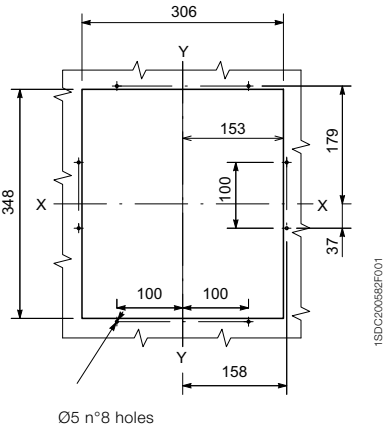
7

### Compartment door drilling

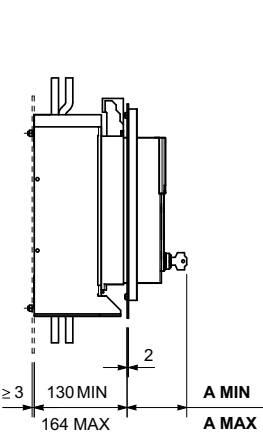
E1.2



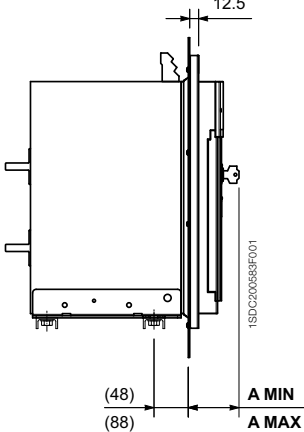
E2.2 - E4.2 - E6.2



E1.2



E2.2 - E4.2 - E6.2

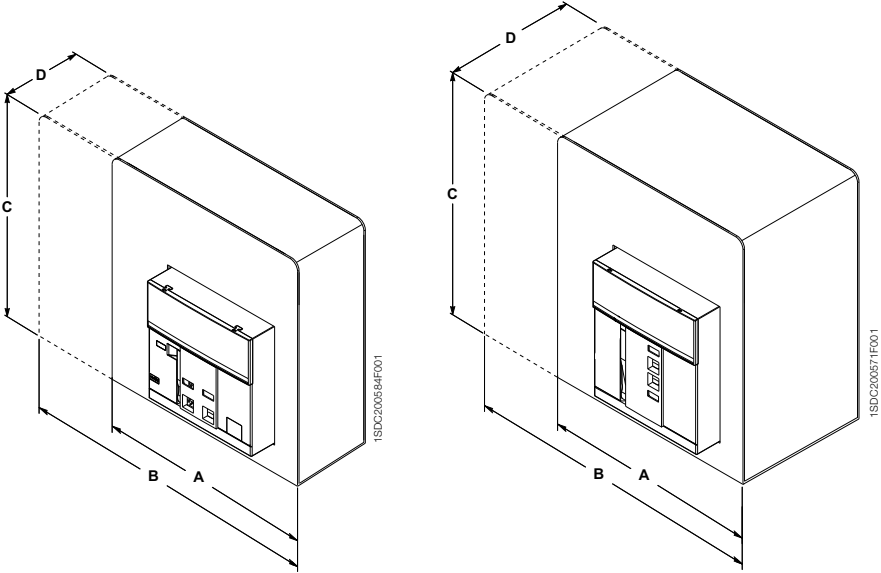


| E1.2  |      | Standard | Ronis/Profalux | Kirk | Castell |
|-------|------|----------|----------------|------|---------|
| A MIN | [mm] | 49.5     | 63.5           | 63.5 | 83.5    |
| A MAX | [mm] | 83.5     | 97.5           | 97.5 | 117.5   |

| E2.2-E4.2-E6.2 |      | Standard | Ronis/Profalux | Kirk | Castell |
|----------------|------|----------|----------------|------|---------|
| A MIN          | [mm] | 29.5     | 41.5           | 46.5 | 65      |
| A MAX          | [mm] | 69.5     | 81.5           | 86.5 | 105     |

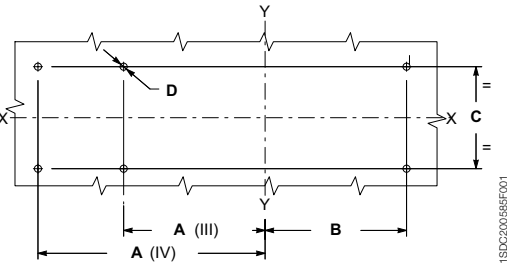
Dimensions of the compartment



|        | A   | B    | C       | D   |
|--------|-----|------|---------|-----|
| [mm]   | 3p  | 4p   |         |     |
| E1.2   | 250 | 322  | 382.5 * | 130 |
| E2.2   | 400 | 490  | 500     | 221 |
| E4.2   | 500 | 600  | 500     | 221 |
| E6.2   | 900 | 1000 | 500     | 221 |
| E6.2/f | -   | 1200 | 500     | 221 |

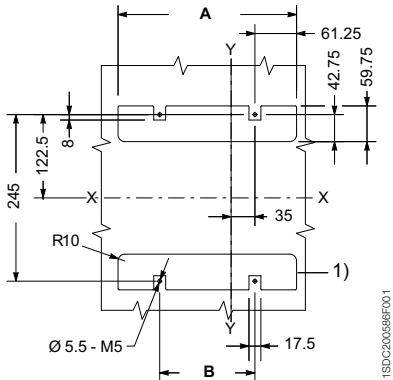
\* 332.5 for voltages ≤ 440V AC

Floor fixing



|        | A   | B   | C   | D    |
|--------|-----|-----|-----|------|
| [mm]   | 3p  | 4p  |     |      |
| E1.2   | 117 | 187 | 80  | 5.5  |
| E2.2   | 154 | 244 | 150 | 10.5 |
| E4.2   | 208 | 334 | 150 | 10.5 |
| E6.2   | 460 | 460 | 150 | 10.5 |
| E6.2/f | -   | 586 | 150 | 10.5 |

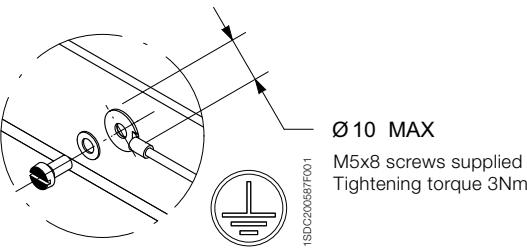
Wall fixing (only for E1.2)



| [mm] | 3 p   | 4 p   |
|------|-------|-------|
| A    | 192.5 | 262.5 |
| B    | 70    | 140   |

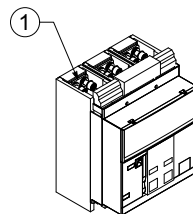
1) for fixing with rear terminals

Earthing device E2.2 - E4.2 - E6.2

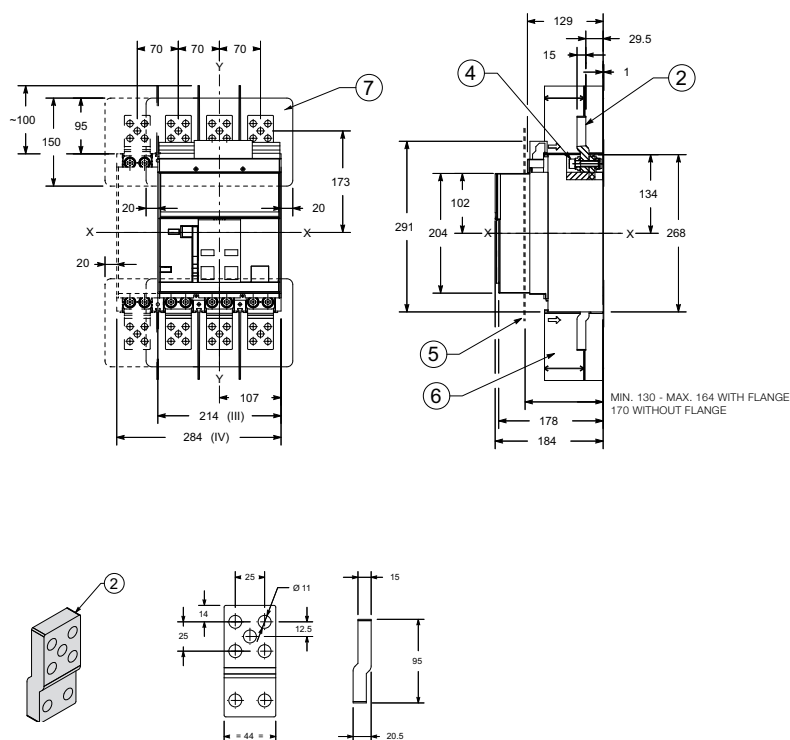


Ø 10 MAX  
M5x8 screws supplied  
Tightening torque 3Nm

## Front terminals – F

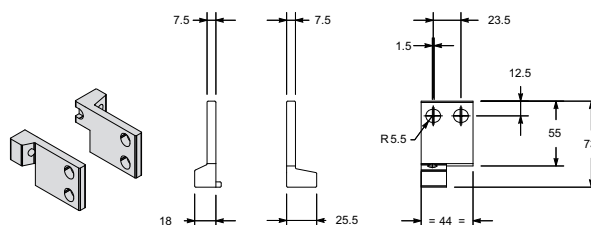
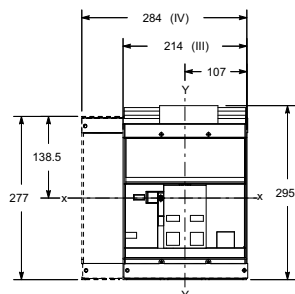


## 7

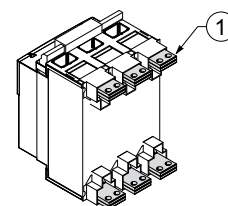
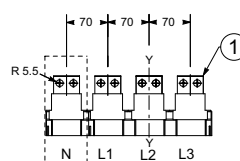
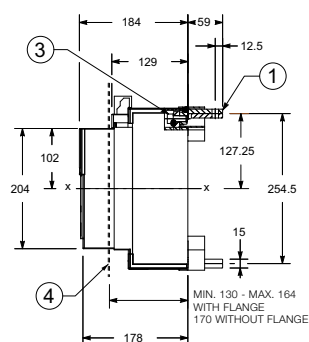


## SDC200594F001

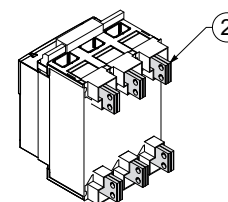
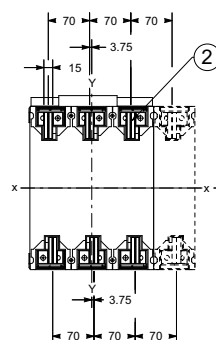
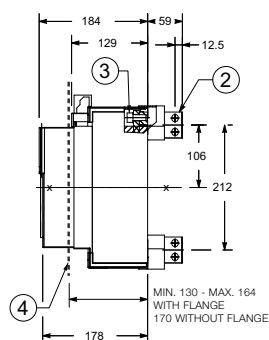
## Orientable rear terminals - HR/VR



### Terminals HR



### Terminals VR



#### Key

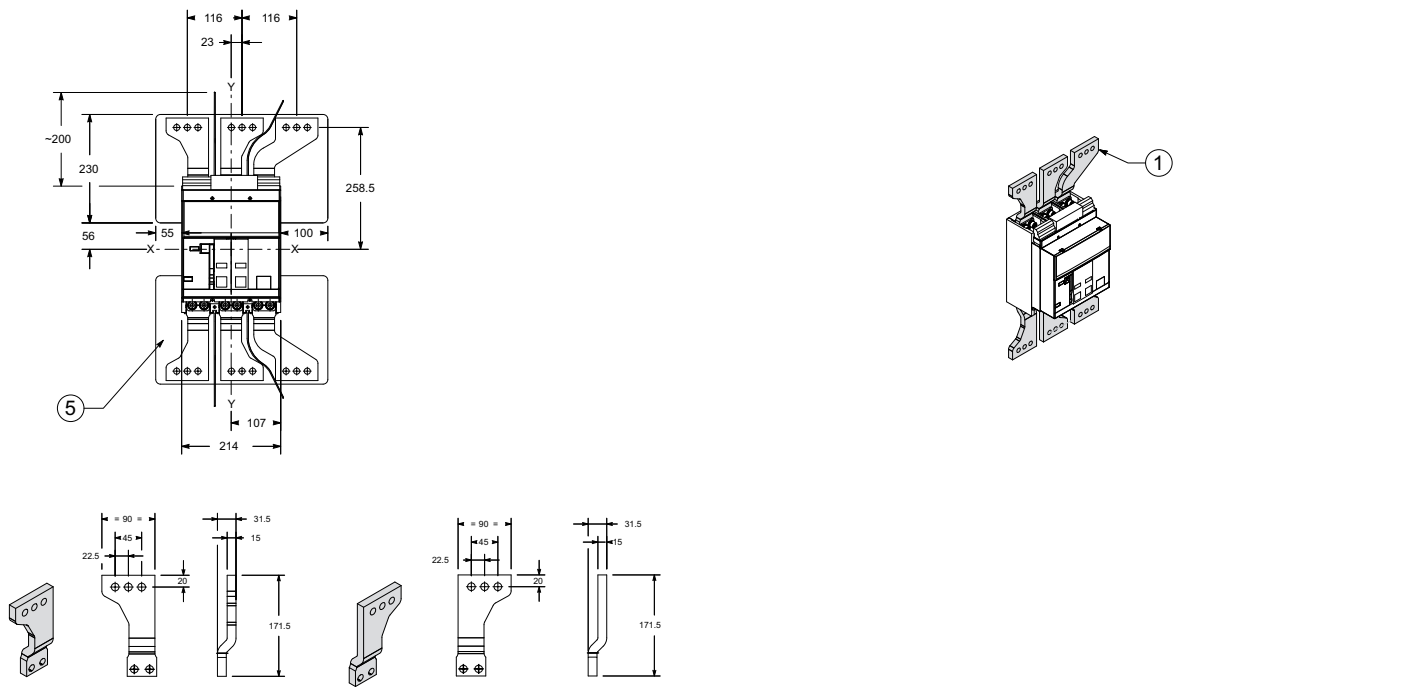
- 1 Horizontal orientable terminals HR
- 2 Vertical orientable terminals VR
- 3 Tightening torque 20Nm
- 4 Door position - Ref. page 7/2

# Dimensions

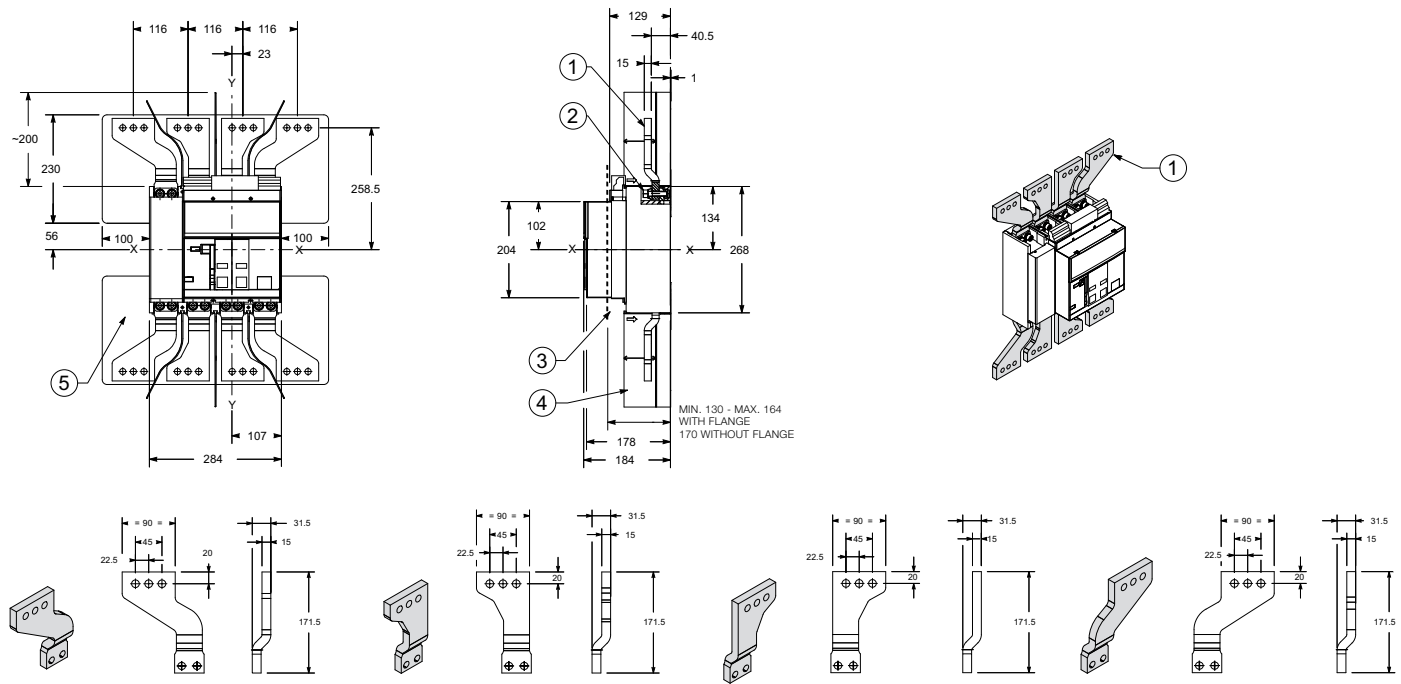
## Fixed circuit-breaker - E1.2

### Splayed extended front terminals - ES

#### 3-pole version

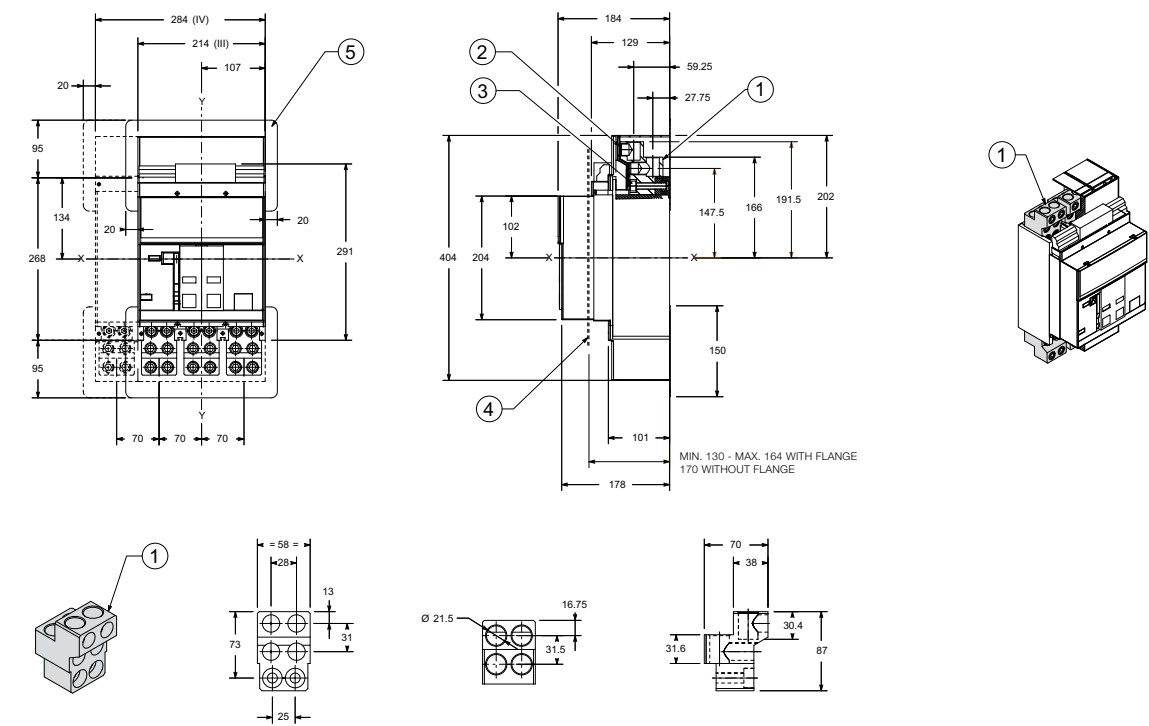


#### 4-pole version



- Key**
- 1 Splayed extended front terminals
  - 2 Tightening torque 18Nm
  - 3 Door position - Ref. page 7/2
  - 4 Obligatory phase separators 200mm
  - 5 Obligatory insulating plate to be supplied by the customer

# Front terminals for cables – FcCuAl

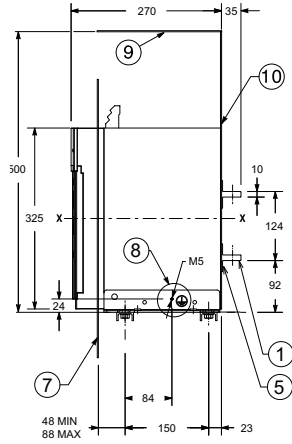
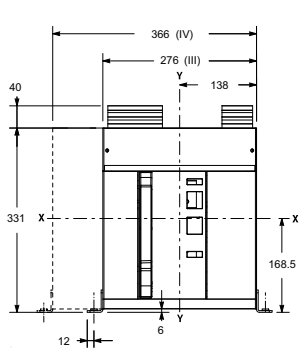


- Key**
- 1 Front terminals for cables FC CU AL
  - 2 Tightening torque 43Nm
  - 3 Tightening torque 18Nm
  - 4 Door position - Ref. page 7/2
  - 5 Obligatory insulating plate to be supplied by the customer

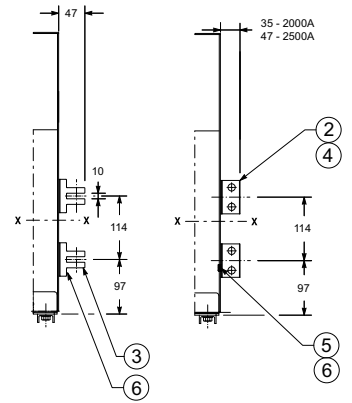
## Fixed circuit-breaker - E2.2

## Orientable rear terminals - HR/VR

## E2.2 B/N/S/H 2000A

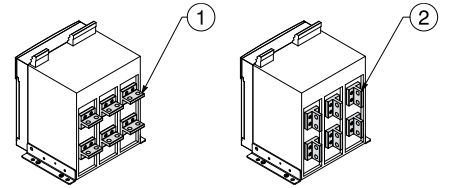
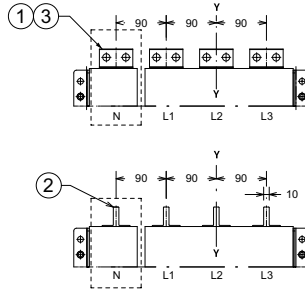
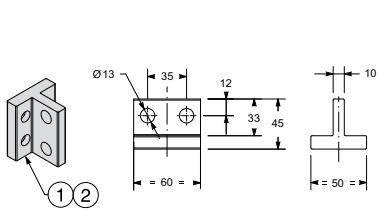


## E2.2 N/S/H 2500A

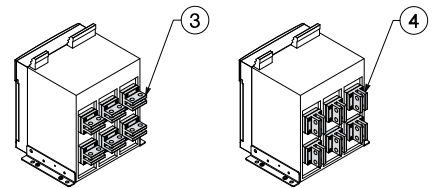
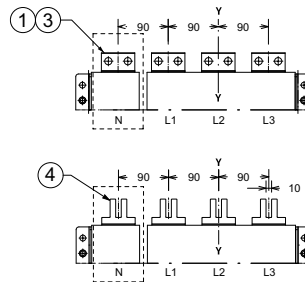
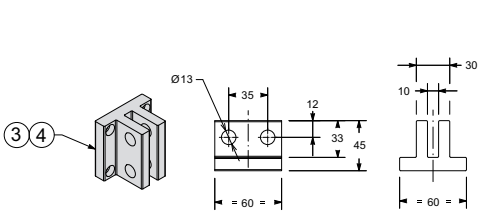


## E2.2 B/N/S/H 2000A

7



## E2.2 N/S/H 2500A



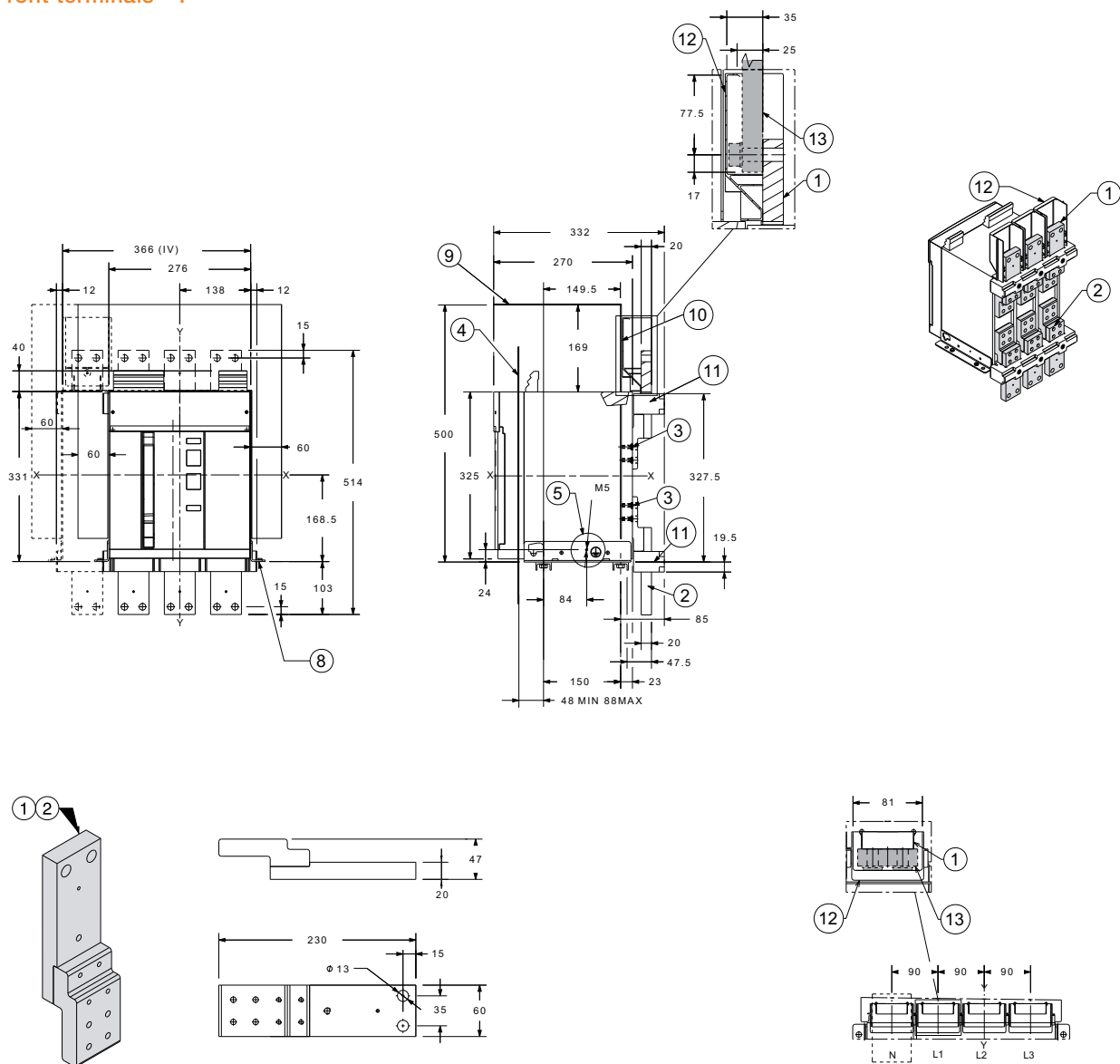
### Key

- 1 Horizontal terminals 2000A
- 2 Vertical terminals 2000A
- 3 Horizontal terminals 2500A
- 4 Vertical terminals 2500A

- 5 Tightening torque 2000A 8.6Nm  
6 Tightening torque 2500A 8.6Nm  
7 Door position - Ref. page 7/2  
8 Earthing device - Ref. page 7/3

- 9 Metallic sheet  
10 Insulating sheet or insulated metallic sheet

## Front terminals – F



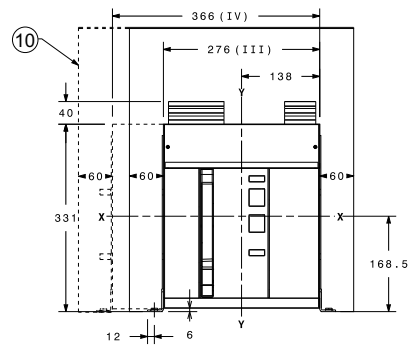
### Key

- |                                   |                                                                  |                                                 |
|-----------------------------------|------------------------------------------------------------------|-------------------------------------------------|
| 1 Upper front terminals           | 8 External fixing point.<br>Reccomended screws M10x25 high class | 11 Crossbeam front terminals                    |
| 2 Lower front terminals           | 9 Metallic sheet                                                 | 12 Plastic protection                           |
| 3 Tightening torque 8.6Nm         | 10 Insulating sheet or<br>insulated metallic sheet               | 13 Customer busbar and screws<br>(not provided) |
| 4 Door position - Ref. page 7/2   |                                                                  |                                                 |
| 5 Earthing device - Ref. page 7/3 |                                                                  |                                                 |

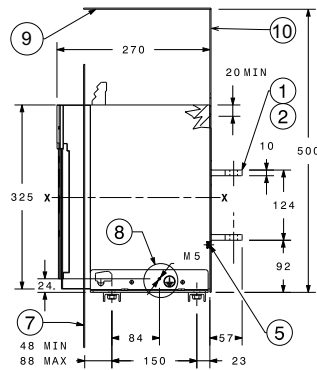
# Dimensions

## Fixed circuit-breaker - E2.2

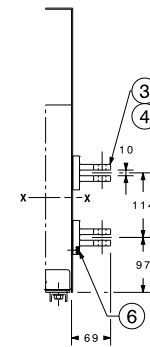
### Horizontal spread terminals – SHR



E2.2 B/N/S/H 2000A

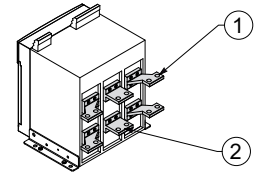
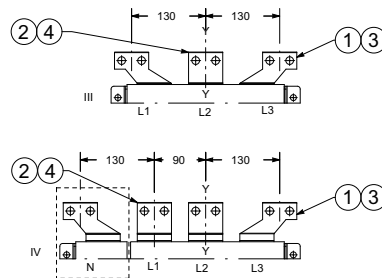
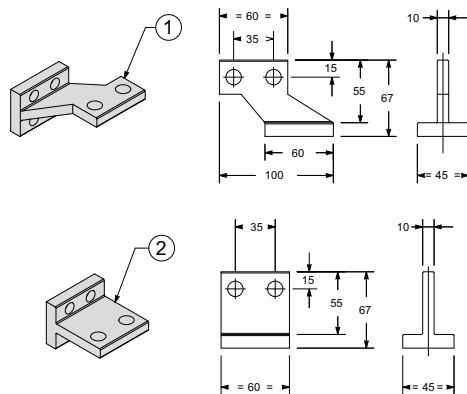


E2.2 N/S/H 2500A

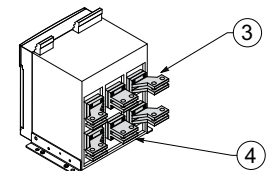
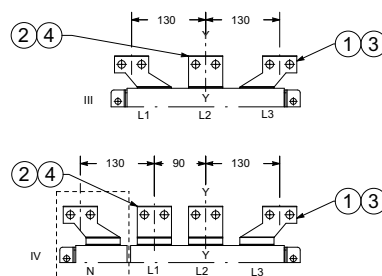
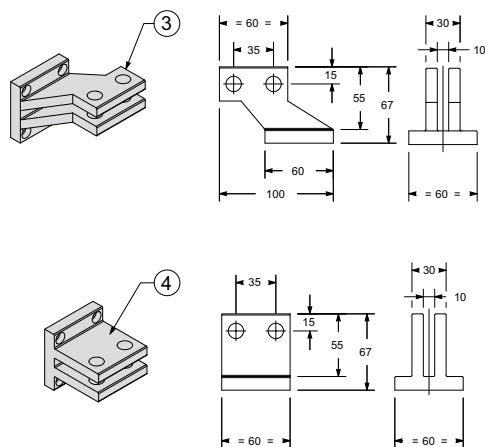


E2.2 B/N/S/H 2000A

7



E2.2 N/S/H 2500A



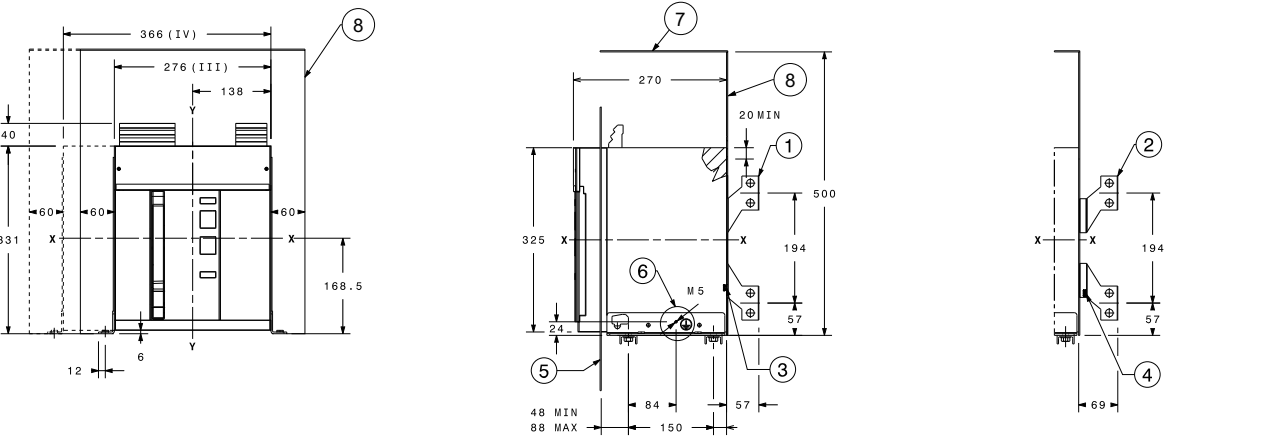
#### Key

- 1 Side horizontal splayed terminals 2000A
- 2 Central horizontal splayed terminals 2000A
- 3 Side horizontal splayed terminals 2500A
- 4 Central horizontal splayed terminals 2500A

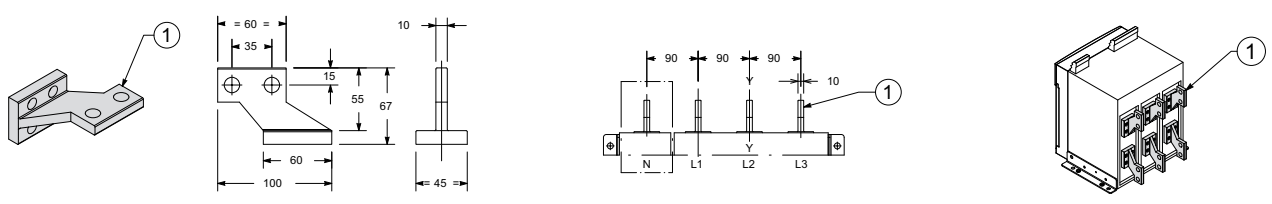
- 5 Tightening torque 2000A 8.6Nm
- 6 Tightening torque 2500A 8.6Nm
- 7 Door position - Ref. page 7/2
- 8 Earthing device - Ref. page 7/3

- 9 Metallic sheet
- 10 Insulating sheet or insulated metallic sheet

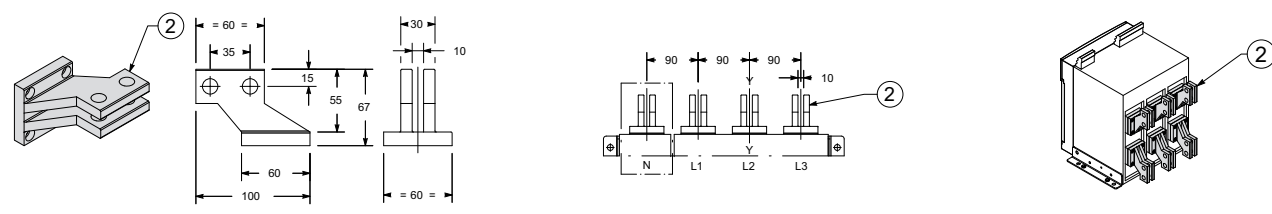
Vertical spread terminals – SVR



E2.2 B/N/S/H 2000A



E2.2 N/S/H 2500A

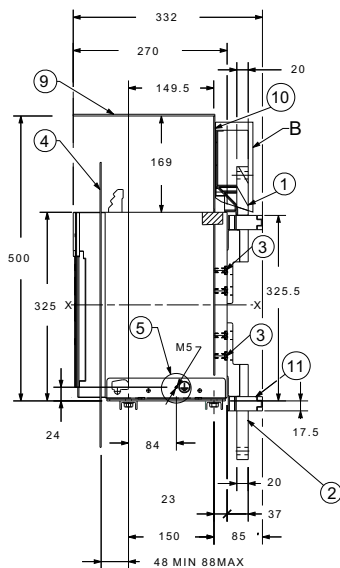
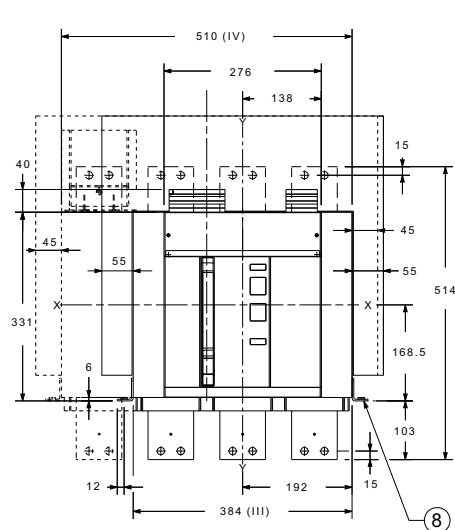


Key

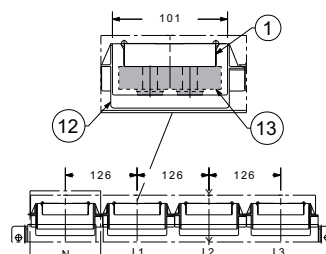
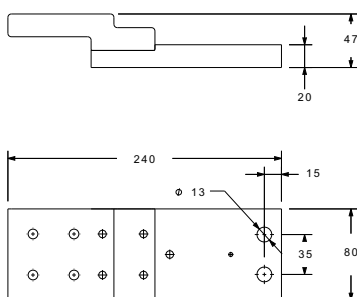
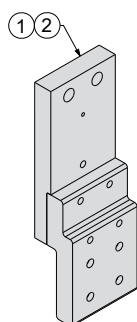
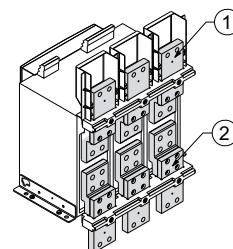
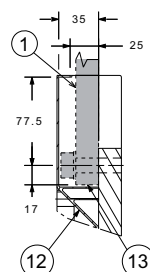
- |                                    |                                   |                                                |
|------------------------------------|-----------------------------------|------------------------------------------------|
| 1 Vertical splayed terminals 2000A | 4 Tightening torque 2500A 8.6Nm   | 7 Metallic sheet                               |
| 2 Vertical splayed terminals 2500A | 5 Door position - Ref. page 7/2   | 8 Insulating sheet or insulated metallic sheet |
| 3 Tightening torque 2000A 8.6Nm    | 6 Earthing device - Ref. page 7/3 |                                                |



## Front terminals – F



Dettaglio B



### Key

- 1 Upper front terminals
- 2 Lower front terminals
- 3 Tightening torque 8.6Nm
- 4 Door position - Ref. page 7/2
- 5 Earthing device - Ref. page 7/3

- 8 External fixing point.  
Reccomended screws M10x25 high class
- 9 Metallic sheet
- 10 Insulating sheet or  
insulated metallic sheet

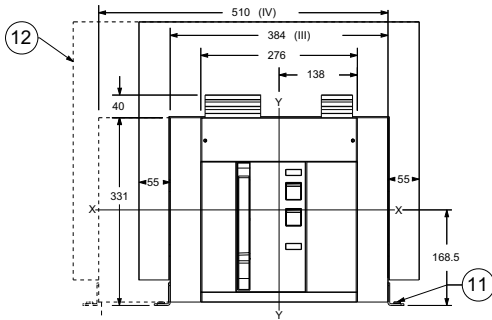
- 11 Crossbeam front terminals
- 12 Plastic protection
- 13 Customer busbar and screws  
(not provided)

# Dimensions

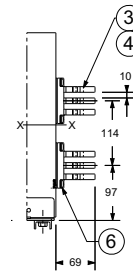
## Fixed circuit-breaker - E4.2

### Horizontal spread terminals – SHR

E4.2 N/S/H 3200A

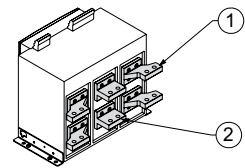
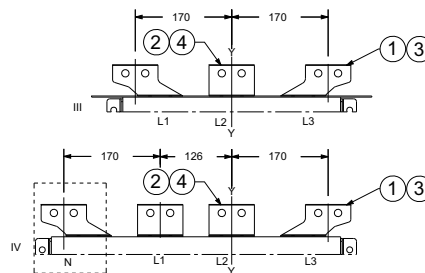
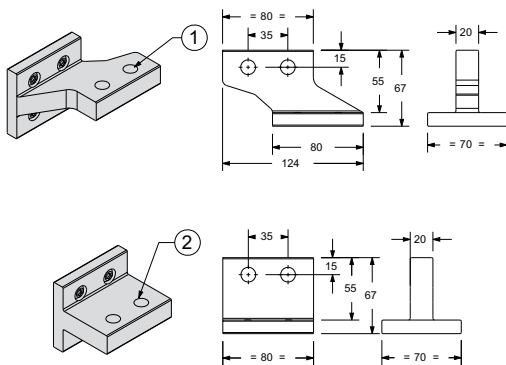


E4.2 N/S/H 4000A  
E4.2 V 2000 ... 4000A

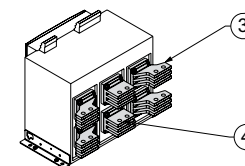
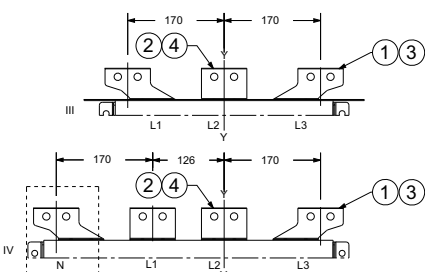
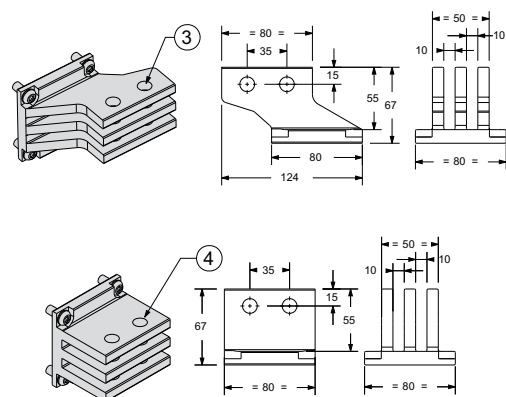


E4.2 N/S/H 3200A

7



E4.2 N/S/H 4000A  
E4.2 V 2000 ... 4000A



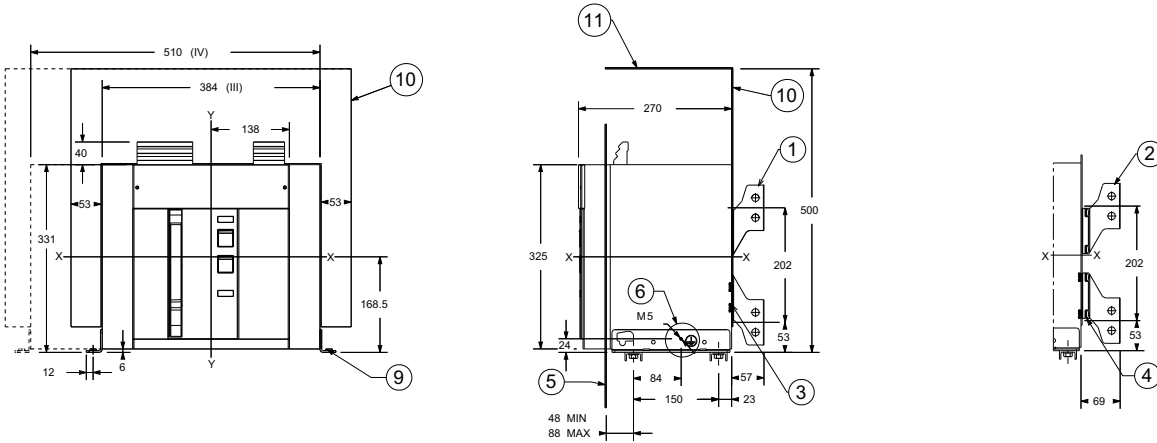
### Key

- 1 Side horizontal divaricate terminals 3200A
- 2 Central horizontal divaricate terminals 3200A
- 3 Side horizontal divaricate terminals 4000A
- 4 Central horizontal divaricate terminals 4000A
- 5 Tightening torque 3200A 8.6Nm
- 6 Tightening torque 4000A 8.6Nm

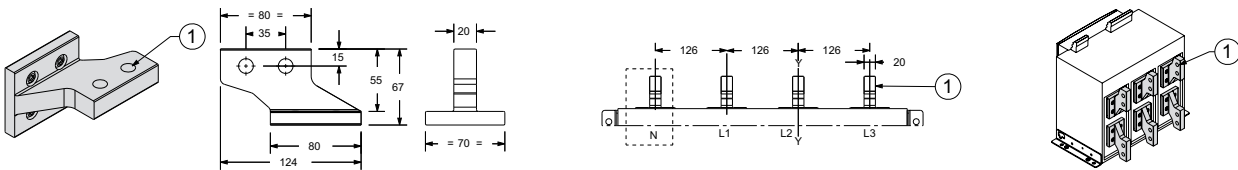
- 7 Door position - Ref. page 7/2
  - 8 Grounding
  - 11 Mounting outside feet
- Screws recommend M10x25 high class 8.8 or couple superior
- Tightening torque 40Nm compulsory fixing screws from high

- 12 Insulating sheet or insulated metallic sheet
- 13 Metallic sheet

## Vertical spread terminals – SVR

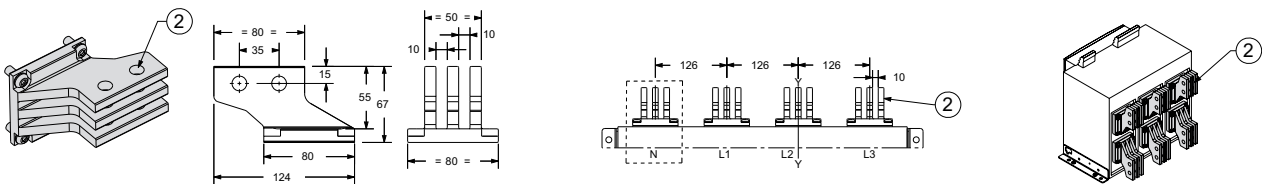


### E4.2 N/S/H 3200A



### E4.2 N/S/H 4000A

### E4.2 V 2000 ... 4000A



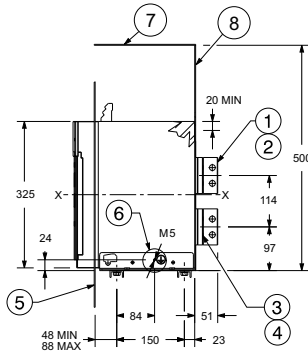
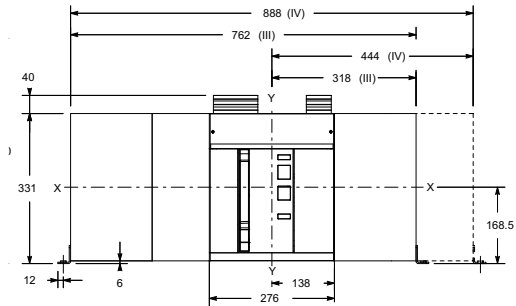
#### Key

- |                                       |                                                           |                                                 |
|---------------------------------------|-----------------------------------------------------------|-------------------------------------------------|
| 1 Vertical divaricate terminals 3200A | 6 Grounding                                               | 10 Insulating sheet or insulated metallic sheet |
| 2 Vertical divaricate terminals 4000A | 9 Mounting outside feet                                   | 11 Metallic sheet                               |
| 3 Tightening torque 3200A 8.6Nm       |                                                           |                                                 |
| 4 Tightening torque 4000A 8.6Nm       |                                                           |                                                 |
| 5 Door position - Ref. page 7/2       |                                                           |                                                 |
|                                       | Screws recommend M10x25 high class 8.8 or couple superior |                                                 |
|                                       | Tightening torque 40Nm compulsory fixing screws from high |                                                 |

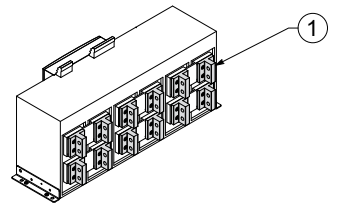
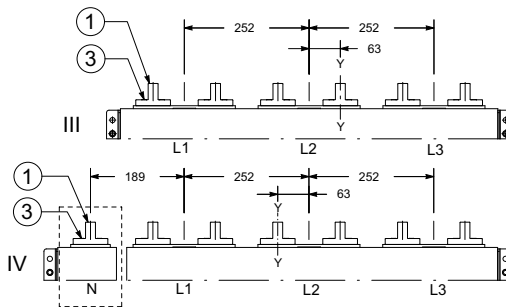
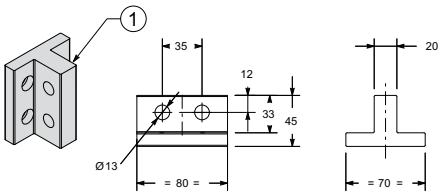


## Vertical rear terminals – VR

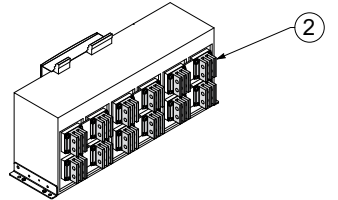
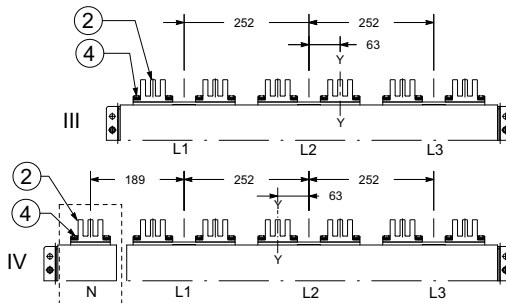
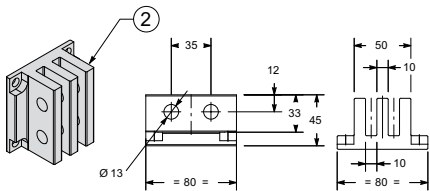
## E6.2 H/V/X 4000...6300A



## E6.2 H/V/X 4000-5000A



## E6.2 H/V/X 4000-6300A



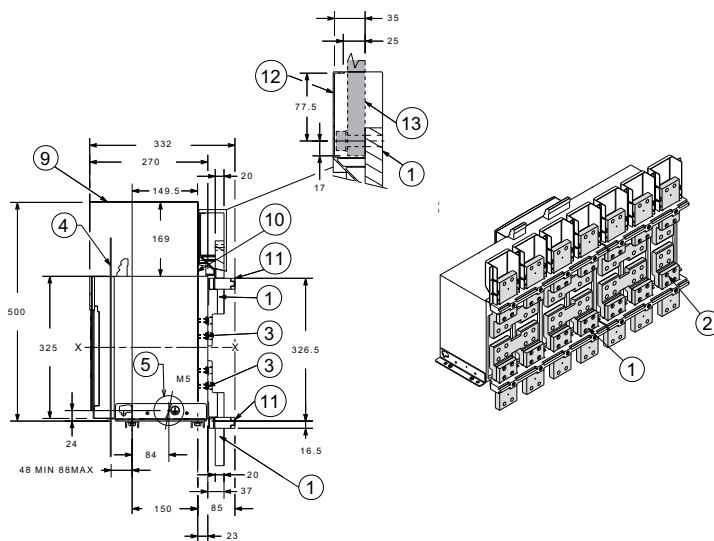
### Key

- 1 Vertical terminals 5000A
- 2 Vertical terminals 6300A
- 3 Tightening torque 5000A 20Nm

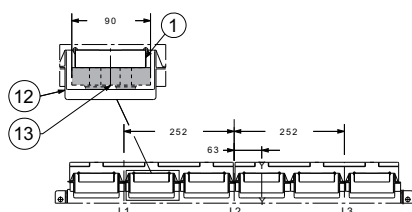
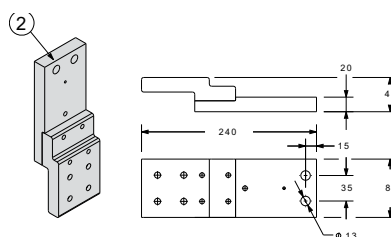
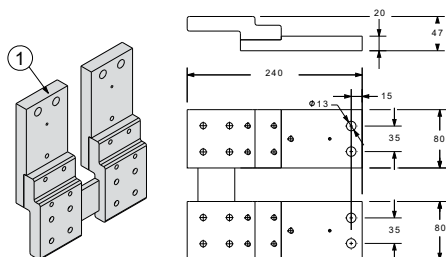
- 4 Tightening torque 6300A 20Nm  
5 Door position - Ref. page 7/2  
6 Earthing device - Ref. page 7/3

- 7 Metallic sheet  
8 Insulating sheet or insulated metallic sheet

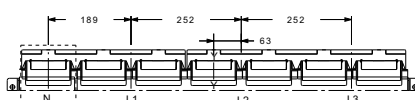




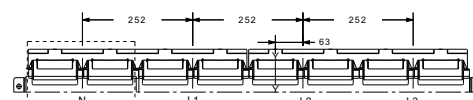
## Lower front terminal



3-pole



4-pole



4-pole full size

- 1 Upper front terminals
- 2 Lower front terminals
- 3 Tightening torque 8.6Nm
- 4 Door position - Ref. page 7/2
- 5 Earthing device - Ref. page 7/3

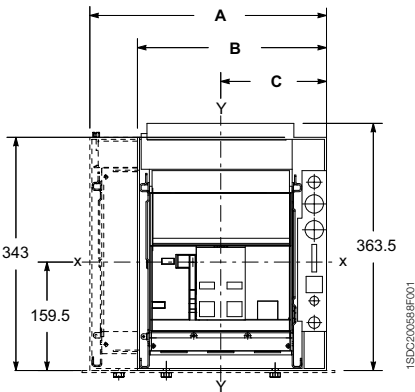
- 8 External fixing point.  
Recommened screws M10x25 high class
- 9 Metallic sheet
- 10 Insulating sheet or  
insulated metallic sheet

- 11 Crossbeam front terminals  
12 Plastic protection  
13 Customer busbar and screws  
(not provided)

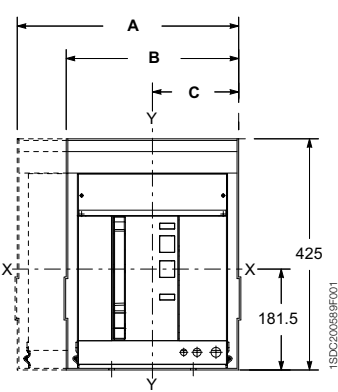
# Dimensions

## Withdrawable circuit-breaker

E1.2



E2.2 - E4.2 - E6.2

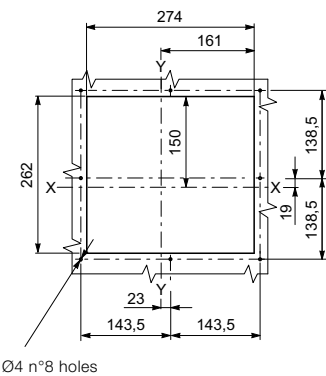


|        | A    | B   | C     |       |
|--------|------|-----|-------|-------|
| [mm]   | 4p   | 3p  | 3p    | 4p    |
| E1.2   | 348  | 278 | 155.5 | 155.5 |
| E2.2   | 407  | 317 | 158.5 | 158.5 |
| E4.2   | 551  | 425 | 212.5 | 212.5 |
| E6.2   | 929  | 803 | 338.5 | 464.5 |
| E6.2/f | 1055 | -   | -     | 464.5 |

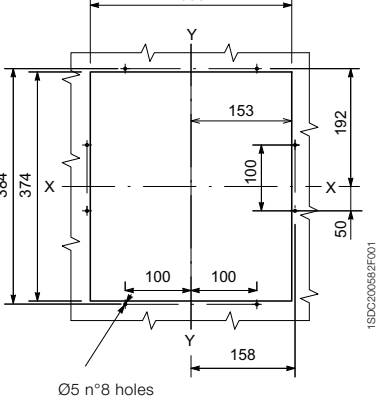
7

### Compartment door drilling

E1.2

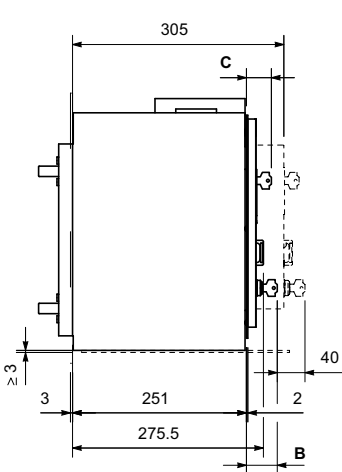


E2.2 - E4.2 - E6.2

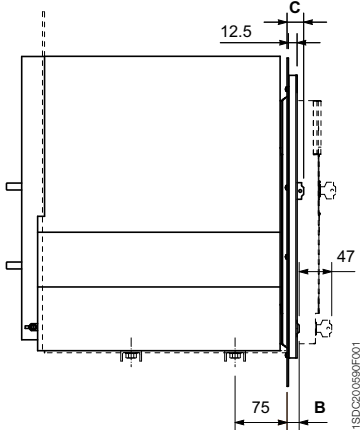


### Distance from connected to isolated position

E1.2



E2.2 - E4.2 - E6.2



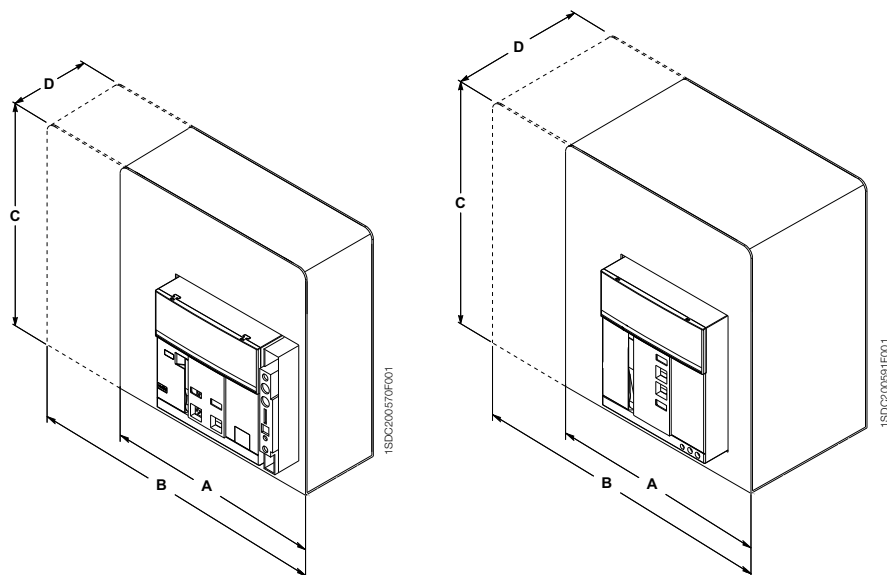
| E1.2 |      | Standard | Ronis/Profalux | Kirk | Castell |
|------|------|----------|----------------|------|---------|
| B    | [mm] | 44.5     | 55             | 55   | 85      |
| C    | [mm] | 36       | 46.5           | 46.5 | 76.5    |

| E2.2-E4.2-E6.2 |      | Standard | Ronis/Profalux | Kirk | Castell |
|----------------|------|----------|----------------|------|---------|
| B              | [mm] | 22       | 34             | 39   | 57.5    |
| C              | [mm] | 23       | 35             | 40   | 58.5    |

B refers to KLC; C refers to KLP

## Dimensions of the compartment

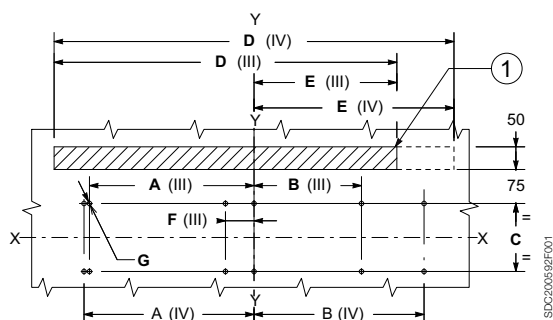


|        | A   | B    | C    | D   |
|--------|-----|------|------|-----|
| [mm]   | 3p  | 4p   |      |     |
| E1.2   | 280 | 350  | 440* | 252 |
| E2.2   | 400 | 490  | 500  | 355 |
| E4.2   | 500 | 600  | 500  | 355 |
| E6.2   | 900 | 1000 | 500  | 355 |
| E6.2/f | -   | 1200 | 500  | 355 |

\* 390 for voltages ≤ 440V AC

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## Floor fixing

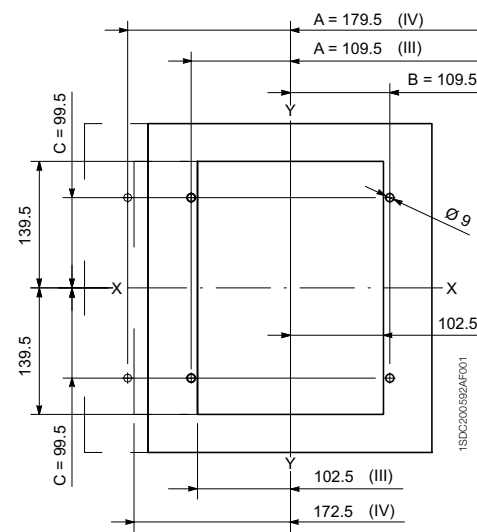


### Key

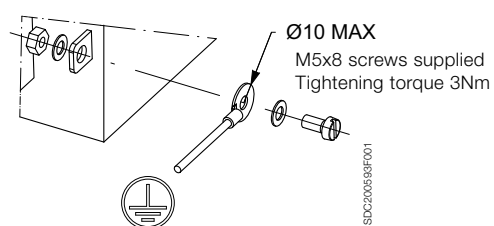
- 1 Ventilation drilling on the switchgear

|        | A   | B   | C   | D   | E   | F    | G  |
|--------|-----|-----|-----|-----|-----|------|----|
| [mm]   | 3p  | 4p  | 3p  | 4p  | 3p  | 4p   |    |
| E1.2   | 80  | 150 | 80  | 80  | 100 | -    | 9  |
| E2.2   | 75  | 175 | 75  | 75  | 150 | 270  | 10 |
| E4.2   | 100 | 225 | 100 | 100 | 150 | 378  | 10 |
| E6.2   | 363 | 375 | 237 | 375 | 150 | 756  | 10 |
| E6.2/f | -   | 425 | -   | 425 | 150 | 1008 | 10 |

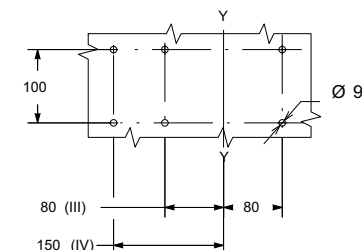
## Wall fixing (only for E1.2)



## Earthing device E2.2 - E4.2 - E6.2



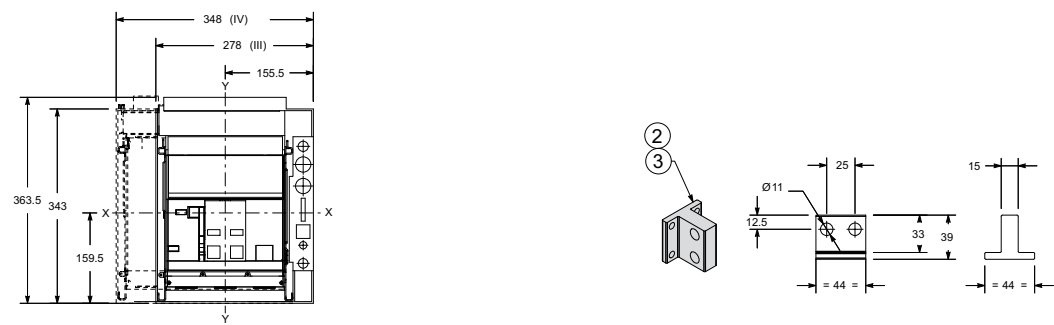
## Fixing on support sheet (only for E1.2)



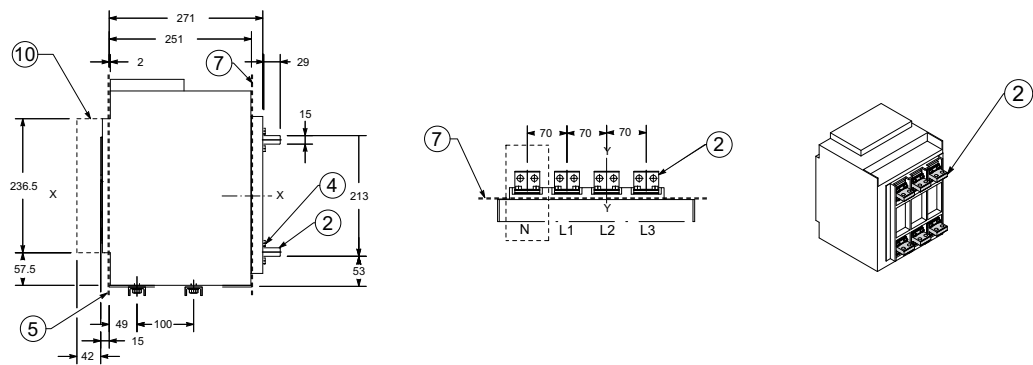
# Dimensions

## Withdrawable circuit-breaker - E1.2

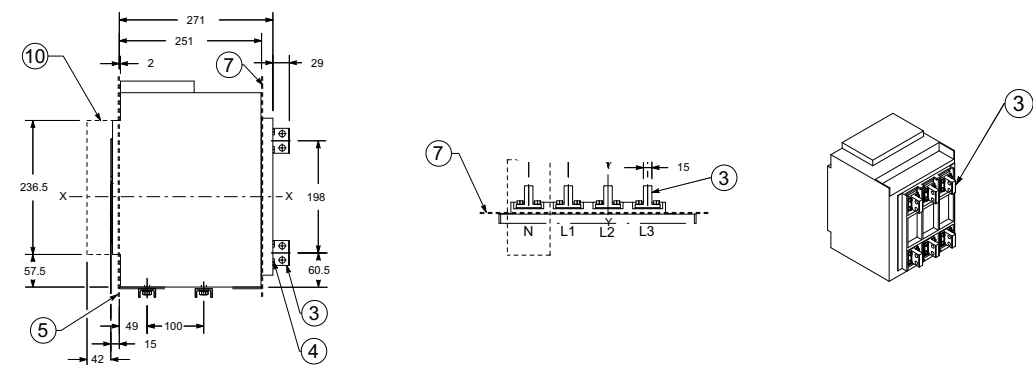
### Rear orientable terminals - HR/VR



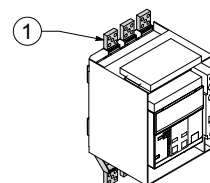
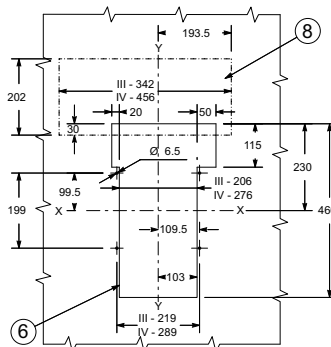
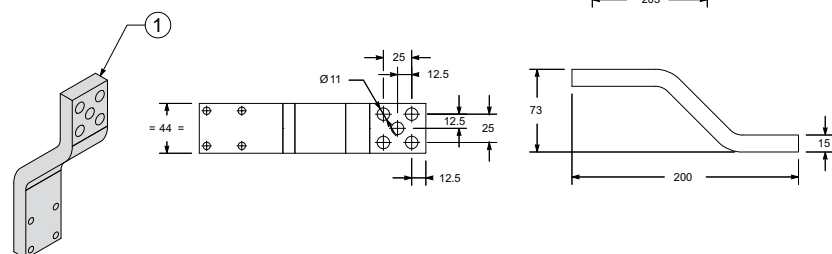
### Terminals HR



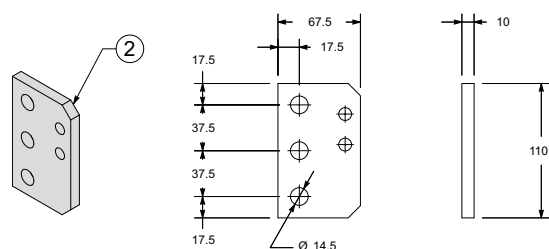
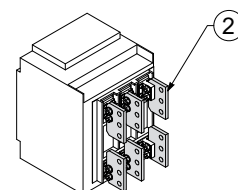
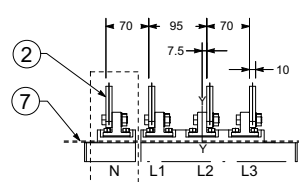
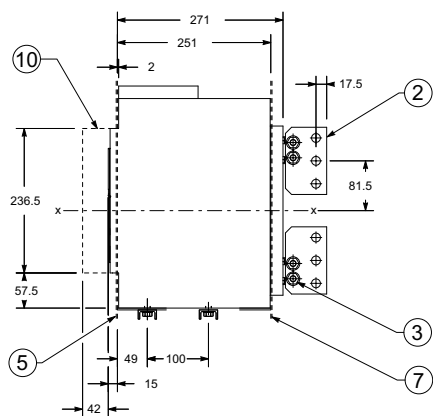
### Terminals VR



- Key**
- 2 Horizontal rear terminals
  - 3 Vertical rear terminals
  - 4 Tightening torque 12 Nm
  - 5 Door position - Ref. page 7/18
  - 7 Rear segregation for rear terminals
  - 10 Sectioning run



7

[illegible]

- 1 Front terminals
- 2 Rear terminals for cables
- 3 Tightening torque 48 Nm
- 4 Tightening torque 12 Nm

- 5 Door position - Ref. page 7/18  
6 Rear segregation for front terminals  
7 Rear segregation for rear terminals  
- Ref. page 7/21

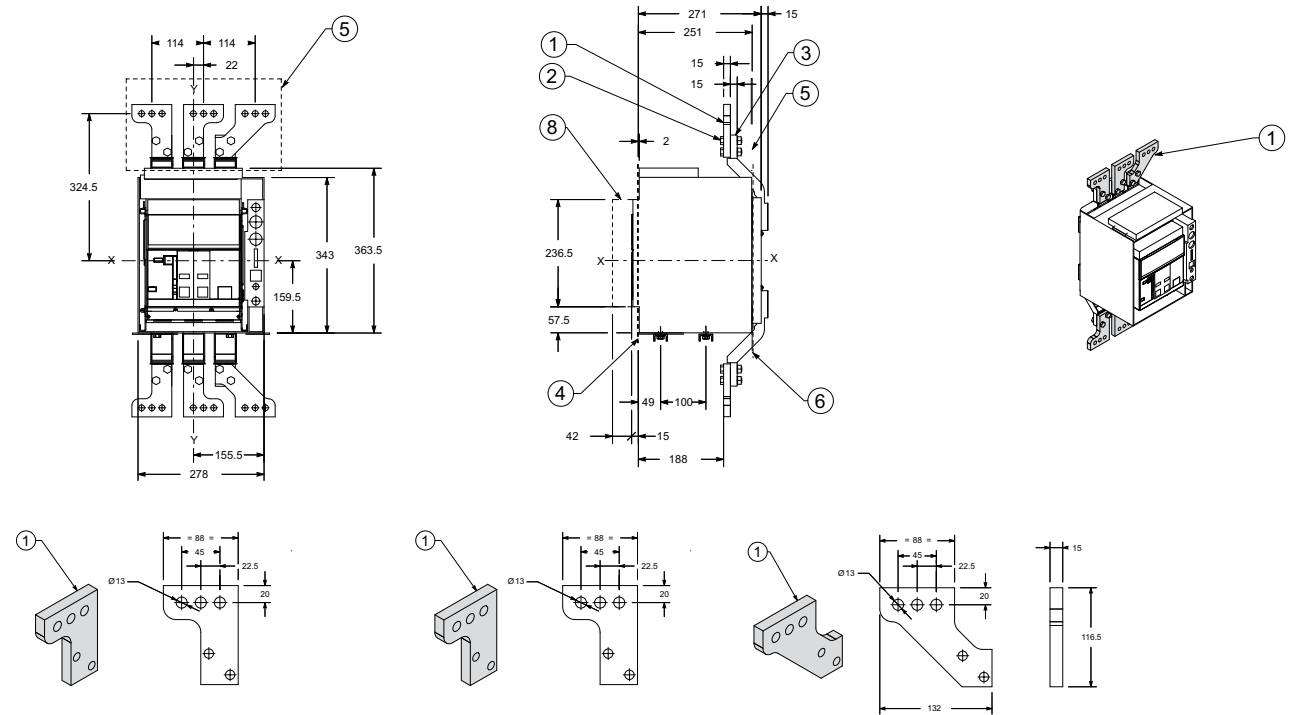
- 8 Insulating protection  
10 Sectioning run

# Dimensions

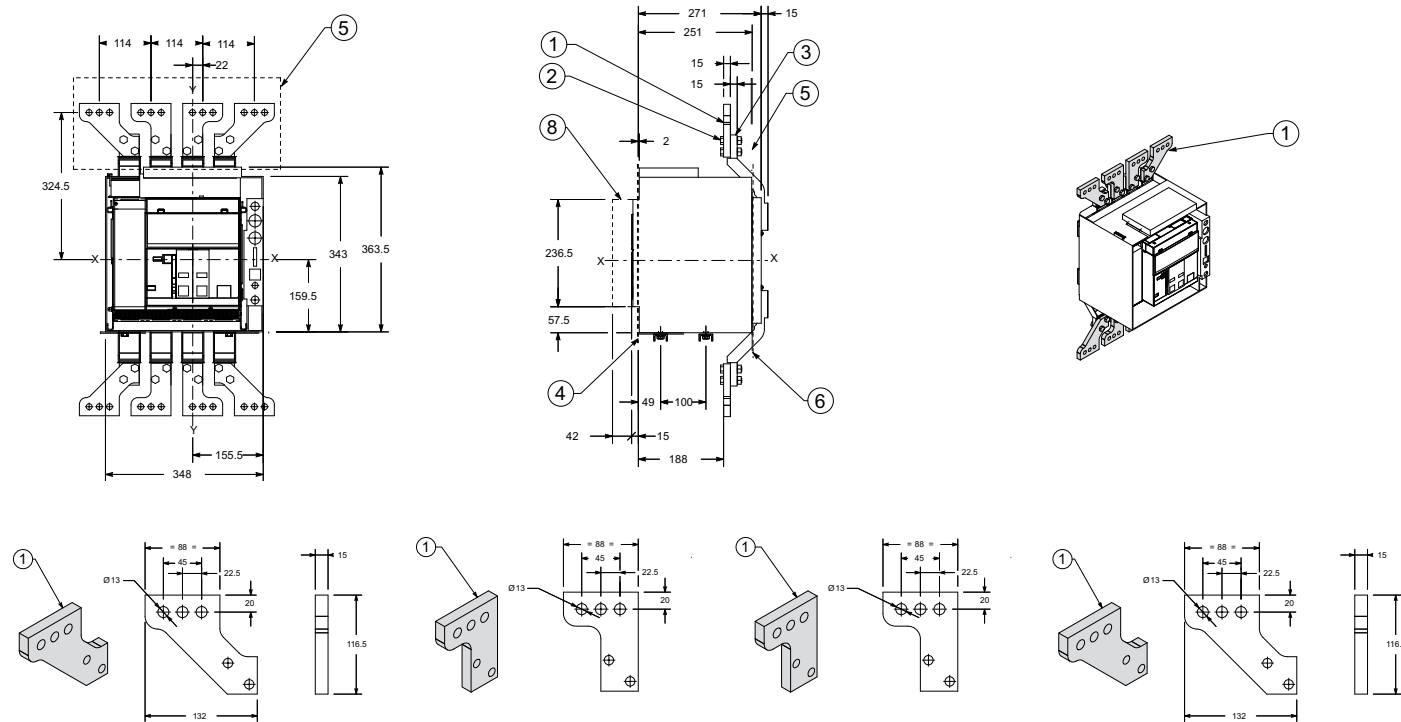
## Withdrawable circuit-breaker - E1.2

### Front spread terminals - ES

#### 3-pole version

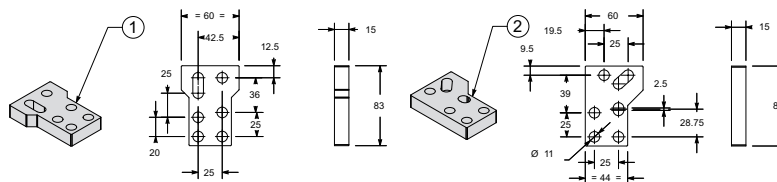


#### 4-pole version



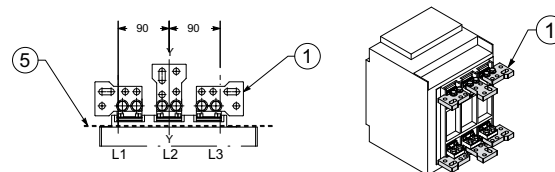
#### Key

- 1 Spread terminal
- 2 Tightening torque 40 Nm
- 3 Front terminal
- 4 Door position - Ref. page 7/18
- 5 Insulating protection (refer to front terminals page 7/21)
- 6 Rear segregation for front terminals - Ref. page 7/21
- 8 Sectioning run



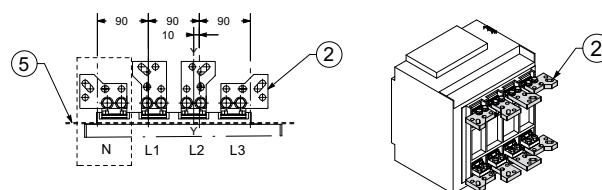
Technical drawing of a rectangular plate with dimensions and callouts:

- Top horizontal dimensions: 271 (total width), 251 (width to the start of a 2-unit thick section), and 90 (width of the rightmost section).
- Left vertical dimensions: 236.5 (total height), 57.5 (height of the bottom section), and  $x$  (height of the main body).
- Right vertical dimensions: 15 (height of the top section), 121.5 (height of the main body), and 24 (height of the bottom section).
- Bottom horizontal dimensions: 42 (width of the leftmost section), 49 (width of the main body), and 100 (width of the rightmost section).
- Callouts: 1, 2, 3, 4, 5, and 7 point to various features and sections of the plate.



Technical drawing of a rectangular plate with dimensions and callouts:

- Top horizontal dimensions: 271 (total width), 251 (width to the start of a 2-unit gap), and 90 (width of the right-hand section).
- Right vertical dimensions: 15 (height of the top section), 121.5 (height of the middle section), and 24 (height of the bottom section).
- Left vertical dimensions: 236.5 (total height), 57.5 (height of the bottom section), and 'x' (height of the middle section).
- Bottom horizontal dimensions: 42 (width of the left section), 49 (width of the middle section), and 100 (width of the right section).
- Callouts: 1, 2, 3, 4, 5, and 7 point to various features and sections of the plate.

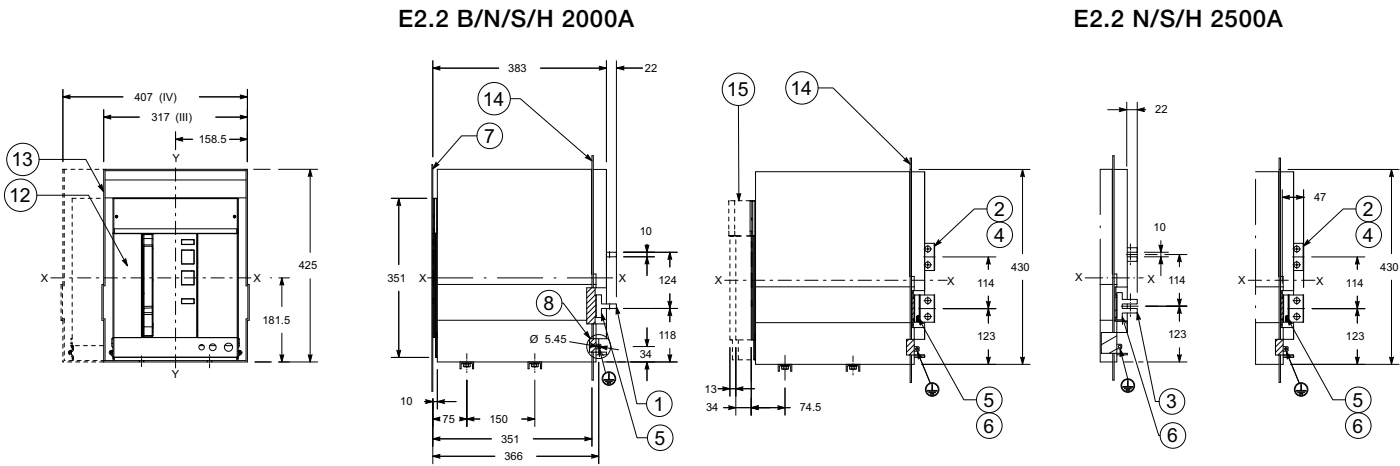


|                                            |                                      |
|--------------------------------------------|--------------------------------------|
| 1 Spread rear terminals for 3-pole version | 4 Door position - Ref. page 7/18     |
| 2 Spread rear terminals for 4-pole version | 5 Rear segregation of rear terminals |
| 3 Tightening torque 18 Nm                  | 7 Sectioning run                     |

# Dimensions

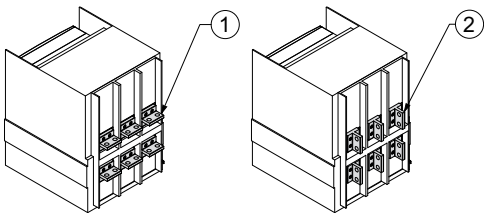
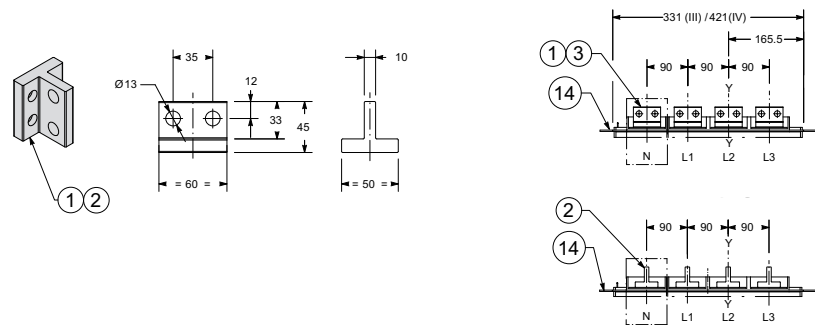
## Withdrawable circuit-breaker - E2.2

Rear orientable terminals - HR/VR

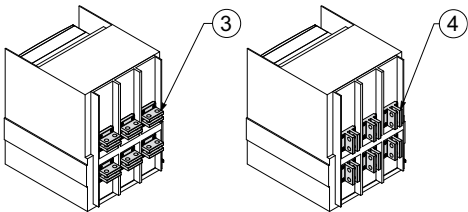
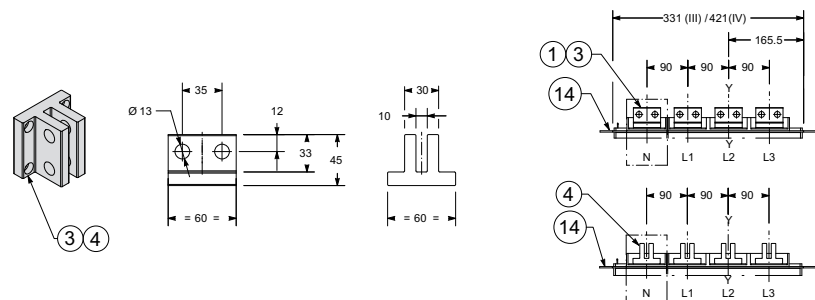


7

E2.2 B/N/S/H 2000A



E2.2 N/S/H 2500A



- Key

  - 1 Horizontal terminals 2000A
  - 2 Vertical terminals 2000A
  - 3 Horizontal terminals 2500A
  - 4 Vertical terminals 2500A

- 5 Tightening torque 2000A 8.6Nm
  - 6 Tightening torque 2500A 8.6Nm
  - 7 Door position - Ref. page 7/19
  - 8 Earthing device

- 12 Mobile part
  - 13 Fixed part
  - 14 Segregation (where envisaged)
  - 15 Distance from connected for testing to isolated

Technical drawings of the 1000 Series terminal block, showing dimensions and callouts:

- Top View (Left):** Dimensions include 407 (IV), 317 (III), 158.5, 15, 582, 425, 181.5, 111, and 15. Callouts 8, 9, and 10 point to specific features.
- Side View (Top):** Dimensions include 500, 415.5, 13, 34, 74.5, 270, 5.5, and 14. Callouts 11, 12, and 13 point to specific features.
- Side View (Bottom):** Dimensions include 351, 10, 75, 150, 207, 366, 383, 432, 20, 24, and 16. Callouts 1, 2, 3, 4, 5, and 16 point to specific features.
- Detail A (Bottom):** Shows a cross-section with a dimension of  $> 30$ .
- Detail B (Right):** Shows a cross-section with dimensions 34, 12.5, and 18. Callouts 1, 16, and 17 point to specific features.
- Front View (Bottom Left):** Dimensions include 47, 20, 264, 15, 35, 60, and 13. Callouts 1 and 2 point to specific features.
- Front View (Bottom Right):** Dimensions include 81, 90, 90, 90, and 17. Callouts 1, 17, and 18 point to specific features.
- Isometric View (Bottom Right):** Shows the 3D perspective of the terminal block with callouts 1 and 2.

- 1 Upper front terminals
- 2 Lower front terminals
- 3 Tightening torque 8.6Nm
- 4 Door position - Ref. page 7/19
- 5 Earthing device
- 8 External fixing point

Recommened screws M10x25 high class

- 9 Moving part  
10 Fixed part  
11 Connected, test, disconnected distances  
12 Insulating sheet or insulated metallic sheet  
13 Roof insulation or insulated metal  
14 Fixing plate

- 15 Crossbeam front terminal  
16 Plastic protection  
17 Customer busbar and screws  
(not provided)

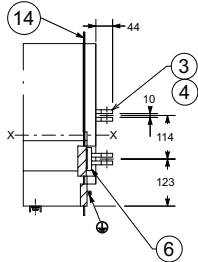
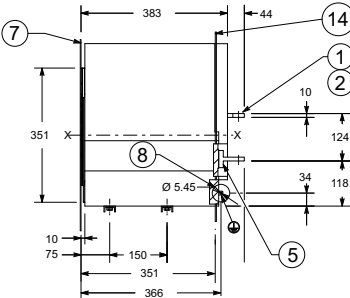
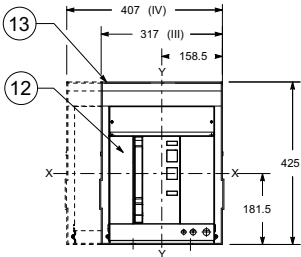
# Dimensions

## Withdrawable circuit-breaker - E2.2

### Horizontal rear spread terminals – SHR

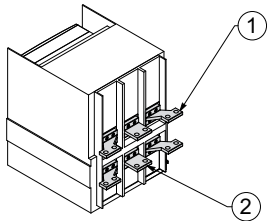
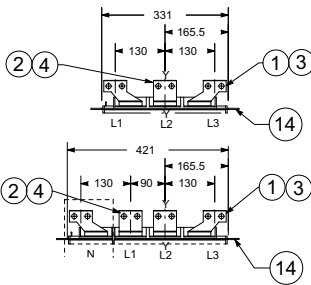
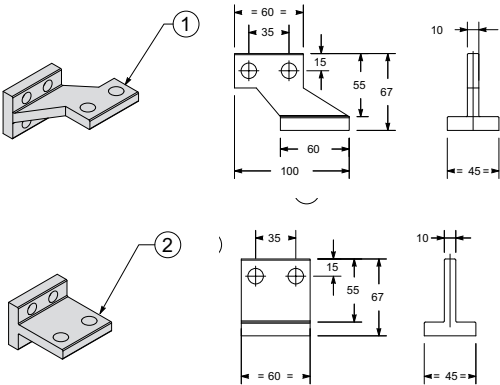
E2.2 B/N/S/H 2000A

E2.2 N/S/H 2500A

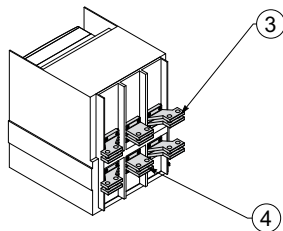
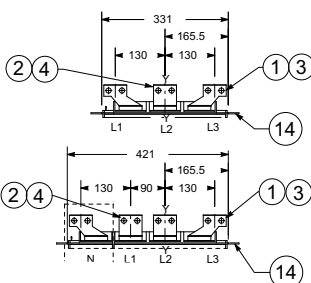
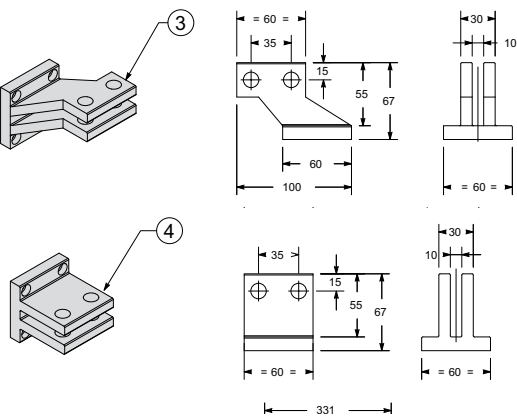


E2.2 B/N/S/H 2000A

7



E2.2 N/S/H 2500A



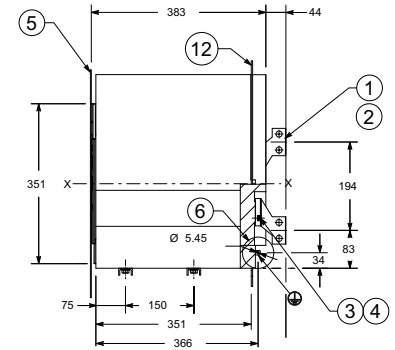
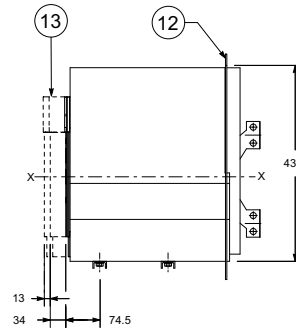
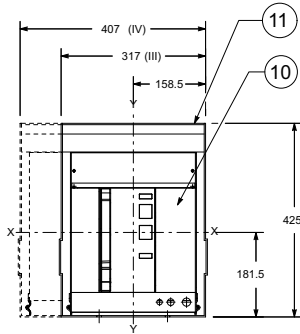
### Key

- |                                              |                                  |                                  |
|----------------------------------------------|----------------------------------|----------------------------------|
| 1 Side horizontal splayed terminals 2000A    | 5 Tightening torque 2000A 8.6Nm  | 12 Mobile part                   |
| 2 Central horizontal splayed terminals 2000A | 6 Tightening torque 2500A 8.6Nm  | 13 Fixed part                    |
| 3 Side horizontal splayed terminals 2500A    | 7 Door position - Ref. page 7/19 | 14 Segregation (where envisaged) |
| 4 Central horizontal splayed terminals 2500A | 8 Earthing device                |                                  |

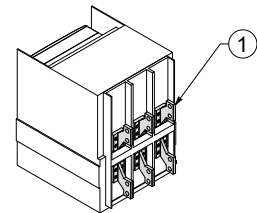
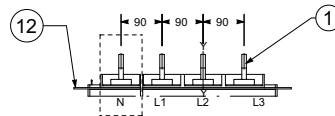
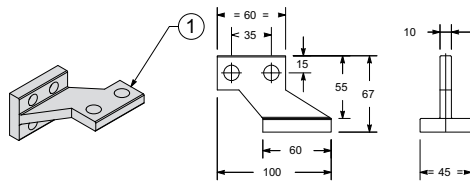
## Vertical rear spread terminals – SVR

E2.2 B/N/S/H 2000A

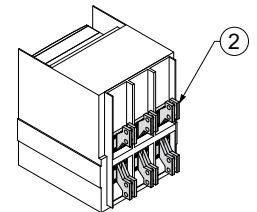
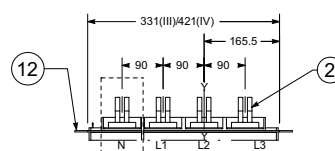
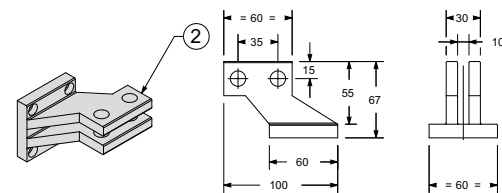
E2.2 N/S/H 2500A



E2.2 B/N/S/H 2000A



E2.2 N/S/H 2500A



### Key

- 1 Vertical splayed terminals 2000A
- 2 Vertical splayed terminals 2500A
- 3 Tightening torque 2000A 8.6Nm
- 4 Tightening torque 2500A 8.6Nm

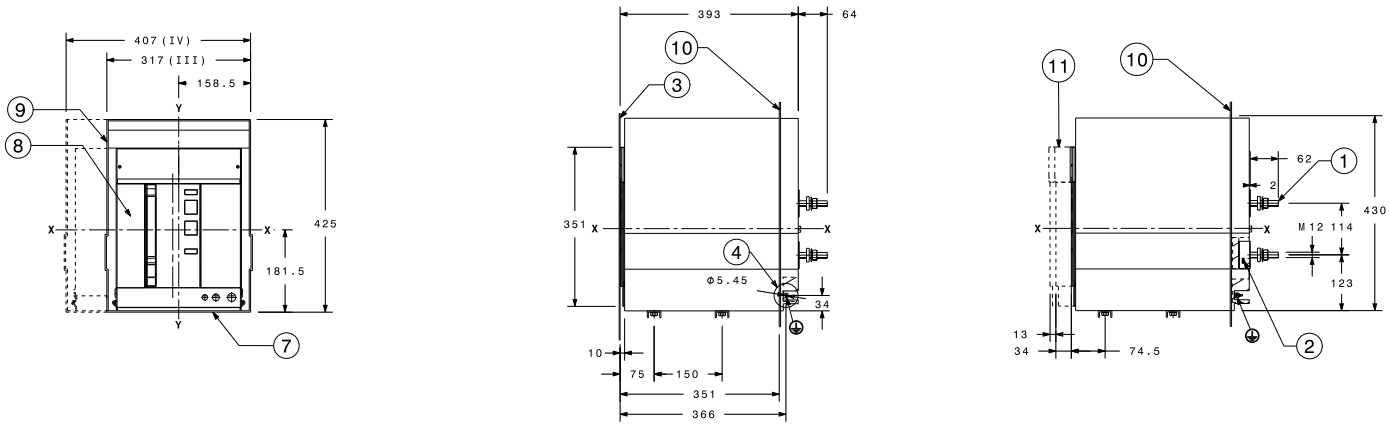
- 5 Door position - Ref. page 7/19
- 6 Earthing device
- 10 Mobile part
- 11 Fixed part

- 12 Segregation (where envisaged)
- 13 Distance from connected for testing to isolated

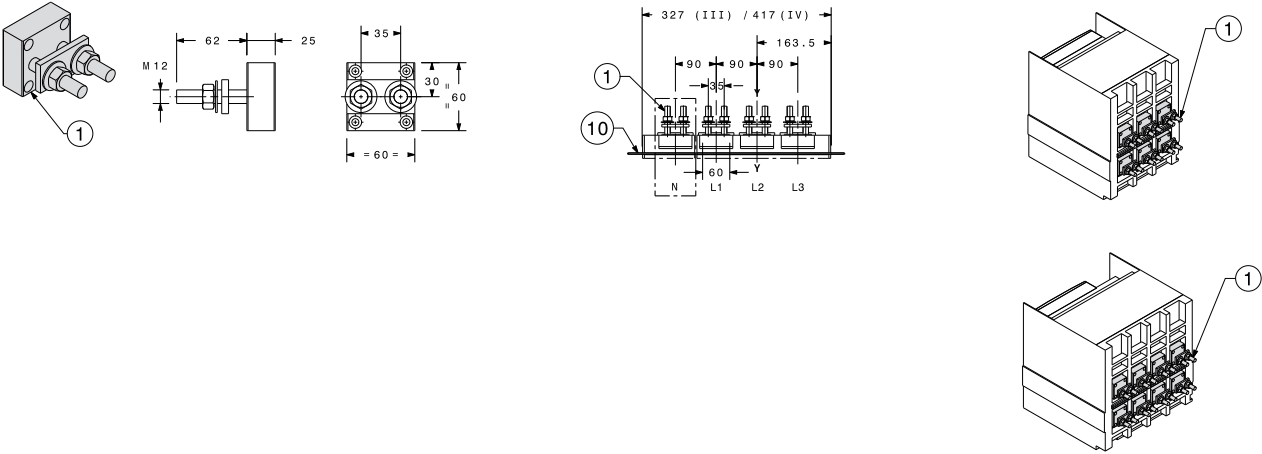
1SDC2000615F001



# Flat terminals



## E2.2 N/S/H 2500A



### Key

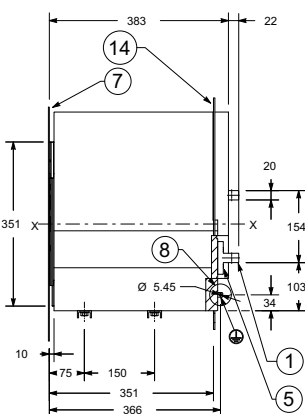
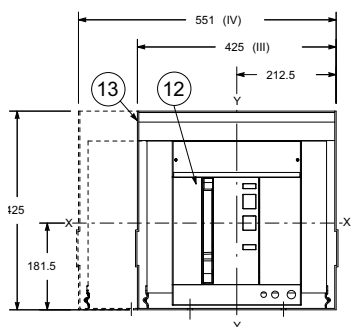
- 1 Flat terminals 2500A  
2 Tightening torque 8.6Nm  
3 Door position - Ref. page 7/19  
4 Grounding
- 7 Mounting fixed part screws provided M8x25  
8 Moving part  
9 Fixed part
- 10 Segregation (where envisaged)  
11 Connected, test, disconnected distances

# Dimensions

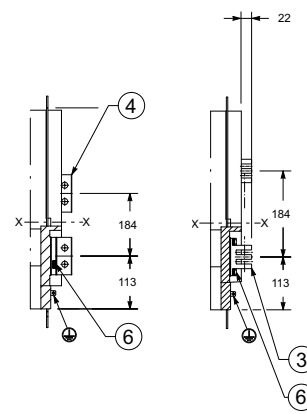
## Withdrawable circuit-breaker - E4.2

### Rear orientable terminals - HR/VR

E4.2 N/S/H 3200A

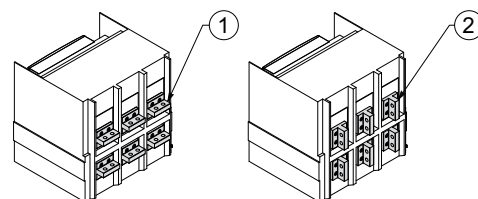
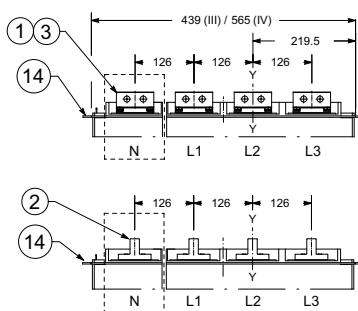
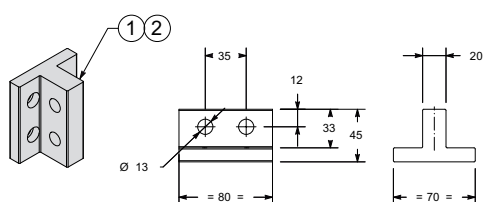


E4.2 N/S/H 4000A  
E4.2 V 2000...4000A

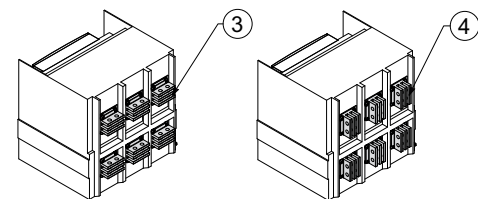
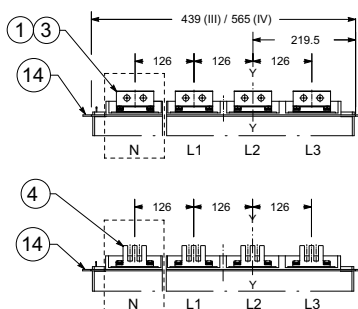
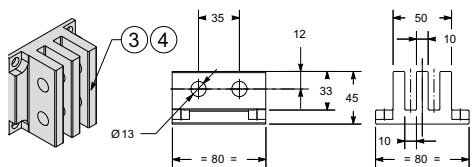


E4.2 N/S/H 3200A

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E4.2 N/S/H 4000A  
E4.2 V 2000...4000A



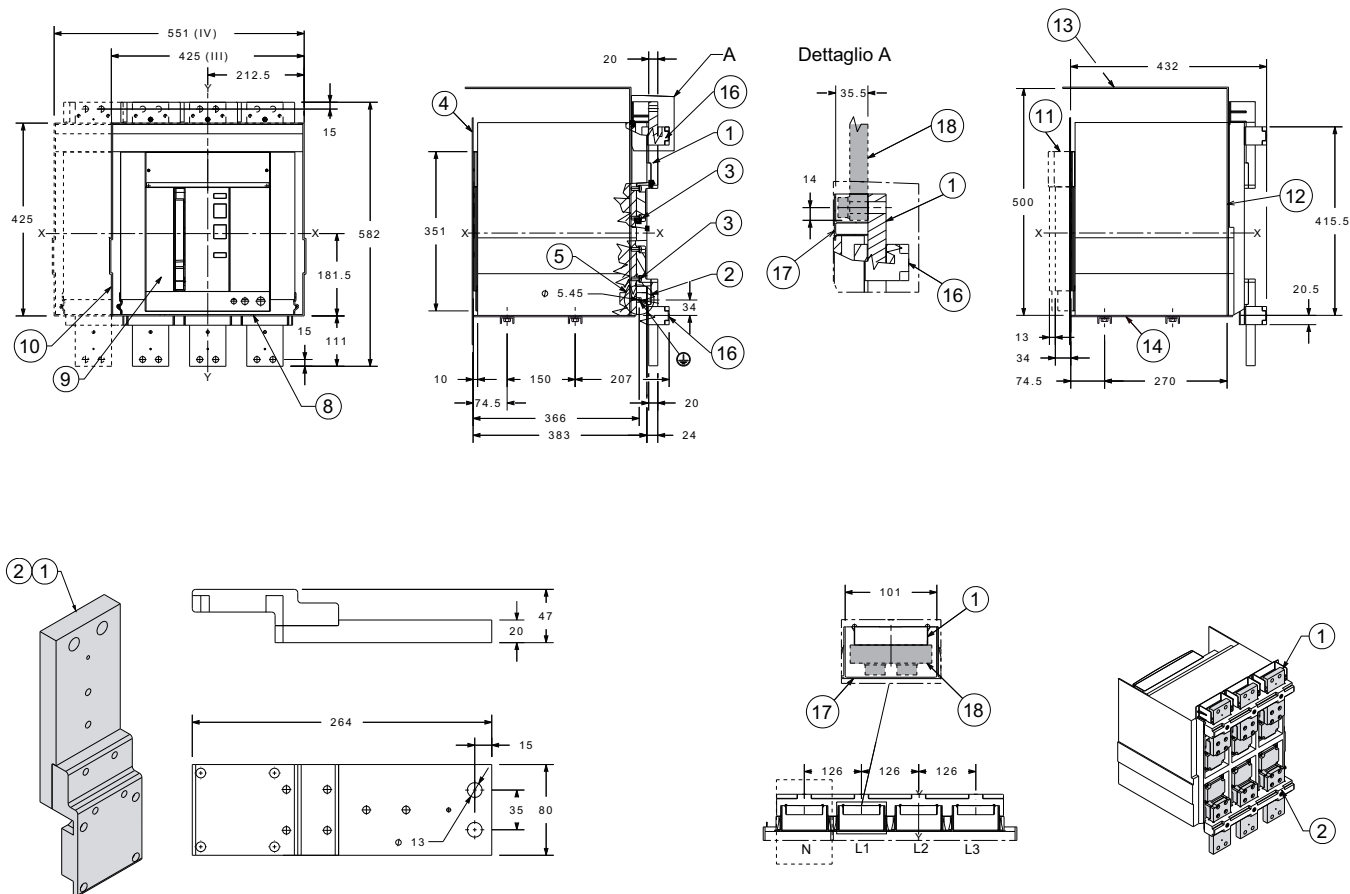
### Key

- 1 Horizontal terminals 3200A
- 2 Vertical terminals 3200A
- 3 Horizontal terminals 4000A
- 4 Vertical terminals 4000A

- 5 Tightening torque 3200A 20Nm
- 6 Tightening torque 4000A 20Nm
- 7 Door position - Ref. page 7/19
- 8 Earthing device

- 12 Mobile part
- 13 Fixed part
- 14 Segregation (where envisaged)
- 15 Distance from connected for testing to isolated

## Front terminals – F



### Key

- 1 Upper front terminals
- 2 Lower front terminals
- 3 Tightening torque 8.6Nm
- 4 Door position - Ref. page 7/19
- 5 Earthing device
- 8 External fixing point
- Reccomended screws M10x25 high class

- 9 Moving part
- 10 Fixed part
- 11 Connected, test, disconnected distances
- 12 Insulating sheet or insulated metallic sheet
- 13 Roof insulation or insulated metal
- 14 Fixing plate

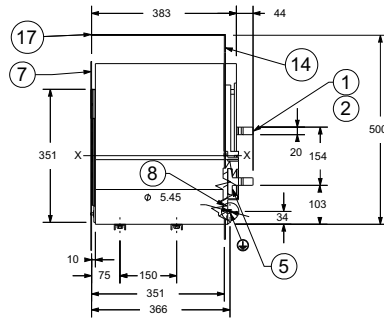
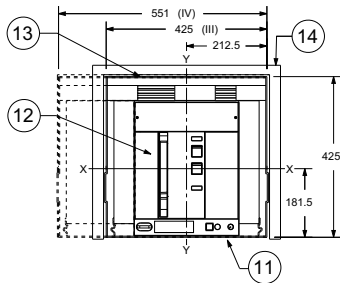
- 15 Crossbeam front terminal
- 16 Plastic protection
- 17 Customer busbar and screws (not provided)

# Dimensions

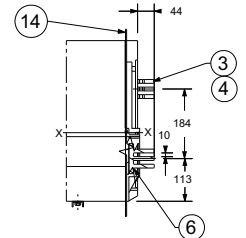
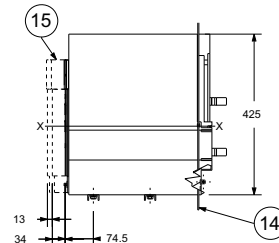
## Withdrawable circuit-breaker - E4.2

### Horizontal rear spread terminals – SHR

E4.2 N/S/H 3200A

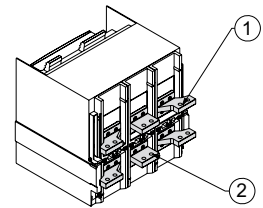
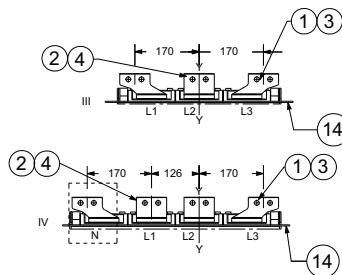
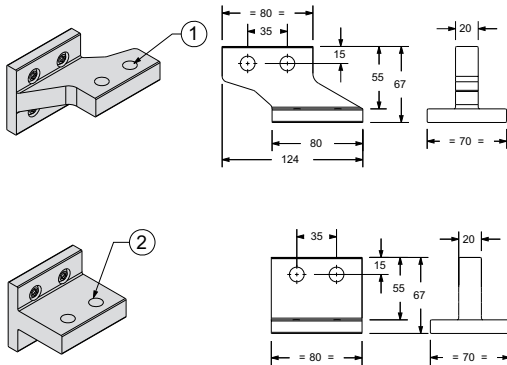


E4.2 N/S/H 4000A  
E4.2 V 2000 ... 4000A

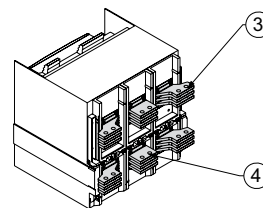
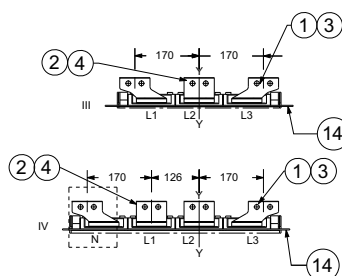
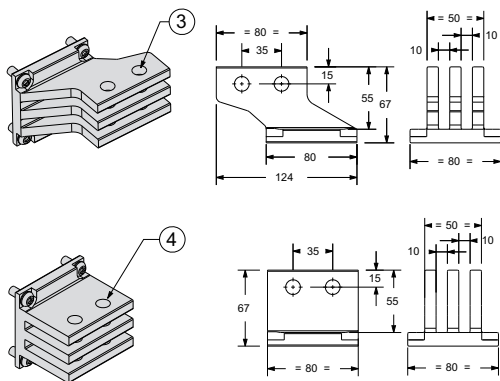


E4.2 N/S/H 3200A

7



E4.2 N/S/H 4000A  
E4.2 V 2000 ... 4000A



### Key

- 1 Side horizontal divaricated terminals 3200A
- 2 Central horizontal divaricated terminals 3200A
- 3 Side horizontal divaricated terminals 4000A
- 4 Central horizontal divaricated terminals 4000A
- 5 Tightening torque 3200A 8.6Nm
- 6 Tightening torque 4000A 8.6Nm
- 7 Door position - Ref. page 7/19
- 8 Grounding
- 11 Mounting fixed part

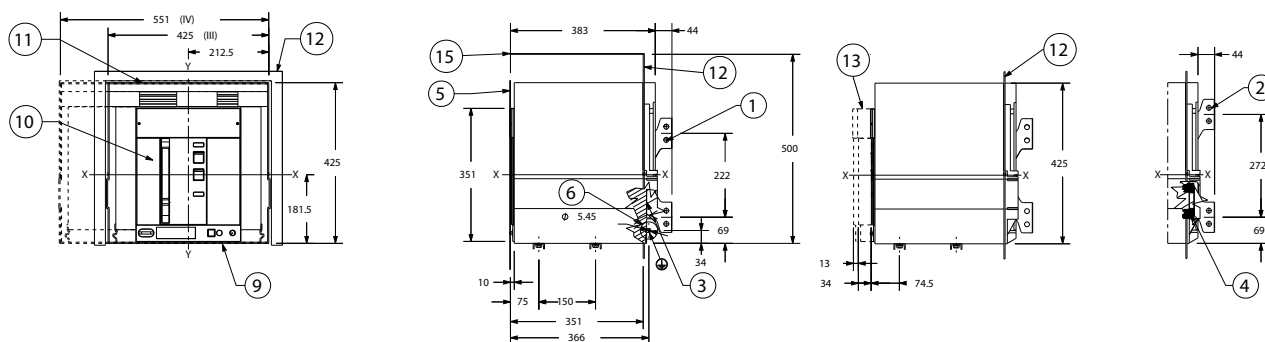
Screws recommend M8x25 high class 8.8 or couple superior  
Tightening torque 20Nm compulsory fixing screws from high

- 12 Moving part
- 13 Fixed part
- 15 Connected, test, disconnected distances
- 17 Metallic sheet

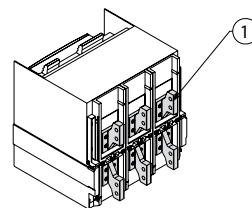
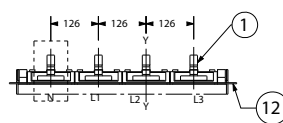
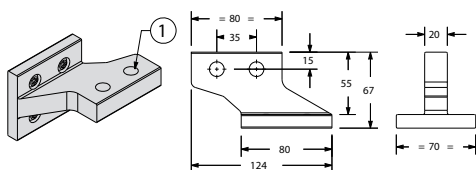
## Vertical rear spread terminals – SVR

### E4.2 N/S/H 3200A

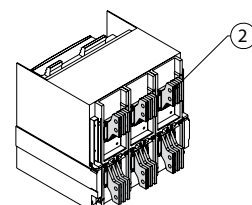
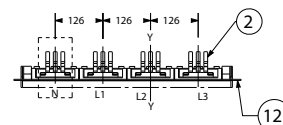
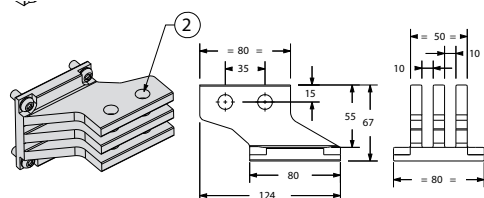
### E4.2 N/S/H 4000A E4.2 V 2000 ... 4000A



### E4.2 N/S/H 3200A



### E4.2 N/S/H 4000A E4.2 V 2000 ... 4000A



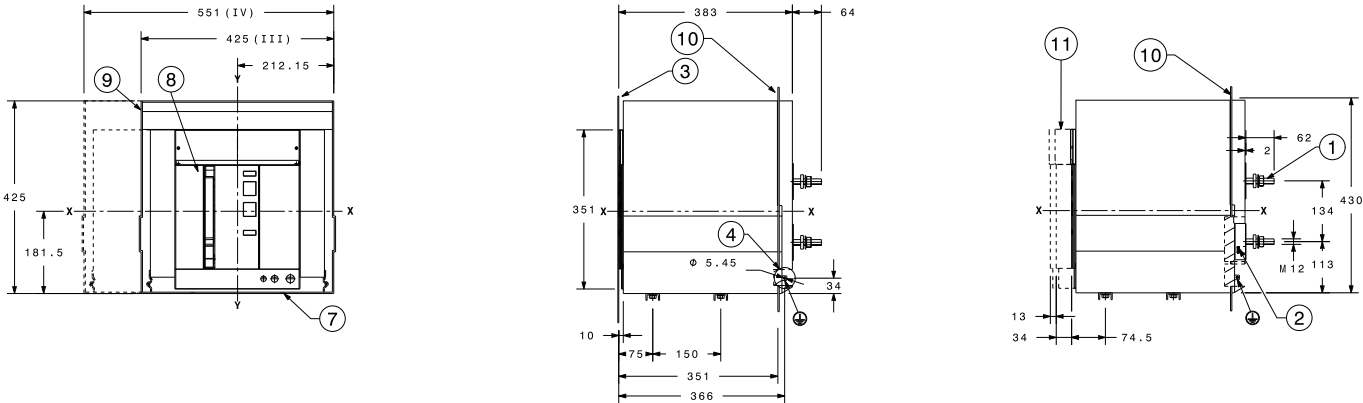
## Key

- |                                        |                                                                                   |                                            |
|----------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------|
| 1 Vertical divaricated terminals 3200A | 9 Mounting fixed part<br>Screws recommend M8x25 high class 8.8 or couple superior | 11 Fixed part                              |
| 2 Vertical divaricated terminals 4000A | 10 Moving part                                                                    | 12 Metallic segregation (when provided)    |
| 3 Tightening torque 3200A 8.6Nm        |                                                                                   | 13 Connected, test, disconnected distances |
| 4 Tightening torque 4000A 8.6Nm        |                                                                                   | 15 Metallic sheet                          |
| 5 Door position - Ref. page 7/19       |                                                                                   |                                            |
| 6 Grounding                            |                                                                                   |                                            |

# Dimensions

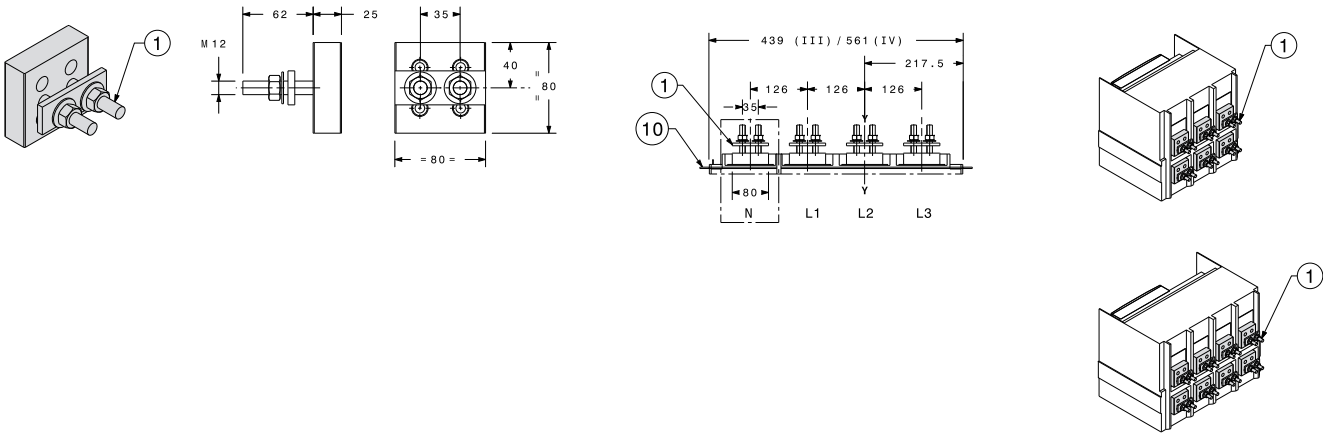
## Withdrawable circuit-breaker - E4.2

### Flat terminals



7

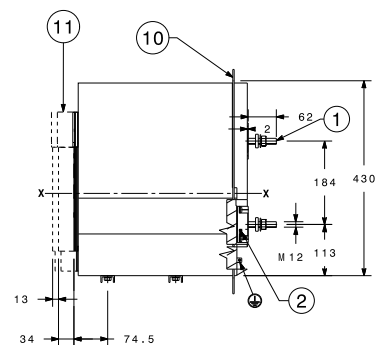
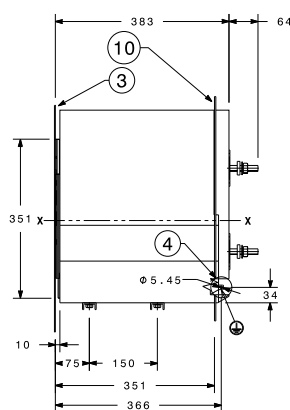
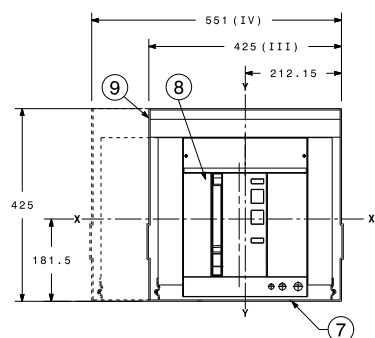
### E4.2 N/S/H 3200A



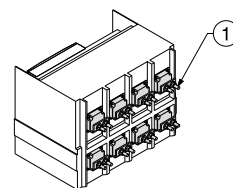
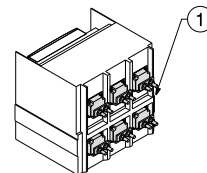
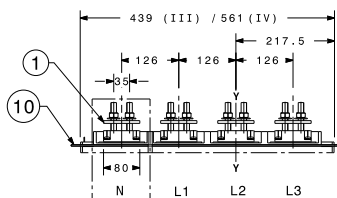
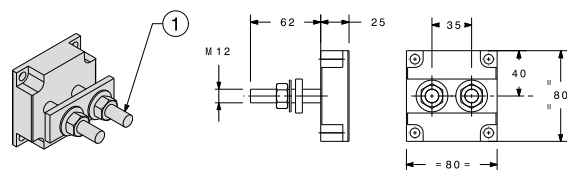
### Key

- |                                  |                                             |                                            |
|----------------------------------|---------------------------------------------|--------------------------------------------|
| 1 Flat terminals 3200A           | 7 Mounting fixed part screws provided M8x25 | 10 Segregation (where envisaged)           |
| 2 Tightening torque 20Nm         | 8 Moving part                               | 11 Connected, test, disconnected distances |
| 3 Door position - Ref. page 7/19 | 9 Fixed part                                |                                            |
| 4 Grounding                      |                                             |                                            |

## Flat terminals



## E4.2 N/S/H 4000A E4.2 V 2000...4000A



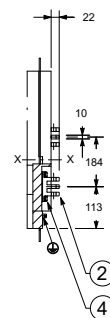
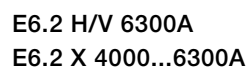
### Key

- 1 Flat terminals 4000A
- 2 Tightening torque 20Nm
- 3 Door position - Ref. page 7/19
- 4 Grounding

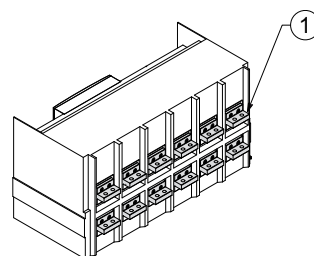
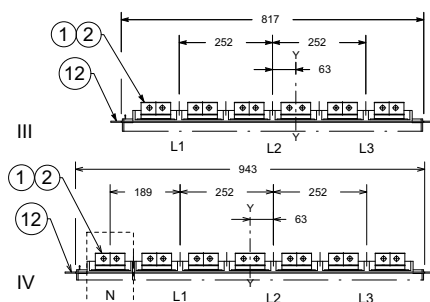
- 7 Mounting fixed part screws provided M8x25
- 8 Moving part
- 9 Fixed part

- 10 Segregation (where envisaged)
- 11 Connected, test, disconnected distances

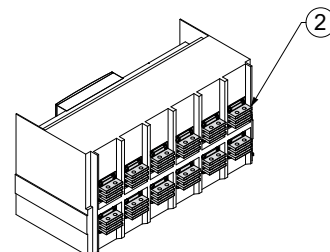
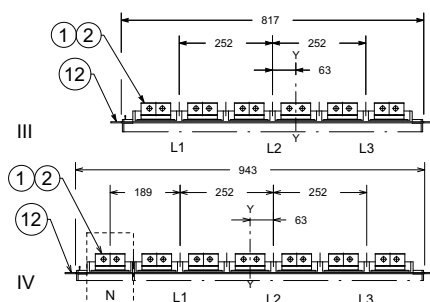
### Horizontal rear terminals – HR



## 7



Technical drawing of a mechanical part. The drawing includes a perspective view on the left and two cross-sectional views on the right. The perspective view shows a component with a central slot and two circular holes, labeled with a circled '2'. The cross-sectional views provide dimensions: the top view shows a width of 35, a central slot width of 12, and a total height of 45. The side view shows a width of 50, a central slot width of 10, and a total height of 45. The bottom view shows a width of 80 and a central slot width of 10. A hole with a diameter of  $\varnothing 13$  is indicated in the side view.



- 1 Horizontal terminals 4000-5000A
- 2 Horizontal terminals 6300A
- 3 Tightening torque 4000-5000A 20Nm

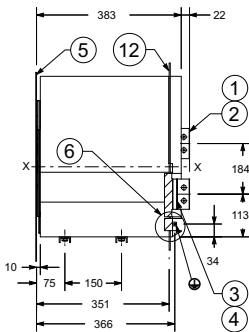
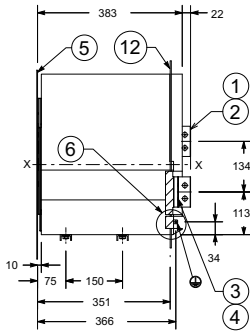
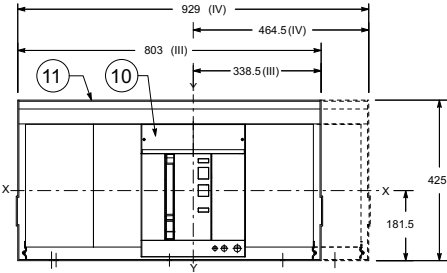
- 4 Tightening torque 6300A 20Nm  
5 Door position - Ref. page 7/19  
6 Earthing device

- SDC200618F001

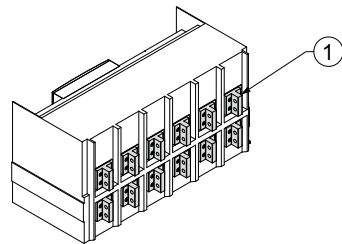
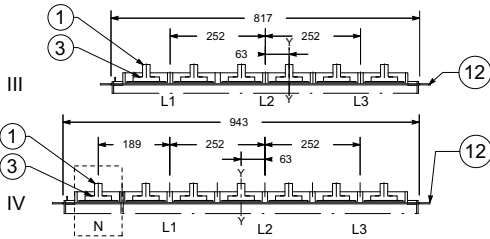
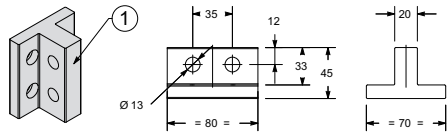
Vertical rear terminals – VR

E6.2 H/V 4000-5000A

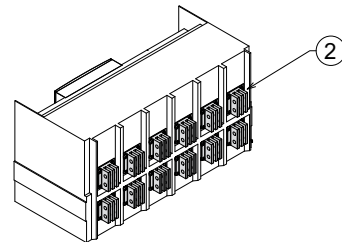
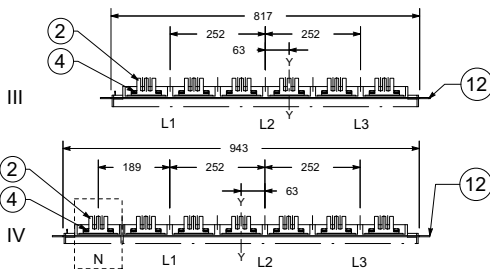
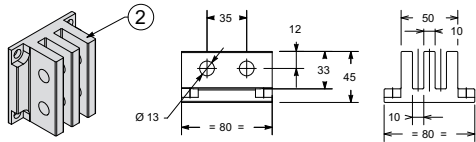
E6.2 H/V 6300A  
E6.2 X 4000...6300A



E6.2 H/V 4000-5000A



E6.2 H/V 6300A  
E6.2 X 4000...6300A



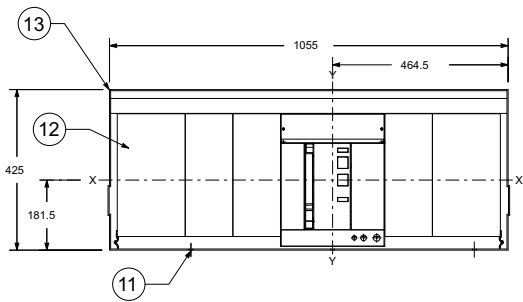
Key

- |                                     |                                  |                                  |
|-------------------------------------|----------------------------------|----------------------------------|
| 1 Vertical terminals 4000-5000A     | 4 Tightening torque 6300A 20Nm   | 10 Mobile part                   |
| 2 Vertical terminals 6300A          | 5 Door position - Ref. page 7/19 | 11 Fixed part                    |
| 3 Tightening torque 4000-5000A 20Nm | 6 Earthing device                | 12 Segregation (where envisaged) |

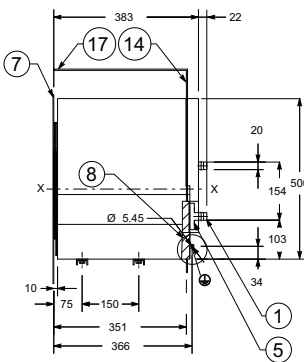
# Dimensions

## Withdrawable circuit-breaker - E6.2

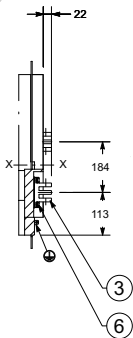
### Rear orientable terminals - HR/VR full size



E6.2 H/V 4000...5000A

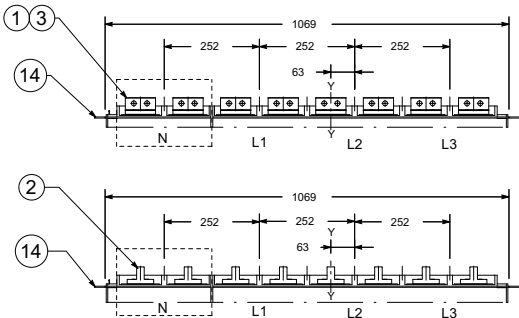
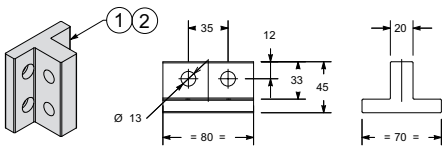


E6.2 H/V 6300A  
E6.2 X 4000...6300A

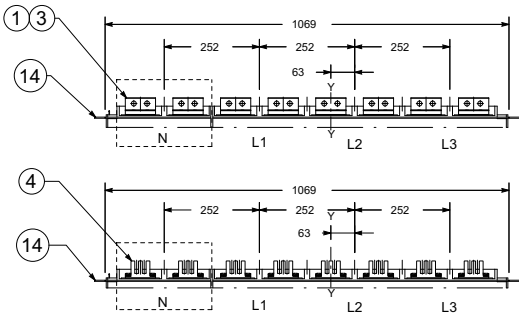
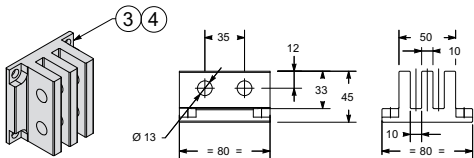


E6.2 H/V 4000-5000A

7



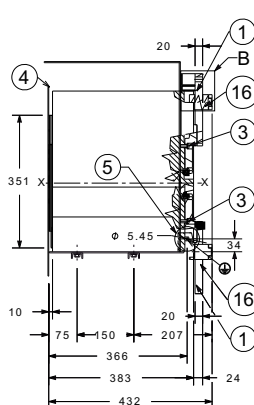
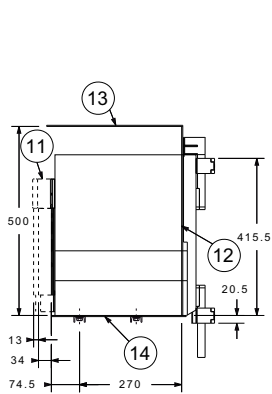
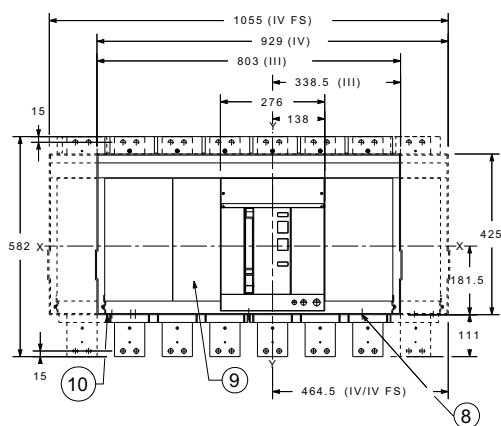
E6.2 H/V 6300A  
E6.2 X 4000...6300A



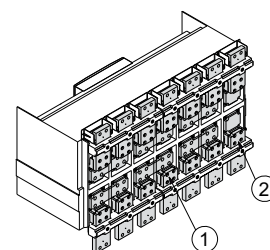
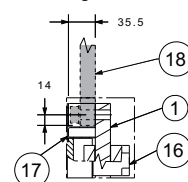
### Key

- |                                   |                                     |                                  |
|-----------------------------------|-------------------------------------|----------------------------------|
| 1 Horizontal terminals 4000-5000A | 5 Tightening torque 4000-5000A 20Nm | 12 Mobile part                   |
| 2 Vertical terminals 4000-5000A   | 6 Tightening torque 6300A 20Nm      | 13 Fixed part                    |
| 3 Horizontal terminals 6300A      | 7 Door position - Ref. page 7/19    | 14 Segregation (where envisaged) |
| 4 Vertical terminals 6300A        | 8 Earthing device                   | 17 Metallic sheet                |

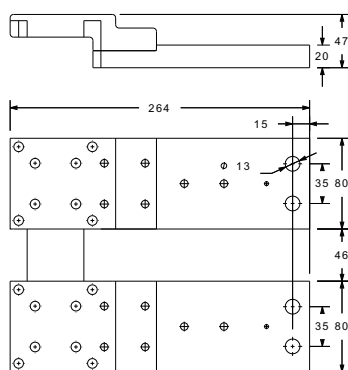
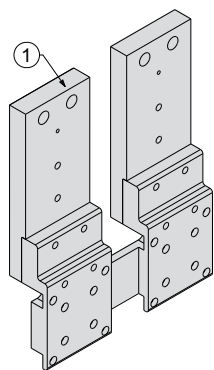
## Front terminals – F



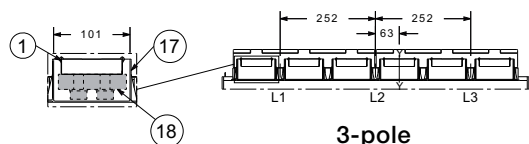
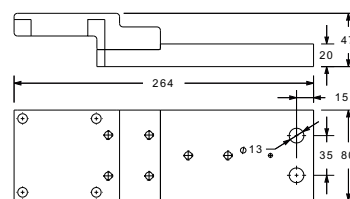
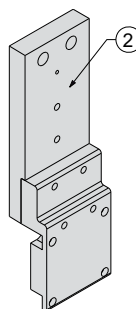
Dettaglio B



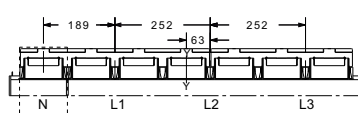
## Upper front terminals



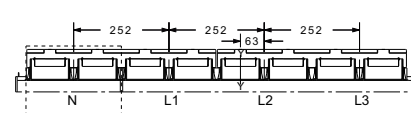
## Lower front terminal



3-pole



4-pole



4-pole full size

## Key

- 1 Upper front terminals
- 2 Lower front terminals
- 3 Tightening torque 8.6Nm
- 4 Door position - Ref. page 7/19
- 5 Earthing device
- 8 External fixing point  
Recommened screws M10x25 high class

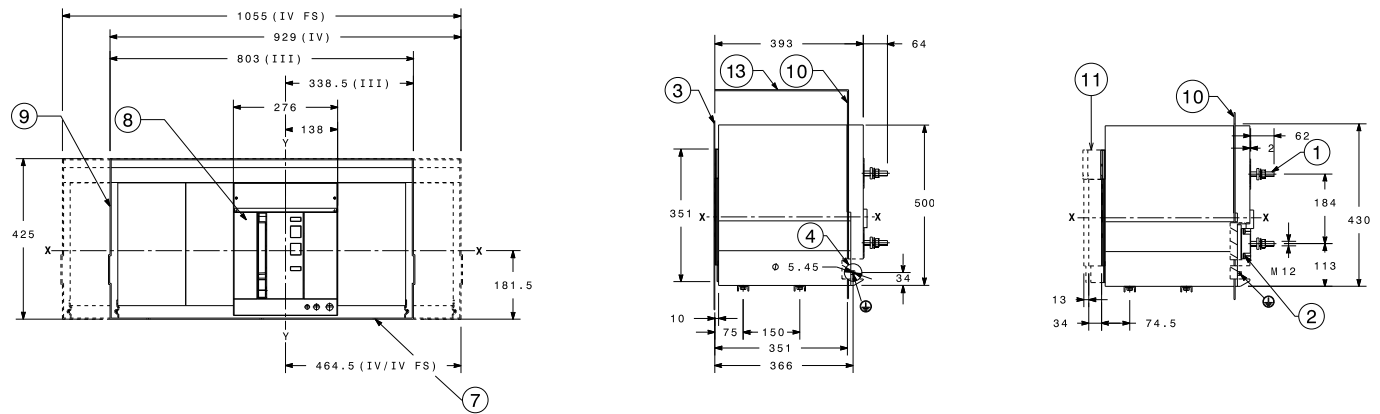
- 9 Moving part
- 10 Fixed part
- 11 Connected, test, disconnected distances
- 12 Insulating sheet or insulated metallic sheet
- 13 Roof insulation or insulated metal
- 14 Fixing plate

- 15 Crossbeam front terminal
- 16 Plastic protection
- 17 Customer busbar and screws  
(not provided)

# Dimensions

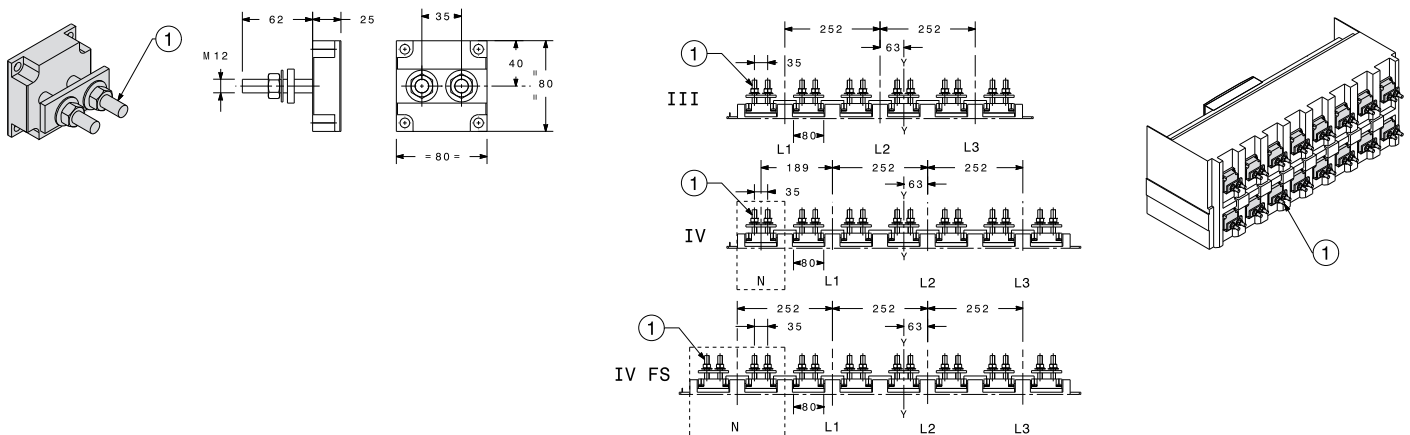
## Withdrawable circuit-breaker - E6.2

### Flat terminals



7

### E6.2 H/V/X 4000...6300A



#### Key

- |                                                                        |                                                                                                                                                    |                                                                                                                                    |
|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| 1 Flat terminal<br>Tightening torque on power circuit connections 45Nm | 3 Mounting fixed part screws provided<br>M8x25 head convex high class 8.8 or couple superior<br>Tightening torque 20Nm compulsory fixing from high | 6 Moving part<br>9 Fixed part<br>10 Segregation (when provided)<br>11 Connected, test, disconnected distances<br>13 Metallic sheet |
|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|

# Electrical diagrams

|                                 |      |
|---------------------------------|------|
| Reading information             |      |
| Circuit-breakers                | 8/2  |
| ATS021 and ATS022               | 8/7  |
| Power controller                | 8/8  |
| Circuit-breakers                |      |
| Terminal box E1.2               | 8/9  |
| Terminal box E2.2 - E4.2 - E6.2 | 8/10 |
| Electrical accessories          | 8/11 |
| ATS021 and ATS022               | 8/12 |
| ATS021 and ATS022               | 8/37 |

# Electrical diagrams

## Reading information – Circuit-breakers

### Operating state shown

The diagram is shown in the following conditions:

- withdrawable version circuit-breaker, open and racked-in
- with de-energized circuits
- trip units not tripped
- motor operator with unloaded springs.

### Versions

The diagram shows a withdrawable version circuit-breaker, but it is also valid for fixed version circuit-breakers.

### Fixed version

The control circuits are included between the XV terminals (the X connector is not supplied).

### Withdrawable version

The control circuits are included between the poles of the X connector (the XV terminal box is not supplied).

### Description of figures

- 1) Supplementary open/closed auxiliary contacts of the circuit-breaker - AUX 6Q (6 Form C)
- 2) Ekip Signalling 4K
- 11) Trip signalling contact
- 12) Contact for signalling position of loaded springs - S33 M/2
- 13) Motor for loading closing springs- M
- 14) Remote reset - YR
- 20) Ekip Measuring/Measuring Pro with voltage socket inside the four pole circuit-breaker
- 21) Ekip Measuring/Measuring Pro with voltage sockets inside the three-pole circuit-breaker and connection for external neutral
- 22) Ekip Measuring Pro for residual voltage protection (for Ekip G only)
- 23) Ekip Measuring/Measuring Pro with external voltage socket
- 24) Rc residual current protection sensor input
- 25) Transformer star center sensor input
- 26) Zone selectivity
- 27) Current sensor input on external neutral (only for 3-pole circuit-breakers)
- 31) Direct auxiliary supply 24V DC and local bus - Ekip Supply
- 32) Auxiliary supply through module 110-240V AC/DC or 24-48V DC and local bus - Ekip Supply
- 41) Ekip signalling 2K-1
- 42) Ekip signalling 2K-2
- 43) Ekip signalling 2K-3
- 48) Ekip sinchrocheck
- 51) Ekip COM Modbus RS-485
- 52) Ekip COM Modbus TCP
- 53) Ekip COM Profibus
- 54) Ekip COM Profinet
- 55) Ekip COM EtherNet/IP™
- 56) Ekip COM EtherNet/IP™
- 57) Ekip COM IEC61850
- 58) Ekip LINK
- 61) Ekip COM R Modbus RS-485 Redundant
- 62) Ekip COM R Modbus TCP Redundant
- 63) Ekip COM R Profibus Redundant
- 64) Ekip COM R Profinet Redundant

- 65) Ekip COM R DeviceNet™ Redundant
- 66) Ekip COM R EtherNet/IP™ Redundant
- 71) Ready to close contact - RTC
- 72) Second opening coil - YO2
- 73) Undervoltage coil - YU
- 74) Undervoltage coil with external time-lag device - YU, D
- 75) First opening coil - YO
- 76) First opening coil with control from protection trip unit - YO, Ekip Com Actuator
- 77) First closing coil - YC
- 78) First closing coil with control from protection trip unit - YC, Ekip Com Actuator
- 79) Second closing coil - YC2
- 81) Open/closed auxiliary contacts of circuit-breaker - AUX 4Q (4 Form C)
- 91) External supplementary open/closed auxiliary contacts of circuit-breaker - AUX 15Q (15 Form C)
- 95) Contacts for signalling of circuit-breaker in racked-in, test, racked-out position
- 96) Contacts for signalling of circuit-breaker in racked-in, test, racked-out position (first set)
- 97) Contacts for signalling of circuit-breaker in racked-in, test, racked-out position (second set)
- 97A) Contacts for signalling of circuit-breaker in racked-in, test, racked-out position (second set)
- 99) Circuit-breakers with auxiliary safety voltage in direct and alternating current
- 100) ATS021
- 101) ATS022
- 102) Third circuit-breaker controlling with ATS022
- 103) Ekip Signalling 10K
- 104) Ekip Multimeter
- 105) Application diagram for Ekip Touch, Hi-Touch, G Touch, G Hi-Touch with Power Controller function.

# Electrical diagrams

## Reading information – Circuit-breakers

### Key

|             |                                                                                                                                                                                    |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| *           | = See the note indicated by the letter                                                                                                                                             |
| A1          | = Applications located on the mobile part of the circuit-breaker                                                                                                                   |
| A3          | = Applications located on the fixed part of the circuit-breaker                                                                                                                    |
| A4          | = Indicative devices and connections for control and signalling, outside the circuit-breaker                                                                                       |
| BUS1        | = Serial interface with external bus                                                                                                                                               |
| D           | = Electronic time-lag device of YU undervoltage coil, outside the circuit-breaker                                                                                                  |
| F1          | = Time-delayed trip fuse                                                                                                                                                           |
| GZi(DBi)    | = Zone selectivity input for G protection or input in “reverse” direction for D protection                                                                                         |
| GZo(DBo)    | = Zone selectivity output for G protection or output in “reverse” direction for D protection                                                                                       |
| I O1...32   | = Programmable digital inputs of the EKIP protection trip unit                                                                                                                     |
| K51         | = Electronic overcurrent protection trip unit of the types: EKIP DIP, EKIP TOUCH, EKIP LCD, EKIP HI-TOUCH , EKIP HI-LCD, EKIP G TOUCH, EKIP G LCD, EKIP G HI-TOUCH , EKIP G HI-LCD |
| K51/COM     | = Communication module                                                                                                                                                             |
| K51/MEAS    | = Measurement module                                                                                                                                                               |
| K51/SIGN    | = Signalling module                                                                                                                                                                |
| K51/SUPPLY  | = Optional auxiliary supply module (110-220VAC/DC and 24-48VDC)                                                                                                                    |
| K51/SYNC    | = Synchronization module                                                                                                                                                           |
| K51/YC      | = Closing control from the EKIP protection trip unit                                                                                                                               |
| K51/YO      | = Opening control from the EKIP protection trip unit                                                                                                                               |
| M           | = Motor for loading closing springs                                                                                                                                                |
| O 01...32   | = Programmable signalling contacts of the EKIP protection trip unit                                                                                                                |
| O SC        | = EKIP protection trip unit contact for synchronism control                                                                                                                        |
| Q           | = Circuit-breaker                                                                                                                                                                  |
| Q/1...Q/25  | = Auxiliary contacts of circuit-breaker                                                                                                                                            |
| Q/26...Q/27 | = Auxiliary open/close contacts used internally by the trip unit                                                                                                                   |
| RC          | = RC (residual current) protection sensor                                                                                                                                          |
| RT1...RT3   | = Temperature sensors                                                                                                                                                              |
| RTC EKIP    | = Auxiliary ready to close contact of circuit-breaker, used internally by the trip unit                                                                                            |
| RTC         | = Contact for signalling circuit-breaker is ready to close                                                                                                                         |
| S33M/1...2  | = Limit contacts of spring loading motor                                                                                                                                           |
| S43         | = Switch for presetting remote/local control                                                                                                                                       |
| S51         | = Trip signalling contact                                                                                                                                                          |
| S75E/1...4  | = Contacts for signalling circuit-breaker in racked-out position (provided only with withdrawable version)                                                                         |
| S75I/1...5  | = Contacts for signalling circuit-breaker in racked-in position (provided only with withdrawable version)                                                                          |
| S75T/1...2  | = Contact for signalling circuit-breaker in test position (provided only with withdrawable version)                                                                                |
| SC          | = Pushbutton or contact for closing the circuit-breaker                                                                                                                            |
| SO          | = Pushbutton or contact for immediate opening of the circuit-breaker                                                                                                               |
| SO1         | = Pushbutton or contact for opening the circuit-breaker with time-delayed trip                                                                                                     |
| SR          | = Pushbutton or contact for electrical resetting of S51 trip contact                                                                                                               |
| SZi(DFi)    | = Input for zone selectivity for S protection or input in “direct” direction for S protection                                                                                      |
| SZo(DFo)    | = Output for zone selectivity for S protection or output in “direct” direction for D protection                                                                                    |
| TI/L1       | = Current transformer phase L1                                                                                                                                                     |
| TI/L2       | = Current transformer phase L2                                                                                                                                                     |
| TI/L3       | = Current transformer phase L3                                                                                                                                                     |
| TI/N        | = Current transformer on neutral                                                                                                                                                   |
| TU1...TU2   | = Insulation voltage transformer (outside circuit-breaker)                                                                                                                         |
| Uaux        | = Auxiliary supply voltage                                                                                                                                                         |
| UI/L1       | = Current sensor phase L1                                                                                                                                                          |

|           |                                                                                            |
|-----------|--------------------------------------------------------------------------------------------|
| UI/L2     | = Current sensor phase L2                                                                  |
| UI/L3     | = Current sensor on phase L3                                                               |
| UI/N      | = Current sensor on neutral                                                                |
| UI/O      | = Single-pole current sensor                                                               |
| W2        | = Serial interface with internal bus (local bus)                                           |
| W9...W13  | = RJ45 connector for communication modules                                                 |
| W9R.W11R  | = RJ45 connector for redundant communication modules                                       |
| X         | = Delivery connector for auxiliary circuits for withdrawable version of circuit-breaker    |
| XB1...XB7 | = Connectors for circuit-breaker applications                                              |
| XF        | = Delivery terminal board for position contacts of withdrawable version of circuit-breaker |
| XK1...XK3 | = Connectors for auxiliary circuits of the EKIP protection trip unit                       |
| XK7       | = Connector for auxiliary circuits of communication module                                 |
| XV        | = Delivery terminal box for auxiliary circuits of fixed version circuit-breaker            |
| YC        | = Closing coil                                                                             |
| YC2       | = Second closing coil                                                                      |
| YO        | = Opening coil                                                                             |
| YO1       | = Opening coil for overcurrent                                                             |
| YO2       | = Second opening coil                                                                      |
| YR        | = Coil for electrical resetting of trip contact S51                                        |
| YU        | = Undervoltage coil                                                                        |

# Electrical diagrams

## Reading information – Circuit-breakers

### Notes

- A) Auxiliary supply for Ekip trip unit is mandatory ( refer to diagram 1SDM00009R0001 figures 31 - 32- 33 - 34).
- B) When there are mixed auxiliary contacts Q1 and Q2 are 400V, while Q3 and Q4 are 24V. Then Q5, Q6, Q7 are 400V, while Q8, Q9, Q10 are 24V.
- C) Always supplied with Ekip Com module.
- D) Always supplied with motor for loading closing springs in Fig. 13.
- E) Obligatory voltage transformer in the case of external sockets. Obligatory external sockets for systems with rated voltage greater than 690V.
- F) The connections between the RC residual current protection sensor and the poles of the X connector (or XV) of the circuit-breaker must be made with 4-pole shielded cable with conductors interwoven in pairs (type BELDEN 9696 paired or equivalent), of a length no greater than 10 m. The shield should be earthed on circuit-breaker side.
- G) With all electronic protection trip units equipped with display interface with LSIG protections, protection against an earth fault is available (Gext) by means of current sensor positioned on the star centre of the MV/LV transformer.  
The connection between terminals 1 and 2 of the UI/O current transformer and Ge+ and Ge- poles of the X connector (or XV) must be made with shielded and stranded 2-pole cable (type BELDEN 9841 or equivalent) of length no greater than 15 m.
- H) The connection between the terminal box and external neutral sensor must be made with the 2m cable provided. For three pole circuit breakers, the Ne+ and Ne- poles of the X connector (or XV) must be short-circuited if no sensor is present on the external neutral conductor.
- I) Obligatory in the case of the presence of any Ekip module.
- J) Only for E2.2, E4.2 and E6.2 withdrawable version circuit-breakers as an alternative to Fig. 31-32-34.
- K) Only for E2.2, E4.2 and E6.2 withdrawable version circuit-breakers as an alternative to Fig. 31-32-33.
- K) Only for E2.2, E4.2 and E6.2 withdrawable version circuit-breakers as an alternative to Fig. 31-32-33.
- L) In the presence of Fig. 32, for E2.2, E4.2 and E6.2 circuit-breakers up to three applications between Fig. 41...58 taken only once can be supplied, instead for E1.2 circuit-breakers, up to two applications between Fig. 41...58 taken only once can be supplied. The Ekip Com module selected can be duplicated if required, by choosing between Fig. 61...66.
- M) In the presence of Fig. 33, for E2.2, E4.2 and E6.2 circuit-breakers, up to two applications between Fig. 41...58 taken only once can be supplied. The Ekip Com module selected can be duplicated if required, by choosing between Fig. 61...66.
- N) In the presence of Fig. 34, for E2.2, E4.2 and E6.2 circuit-breakers, a single application between Fig. 41...58 can be supplied.
- O) In the presence of several Ekip Com modules with withdrawable version circuit-breakers, the contact S75I/5 should be connected only once to a single module.
- P) The auxiliary voltage Uaux. enables activation of all the functions of the EKIP electronic protection trip units. Since an earth insulated Uaux was requested, it is necessary to use “galvanically separated convertors” which comply with the standards IEC 60950 (UL 1950) or equivalent, which guarantee a common mode current or leakage current (refer to IEC 478/1, CEI 22/3) no greater than 3.5mA, IEC 60364-41 and CEI 64-8.
- Q) Regarding local bus the maximum cable lenght is 15m.
- R) Suggested RJ45 cable: CAT6 STP.
- T) Connect terminals 120  $\Omega$  on if you want to insert a termination resistance on the Local Bus.

# Electrical diagrams

## Reading information – ATS021 and ATS022

### Operating state shown

The diagram is shown in the following conditions:

- circuit-breakers open and racked-in #
- with de-energized circuits
- trip units not tripped \*
- unloaded closing springs.

### Key

|           |   |                                                                                                    |
|-----------|---|----------------------------------------------------------------------------------------------------|
| A         | = | ATS021 and ATS022 devices for automatic switching of two circuit-breakers                          |
| CB1-N     | = | Normal supply line circuit-breaker                                                                 |
| CB2-E     | = | Emergency supply line circuit-breaker                                                              |
| K1        | = | Auxiliary contactor type NF22E for voltage presence of normal power supply                         |
| K2        | = | Auxiliary contactor type NF22E for voltage presence of emergency power supply                      |
| KC1-KC2   | = | Auxiliary contactors type AL__-30 for the closing of the circuit-breakers                          |
| KO1-KO2   | = | Auxiliary contactors type AL__-30 for the opening of the circuit-breakers                          |
| M         | = | Motor for loading the closing springs                                                              |
| Q/1       | = | Auxiliary contact of the circuit-breaker                                                           |
| Q60       | = | Thermal relay for isolating and protecting the auxiliary circuits of safety auxiliary voltage      |
| Q61/1-2   | = | Thermal relays for isolating and protecting the auxiliary circuits of the lines                    |
| S11       | = | Contact for enabling automatic switching of the ATS021 device                                      |
| S11...S15 | = | Signalling contacts for the inputs of the ATS022 device                                            |
| S1-S2     | = | Contacts controlled by the cam of the motor operator                                               |
| S3        | = | Changeover contact for electrical signalling of local/remote selector state                        |
| S33M/1    | = | Limit contacts of spring loading motor                                                             |
| S51       | = | Contact for electrical signalling of circuit-breaker open due to tripping of overcurrent trip unit |
| S75I/1    | = | Contact for signalling circuit-breaker racked-in #                                                 |
| BUS 1     | = | Serial interface with control system (MODBUS EIA RS485 interface) available with the device ATS022 |
| X         | = | Connector for auxiliary circuits of withdrawable version circuit-breakers                          |
| XF        | = | Delivery terminal box for the position contacts of the circuit-breaker                             |
| XV        | = | Delivery terminal box for the auxiliary circuits of the fixed version circuit-breakers             |
| YC        | = | Shunt closing release                                                                              |
| YO        | = | Shunt opening release                                                                              |

# This diagram shows the withdrawable version circuit-breakers, but it is also valid for the fixed version circuit-breakers. In this case, it is not necessary to connect the S75I/1 contacts on the X31:1 input of the ATS021 device otherwise it is necessary to connect the X32:5 and X32:6 terminals with the terminal X32:9 of the ATS022 device.

\* This diagram shows circuit-breakers with overcurrent release but it is also valid for circuit-breakers without release (switch-disconnectors). If the S51 contact is not present, the S51 contacts on the X31:1 input of the ATS021 device should not be considered, while it is necessary to connect the X32:7 and X32:8 terminals with the X32:9 terminal of the ATS022 device.

# Electrical diagrams

## Reading information – Power Controller

### Operating state shown

The diagram is shown in the following conditions:

- circuit-breaker, open and racked-in #
- with de-energized circuits
- trip units not tripped \*
- motor operator with unloaded springs.

### Key

|             |   |                                                                                                               |
|-------------|---|---------------------------------------------------------------------------------------------------------------|
| A13         | = | EKIP SIGNALLING 10K unit                                                                                      |
| A17         | = | MOE actuator unit for stored energy operating mechanism for the Tmax XT circuit-breaker                       |
| A21         | = | EtherNet Switch device                                                                                        |
| FI          | = | Time-delayed trip fuse                                                                                        |
| I 01 ... 12 | = | Programmable digital inputs of the EKIP protection trip unit                                                  |
| J ..        | = | Connectors for auxiliary circuits of the Tmax XT circuit-breaker in the withdrawable version                  |
| K51         | = | Electronic overcurrent protection trip unit type EKIP for EMAX 2 circuit-breaker type                         |
| K51/COM     | = | Communication module for the EKIP trip unit                                                                   |
| K51/SIGN    | = | Signalling module for EKIP trip unit                                                                          |
| K51/SUPPLY  | = | Optional auxiliary supply module for the EKIP trip unit                                                       |
| K51/YC      | = | Closing control from the EKIP protection trip unit                                                            |
| K51/YO      | = | Opening control from the EKIP protection trip unit                                                            |
| M           | = | Motor for loading closing springs for EMAX 2 circuit-breaker type                                             |
| M           | = | Motor for opening the circuit-breaker and for loading closing springs for TMAX XT circuit-breaker type        |
| O 01 ... 12 | = | Programmable signalling contacts of the EKIP protection trip unit                                             |
| Q/1         | = | Auxiliary contacts of circuit-breaker                                                                         |
| Q1          | = | Emax 2 circuit-breaker equipped with EKIP POWER CONTROLLER                                                    |
| Q2          | = | Emax 2 circuit-breaker                                                                                        |
| Q3          | = | Tmax XT circuit-breaker equipped with MOE actuator unit                                                       |
| Q4          | = | Emax 2 MS switch-disconnector                                                                                 |
| R1          | = | Resistor                                                                                                      |
| S33M/1      | = | Limit contacts of spring loading motor                                                                        |
| S51         | = | Trip signalling contact                                                                                       |
| S75I/5      | = | Contacts for signalling Emax 2 circuit-breaker in racked-in position (provided only for withdrawable version) |
| W13         | = | RJ45 connector for communication modules                                                                      |
| X           | = | Delivery connector for auxiliary circuits for withdrawable version of Emax 2 circuit-breaker                  |
| XV          | = | Delivery terminal box for auxiliary circuits of fixed version circuit-breaker                                 |
| YC          | = | Closing coil                                                                                                  |
| YO          | = | Opening coil                                                                                                  |

### 3-pole or 4-pole circuit-breaker



## 8

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81

75 76

[77][78]

[72][73][74]

[71]

41 42 43

48

[ 51 ] .. [ 58 ]

[61] .. [66]

[31][32]

27

26

25

24 24A

|    |    |    |    |
|----|----|----|----|
| 20 | 21 | 22 | 23 |
|----|----|----|----|

14

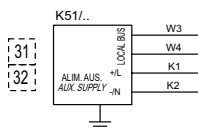
13

12

11

## Terminal box E2.2 - E4.2 - E6.2

□

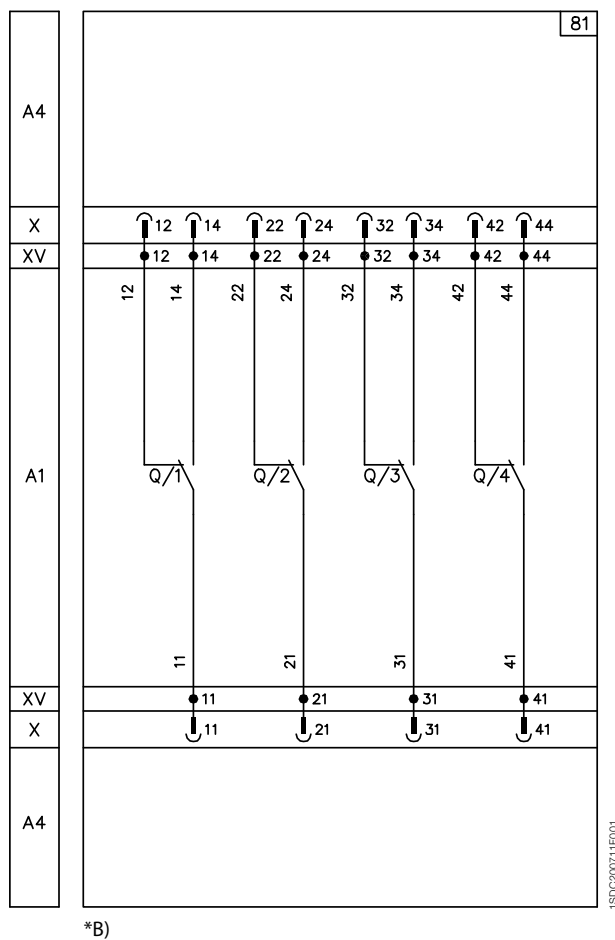


Supplementary auxiliary contacts  
of circuit-breaker

Electrical diagrams  
Electrical accessories

[illegible]

81) Open/closed auxiliary contacts of circuit-breaker - AUX 4Q (4 Form C)



|     |           |    |     |     |
|-----|-----------|----|-----|-----|
| 45  | D1        | C1 | C11 | C21 |
| 46  |           | C3 | C13 |     |
| 48  | D2        | C2 | C12 | C22 |
| RTC | YU<br>YO2 | YC | YO  | YC2 |

79) Second closing coil - YC2

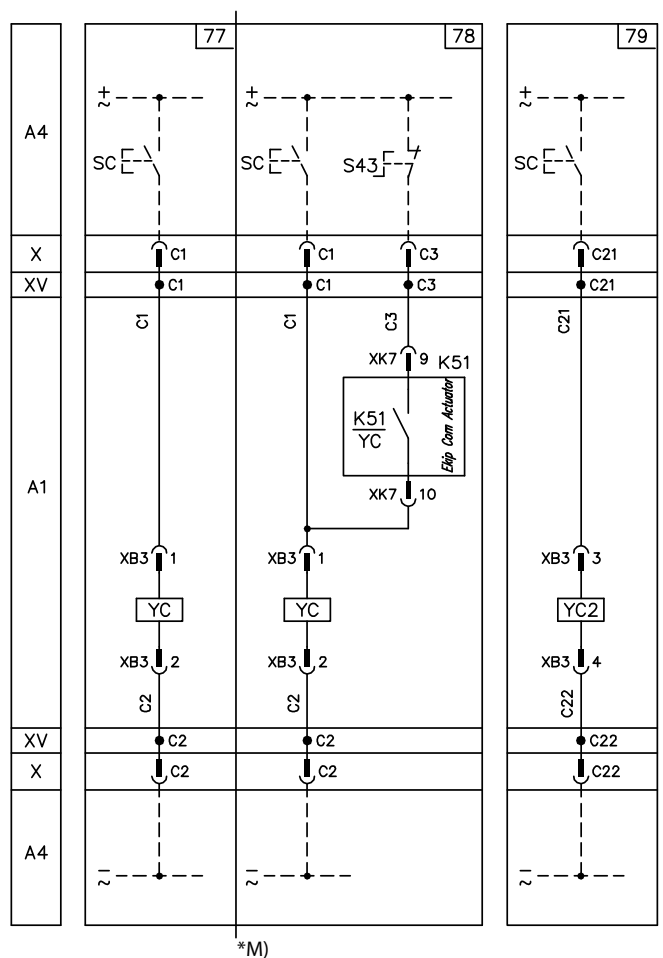


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Electrical diagrams  
Electrical accessories

|     |           |    |     |     |
|-----|-----------|----|-----|-----|
| 45  | D1        | C1 | C11 | C21 |
| 46  |           | C3 | C13 |     |
| 48  | D2        | C2 | C12 | C22 |
| RTC | YU<br>YO2 | YC | YO  | YC2 |

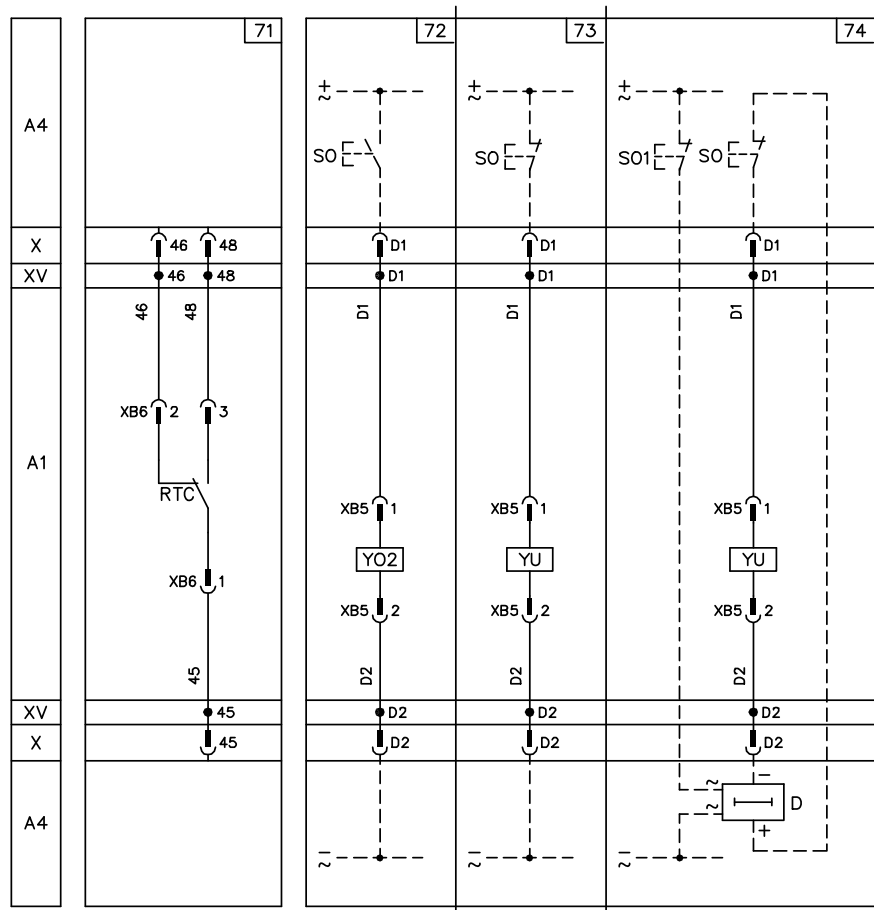
### 75) First opening coil - YO

76) First opening coil with control from protection trip unit - YO, Ekip Com Actuator

 $^1M)$ 

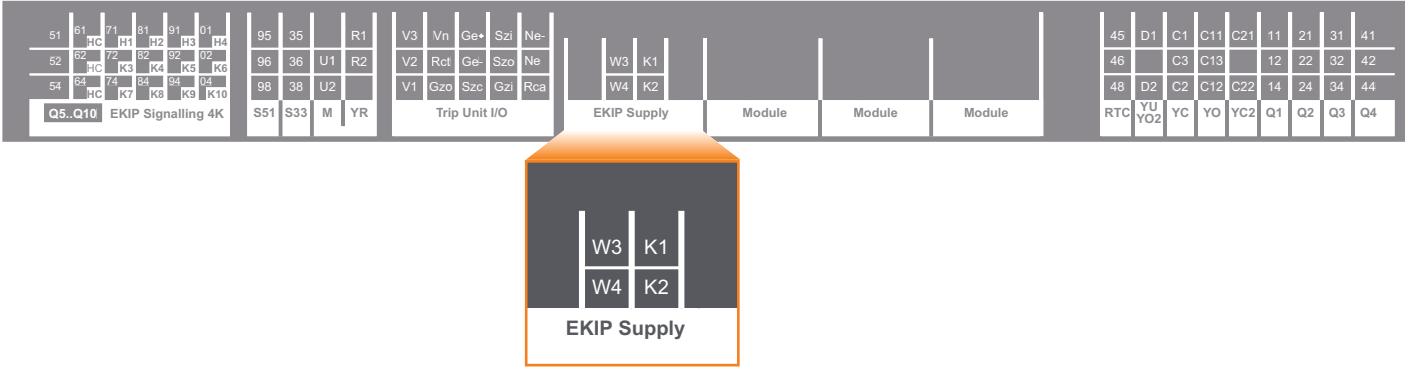
75-76 as an alternative to each other

|     |           |    |     |     |
|-----|-----------|----|-----|-----|
| 45  | D1        | C1 | C11 | C21 |
| 46  |           | C3 | C13 |     |
| 48  | D2        | C2 | C12 | C22 |
| RTC | YU<br>YO2 | YC | YO  | YC2 |

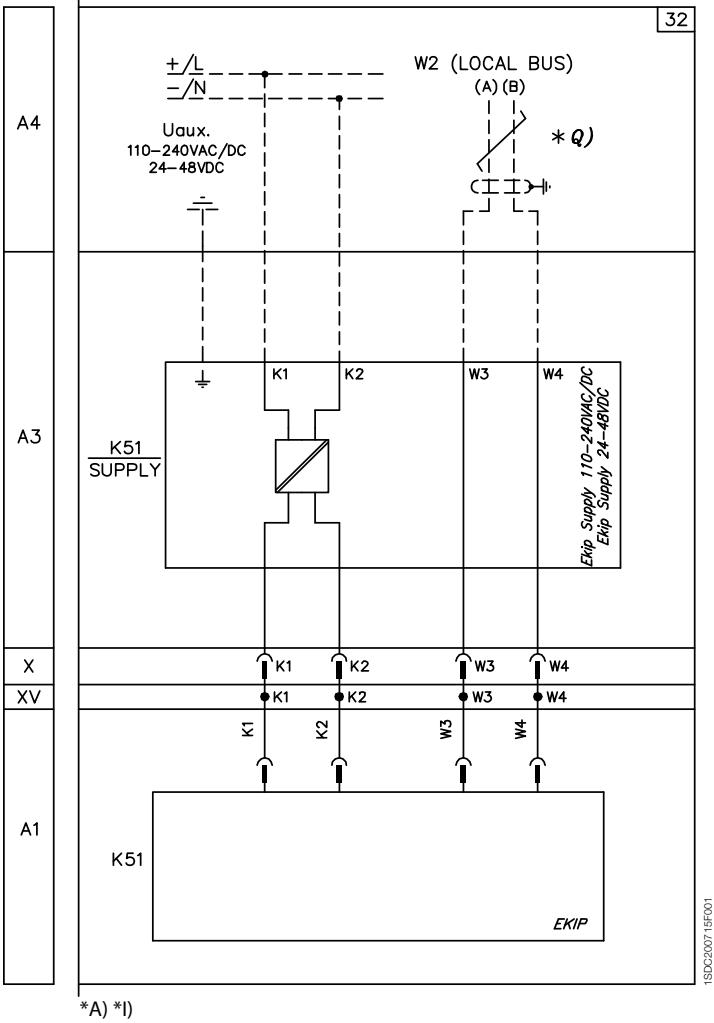


# Electrical diagrams

## Electrical accessories



32) Auxiliary supply through module 110-240V AC/DC or 24-48V DC and local bus - Ekip Supply

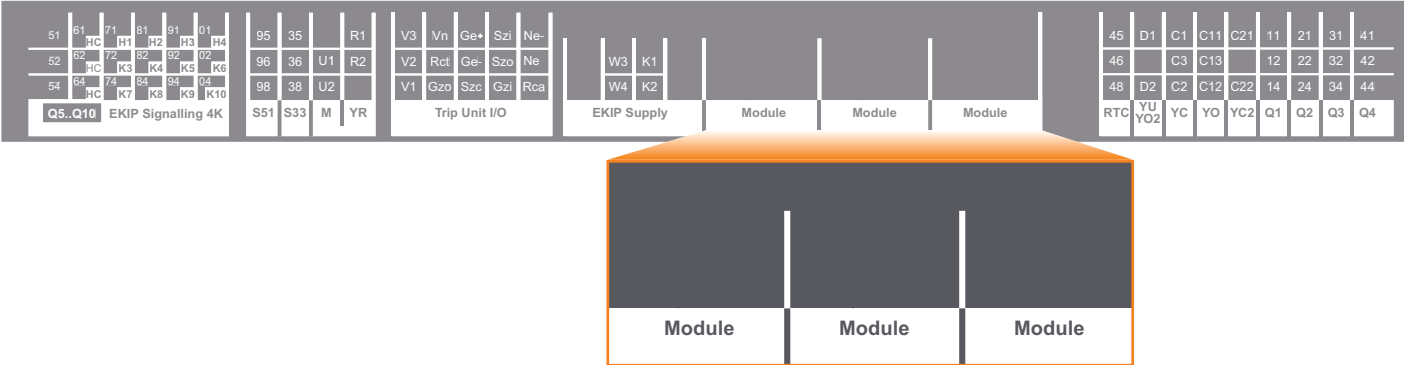


As an alternative to figures 31



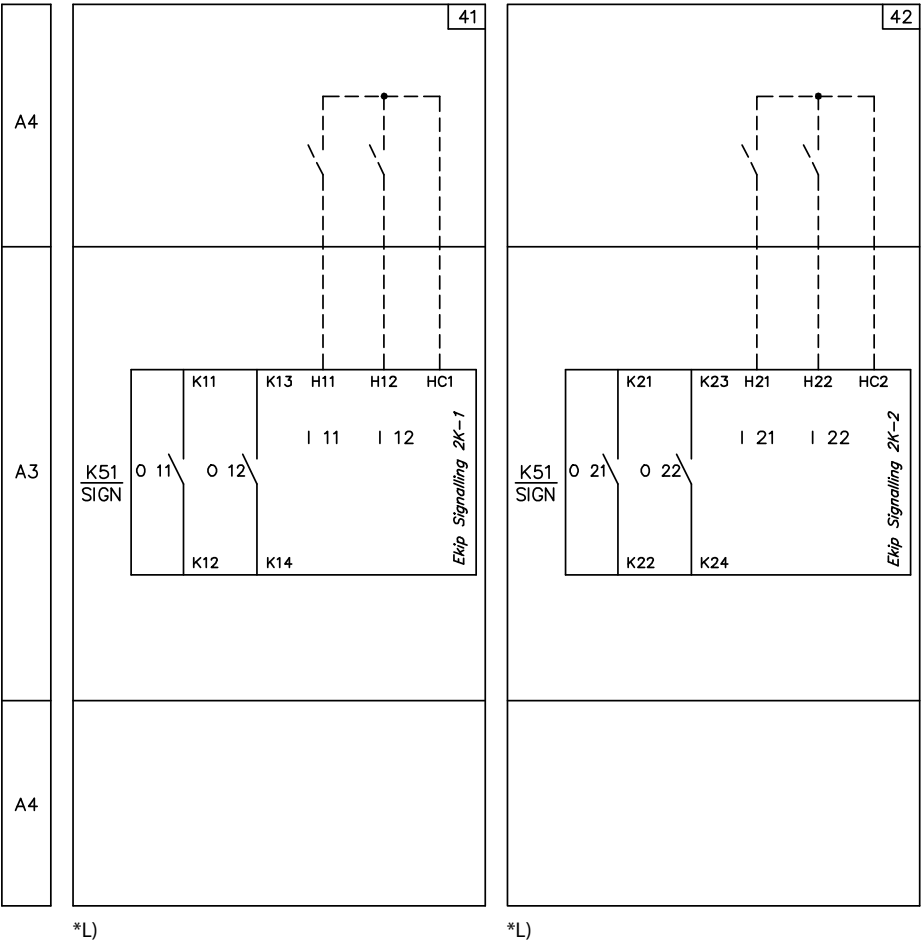
# Electrical diagrams

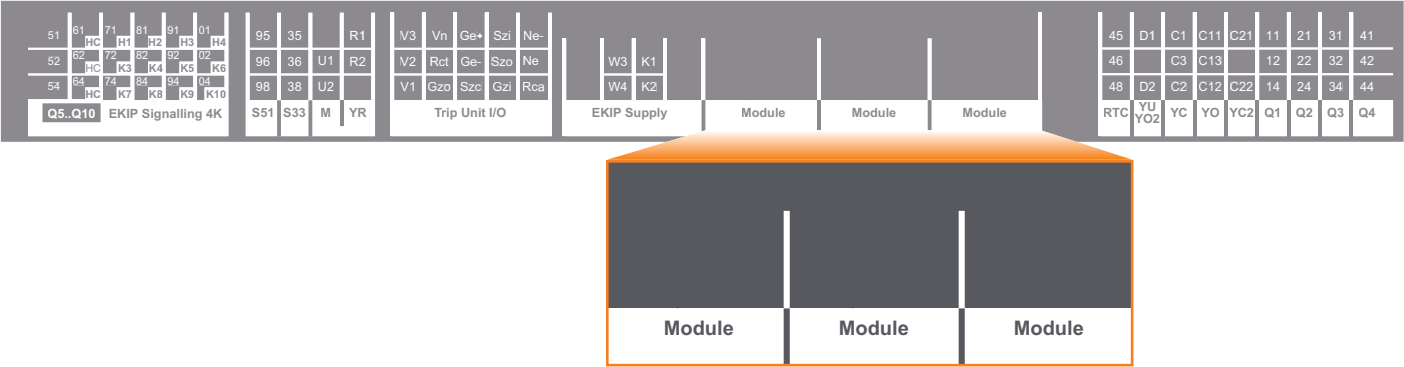
## Electrical accessories



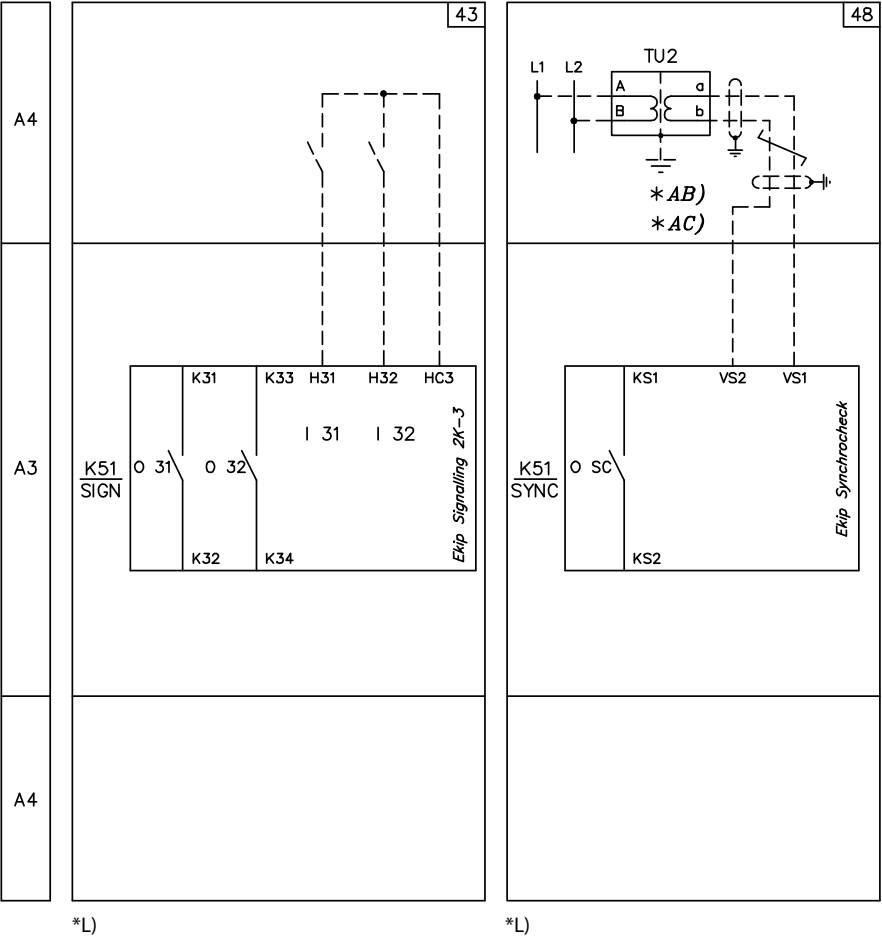
- 41) Ekip signalling 2K-1
- 42) Ekip signalling 2K-2

8

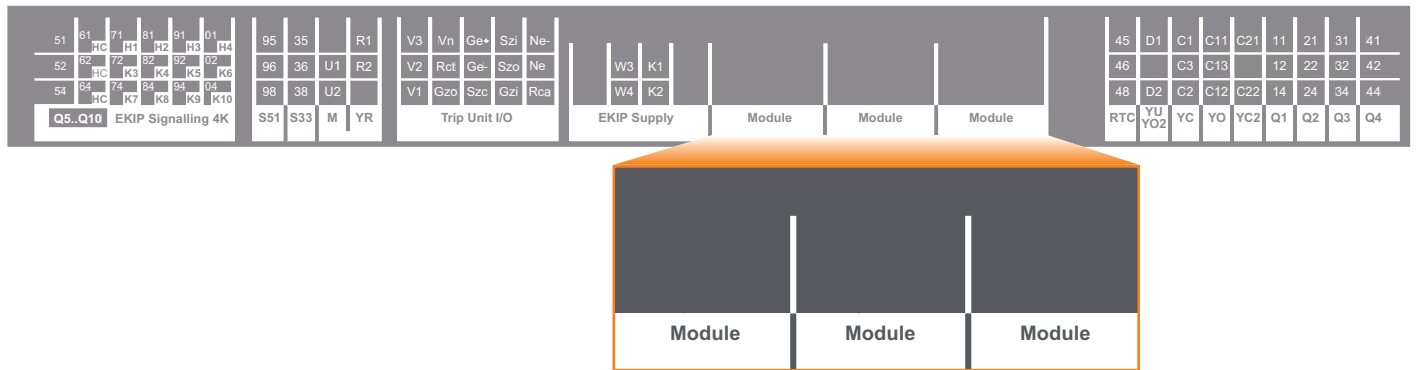




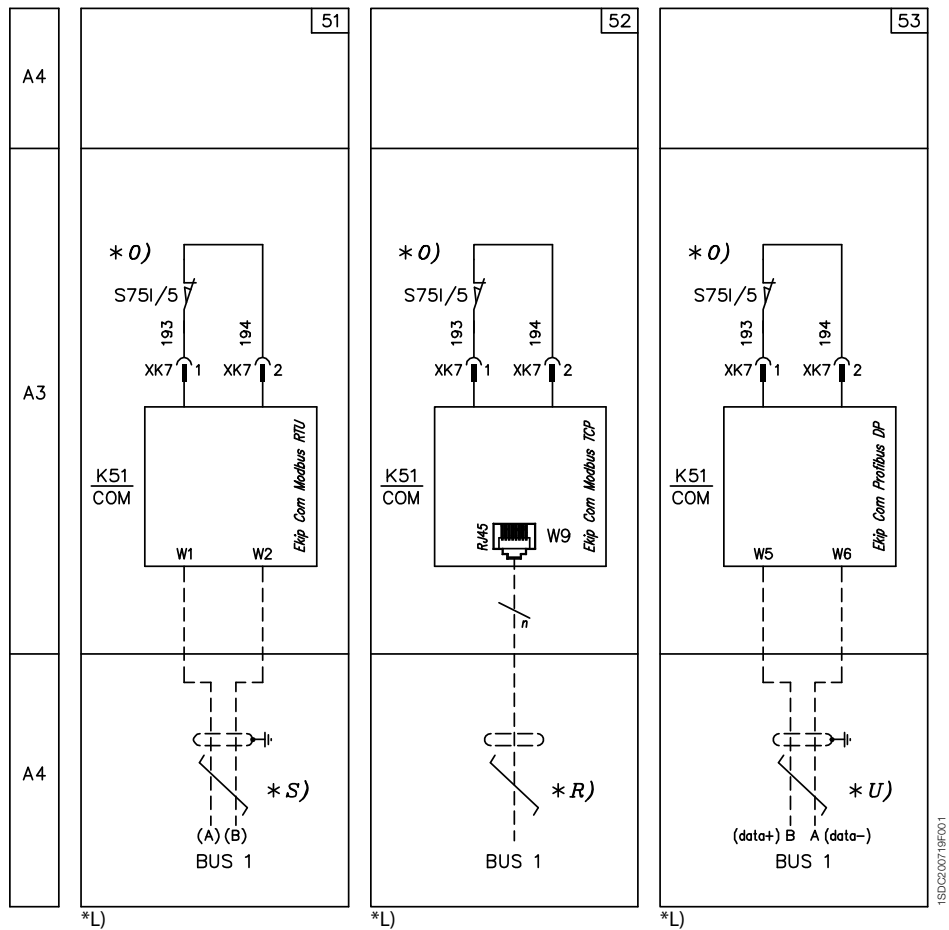
- 43) Ekip signalling 2K-3
- 48) Ekip Synchrocheck

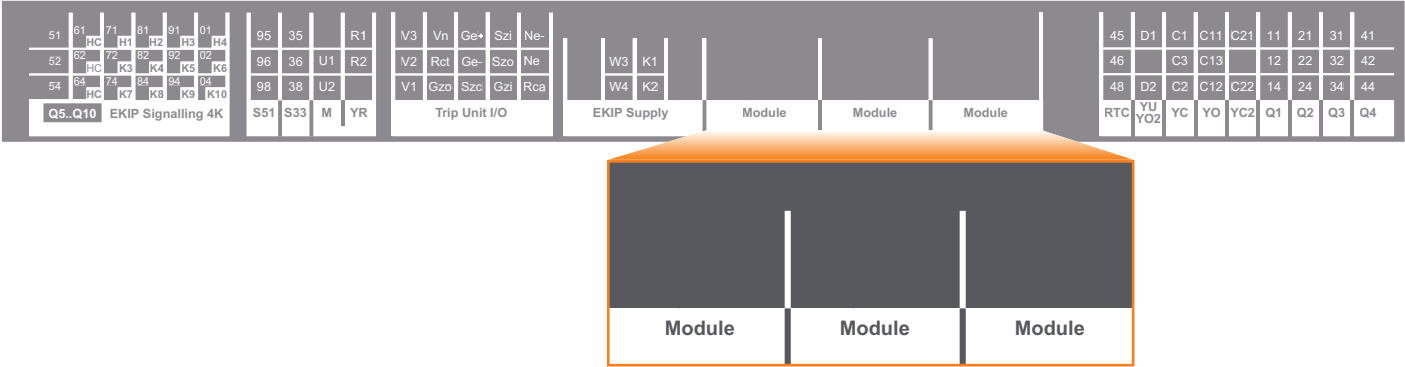


Electrical diagrams  
Electrical accessories

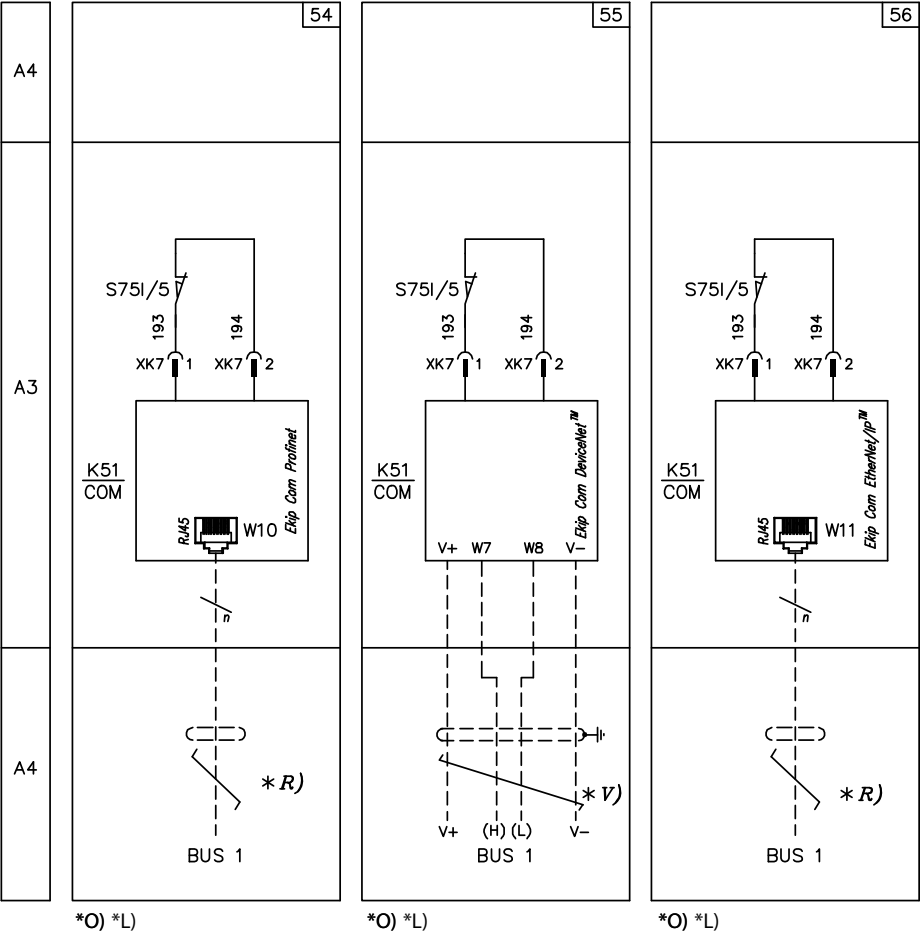


- 51) Ekip COM Modbus RS-485
- 52) Ekip COM Modbus TCP
- 53) Ekip COM Profibus



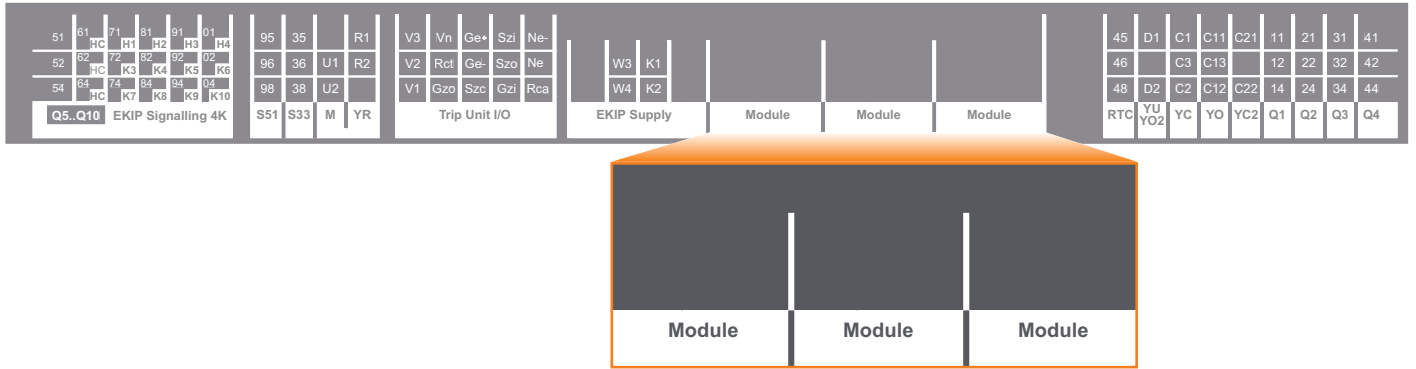


- 54) Ekip COM Profinet
- 55) Ekip COM DeviceNet™
- 56) Ekip COM EtherNet/IP™

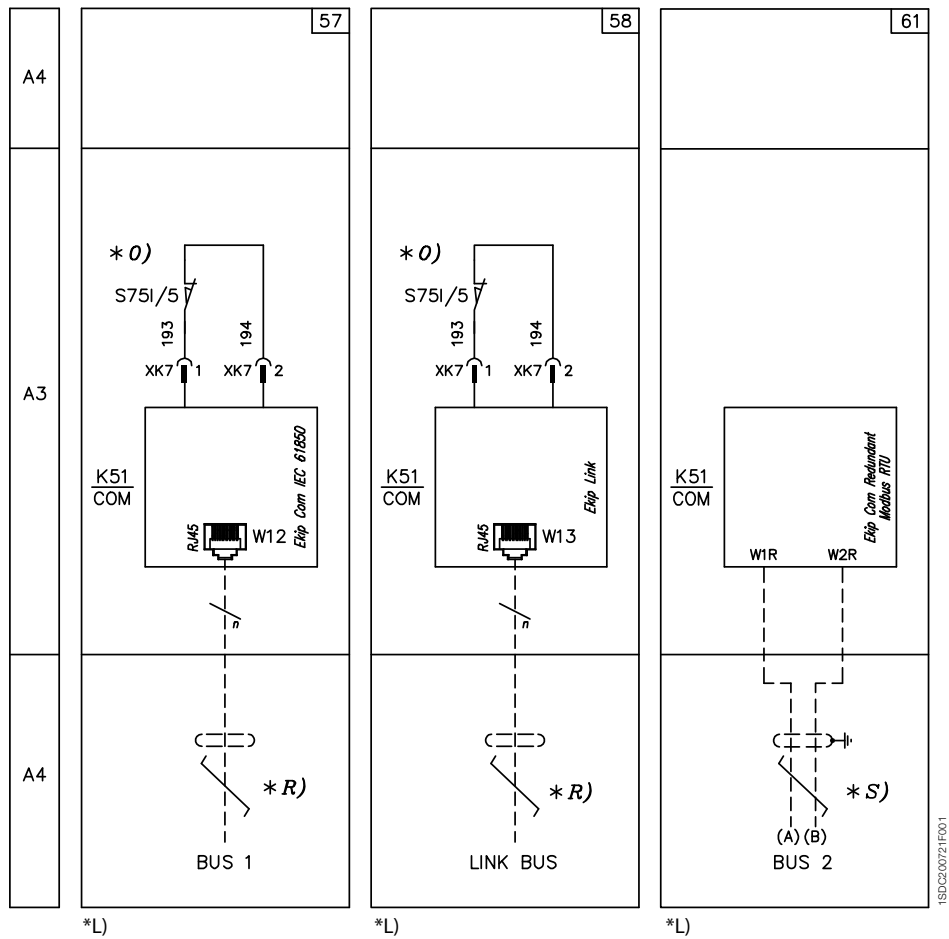


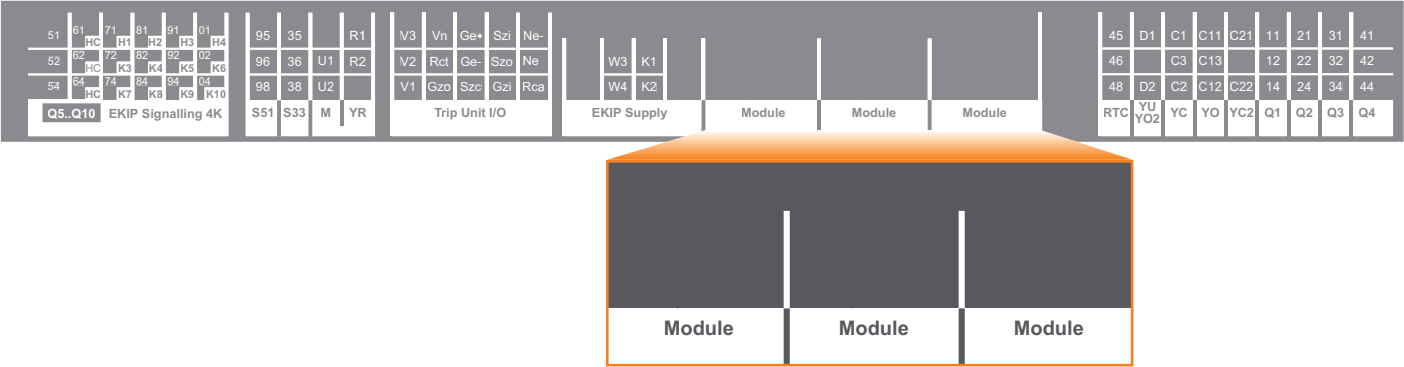
1SDC200720F001

Electrical diagrams  
Electrical accessories

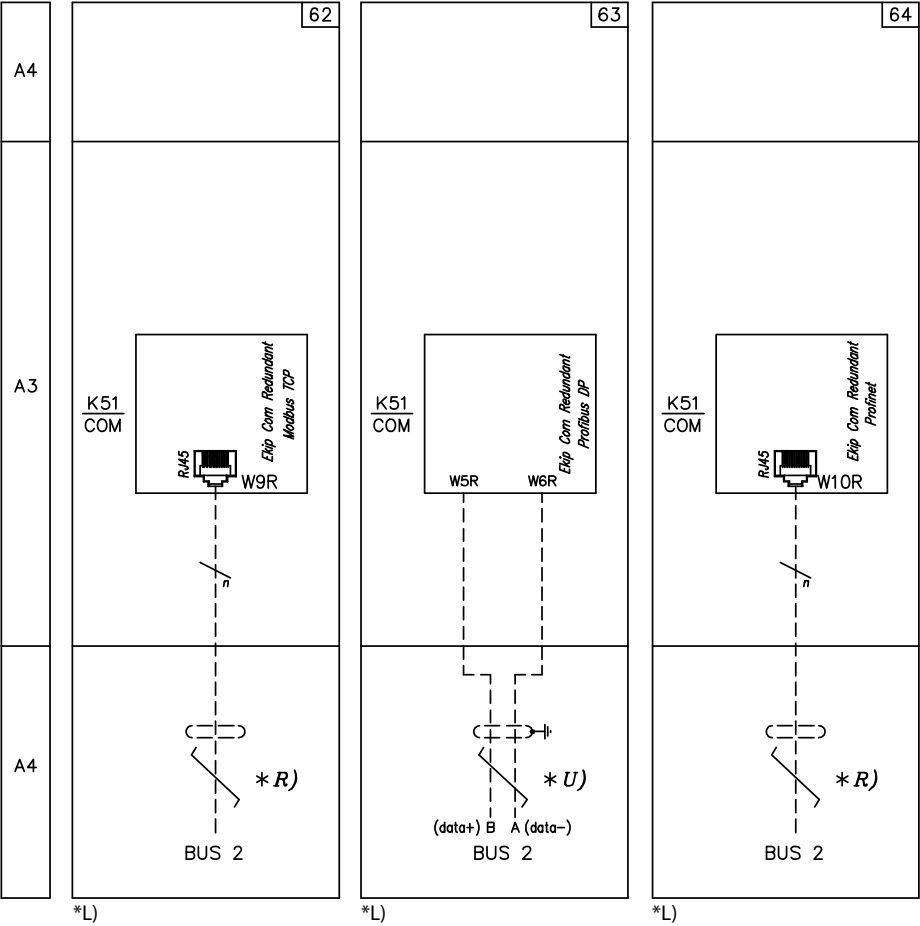


- 57) Ekip COM IEC61850  
58) Ekip LINK  
61) Ekip COM R Modbus RS-485 Redundant



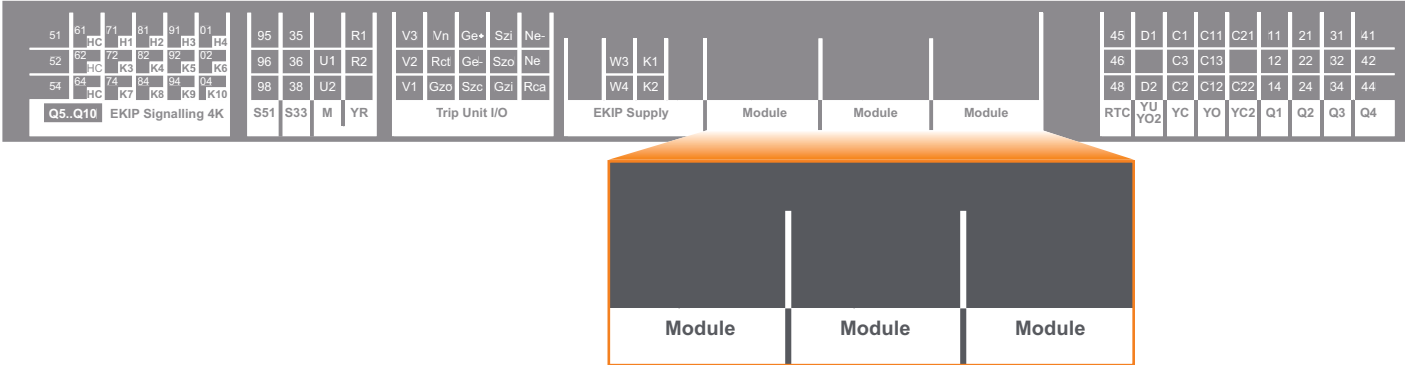


- 62) Ekip COM R Modbus TCP Redundant
- 63) Ekip COM R Profibus Redundant
- 64) Ekip COM R ProfiNet Redundant

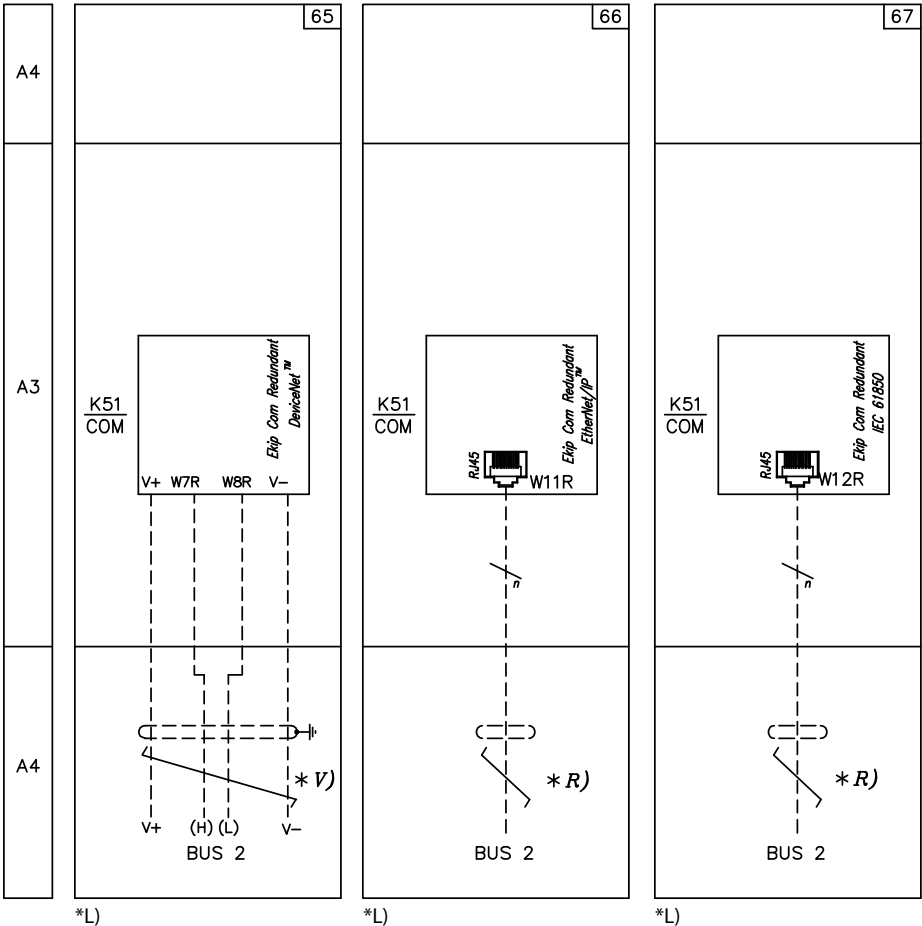


# Electrical diagrams

## Electrical accessories



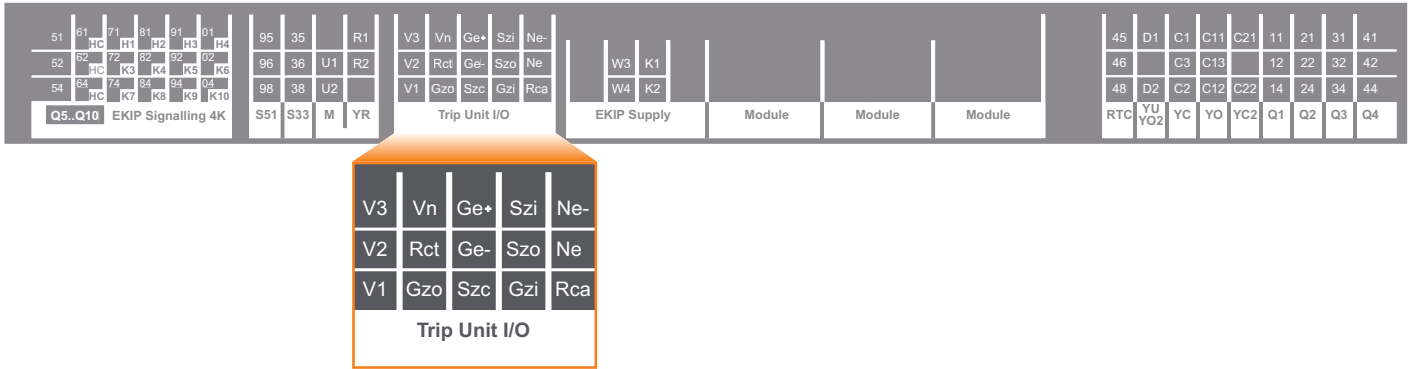
- 65) Ekip COM R DeviceNet™ Redundant
- 66) Ekip COM R EtherNet/IP™ Redundant
- 66) Ekip COM R IEC 61850 Redundant



1SDC200723F001

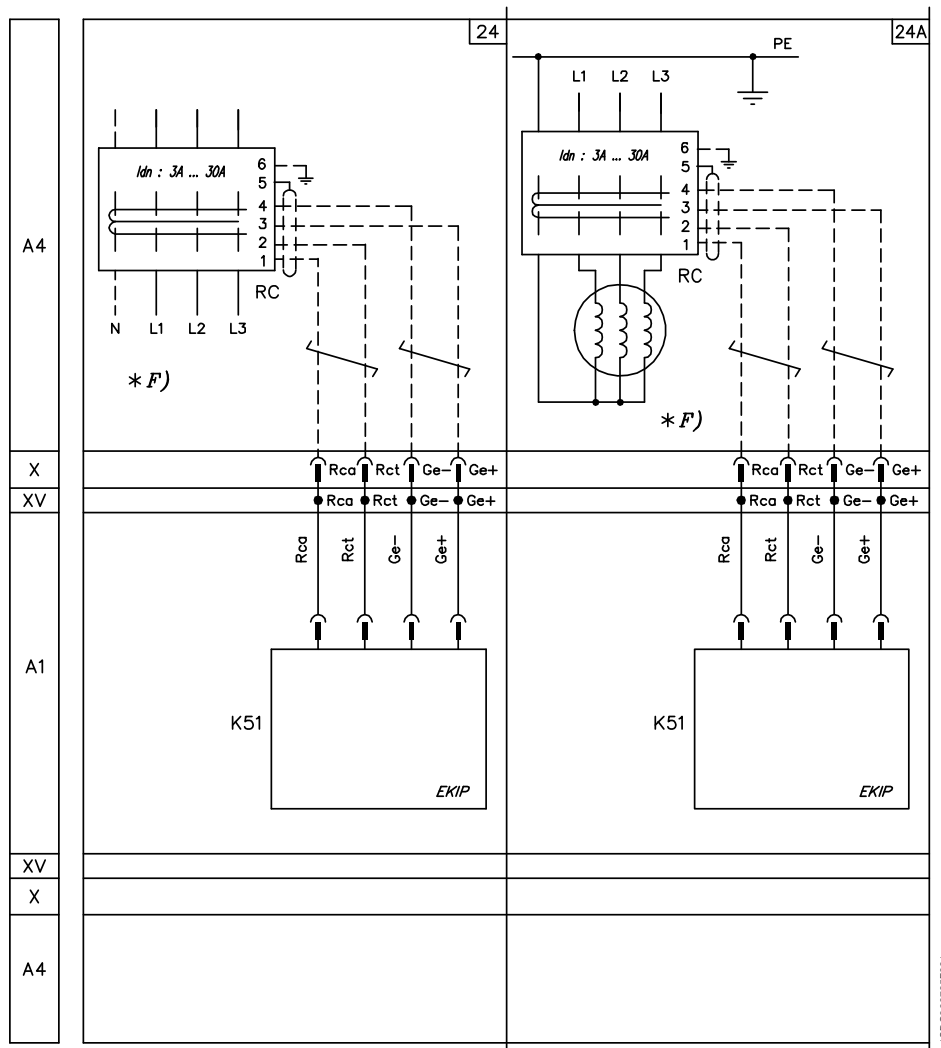


Electrical diagrams  
Electrical accessories

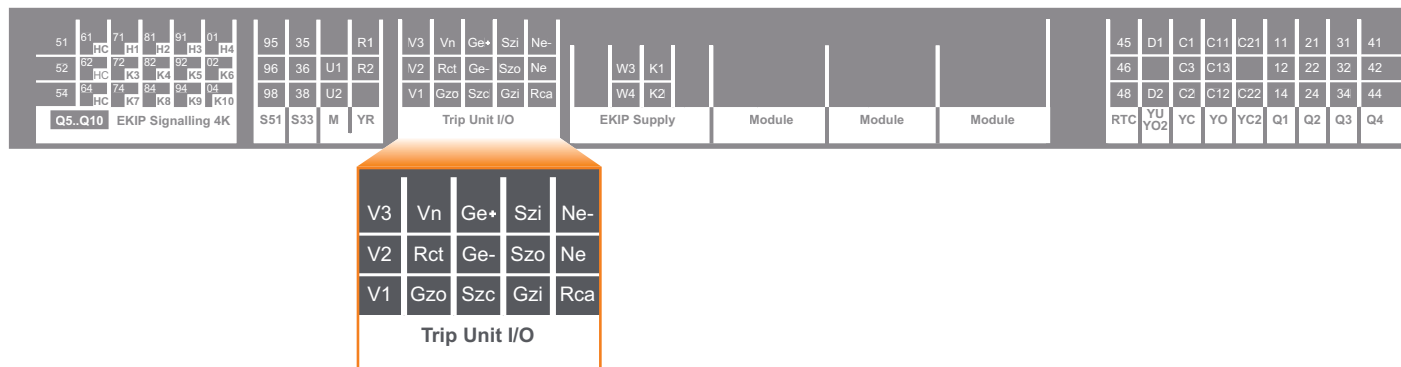


24) Rc residual current protection sensor input (ANSI 64 & 50NTD)

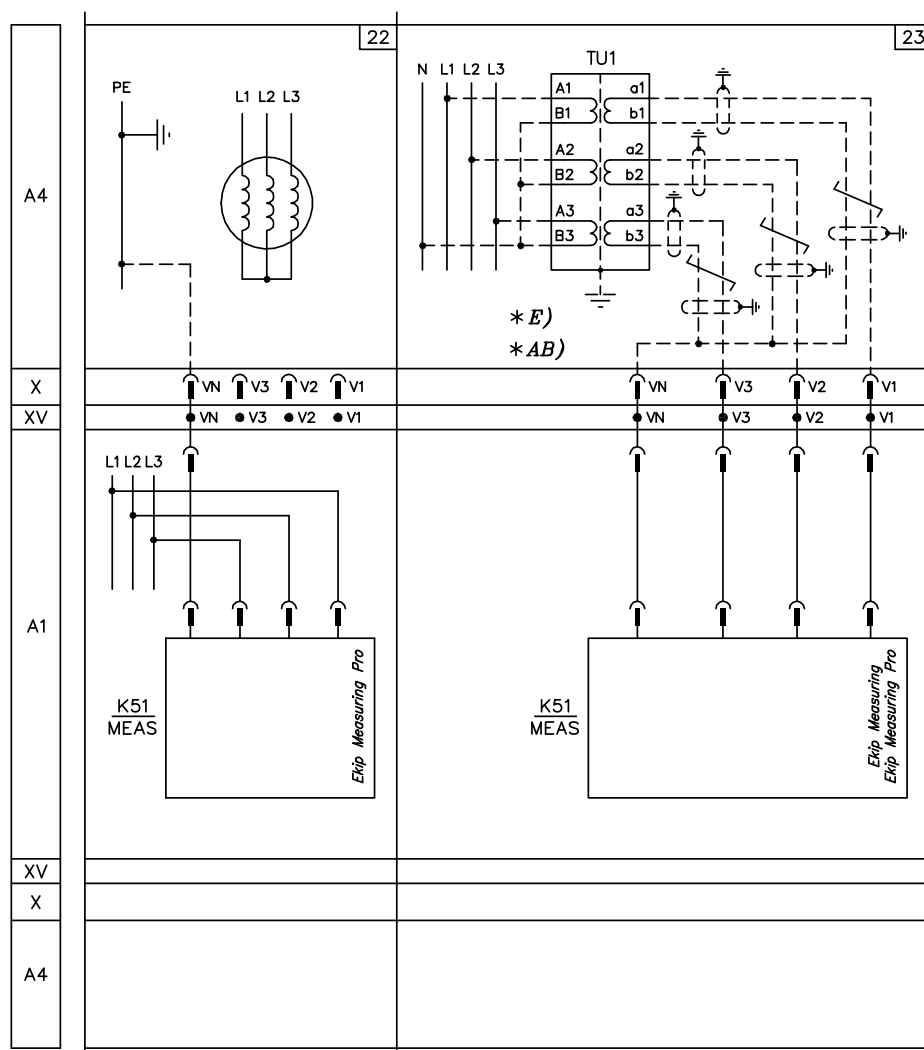
### 24a) Rc differential ground fault protection (ANSI 87N)



As an alternative to figure 25



- 22) Ekip Measuring Pro for residual voltage protection (for Ekip G only)  
23) Ekip Measuring/Measuring Pro with external voltage socket



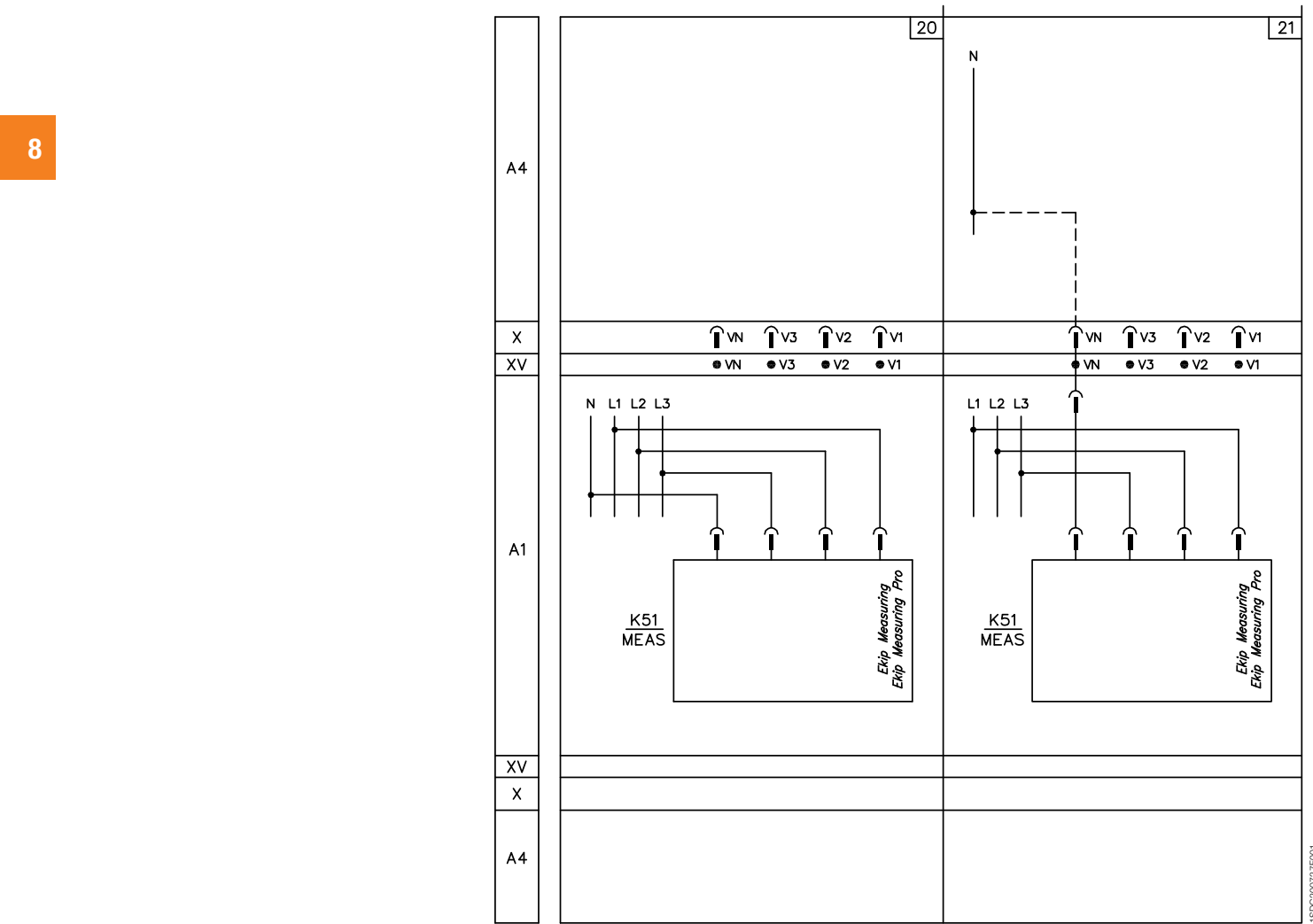
As an alternative to each other or to 20-21 diagram

# Electrical diagrams

## Electrical accessories



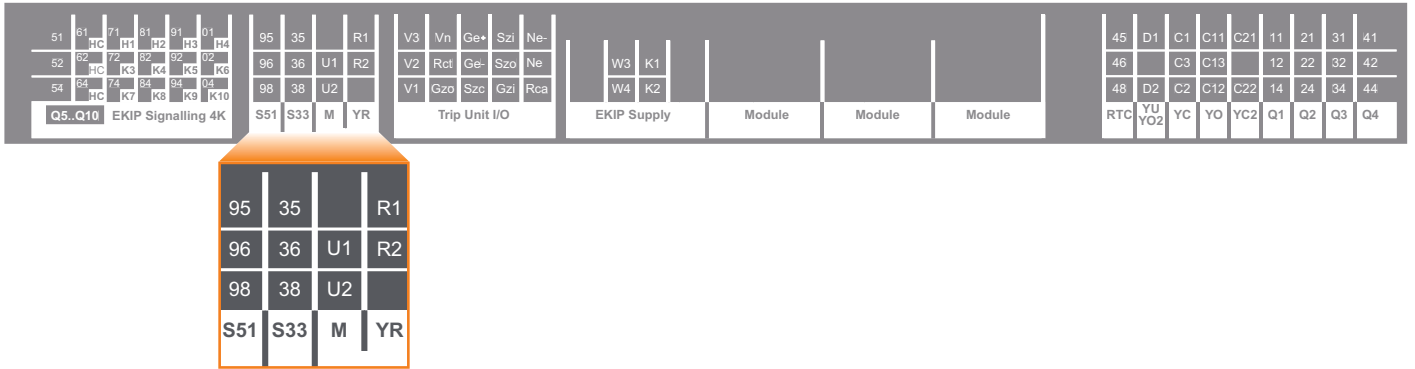
- 20) Ekip Measuring/Measuring Pro with voltage socket inside the four pole circuit-breaker
- 21) Ekip Measuring/Measuring Pro with voltage sockets inside the three-pole circuit-breaker and connection to the external neutral



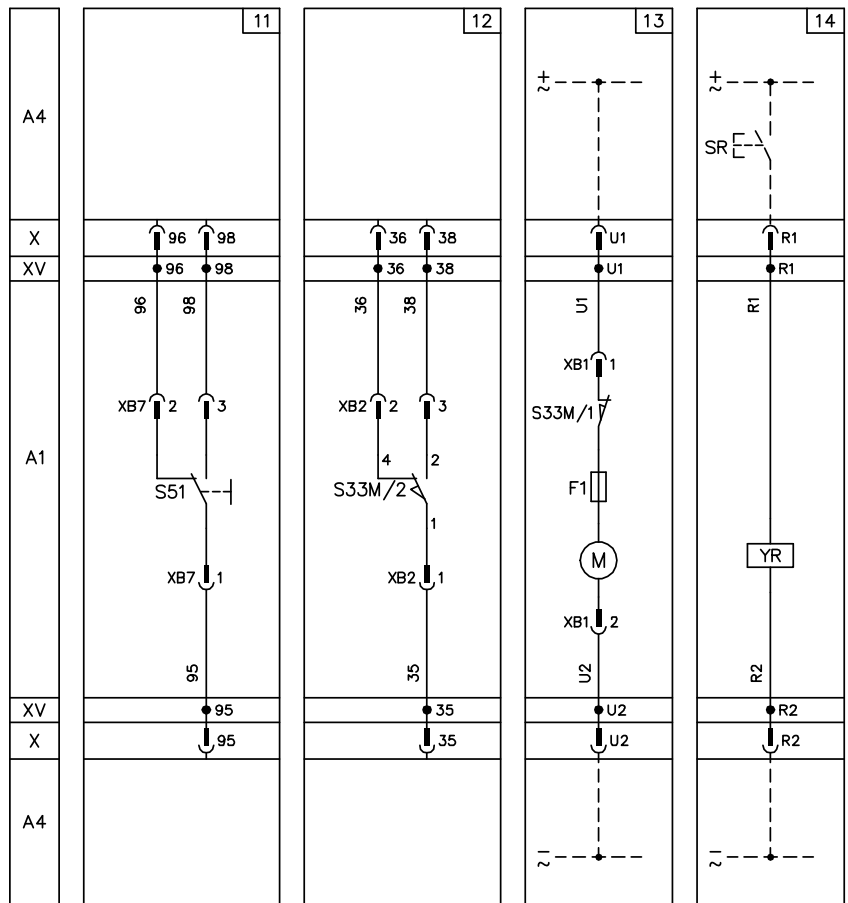
As an alternative to each other or to 22-23 diagram



Electrical diagrams  
Electrical accessories



- 11) Trip signalling contact - S51
- 12) Contact for signalling position of loaded springs - S33 M/2
- 13) Motor for loading closing springs - M
- 14) Trip contact reset coil – YR

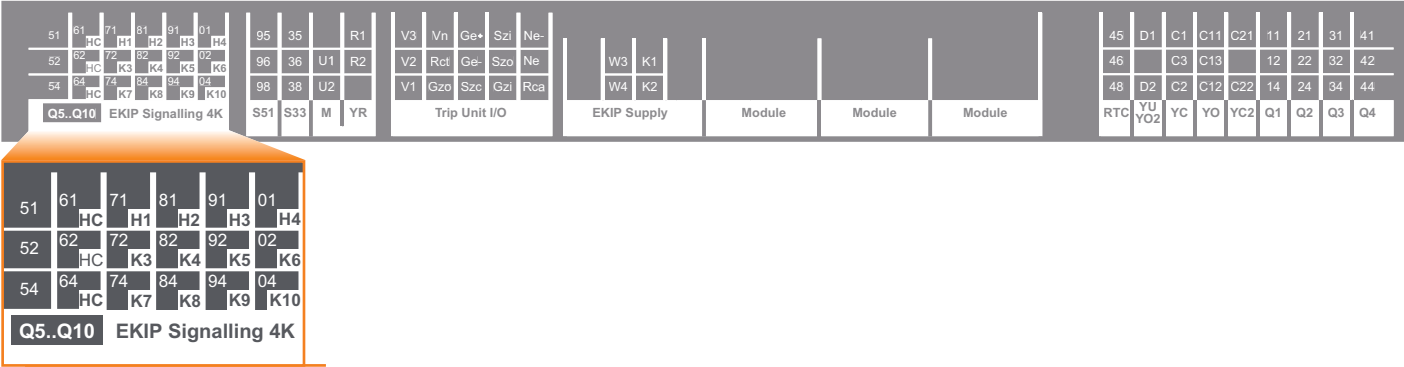


\*D)

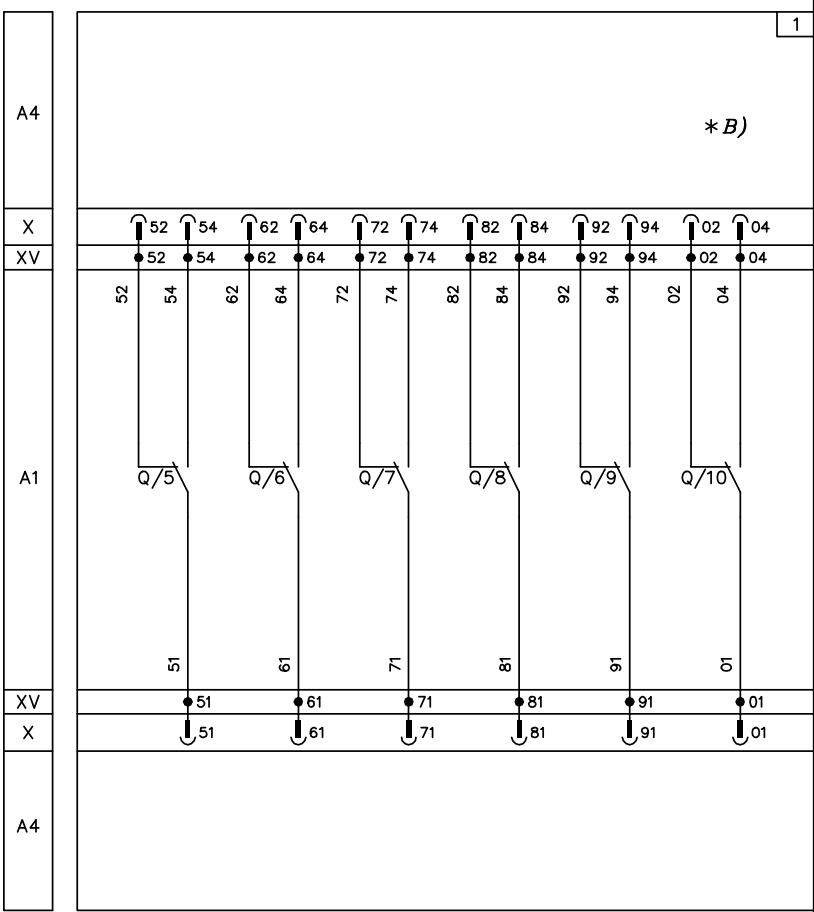
|    |    |    |    |    |     |
|----|----|----|----|----|-----|
| 51 | 61 | 71 | 81 | 91 | 01  |
|    | HC | H1 | H2 | H3 | H4  |
| 52 | 62 | 72 | 82 | 92 | 02  |
|    | HC | K3 | K4 | K5 | K6  |
| 54 | 64 | 74 | 84 | 94 | 04  |
|    | HC | K7 | K8 | K9 | K10 |

**Q5..Q10** EKIP Signalling 4K

Electrical diagrams  
Electrical accessories

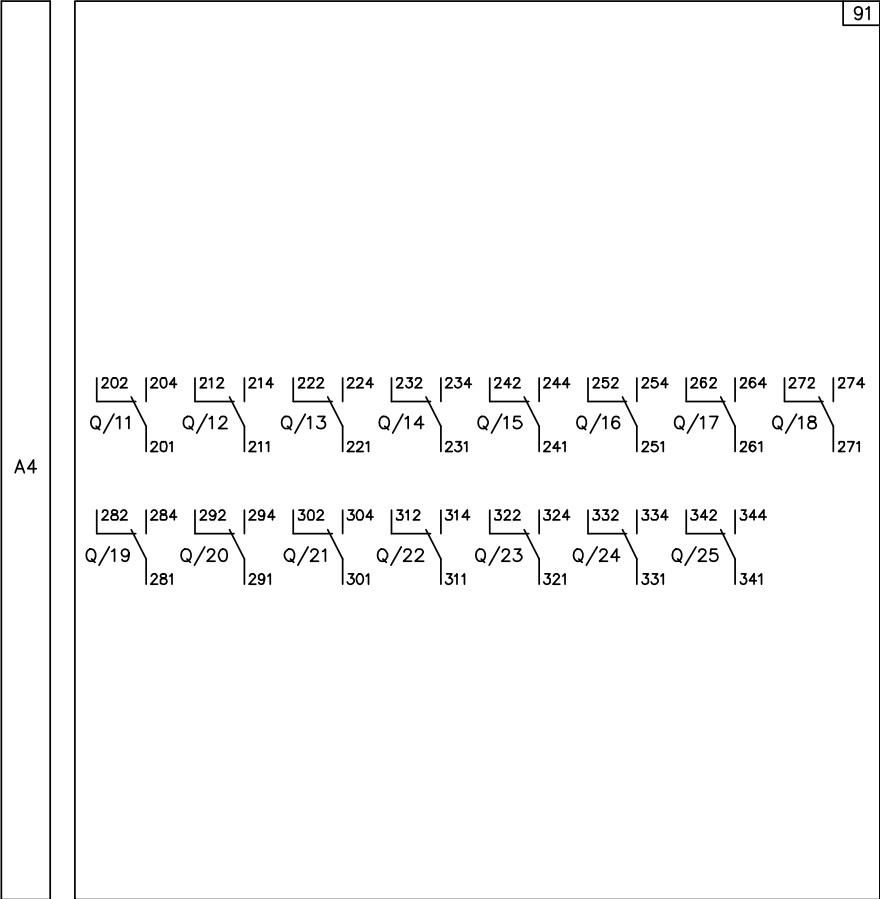


1) Supplementary open/closed auxiliary contacts of the circuit-breaker - AUX 6Q (6 Form C)



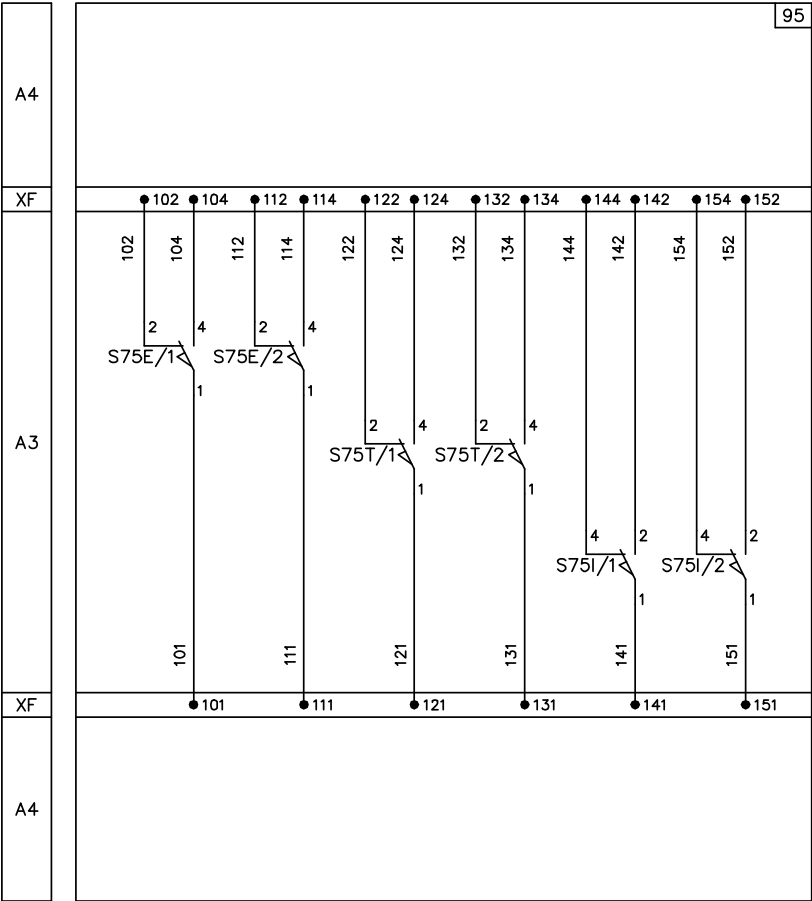
Only for circuit-breakers E2.2, E4.2, E6.2 (as an alternative to figure 2)

91) Supplementary open/closed auxiliary contacts outside the circuit-breaker - AUX 15Q (15 Form C)



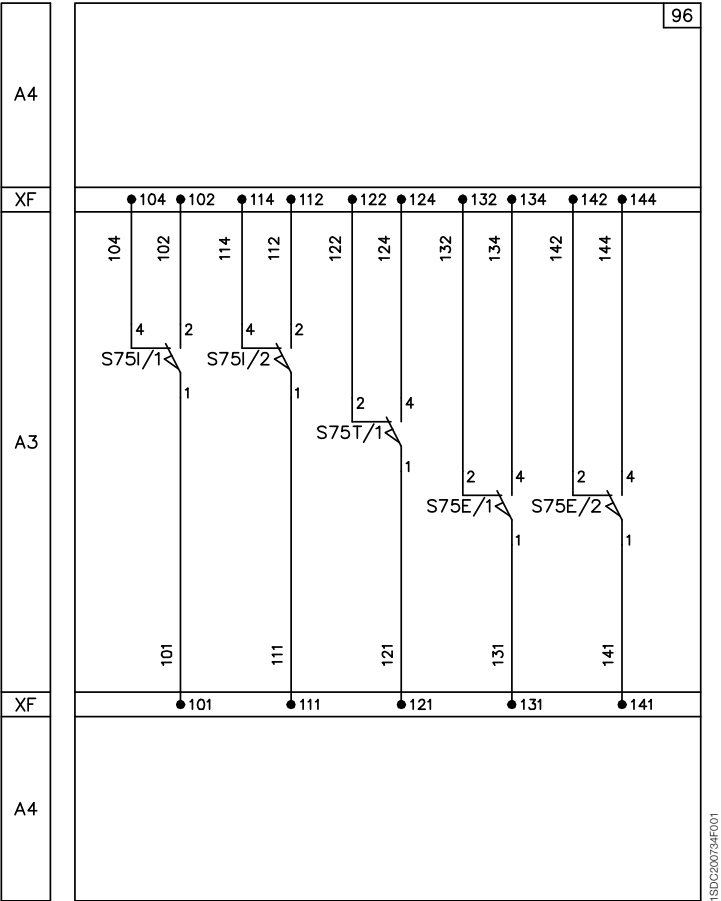
95) Contacts for signalling of circuit-breaker in racked-in, test, racked-out position

8



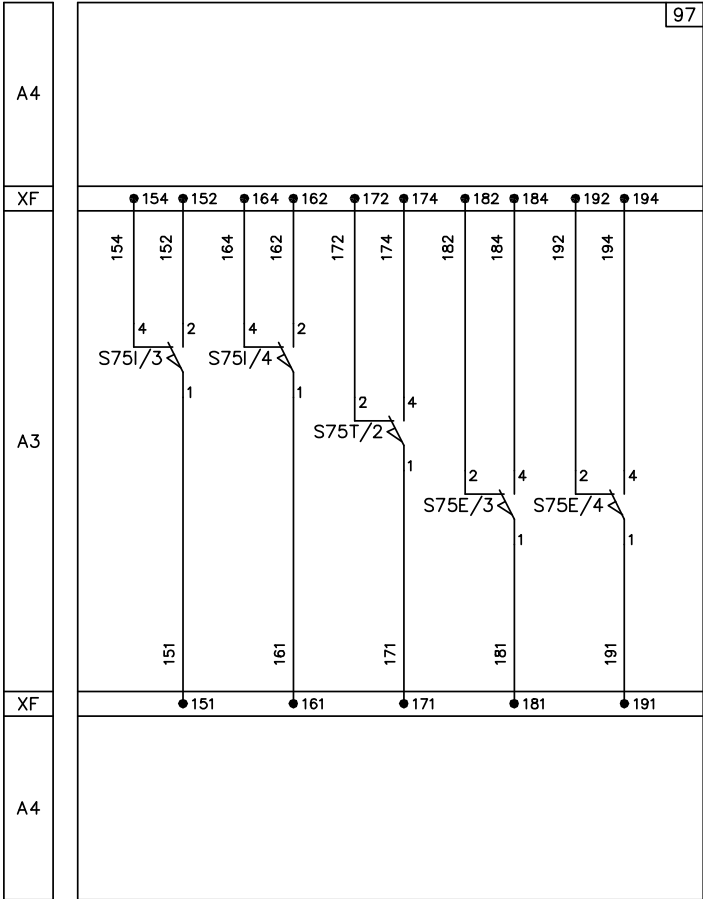
Only for circuit-breakers E1.2 in withdrawable version

96) Contacts for signalling of circuit-breaker in racked-in, test, racked-out position (first set)



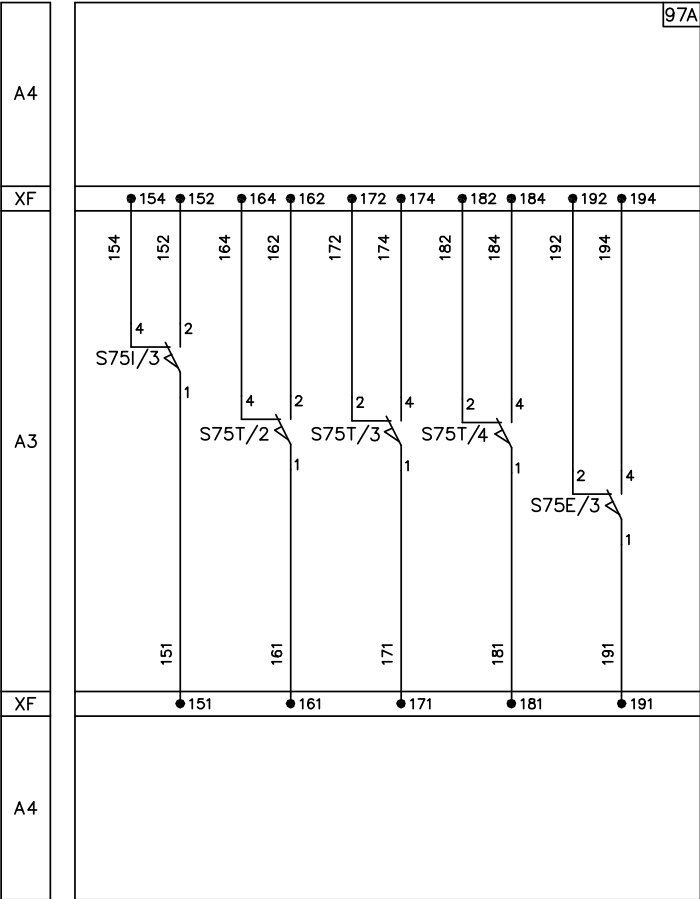
Only for circuit-breakers E2.2, E4.2, E6.2 in withdrawable version

97) Contacts for signalling of circuit-breaker in racked-in, test, racked-out position (second set)



Only for circuit-breakers E2.2, E4.2, E6.2 in withdrawable version

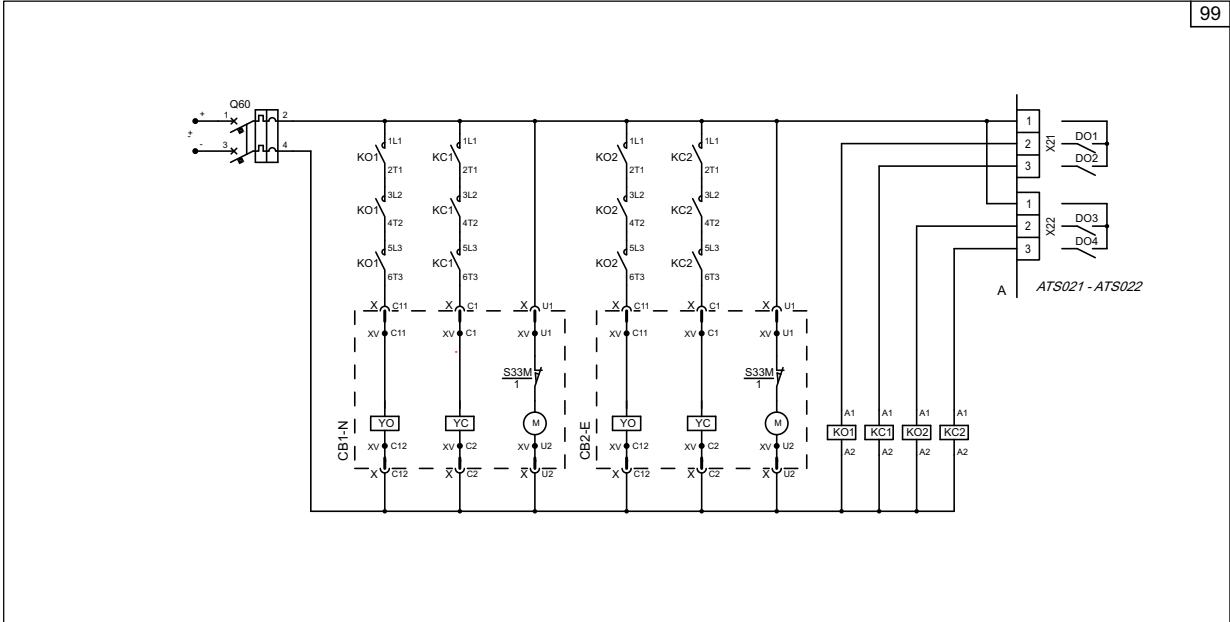
97A) Contacts for signalling of circuit-breaker in racked-in, test, racked-out position (second set)



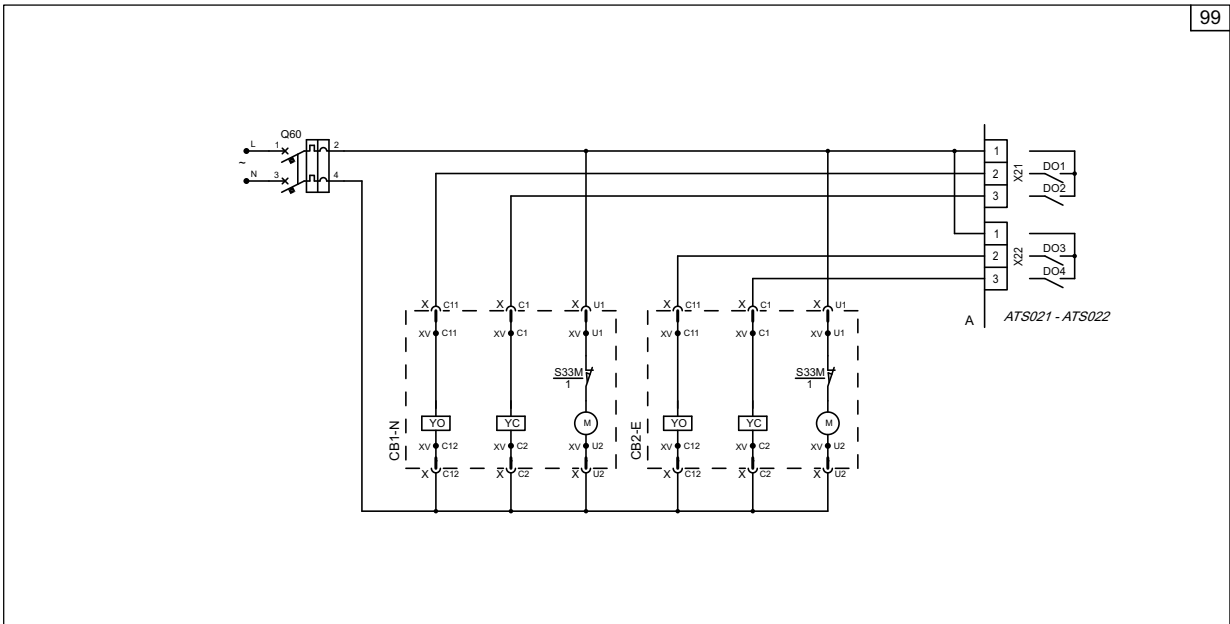
# Electrical diagrams

## Electrical accessories

### 99) Circuit-breakers with auxiliary safety voltage in direct current



### 99) Circuit-breakers with auxiliary safety voltage in alternating current

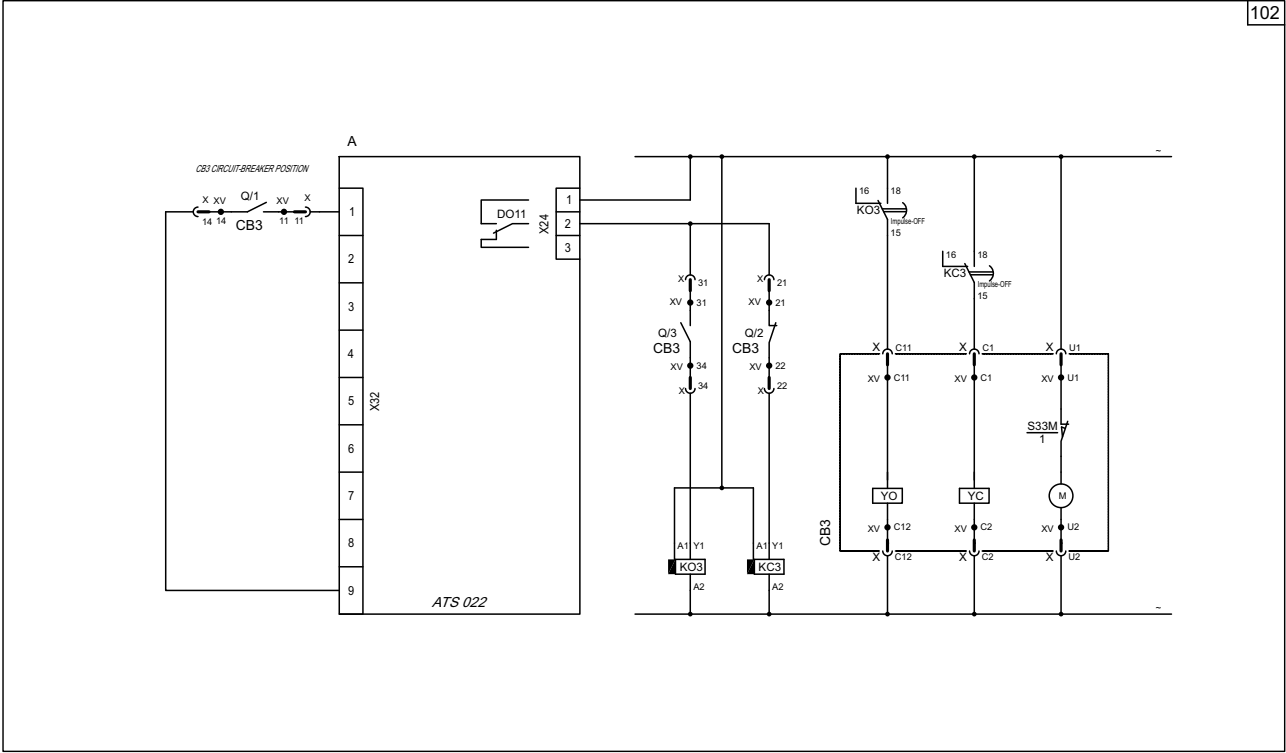




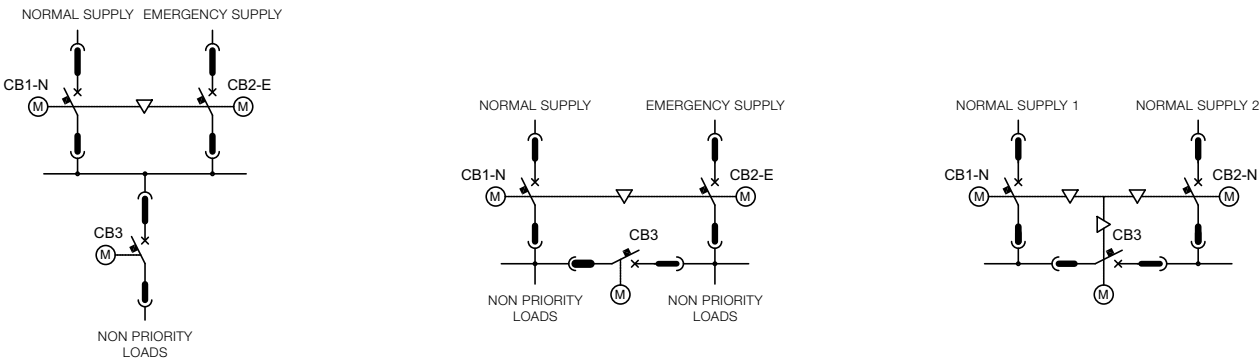
# Electrical diagrams

## ATS021 and ATS022

### 102) Third circuit-breaker control with ATS022



### Possible configurations - ATS022 with three circuit-breakers

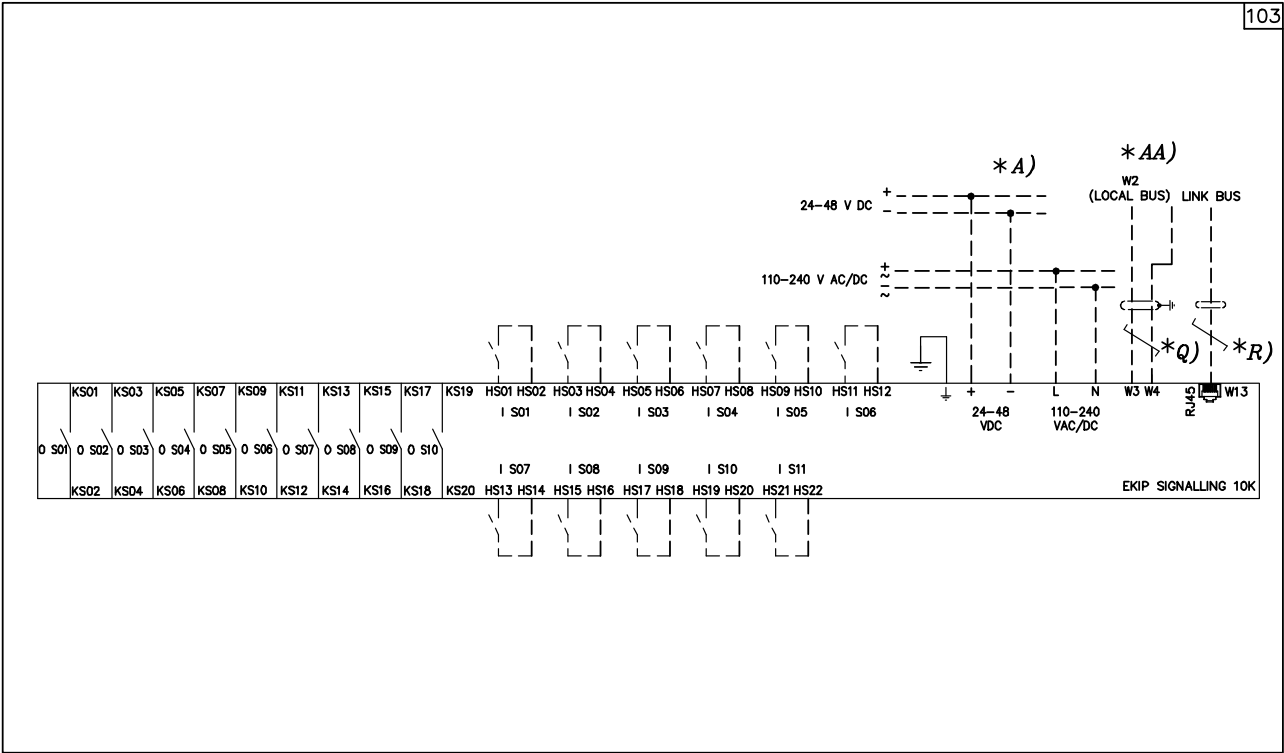


Note: Use auxiliary voltage of 110-130V AC or 220-240V AC.

# Electrical diagrams

## Power Controller

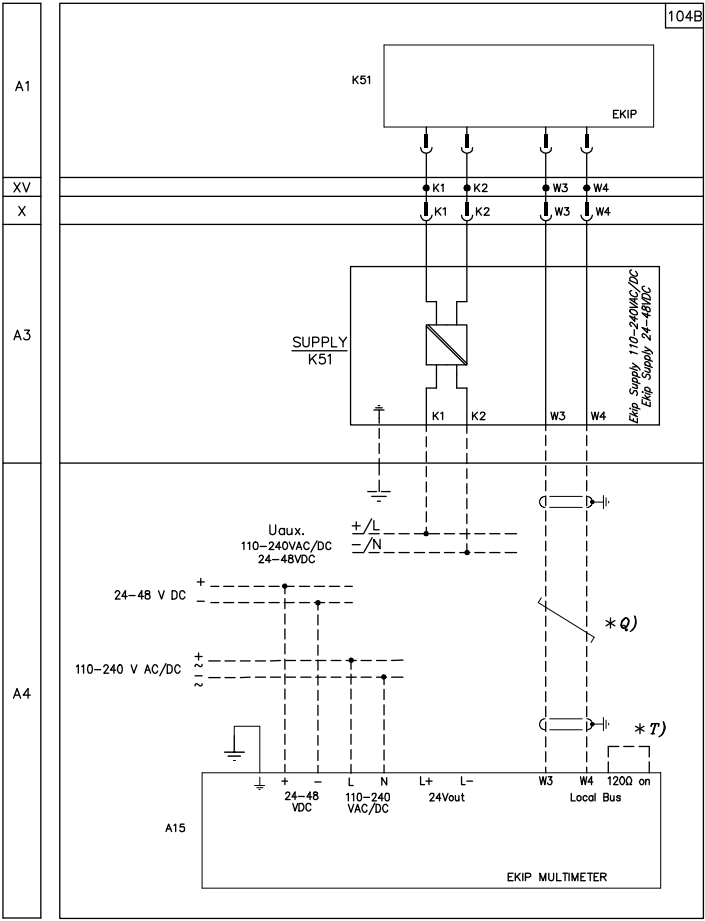
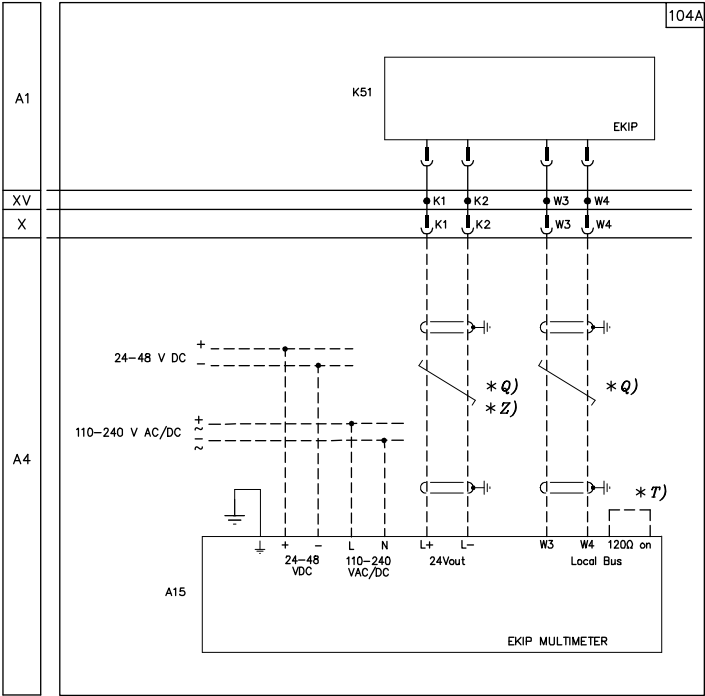
### 103) Ekip Signalling 10K



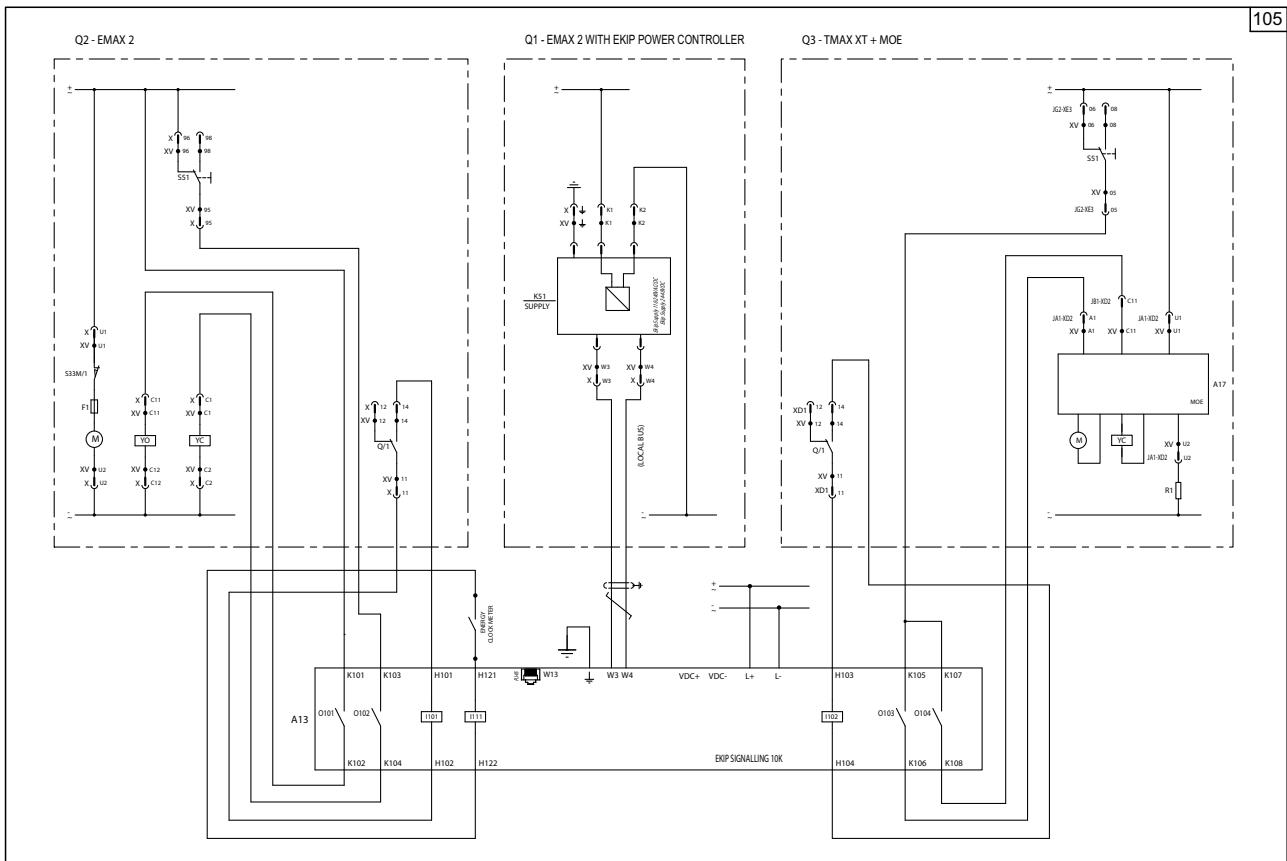
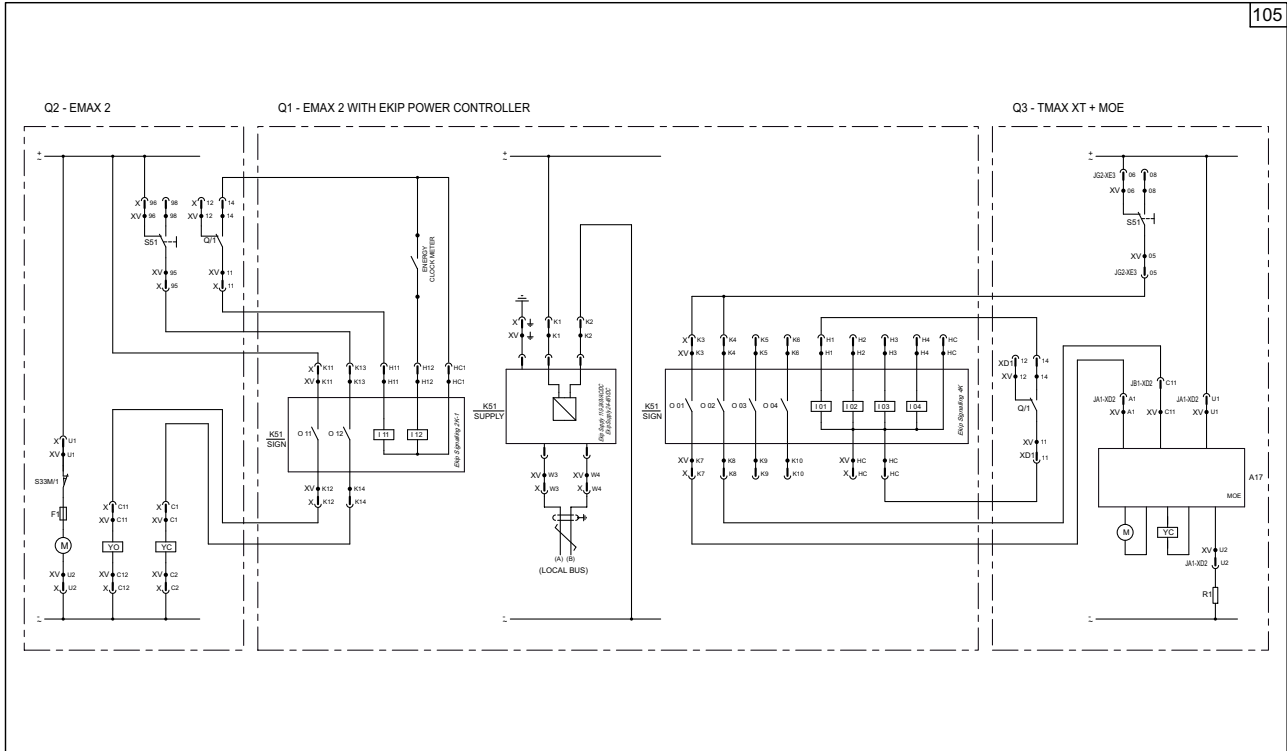
# Electrical diagrams

## Power Controller

### 104) Ekip Multimeter

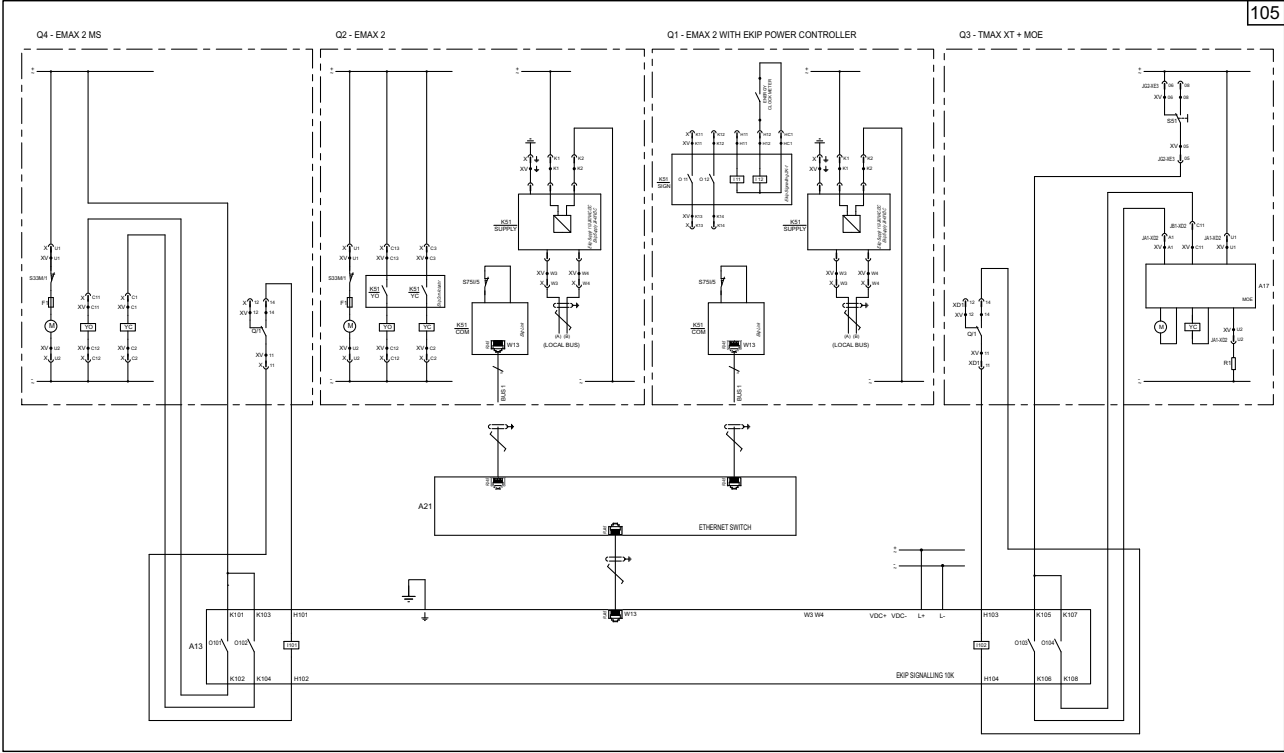


# 105) Application diagram for Ekip Touch, Hi-Touch, G Touch, G Hi-Touch with Power Controller function



# Electrical diagrams

## Power Controller



105

1SDC200658EN001

# Ordering codes

## Instructions for ordering

|                   |     |
|-------------------|-----|
| Ordering examples | 9/2 |
|-------------------|-----|

## General information

9/5

### Automatic circuit-breakers

|                                             |      |
|---------------------------------------------|------|
| Fixed version for power distribution        | 9/6  |
| Withdrawable version for power distribution | 9/21 |
| Fixed version for generators                | 9/35 |
| Withdrawable version for generators         | 9/40 |

### Switch-disconnectors

|                                                      |      |
|------------------------------------------------------|------|
| Fixed version                                        | 9/45 |
| Withdrawable version                                 | 9/48 |
| Version for applications up to 1150V AC              | 9/50 |
| Fixed version for applications up to 1000V DC        | 9/51 |
| Withdrawable version for applications up to 1000V DC | 9/52 |

### Derived versions

|                                      |      |
|--------------------------------------|------|
| Sectionalizing truck                 | 9/53 |
| Earthing truck                       | 9/53 |
| Earthing switch with making capacity | 9/53 |

### Fixed parts

9/54

### Accessories

|                        |      |
|------------------------|------|
| Electrical accessories | 9/55 |
| Mechanical accessories | 9/58 |
| Mechanical interlock   | 9/61 |
| Ekip modules           | 9/62 |
| Terminals              | 9/65 |
| Service                | 9/70 |
| Spare Parts            | 9/71 |

# Instructions for ordering

## Ordering examples

Standard version Emax 2 series circuit-breakers are identified by means of commercial codes that can be accessorized.

### Ordering examples

- **Terminal kit codes** (other than standard supply) for fixed circuit-breaker or for fixed part of withdrawable circuit-breaker.  
The codes refer to 3 or 4 pieces (for mounting on top or bottom terminals).  
To convert a complete circuit-breaker, 1 kit for upper terminals and 1 kit for lower terminals must be specified in the order.

#### Example no. 1

##### Emax E2.2N 3 poles fixed with vertical rear terminals (VR)

|              |                                    |
|--------------|------------------------------------|
| 1SDA071066R1 | E2.2N 2500 Ekip Touch LSIG 3p F HR |
| 1SDA074009R1 | Kit VR Sup E2.2 lu=2500 3pcs INST  |
| 1SDA074011R1 | Kit VR Inf E2.2 lu=2500 3pcs INST  |

#### Example no. 2

##### Emax E1.2N 4 poles fixed with upper vertical rear (VR) and front (F) terminals (standard supply)

|              |                                 |
|--------------|---------------------------------|
| 1SDA071513R1 | E1.2N 1600 Ekip Dip LSIG 4p F F |
| 1SDA073986R1 | Kit VR Upper E1.2 F 4pcs INST   |

#### Example no. 3

##### Emax E4.2H 3 poles fixed with upper front terminals (F) and adjustable rear bottom vertical (VR) terminals

|              |                                       |
|--------------|---------------------------------------|
| 1SDA071169R1 | E4.2H 3200 Ekip Hi-Touch LSIG 3p F HR |
| 1SDA074126R1 | Kit F upper E4.2 F 3pcs INST          |
| 1SDA074017R1 | Kit VR lower E4.2 lu=3200 3pcs INST   |

#### Example no. 4

##### Emax E2.2 2000A 3 poles fixed part with spread upper vertical terminals (SVR) and rear bottom adjustable horizontal (HR) terminals (standard supply)

|              |                                      |
|--------------|--------------------------------------|
| 1SDA073909R1 | E2.2 W FP lu=2000 3p HR HR           |
| 1SDA074057R1 | Kit SVR upper E2.2 lu=2000 3pcs INST |

- **Rating Plug for lower values than rated current.**

Rating plug installed on the circuit-breaker enables to obtain lower current values than rated current.

#### Example no. 5

##### Emax E2.2S 2500 4 poles fixed In=1600A

|              |                                    |
|--------------|------------------------------------|
| 1SDA071706R1 | E2.2S 2500 Ekip Touch LSIG 4p F HR |
| 1SDA074266R1 | Rating Plug 1600 E1.2..E6.2 INST   |

- **Special version for rated service voltages up to 1150V AC.**

Upgrade kits for SACE Emax 2 circuit-breakers enables the version for applications up to 1150V AC.

#### Example no. 6

##### Emax E6.2X 6300 4 poles fixed for applications up to 1150V AC

|              |                                         |
|--------------|-----------------------------------------|
| 1SDA071949R1 | E6.2X 6300 Ekip HI-Touch LSIG 4p F HR   |
| 1SDA074347R1 | E6.2X/E lu=6300 Upgrade Kit 1150V AC 4p |

– **Ordering for Ekip modules.**

Ekip Supply module enables Ekip Com, Ekip Link, Ekip 2K, Ekip Syncrocheck cartridge modules to be installed.

In addition to Ekip Supply modules, up to 3 cartridge modules can be installed on E2.2, E4.2 and E6.2 and up to 2 modules on E1.2.

**Example no. 7**

**Emax E4.2H 3 poles fixed with modules: Ekip Supply, Ekip Com Modbus TCP, Ekip Signalling 2K-1, Ekip Com Modbus TCP Redundant and Ekip Signalling 4K**

|              |                                       |
|--------------|---------------------------------------|
| 1SDA071169R1 | E4.2H 3200 Ekip Hi-Touch LSiG 3p F HR |
| 1SDA074173R1 | Ekip Supply 24-48V DC E1.2..E6.2      |
| 1SDA074151R1 | Ekip Com Modbus TCP E1.2..E6.2        |
| 1SDA074158R1 | Ekip Com R Modbus TCP E1.2..E6.2      |
| 1SDA074167R1 | Ekip Sign. 2K-1 E1.2..E6.2            |
| 1SDA074170R1 | Ekip Sign. 4K E2.2..E6.2              |

**Example no. 8**

**Emax E4.2H 3 poles fixed with modules: Ekip Supply, Ekip Com EtherNet/IP™, Ekip Com Modbus RS-485 and Ekip Measuring Pro**

|              |                                    |
|--------------|------------------------------------|
| 1SDA071166R1 | E4.2H 3200 Ekip Touch LSiG 3p F HR |
| 1SDA074173R1 | Ekip Supply 24-48V DC E1.2..E6.2   |
| 1SDA074155R1 | Ekip Com EtherNet/IP™ E1.2..E6.2   |
| 1SDA074150R1 | Ekip Com Modbus RS-485 E1.2..E6.2  |
| 1SDA074189R1 | Ekip Measuring Pro E4.2            |

**Example no. 9**

**Emax E1.2N 4 poles fixed with modules: Ekip Supply, Ekip Link**

|              |                                       |
|--------------|---------------------------------------|
| 1SDA071513R1 | E1.2N 1600 Ekip Dip LSiG 4p F F       |
| 1SDA074172R1 | Ekip Supply 110-240V AC/DC E1.2..E6.2 |
| 1SDA074163R1 | Ekip Link E1.2..E6.2                  |

– **Ordering for electrical accessories.**

All the accessories are available. In particular, up to 3 coils can be ordered for E1.2, whereas up to 4 coils for E2.2, E4.2 and E6.2.

**Example no. 10**

**Emax E2.2S 3 poles withdrawable with accessories: opening release, closing release, motor for automatic charging of the springs, second opening release**

|              |                                       |
|--------------|---------------------------------------|
| 1SDA072395R1 | E2.2S 2000 Ekip Touch LSi LSiG 3p WMP |
| 1SDA073674R1 | YO E1.2..E6.2 220-240V AC/DC          |
| 1SDA073687R1 | YC E1.2..E6.2 220-240V AC/DC          |
| 1SDA073725R1 | M E2.2...E6.2 220-250V AC/DC          |
| 1SDA073674R1 | YO E1.2..E6.2 220-240V AC/DC          |

– **Ordering for key locks.**

**Example no. 11**

**Emax E2.2N 3 poles with double key lock in racked-in / test / racked-out position, using different keys**

|              |                                             |
|--------------|---------------------------------------------|
| 1SDA071066R1 | E2.2N 2500 Ekip Touch LSiG 3p F HR          |
| 1SDA073806R1 | KLP-D Bl. Racked in/out E2.2...E6.2 1st key |
| 1SDA073812R1 | KLP-D Bl. Racked in/out E2.2...E6.2 2nd key |

# Instructions for ordering

## Ordering examples

– Ordering for mechanical Interlocks.

Interlocks have several strategy configuration, suitable for fixed circuit-breakers and withdrawable circuit-breakers.

Each configuration requires different groups:

- **Cables**, select one Kit for strategy A / B / C / D. The cables must be ordered on fixed circuit-breaker or fixed part of withdrawable circuit-breaker.
- **Lever**, required only for E2.2, E4.2 and E6.2. These lever must be mounted on fixed circuit-breaker or on mobile part of withdrawable circuit-breaker.
- **Support**, installed on fixed circuit-breaker or on fixed part of withdrawable circuit-breaker. This support is mounted on the external right side of the circuit-breaker.

Example no. 12

Interlock between two fixed circuit-breakers: E1.2 and E2.2

| E1.2 Fixed circuit-breaker | E2.2 Fixed circuit-breaker |
|----------------------------|----------------------------|
| Cables [Group 1]: 1 Item   | Lever [Group 2]: 1 Item    |
| Support [Group 3]: 1 Item  | Support [Group 3]: 1 Item  |

Example no. 13

Interlock between three fixed circuit-breakers: one E2.2 and two E4.2

| E2.2 Fixed circuit-breaker | E4.2 Fixed circuit-breaker | E4.2 Fixed circuit-breaker |
|----------------------------|----------------------------|----------------------------|
| Cables [Group 1]: 1 Item   | Lever [Group 2]: 1 Item    | Lever [Group 2]: 1 Item    |
| Lever [Group 2]: 1 Item    | Support [Group 3]: 1 Item  | Support [Group 3]: 1 Item  |
| Support [Group 3]: 1 Item  |                            |                            |

Example no. 14

Interlock between two withdrawable circuit-breakers: E1.2 and E2.2

| E1.2 Fixed Part           | E2.2 Mobile Part          |
|---------------------------|---------------------------|
| Cables [Group 1]: 1 Item  | Lever [Group 2]: 1 Item   |
| Support [Group 4]: 1 Item | +                         |
|                           | E2.2 Fixed Part           |
|                           | Support [Group 4]: 1 Item |

Example no. 15

Interlock between three withdrawable circuit-breakers: one E2.2 and two E4.2

| E2.2 Mobile Part          | E4.2 Mobile Part          | E4.2 Mobile Part          |
|---------------------------|---------------------------|---------------------------|
| Lever [Group 2]: 1 Item   | Lever [Group 2]: 1 Item   | Lever [Group 2]: 1 Item   |
| +                         |                           |                           |
| E2.2 Fixed Part           | E4.2 Fixed Part           | E4.2 Fixed Part           |
| Cables [Group 1]: 1 Item  | Support [Group 4]: 1 Item | Support [Group 4]: 1 Item |
| Support [Group 4]: 1 Item |                           |                           |

# General informations

## Abbreviations used for the description of the product

### Versions and terminals

|                |                                                      |
|----------------|------------------------------------------------------|
| <b>F</b>       | Fixed circuit-breaker                                |
| <b>W</b>       | Withdrawable circuit-breaker                         |
| <b>MP</b>      | Mobile part of withdrawable circuit-breaker          |
| <b>FP</b>      | Fixed part of withdrawable circuit-breaker           |
| <b>Iu</b>      | Rated uninterrupted current                          |
| <b>In</b>      | Rated current of the rating plug                     |
| <b>Icu</b>     | Rated ultimate short-circuit breaking capacity       |
| <b>Icw</b>     | Rated short-time withstand current                   |
| <b>/MS</b>     | Switch-disconnector                                  |
| <b>/E</b>      | Circuit-breakers for 1150V applications              |
| <b>/f</b>      | Four-pole circuit-breakers with neutral pole at 100% |
| <b>CS</b>      | Sectionalizing truck                                 |
| <b>MT</b>      | Earthing truck                                       |
| <b>MTP</b>     | Earthing switch with making capacity                 |
| <b>HR VR</b>   | Rear orientable terminals                            |
| <b>SHR</b>     | Horizontal rear spread terminals                     |
| <b>SVR</b>     | Vertical rear spread terminals                       |
| <b>F</b>       | Front terminals                                      |
| <b>FL</b>      | Flat terminals                                       |
| <b>EF</b>      | Extended front terminals                             |
| <b>ES</b>      | Front spread terminals                               |
| <b>Fc CuAl</b> | Terminals for cables                                 |

### Protection trip units and functions

|                         |                                                                                     |
|-------------------------|-------------------------------------------------------------------------------------|
| <b>Ekip Dip</b>         | Protection trip unit for power distribution                                         |
| <b>Ekip Touch</b>       | Measurement and protection trip unit for power distribution                         |
| <b>Ekip Hi Touch</b>    | Measurement and protection trip unit and network analyzer for power distribution    |
| <b>Ekip G Touch</b>     | Measurement and protection trip unit for generators                                 |
| <b>Ekip G Hi-Touch</b>  | Measurement and protection trip unit and protection network analyzer for generators |
| <b>L</b>                | Overload protection                                                                 |
| <b>S</b>                | Protection against selective short circuit                                          |
| <b>I</b>                | Protection against instantaneous short circuit                                      |
| <b>G</b>                | Earth fault protection                                                              |
| <b>Rc</b>               | Residual current protection                                                         |
| <b>Power Controller</b> | Load management function                                                            |

# Automatic circuit-breakers

## Fixed version for power distribution



### SACE Emax E1.2B • Front terminals (F)

| Size  | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      | 4 Poles      |
|-------|------|----------------|-------------|-------------------------------|--------------|--------------|
|       |      |                |             |                               | Code         | Code         |
| E1.2B | 630  | 42             | 42          | E1.2B 630 Ekip Dip LI         | 1SDA070701R1 | 1SDA071331R1 |
|       |      |                |             | E1.2B 630 Ekip Dip LSI        | 1SDA070702R1 | 1SDA071332R1 |
|       |      |                |             | E1.2B 630 Ekip Dip LSIG       | 1SDA070703R1 | 1SDA071333R1 |
|       |      |                |             | E1.2B 630 Ekip Touch LI       | 1SDA070704R1 | 1SDA071334R1 |
|       |      |                |             | E1.2B 630 Ekip Touch LSI      | 1SDA070705R1 | 1SDA071335R1 |
|       |      |                |             | E1.2B 630 Ekip Touch LSIG     | 1SDA070706R1 | 1SDA071336R1 |
|       |      |                |             | E1.2B 630 Ekip Hi-Touch LSI   | 1SDA070708R1 | 1SDA071338R1 |
|       |      |                |             | E1.2B 630 Ekip Hi-Touch LSIG  | 1SDA070709R1 | 1SDA071339R1 |
|       | 800  | 42             | 42          | E1.2B 800 Ekip Dip LI         | 1SDA070741R1 | 1SDA071371R1 |
|       |      |                |             | E1.2B 800 Ekip Dip LSI        | 1SDA070742R1 | 1SDA071372R1 |
|       |      |                |             | E1.2B 800 Ekip Dip LSIG       | 1SDA070743R1 | 1SDA071373R1 |
|       |      |                |             | E1.2B 800 Ekip Touch LI       | 1SDA070744R1 | 1SDA071374R1 |
|       |      |                |             | E1.2B 800 Ekip Touch LSI      | 1SDA070745R1 | 1SDA071375R1 |
|       |      |                |             | E1.2B 800 Ekip Touch LSIG     | 1SDA070746R1 | 1SDA071376R1 |
|       |      |                |             | E1.2B 800 Ekip Hi-Touch LSI   | 1SDA070748R1 | 1SDA071378R1 |
|       |      |                |             | E1.2B 800 Ekip Hi-Touch LSIG  | 1SDA070749R1 | 1SDA071379R1 |
|       | 1000 | 42             | 42          | E1.2B 1000 Ekip Dip LI        | 1SDA070781R1 | 1SDA071411R1 |
|       |      |                |             | E1.2B 1000 Ekip Dip LSI       | 1SDA070782R1 | 1SDA071412R1 |
|       |      |                |             | E1.2B 1000 Ekip Dip LSIG      | 1SDA070783R1 | 1SDA071413R1 |
|       |      |                |             | E1.2B 1000 Ekip Touch LI      | 1SDA070784R1 | 1SDA071414R1 |
|       |      |                |             | E1.2B 1000 Ekip Touch LSI     | 1SDA070785R1 | 1SDA071415R1 |
|       |      |                |             | E1.2B 1000 Ekip Touch LSIG    | 1SDA070786R1 | 1SDA071416R1 |
|       |      |                |             | E1.2B 1000 Ekip Hi-Touch LSI  | 1SDA070788R1 | 1SDA071418R1 |
|       |      |                |             | E1.2B 1000 Ekip Hi-Touch LSIG | 1SDA070789R1 | 1SDA071419R1 |
|       | 1250 | 42             | 42          | E1.2B 1250 Ekip Dip LI        | 1SDA070821R1 | 1SDA071451R1 |
|       |      |                |             | E1.2B 1250 Ekip Dip LSI       | 1SDA070822R1 | 1SDA071452R1 |
|       |      |                |             | E1.2B 1250 Ekip Dip LSIG      | 1SDA070823R1 | 1SDA071453R1 |
|       |      |                |             | E1.2B 1250 Ekip Touch LI      | 1SDA070824R1 | 1SDA071454R1 |
|       |      |                |             | E1.2B 1250 Ekip Touch LSI     | 1SDA070825R1 | 1SDA071455R1 |
|       |      |                |             | E1.2B 1250 Ekip Touch LSIG    | 1SDA070826R1 | 1SDA071456R1 |
|       |      |                |             | E1.2B 1250 Ekip Hi-Touch LSI  | 1SDA070828R1 | 1SDA071458R1 |
|       |      |                |             | E1.2B 1250 Ekip Hi-Touch LSIG | 1SDA070829R1 | 1SDA071459R1 |
|       | 1600 | 42             | 42          | E1.2B 1600 Ekip Dip LI        | 1SDA070861R1 | 1SDA071491R1 |
|       |      |                |             | E1.2B 1600 Ekip Dip LSI       | 1SDA070862R1 | 1SDA071492R1 |
|       |      |                |             | E1.2B 1600 Ekip Dip LSIG      | 1SDA070863R1 | 1SDA071493R1 |
|       |      |                |             | E1.2B 1600 Ekip Touch LI      | 1SDA070864R1 | 1SDA071494R1 |
|       |      |                |             | E1.2B 1600 Ekip Touch LSI     | 1SDA070865R1 | 1SDA071495R1 |
|       |      |                |             | E1.2B 1600 Ekip Touch LSIG    | 1SDA070866R1 | 1SDA071496R1 |
|       |      |                |             | E1.2B 1600 Ekip Hi-Touch LSI  | 1SDA070868R1 | 1SDA071498R1 |
|       |      |                |             | E1.2B 1600 Ekip Hi-Touch LSIG | 1SDA070869R1 | 1SDA071499R1 |



1SDC20061F001

## SACE Emax E1.2C • Front terminals (F)

| Size         | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      | 4 Poles      |
|--------------|------|----------------|-------------|-------------------------------|--------------|--------------|
|              |      |                |             |                               | Code         | Code         |
| <b>E1.2C</b> | 630  | 50             | 42          | E1.2C 630 Ekip Dip LI         | 1SDA070711R1 | 1SDA071341R1 |
|              |      |                |             | E1.2C 630 Ekip Dip LSI        | 1SDA070712R1 | 1SDA071342R1 |
|              |      |                |             | E1.2C 630 Ekip Dip LSIG       | 1SDA070713R1 | 1SDA071343R1 |
|              |      |                |             | E1.2C 630 Ekip Touch LI       | 1SDA070714R1 | 1SDA071344R1 |
|              |      |                |             | E1.2C 630 Ekip Touch LSI      | 1SDA070715R1 | 1SDA071345R1 |
|              |      |                |             | E1.2C 630 Ekip Touch LSIG     | 1SDA070716R1 | 1SDA071346R1 |
|              |      |                |             | E1.2C 630 Ekip Hi-Touch LSI   | 1SDA070718R1 | 1SDA071348R1 |
|              |      |                |             | E1.2C 630 Ekip Hi-Touch LSIG  | 1SDA070719R1 | 1SDA071349R1 |
|              | 800  | 50             | 42          | E1.2C 800 Ekip Dip LI         | 1SDA070751R1 | 1SDA071381R1 |
|              |      |                |             | E1.2C 800 Ekip Dip LSI        | 1SDA070752R1 | 1SDA071382R1 |
|              |      |                |             | E1.2C 800 Ekip Dip LSIG       | 1SDA070753R1 | 1SDA071383R1 |
|              |      |                |             | E1.2C 800 Ekip Touch LI       | 1SDA070754R1 | 1SDA071384R1 |
|              |      |                |             | E1.2C 800 Ekip Touch LSI      | 1SDA070755R1 | 1SDA071385R1 |
|              |      |                |             | E1.2C 800 Ekip Touch LSIG     | 1SDA070756R1 | 1SDA071386R1 |
|              |      |                |             | E1.2C 800 Ekip Hi-Touch LSI   | 1SDA070758R1 | 1SDA071388R1 |
|              |      |                |             | E1.2C 800 Ekip Hi-Touch LSIG  | 1SDA070759R1 | 1SDA071389R1 |
|              | 1000 | 50             | 42          | E1.2C 1000 Ekip Dip LI        | 1SDA070791R1 | 1SDA071421R1 |
|              |      |                |             | E1.2C 1000 Ekip Dip LSI       | 1SDA070792R1 | 1SDA071422R1 |
|              |      |                |             | E1.2C 1000 Ekip Dip LSIG      | 1SDA070793R1 | 1SDA071423R1 |
|              |      |                |             | E1.2C 1000 Ekip Touch LI      | 1SDA070794R1 | 1SDA071424R1 |
|              |      |                |             | E1.2C 1000 Ekip Touch LSI     | 1SDA070795R1 | 1SDA071425R1 |
|              |      |                |             | E1.2C 1000 Ekip Touch LSIG    | 1SDA070796R1 | 1SDA071426R1 |
|              |      |                |             | E1.2C 1000 Ekip Hi-Touch LSI  | 1SDA070798R1 | 1SDA071428R1 |
|              |      |                |             | E1.2C 1000 Ekip Hi-Touch LSIG | 1SDA070799R1 | 1SDA071429R1 |
|              | 1250 | 50             | 42          | E1.2C 1250 Ekip Dip LI        | 1SDA070831R1 | 1SDA071461R1 |
|              |      |                |             | E1.2C 1250 Ekip Dip LSI       | 1SDA070832R1 | 1SDA071462R1 |
|              |      |                |             | E1.2C 1250 Ekip Dip LSIG      | 1SDA070833R1 | 1SDA071463R1 |
|              |      |                |             | E1.2C 1250 Ekip Touch LI      | 1SDA070834R1 | 1SDA071464R1 |
|              |      |                |             | E1.2C 1250 Ekip Touch LSI     | 1SDA070835R1 | 1SDA071465R1 |
|              |      |                |             | E1.2C 1250 Ekip Touch LSIG    | 1SDA070836R1 | 1SDA071466R1 |
|              |      |                |             | E1.2C 1250 Ekip Hi-Touch LSI  | 1SDA070838R1 | 1SDA071468R1 |
|              |      |                |             | E1.2C 1250 Ekip Hi-Touch LSIG | 1SDA070839R1 | 1SDA071469R1 |
|              | 1600 | 50             | 42          | E1.2C 1600 Ekip Dip LI        | 1SDA070871R1 | 1SDA071501R1 |
|              |      |                |             | E1.2C 1600 Ekip Dip LSI       | 1SDA070872R1 | 1SDA071502R1 |
|              |      |                |             | E1.2C 1600 Ekip Dip LSIG      | 1SDA070873R1 | 1SDA071503R1 |
|              |      |                |             | E1.2C 1600 Ekip Touch LI      | 1SDA070874R1 | 1SDA071504R1 |
|              |      |                |             | E1.2C 1600 Ekip Touch LSI     | 1SDA070875R1 | 1SDA071505R1 |
|              |      |                |             | E1.2C 1600 Ekip Touch LSIG    | 1SDA070876R1 | 1SDA071506R1 |
|              |      |                |             | E1.2C 1600 Ekip Hi-Touch LSI  | 1SDA070878R1 | 1SDA071508R1 |
|              |      |                |             | E1.2C 1600 Ekip Hi-Touch LSIG | 1SDA070879R1 | 1SDA071509R1 |

# Automatic circuit-breakers

## Fixed version for power distribution



SACE Emax E1.2N • Front terminals (F)

| Size  | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      |  | 4 Poles      |  |
|-------|------|----------------|-------------|-------------------------------|--------------|--|--------------|--|
|       |      |                |             |                               | Code         |  | Code         |  |
| E1.2N | 250  | 66             | 50          | E1.2N 250 Ekip Dip LI         | 1SDA070691R1 |  | 1SDA071321R1 |  |
|       |      |                |             | E1.2N 250 Ekip Dip LSI        | 1SDA070692R1 |  | 1SDA071322R1 |  |
|       |      |                |             | E1.2N 250 Ekip Dip LSIG       | 1SDA070693R1 |  | 1SDA071323R1 |  |
|       |      |                |             | E1.2N 250 Ekip Touch LI       | 1SDA070694R1 |  | 1SDA071324R1 |  |
|       |      |                |             | E1.2N 250 Ekip Touch LSI      | 1SDA070695R1 |  | 1SDA071325R1 |  |
|       |      |                |             | E1.2N 250 Ekip Touch LSIG     | 1SDA070696R1 |  | 1SDA071326R1 |  |
|       |      |                |             | E1.2N 250 Ekip Hi-Touch LSI   | 1SDA070698R1 |  | 1SDA071328R1 |  |
|       |      |                |             | E1.2N 250 Ekip Hi-Touch LSIG  | 1SDA070699R1 |  | 1SDA071329R1 |  |
|       | 630  | 66             | 50          | E1.2N 630 Ekip Dip LI         | 1SDA070721R1 |  | 1SDA071351R1 |  |
|       |      |                |             | E1.2N 630 Ekip Dip LSI        | 1SDA070722R1 |  | 1SDA071352R1 |  |
|       |      |                |             | E1.2N 630 Ekip Dip LSIG       | 1SDA070723R1 |  | 1SDA071353R1 |  |
|       |      |                |             | E1.2N 630 Ekip Touch LI       | 1SDA070724R1 |  | 1SDA071354R1 |  |
|       |      |                |             | E1.2N 630 Ekip Touch LSI      | 1SDA070725R1 |  | 1SDA071355R1 |  |
|       |      |                |             | E1.2N 630 Ekip Touch LSIG     | 1SDA070726R1 |  | 1SDA071356R1 |  |
|       |      |                |             | E1.2N 630 Ekip Hi-Touch LSI   | 1SDA070728R1 |  | 1SDA071358R1 |  |
|       |      |                |             | E1.2N 630 Ekip Hi-Touch LSIG  | 1SDA070729R1 |  | 1SDA071359R1 |  |
|       | 800  | 66             | 50          | E1.2N 800 Ekip Dip LI         | 1SDA070761R1 |  | 1SDA071391R1 |  |
|       |      |                |             | E1.2N 800 Ekip Dip LSI        | 1SDA070762R1 |  | 1SDA071392R1 |  |
|       |      |                |             | E1.2N 800 Ekip Dip LSIG       | 1SDA070763R1 |  | 1SDA071393R1 |  |
|       |      |                |             | E1.2N 800 Ekip Touch LI       | 1SDA070764R1 |  | 1SDA071394R1 |  |
|       |      |                |             | E1.2N 800 Ekip Touch LSI      | 1SDA070765R1 |  | 1SDA071395R1 |  |
|       |      |                |             | E1.2N 800 Ekip Touch LSIG     | 1SDA070766R1 |  | 1SDA071396R1 |  |
|       |      |                |             | E1.2N 800 Ekip Hi-Touch LSI   | 1SDA070768R1 |  | 1SDA071398R1 |  |
|       |      |                |             | E1.2N 800 Ekip Hi-Touch LSIG  | 1SDA070769R1 |  | 1SDA071399R1 |  |
|       | 1000 | 66             | 50          | E1.2N 1000 Ekip Dip LI        | 1SDA070801R1 |  | 1SDA071431R1 |  |
|       |      |                |             | E1.2N 1000 Ekip Dip LSI       | 1SDA070802R1 |  | 1SDA071432R1 |  |
|       |      |                |             | E1.2N 1000 Ekip Dip LSIG      | 1SDA070803R1 |  | 1SDA071433R1 |  |
|       |      |                |             | E1.2N 1000 Ekip Touch LI      | 1SDA070804R1 |  | 1SDA071434R1 |  |
|       |      |                |             | E1.2N 1000 Ekip Touch LSI     | 1SDA070805R1 |  | 1SDA071435R1 |  |
|       |      |                |             | E1.2N 1000 Ekip Touch LSIG    | 1SDA070806R1 |  | 1SDA071436R1 |  |
|       |      |                |             | E1.2N 1000 Ekip Hi-Touch LSI  | 1SDA070808R1 |  | 1SDA071438R1 |  |
|       |      |                |             | E1.2N 1000 Ekip Hi-Touch LSIG | 1SDA070809R1 |  | 1SDA071439R1 |  |
|       | 1250 | 66             | 50          | E1.2N 1250 Ekip Dip LI        | 1SDA070841R1 |  | 1SDA071471R1 |  |
|       |      |                |             | E1.2N 1250 Ekip Dip LSI       | 1SDA070842R1 |  | 1SDA071472R1 |  |
|       |      |                |             | E1.2N 1250 Ekip Dip LSIG      | 1SDA070843R1 |  | 1SDA071473R1 |  |
|       |      |                |             | E1.2N 1250 Ekip Touch LI      | 1SDA070844R1 |  | 1SDA071474R1 |  |
|       |      |                |             | E1.2N 1250 Ekip Touch LSI     | 1SDA070845R1 |  | 1SDA071475R1 |  |
|       |      |                |             | E1.2N 1250 Ekip Touch LSIG    | 1SDA070846R1 |  | 1SDA071476R1 |  |
|       |      |                |             | E1.2N 1250 Ekip Hi-Touch LSI  | 1SDA070848R1 |  | 1SDA071478R1 |  |
|       |      |                |             | E1.2N 1250 Ekip Hi-Touch LSIG | 1SDA070849R1 |  | 1SDA071479R1 |  |
|       | 1600 | 66             | 50          | E1.2N 1600 Ekip Dip LI        | 1SDA070881R1 |  | 1SDA071511R1 |  |
|       |      |                |             | E1.2N 1600 Ekip Dip LSI       | 1SDA070882R1 |  | 1SDA071512R1 |  |
|       |      |                |             | E1.2N 1600 Ekip Dip LSIG      | 1SDA070883R1 |  | 1SDA071513R1 |  |
|       |      |                |             | E1.2N 1600 Ekip Touch LI      | 1SDA070884R1 |  | 1SDA071514R1 |  |
|       |      |                |             | E1.2N 1600 Ekip Touch LSI     | 1SDA070885R1 |  | 1SDA071515R1 |  |
|       |      |                |             | E1.2N 1600 Ekip Touch LSIG    | 1SDA070886R1 |  | 1SDA071516R1 |  |
|       |      |                |             | E1.2N 1600 Ekip Hi-Touch LSI  | 1SDA070888R1 |  | 1SDA071518R1 |  |
|       |      |                |             | E1.2N 1600 Ekip Hi-Touch LSIG | 1SDA070889R1 |  | 1SDA071519R1 |  |



1SDC20061 F001

## SACE Emax E1.2L • Front terminals (F)

| Size  | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      | 4 Poles      |
|-------|------|----------------|-------------|-------------------------------|--------------|--------------|
|       |      |                |             |                               | Code         | Code         |
| E1.2L | 630  | 130            | 15          | E1.2L 630 Ekip Dip LI         | 1SDA070731R1 | 1SDA071361R1 |
|       |      |                |             | E1.2L 630 Ekip Dip LSI        | 1SDA070732R1 | 1SDA071362R1 |
|       |      |                |             | E1.2L 630 Ekip Dip LSIG       | 1SDA070733R1 | 1SDA071363R1 |
|       |      |                |             | E1.2L 630 Ekip Touch LI       | 1SDA070734R1 | 1SDA071364R1 |
|       |      |                |             | E1.2L 630 Ekip Touch LSI      | 1SDA070735R1 | 1SDA071365R1 |
|       |      |                |             | E1.2L 630 Ekip Touch LSIG     | 1SDA070736R1 | 1SDA071366R1 |
|       |      |                |             | E1.2L 630 Ekip Hi-Touch LSI   | 1SDA070738R1 | 1SDA071368R1 |
|       |      |                |             | E1.2L 630 Ekip Hi-Touch LSIG  | 1SDA070739R1 | 1SDA071369R1 |
|       | 800  | 130            | 15          | E1.2L 800 Ekip Dip LI         | 1SDA070771R1 | 1SDA071401R1 |
|       |      |                |             | E1.2L 800 Ekip Dip LSI        | 1SDA070772R1 | 1SDA071402R1 |
|       |      |                |             | E1.2L 800 Ekip Dip LSIG       | 1SDA070773R1 | 1SDA071403R1 |
|       |      |                |             | E1.2L 800 Ekip Touch LI       | 1SDA070774R1 | 1SDA071404R1 |
|       |      |                |             | E1.2L 800 Ekip Touch LSI      | 1SDA070775R1 | 1SDA071405R1 |
|       |      |                |             | E1.2L 800 Ekip Touch LSIG     | 1SDA070776R1 | 1SDA071406R1 |
|       |      |                |             | E1.2L 800 Ekip Hi-Touch LSI   | 1SDA070778R1 | 1SDA071408R1 |
|       |      |                |             | E1.2L 800 Ekip Hi-Touch LSIG  | 1SDA070779R1 | 1SDA071409R1 |
|       | 1000 | 130            | 15          | E1.2L 1000 Ekip Dip LI        | 1SDA070811R1 | 1SDA071441R1 |
|       |      |                |             | E1.2L 1000 Ekip Dip LSI       | 1SDA070812R1 | 1SDA071442R1 |
|       |      |                |             | E1.2L 1000 Ekip Dip LSIG      | 1SDA070813R1 | 1SDA071443R1 |
|       |      |                |             | E1.2L 1000 Ekip Touch LI      | 1SDA070814R1 | 1SDA071444R1 |
|       |      |                |             | E1.2L 1000 Ekip Touch LSI     | 1SDA070815R1 | 1SDA071445R1 |
|       |      |                |             | E1.2L 1000 Ekip Touch LSIG    | 1SDA070816R1 | 1SDA071446R1 |
|       |      |                |             | E1.2L 1000 Ekip Hi-Touch LSI  | 1SDA070818R1 | 1SDA071448R1 |
|       |      |                |             | E1.2L 1000 Ekip Hi-Touch LSIG | 1SDA070819R1 | 1SDA071449R1 |
|       | 1250 | 130            | 15          | E1.2L 1250 Ekip Dip LI        | 1SDA070851R1 | 1SDA071481R1 |
|       |      |                |             | E1.2L 1250 Ekip Dip LSI       | 1SDA070852R1 | 1SDA071482R1 |
|       |      |                |             | E1.2L 1250 Ekip Dip LSIG      | 1SDA070853R1 | 1SDA071483R1 |
|       |      |                |             | E1.2L 1250 Ekip Touch LI      | 1SDA070854R1 | 1SDA071484R1 |
|       |      |                |             | E1.2L 1250 Ekip Touch LSI     | 1SDA070855R1 | 1SDA071485R1 |
|       |      |                |             | E1.2L 1250 Ekip Touch LSIG    | 1SDA070856R1 | 1SDA071486R1 |
|       |      |                |             | E1.2L 1250 Ekip Hi-Touch LSI  | 1SDA070858R1 | 1SDA071488R1 |
|       |      |                |             | E1.2L 1250 Ekip Hi-Touch LSIG | 1SDA070859R1 | 1SDA071489R1 |

# Automatic circuit-breakers

## Fixed version for power distribution



SACE Emax E2.2B • Orientable rear terminals (HR)

| Size  | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      |  | 4 Poles      |  |
|-------|------|----------------|-------------|-------------------------------|--------------|--|--------------|--|
|       |      |                |             |                               | Code         |  | Code         |  |
| E2.2B | 1600 | 42             | 42          | E2.2B 1600 Ekip Dip LI        | 1SDA070981R1 |  | 1SDA071611R1 |  |
|       |      |                |             | E2.2B 1600 Ekip Dip LSI       | 1SDA070982R1 |  | 1SDA071612R1 |  |
|       |      |                |             | E2.2B 1600 Ekip Dip LSIG      | 1SDA070983R1 |  | 1SDA071613R1 |  |
|       |      |                |             | E2.2B 1600 Ekip Touch LI      | 1SDA070984R1 |  | 1SDA071614R1 |  |
|       |      |                |             | E2.2B 1600 Ekip Touch LSI     | 1SDA070985R1 |  | 1SDA071615R1 |  |
|       |      |                |             | E2.2B 1600 Ekip Touch LSIG    | 1SDA070986R1 |  | 1SDA071616R1 |  |
|       |      |                |             | E2.2B 1600 Ekip Hi-Touch LSI  | 1SDA070988R1 |  | 1SDA071618R1 |  |
|       |      |                |             | E2.2B 1600 Ekip Hi-Touch LSIG | 1SDA070989R1 |  | 1SDA071619R1 |  |
|       | 2000 | 42             | 42          | E2.2B 2000 Ekip Dip LI        | 1SDA071021R1 |  | 1SDA071651R1 |  |
|       |      |                |             | E2.2B 2000 Ekip Dip LSI       | 1SDA071022R1 |  | 1SDA071652R1 |  |
|       |      |                |             | E2.2B 2000 Ekip Dip LSIG      | 1SDA071023R1 |  | 1SDA071653R1 |  |
|       |      |                |             | E2.2B 2000 Ekip Touch LI      | 1SDA071024R1 |  | 1SDA071654R1 |  |
|       |      |                |             | E2.2B 2000 Ekip Touch LSI     | 1SDA071025R1 |  | 1SDA071655R1 |  |
|       |      |                |             | E2.2B 2000 Ekip Touch LSIG    | 1SDA071026R1 |  | 1SDA071656R1 |  |
|       |      |                |             | E2.2B 2000 Ekip Hi-Touch LSI  | 1SDA071028R1 |  | 1SDA071658R1 |  |
|       |      |                |             | E2.2B 2000 Ekip Hi-Touch LSIG | 1SDA071029R1 |  | 1SDA071659R1 |  |



1SDC2000021001

## SACE Emax E2.2N • Orientable rear terminals (HR)

| Size  | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      | 4 Poles      |
|-------|------|----------------|-------------|-------------------------------|--------------|--------------|
|       |      |                |             |                               | Code         | Code         |
| E2.2N | 800  | 66             | 66          | E2.2N 800 Ekip Dip LI         | 1SDA070891R1 | 1SDA071521R1 |
|       |      |                |             | E2.2N 800 Ekip Dip LSI        | 1SDA070892R1 | 1SDA071522R1 |
|       |      |                |             | E2.2N 800 Ekip Dip LSIG       | 1SDA070893R1 | 1SDA071523R1 |
|       |      |                |             | E2.2N 800 Ekip Touch LI       | 1SDA070894R1 | 1SDA071524R1 |
|       |      |                |             | E2.2N 800 Ekip Touch LSI      | 1SDA070895R1 | 1SDA071525R1 |
|       |      |                |             | E2.2N 800 Ekip Touch LSIG     | 1SDA070896R1 | 1SDA071526R1 |
|       |      |                |             | E2.2N 800 Ekip Hi-Touch LSI   | 1SDA070898R1 | 1SDA071528R1 |
|       |      |                |             | E2.2N 800 Ekip Hi-Touch LSIG  | 1SDA070899R1 | 1SDA071529R1 |
|       | 1000 | 66             | 66          | E2.2N 1000 Ekip Dip LI        | 1SDA070921R1 | 1SDA071551R1 |
|       |      |                |             | E2.2N 1000 Ekip Dip LSI       | 1SDA070922R1 | 1SDA071552R1 |
|       |      |                |             | E2.2N 1000 Ekip Dip LSIG      | 1SDA070923R1 | 1SDA071553R1 |
|       |      |                |             | E2.2N 1000 Ekip Touch LI      | 1SDA070924R1 | 1SDA071554R1 |
|       |      |                |             | E2.2N 1000 Ekip Touch LSI     | 1SDA070925R1 | 1SDA071555R1 |
|       |      |                |             | E2.2N 1000 Ekip Touch LSIG    | 1SDA070926R1 | 1SDA071556R1 |
|       |      |                |             | E2.2N 1000 Ekip Hi-Touch LSI  | 1SDA070928R1 | 1SDA071558R1 |
|       |      |                |             | E2.2N 1000 Ekip Hi-Touch LSIG | 1SDA070929R1 | 1SDA071559R1 |
|       | 1250 | 66             | 66          | E2.2N 1250 Ekip Dip LI        | 1SDA070951R1 | 1SDA071581R1 |
|       |      |                |             | E2.2N 1250 Ekip Dip LSI       | 1SDA070952R1 | 1SDA071582R1 |
|       |      |                |             | E2.2N 1250 Ekip Dip LSIG      | 1SDA070953R1 | 1SDA071583R1 |
|       |      |                |             | E2.2N 1250 Ekip Touch LI      | 1SDA070954R1 | 1SDA071584R1 |
|       |      |                |             | E2.2N 1250 Ekip Touch LSI     | 1SDA070955R1 | 1SDA071585R1 |
|       |      |                |             | E2.2N 1250 Ekip Touch LSIG    | 1SDA070956R1 | 1SDA071586R1 |
|       |      |                |             | E2.2N 1250 Ekip Hi-Touch LSI  | 1SDA070958R1 | 1SDA071588R1 |
|       |      |                |             | E2.2N 1250 Ekip Hi-Touch LSIG | 1SDA070959R1 | 1SDA071589R1 |
|       | 1600 | 66             | 66          | E2.2N 1600 Ekip Dip LI        | 1SDA070991R1 | 1SDA071621R1 |
|       |      |                |             | E2.2N 1600 Ekip Dip LSI       | 1SDA070992R1 | 1SDA071622R1 |
|       |      |                |             | E2.2N 1600 Ekip Dip LSIG      | 1SDA070993R1 | 1SDA071623R1 |
|       |      |                |             | E2.2N 1600 Ekip Touch LI      | 1SDA070994R1 | 1SDA071624R1 |
|       |      |                |             | E2.2N 1600 Ekip Touch LSI     | 1SDA070995R1 | 1SDA071625R1 |
|       |      |                |             | E2.2N 1600 Ekip Touch LSIG    | 1SDA070996R1 | 1SDA071626R1 |
|       |      |                |             | E2.2N 1600 Ekip Hi-Touch LSI  | 1SDA070998R1 | 1SDA071628R1 |
|       |      |                |             | E2.2N 1600 Ekip Hi-Touch LSIG | 1SDA070999R1 | 1SDA071629R1 |
|       | 2000 | 66             | 66          | E2.2N 2000 Ekip Dip LI        | 1SDA071031R1 | 1SDA071661R1 |
|       |      |                |             | E2.2N 2000 Ekip Dip LSI       | 1SDA071032R1 | 1SDA071662R1 |
|       |      |                |             | E2.2N 2000 Ekip Dip LSIG      | 1SDA071033R1 | 1SDA071663R1 |
|       |      |                |             | E2.2N 2000 Ekip Touch LI      | 1SDA071034R1 | 1SDA071664R1 |
|       |      |                |             | E2.2N 2000 Ekip Touch LSI     | 1SDA071035R1 | 1SDA071665R1 |
|       |      |                |             | E2.2N 2000 Ekip Touch LSIG    | 1SDA071036R1 | 1SDA071666R1 |
|       |      |                |             | E2.2N 2000 Ekip Hi-Touch LSI  | 1SDA071038R1 | 1SDA071668R1 |
|       |      |                |             | E2.2N 2000 Ekip Hi-Touch LSIG | 1SDA071039R1 | 1SDA071669R1 |
|       | 2500 | 66             | 66          | E2.2N 2500 Ekip Dip LI        | 1SDA071061R1 | 1SDA071691R1 |
|       |      |                |             | E2.2N 2500 Ekip Dip LSI       | 1SDA071062R1 | 1SDA071692R1 |
|       |      |                |             | E2.2N 2500 Ekip Dip LSIG      | 1SDA071063R1 | 1SDA071693R1 |
|       |      |                |             | E2.2N 2500 Ekip Touch LI      | 1SDA071064R1 | 1SDA071694R1 |
|       |      |                |             | E2.2N 2500 Ekip Touch LSI     | 1SDA071065R1 | 1SDA071695R1 |
|       |      |                |             | E2.2N 2500 Ekip Touch LSIG    | 1SDA071066R1 | 1SDA071696R1 |
|       |      |                |             | E2.2N 2500 Ekip Hi-Touch LSI  | 1SDA071068R1 | 1SDA071698R1 |
|       |      |                |             | E2.2N 2500 Ekip Hi-Touch LSIG | 1SDA071069R1 | 1SDA071699R1 |

# Automatic circuit-breakers

## Fixed version for power distribution



### SACE Emax E2.2S • Orientable rear terminals (HR)

| Size  | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      |  | 4 Poles      |  |
|-------|------|----------------|-------------|-------------------------------|--------------|--|--------------|--|
|       |      |                |             |                               | Code         |  | Code         |  |
| E2.2S | 250  | 85             | 66          | E2.2S 250 Ekip Dip LI         | 1SDA073628R1 |  | 1SDA073638R1 |  |
|       |      |                |             | E2.2S 250 Ekip Dip LSI        | 1SDA073629R1 |  | 1SDA073639R1 |  |
|       |      |                |             | E2.2S 250 Ekip Dip LSIG       | 1SDA073630R1 |  | 1SDA073640R1 |  |
|       |      |                |             | E2.2S 250 Ekip Touch LI       | 1SDA073631R1 |  | 1SDA073641R1 |  |
|       |      |                |             | E2.2S 250 Ekip Touch LSI      | 1SDA073632R1 |  | 1SDA073642R1 |  |
|       |      |                |             | E2.2S 250 Ekip Touch LSIG     | 1SDA073633R1 |  | 1SDA073643R1 |  |
|       |      |                |             | E2.2S 250 Ekip Hi-Touch LSI   | 1SDA073635R1 |  | 1SDA073645R1 |  |
|       |      |                |             | E2.2S 250 Ekip Hi-Touch LSIG  | 1SDA073636R1 |  | 1SDA073646R1 |  |
|       | 800  | 85             | 66          | E2.2S 800 Ekip Dip LI         | 1SDA070901R1 |  | 1SDA071531R1 |  |
|       |      |                |             | E2.2S 800 Ekip Dip LSI        | 1SDA070902R1 |  | 1SDA071532R1 |  |
|       |      |                |             | E2.2S 800 Ekip Dip LSIG       | 1SDA070903R1 |  | 1SDA071533R1 |  |
|       |      |                |             | E2.2S 800 Ekip Touch LI       | 1SDA070904R1 |  | 1SDA071534R1 |  |
|       |      |                |             | E2.2S 800 Ekip Touch LSI      | 1SDA070905R1 |  | 1SDA071535R1 |  |
|       |      |                |             | E2.2S 800 Ekip Touch LSIG     | 1SDA070906R1 |  | 1SDA071536R1 |  |
|       |      |                |             | E2.2S 800 Ekip Hi-Touch LSI   | 1SDA070908R1 |  | 1SDA071538R1 |  |
|       |      |                |             | E2.2S 800 Ekip Hi-Touch LSIG  | 1SDA070909R1 |  | 1SDA071539R1 |  |
|       | 1000 | 85             | 66          | E2.2S 1000 Ekip Dip LI        | 1SDA070931R1 |  | 1SDA071561R1 |  |
|       |      |                |             | E2.2S 1000 Ekip Dip LSI       | 1SDA070932R1 |  | 1SDA071562R1 |  |
|       |      |                |             | E2.2S 1000 Ekip Dip LSIG      | 1SDA070933R1 |  | 1SDA071563R1 |  |
|       |      |                |             | E2.2S 1000 Ekip Touch LI      | 1SDA070934R1 |  | 1SDA071564R1 |  |
|       |      |                |             | E2.2S 1000 Ekip Touch LSI     | 1SDA070935R1 |  | 1SDA071565R1 |  |
|       |      |                |             | E2.2S 1000 Ekip Touch LSIG    | 1SDA070936R1 |  | 1SDA071566R1 |  |
|       |      |                |             | E2.2S 1000 Ekip Hi-Touch LSI  | 1SDA070938R1 |  | 1SDA071568R1 |  |
|       |      |                |             | E2.2S 1000 Ekip Hi-Touch LSIG | 1SDA070939R1 |  | 1SDA071569R1 |  |
|       | 1250 | 85             | 66          | E2.2S 1250 Ekip Dip LI        | 1SDA070961R1 |  | 1SDA071591R1 |  |
|       |      |                |             | E2.2S 1250 Ekip Dip LSI       | 1SDA070962R1 |  | 1SDA071592R1 |  |
|       |      |                |             | E2.2S 1250 Ekip Dip LSIG      | 1SDA070963R1 |  | 1SDA071593R1 |  |
|       |      |                |             | E2.2S 1250 Ekip Touch LI      | 1SDA070964R1 |  | 1SDA071594R1 |  |
|       |      |                |             | E2.2S 1250 Ekip Touch LSI     | 1SDA070965R1 |  | 1SDA071595R1 |  |
|       |      |                |             | E2.2S 1250 Ekip Touch LSIG    | 1SDA070966R1 |  | 1SDA071596R1 |  |
|       |      |                |             | E2.2S 1250 Ekip Hi-Touch LSI  | 1SDA070968R1 |  | 1SDA071598R1 |  |
|       |      |                |             | E2.2S 1250 Ekip Hi-Touch LSIG | 1SDA070969R1 |  | 1SDA071599R1 |  |



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## SACE Emax E2.2S • Orientable rear terminals (HR)

| Size  | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      | 4 Poles      |
|-------|------|----------------|-------------|-------------------------------|--------------|--------------|
|       |      |                |             |                               | Code         | Code         |
| E2.2S | 1600 | 85             | 66          | E2.2S 1600 Ekip Dip LI        | 1SDA071001R1 | 1SDA071631R1 |
|       |      |                |             | E2.2S 1600 Ekip Dip LSI       | 1SDA071002R1 | 1SDA071632R1 |
|       |      |                |             | E2.2S 1600 Ekip Dip LSIG      | 1SDA071003R1 | 1SDA071633R1 |
|       |      |                |             | E2.2S 1600 Ekip Touch LI      | 1SDA071004R1 | 1SDA071634R1 |
|       |      |                |             | E2.2S 1600 Ekip Touch LSI     | 1SDA071005R1 | 1SDA071635R1 |
|       |      |                |             | E2.2S 1600 Ekip Touch LSIG    | 1SDA071006R1 | 1SDA071636R1 |
|       |      |                |             | E2.2S 1600 Ekip Hi-Touch LSI  | 1SDA071008R1 | 1SDA071638R1 |
|       |      |                |             | E2.2S 1600 Ekip Hi-Touch LSIG | 1SDA071009R1 | 1SDA071639R1 |
|       | 2000 | 85             | 66          | E2.2S 2000 Ekip Dip LI        | 1SDA071041R1 | 1SDA071671R1 |
|       |      |                |             | E2.2S 2000 Ekip Dip LSI       | 1SDA071042R1 | 1SDA071672R1 |
|       |      |                |             | E2.2S 2000 Ekip Dip LSIG      | 1SDA071043R1 | 1SDA071673R1 |
|       |      |                |             | E2.2S 2000 Ekip Touch LI      | 1SDA071044R1 | 1SDA071674R1 |
|       |      |                |             | E2.2S 2000 Ekip Touch LSI     | 1SDA071045R1 | 1SDA071675R1 |
|       |      |                |             | E2.2S 2000 Ekip Touch LSIG    | 1SDA071046R1 | 1SDA071676R1 |
|       |      |                |             | E2.2S 2000 Ekip Hi-Touch LSI  | 1SDA071048R1 | 1SDA071678R1 |
|       |      |                |             | E2.2S 2000 Ekip Hi-Touch LSIG | 1SDA071049R1 | 1SDA071679R1 |
|       | 2500 | 85             | 66          | E2.2S 2500 Ekip Dip LI        | 1SDA071071R1 | 1SDA071701R1 |
|       |      |                |             | E2.2S 2500 Ekip Dip LSI       | 1SDA071072R1 | 1SDA071702R1 |
|       |      |                |             | E2.2S 2500 Ekip Dip LSIG      | 1SDA071073R1 | 1SDA071703R1 |
|       |      |                |             | E2.2S 2500 Ekip Touch LI      | 1SDA071074R1 | 1SDA071704R1 |
|       |      |                |             | E2.2S 2500 Ekip Touch LSI     | 1SDA071075R1 | 1SDA071705R1 |
|       |      |                |             | E2.2S 2500 Ekip Touch LSIG    | 1SDA071076R1 | 1SDA071706R1 |
|       |      |                |             | E2.2S 2500 Ekip Hi-Touch LSI  | 1SDA071078R1 | 1SDA071708R1 |
|       |      |                |             | E2.2S 2500 Ekip Hi-Touch LSIG | 1SDA071079R1 | 1SDA071709R1 |

# Automatic circuit-breakers

## Fixed version for power distribution



### SACE Emax E2.2H • Orientable rear terminals (HR)

| Size  | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      |  | 4 Poles      |  |
|-------|------|----------------|-------------|-------------------------------|--------------|--|--------------|--|
|       |      |                |             |                               | Code         |  | Code         |  |
| E2.2H | 800  | 100            | 85          | E2.2H 800 Ekip Dip LI         | 1SDA070911R1 |  | 1SDA071541R1 |  |
|       |      |                |             | E2.2H 800 Ekip Dip LSI        | 1SDA070912R1 |  | 1SDA071542R1 |  |
|       |      |                |             | E2.2H 800 Ekip Dip LSIG       | 1SDA070913R1 |  | 1SDA071543R1 |  |
|       |      |                |             | E2.2H 800 Ekip Touch LI       | 1SDA070914R1 |  | 1SDA071544R1 |  |
|       |      |                |             | E2.2H 800 Ekip Touch LSI      | 1SDA070915R1 |  | 1SDA071545R1 |  |
|       |      |                |             | E2.2H 800 Ekip Touch LSIG     | 1SDA070916R1 |  | 1SDA071546R1 |  |
|       |      |                |             | E2.2H 800 Ekip Hi-Touch LSI   | 1SDA070918R1 |  | 1SDA071548R1 |  |
|       |      |                |             | E2.2H 800 Ekip Hi-Touch LSIG  | 1SDA070919R1 |  | 1SDA071549R1 |  |
|       | 1000 | 100            | 85          | E2.2H 1000 Ekip Dip LI        | 1SDA070941R1 |  | 1SDA071571R1 |  |
|       |      |                |             | E2.2H 1000 Ekip Dip LSI       | 1SDA070942R1 |  | 1SDA071572R1 |  |
|       |      |                |             | E2.2H 1000 Ekip Dip LSIG      | 1SDA070943R1 |  | 1SDA071573R1 |  |
|       |      |                |             | E2.2H 1000 Ekip Touch LI      | 1SDA070944R1 |  | 1SDA071574R1 |  |
|       |      |                |             | E2.2H 1000 Ekip Touch LSI     | 1SDA070945R1 |  | 1SDA071575R1 |  |
|       |      |                |             | E2.2H 1000 Ekip Touch LSIG    | 1SDA070946R1 |  | 1SDA071576R1 |  |
|       |      |                |             | E2.2H 1000 Ekip Hi-Touch LSI  | 1SDA070948R1 |  | 1SDA071578R1 |  |
|       |      |                |             | E2.2H 1000 Ekip Hi-Touch LSIG | 1SDA070949R1 |  | 1SDA071579R1 |  |
|       | 1250 | 100            | 85          | E2.2H 1250 Ekip Dip LI        | 1SDA070971R1 |  | 1SDA071601R1 |  |
|       |      |                |             | E2.2H 1250 Ekip Dip LSI       | 1SDA070972R1 |  | 1SDA071602R1 |  |
|       |      |                |             | E2.2H 1250 Ekip Dip LSIG      | 1SDA070973R1 |  | 1SDA071603R1 |  |
|       |      |                |             | E2.2H 1250 Ekip Touch LI      | 1SDA070974R1 |  | 1SDA071604R1 |  |
|       |      |                |             | E2.2H 1250 Ekip Touch LSI     | 1SDA070975R1 |  | 1SDA071605R1 |  |
|       |      |                |             | E2.2H 1250 Ekip Touch LSIG    | 1SDA070976R1 |  | 1SDA071606R1 |  |
|       |      |                |             | E2.2H 1250 Ekip Hi-Touch LSI  | 1SDA070978R1 |  | 1SDA071608R1 |  |
|       |      |                |             | E2.2H 1250 Ekip Hi-Touch LSIG | 1SDA070979R1 |  | 1SDA071609R1 |  |
|       | 1600 | 100            | 85          | E2.2H 1600 Ekip Dip LI        | 1SDA071011R1 |  | 1SDA071641R1 |  |
|       |      |                |             | E2.2H 1600 Ekip Dip LSI       | 1SDA071012R1 |  | 1SDA071642R1 |  |
|       |      |                |             | E2.2H 1600 Ekip Dip LSIG      | 1SDA071013R1 |  | 1SDA071643R1 |  |
|       |      |                |             | E2.2H 1600 Ekip Touch LI      | 1SDA071014R1 |  | 1SDA071644R1 |  |
|       |      |                |             | E2.2H 1600 Ekip Touch LSI     | 1SDA071015R1 |  | 1SDA071645R1 |  |
|       |      |                |             | E2.2H 1600 Ekip Touch LSIG    | 1SDA071016R1 |  | 1SDA071646R1 |  |
|       |      |                |             | E2.2H 1600 Ekip Hi-Touch LSI  | 1SDA071018R1 |  | 1SDA071648R1 |  |
|       |      |                |             | E2.2H 1600 Ekip Hi-Touch LSIG | 1SDA071019R1 |  | 1SDA071649R1 |  |
|       | 2000 | 100            | 85          | E2.2H 2000 Ekip Dip LI        | 1SDA071051R1 |  | 1SDA071681R1 |  |
|       |      |                |             | E2.2H 2000 Ekip Dip LSI       | 1SDA071052R1 |  | 1SDA071682R1 |  |
|       |      |                |             | E2.2H 2000 Ekip Dip LSIG      | 1SDA071053R1 |  | 1SDA071683R1 |  |
|       |      |                |             | E2.2H 2000 Ekip Touch LI      | 1SDA071054R1 |  | 1SDA071684R1 |  |
|       |      |                |             | E2.2H 2000 Ekip Touch LSI     | 1SDA071055R1 |  | 1SDA071685R1 |  |
|       |      |                |             | E2.2H 2000 Ekip Touch LSIG    | 1SDA071056R1 |  | 1SDA071686R1 |  |
|       |      |                |             | E2.2H 2000 Ekip Hi-Touch LSI  | 1SDA071058R1 |  | 1SDA071688R1 |  |
|       |      |                |             | E2.2H 2000 Ekip Hi-Touch LSIG | 1SDA071059R1 |  | 1SDA071689R1 |  |
|       | 2500 | 100            | 85          | E2.2H 2500 Ekip Dip LI        | 1SDA071081R1 |  | 1SDA071711R1 |  |
|       |      |                |             | E2.2H 2500 Ekip Dip LSI       | 1SDA071082R1 |  | 1SDA071712R1 |  |
|       |      |                |             | E2.2H 2500 Ekip Dip LSIG      | 1SDA071083R1 |  | 1SDA071713R1 |  |
|       |      |                |             | E2.2H 2500 Ekip Touch LI      | 1SDA071084R1 |  | 1SDA071714R1 |  |
|       |      |                |             | E2.2H 2500 Ekip Touch LSI     | 1SDA071085R1 |  | 1SDA071715R1 |  |
|       |      |                |             | E2.2H 2500 Ekip Touch LSIG    | 1SDA071086R1 |  | 1SDA071716R1 |  |
|       |      |                |             | E2.2H 2500 Ekip Hi-Touch LSI  | 1SDA071088R1 |  | 1SDA071718R1 |  |
|       |      |                |             | E2.2H 2500 Ekip Hi-Touch LSIG | 1SDA071089R1 |  | 1SDA071719R1 |  |



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## SACE Emax E4.2N-S • Orientable rear terminals (HR)

| Size         | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      |  | 4 Poles      |  |
|--------------|------|----------------|-------------|-------------------------------|--------------|--|--------------|--|
|              |      |                |             |                               | Code         |  | Code         |  |
| <b>E4.2N</b> | 3200 | 66             | 66          | E4.2N 3200 Ekip Dip LI        | 1SDA071141R1 |  | 1SDA071771R1 |  |
|              |      |                |             | E4.2N 3200 Ekip Dip LSI       | 1SDA071142R1 |  | 1SDA071772R1 |  |
|              |      |                |             | E4.2N 3200 Ekip Dip LSIG      | 1SDA071143R1 |  | 1SDA071773R1 |  |
|              |      |                |             | E4.2N 3200 Ekip Touch LI      | 1SDA071144R1 |  | 1SDA071774R1 |  |
|              |      |                |             | E4.2N 3200 Ekip Touch LSI     | 1SDA071145R1 |  | 1SDA071775R1 |  |
|              |      |                |             | E4.2N 3200 Ekip Touch LSIG    | 1SDA071146R1 |  | 1SDA071776R1 |  |
|              |      |                |             | E4.2N 3200 Ekip Hi-Touch LSI  | 1SDA071148R1 |  | 1SDA071778R1 |  |
|              |      |                |             | E4.2N 3200 Ekip Hi-Touch LSIG | 1SDA071149R1 |  | 1SDA071779R1 |  |
|              | 4000 | 66             | 66          | E4.2N 4000 Ekip Dip LI        | 1SDA071191R1 |  | 1SDA071821R1 |  |
|              |      |                |             | E4.2N 4000 Ekip Dip LSI       | 1SDA071192R1 |  | 1SDA071822R1 |  |
|              |      |                |             | E4.2N 4000 Ekip Dip LSIG      | 1SDA071193R1 |  | 1SDA071823R1 |  |
|              |      |                |             | E4.2N 4000 Ekip Touch LI      | 1SDA071194R1 |  | 1SDA071824R1 |  |
|              |      |                |             | E4.2N 4000 Ekip Touch LSI     | 1SDA071195R1 |  | 1SDA071825R1 |  |
|              |      |                |             | E4.2N 4000 Ekip Touch LSIG    | 1SDA071196R1 |  | 1SDA071826R1 |  |
|              |      |                |             | E4.2N 4000 Ekip Hi-Touch LSI  | 1SDA071198R1 |  | 1SDA071828R1 |  |
|              |      |                |             | E4.2N 4000 Ekip Hi-Touch LSIG | 1SDA071199R1 |  | 1SDA071829R1 |  |
| <b>E4.2S</b> | 3200 | 85             | 66          | E4.2S 3200 Ekip Dip LI        | 1SDA071151R1 |  | 1SDA071781R1 |  |
|              |      |                |             | E4.2S 3200 Ekip Dip LSI       | 1SDA071152R1 |  | 1SDA071782R1 |  |
|              |      |                |             | E4.2S 3200 Ekip Dip LSIG      | 1SDA071153R1 |  | 1SDA071783R1 |  |
|              |      |                |             | E4.2S 3200 Ekip Touch LI      | 1SDA071154R1 |  | 1SDA071784R1 |  |
|              |      |                |             | E4.2S 3200 Ekip Touch LSI     | 1SDA071155R1 |  | 1SDA071785R1 |  |
|              |      |                |             | E4.2S 3200 Ekip Touch LSIG    | 1SDA071156R1 |  | 1SDA071786R1 |  |
|              |      |                |             | E4.2S 3200 Ekip Hi-Touch LSI  | 1SDA071158R1 |  | 1SDA071788R1 |  |
|              |      |                |             | E4.2S 3200 Ekip Hi-Touch LSIG | 1SDA071159R1 |  | 1SDA071789R1 |  |
|              | 4000 | 85             | 66          | E4.2S 4000 Ekip Dip LI        | 1SDA071201R1 |  | 1SDA071831R1 |  |
|              |      |                |             | E4.2S 4000 Ekip Dip LSI       | 1SDA071202R1 |  | 1SDA071832R1 |  |
|              |      |                |             | E4.2S 4000 Ekip Dip LSIG      | 1SDA071203R1 |  | 1SDA071833R1 |  |
|              |      |                |             | E4.2S 4000 Ekip Touch LI      | 1SDA071204R1 |  | 1SDA071834R1 |  |
|              |      |                |             | E4.2S 4000 Ekip Touch LSI     | 1SDA071205R1 |  | 1SDA071835R1 |  |
|              |      |                |             | E4.2S 4000 Ekip Touch LSIG    | 1SDA071206R1 |  | 1SDA071836R1 |  |
|              |      |                |             | E4.2S 4000 Ekip Hi-Touch LSI  | 1SDA071208R1 |  | 1SDA071838R1 |  |
|              |      |                |             | E4.2S 4000 Ekip Hi-Touch LSIG | 1SDA071209R1 |  | 1SDA071839R1 |  |

# Automatic circuit-breakers

## Fixed version for power distribution



SACE Emax E4.2H-V • Orientable rear terminals (HR)

| Size  | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      |  | 4 Poles      |  |
|-------|------|----------------|-------------|-------------------------------|--------------|--|--------------|--|
|       |      |                |             |                               | Code         |  | Code         |  |
| E4.2H | 3200 | 100            | 85          | E4.2H 3200 Ekip Dip LI        | 1SDA071161R1 |  | 1SDA071791R1 |  |
|       |      |                |             | E4.2H 3200 Ekip Dip LSI       | 1SDA071162R1 |  | 1SDA071792R1 |  |
|       |      |                |             | E4.2H 3200 Ekip Dip LSIG      | 1SDA071163R1 |  | 1SDA071793R1 |  |
|       |      |                |             | E4.2H 3200 Ekip Touch LI      | 1SDA071164R1 |  | 1SDA071794R1 |  |
|       |      |                |             | E4.2H 3200 Ekip Touch LSI     | 1SDA071165R1 |  | 1SDA071795R1 |  |
|       |      |                |             | E4.2H 3200 Ekip Touch LSIG    | 1SDA071166R1 |  | 1SDA071796R1 |  |
|       |      |                |             | E4.2H 3200 Ekip Hi-Touch LSI  | 1SDA071168R1 |  | 1SDA071798R1 |  |
|       |      |                |             | E4.2H 3200 Ekip Hi-Touch LSIG | 1SDA071169R1 |  | 1SDA071799R1 |  |
|       | 4000 | 100            | 85          | E4.2H 4000 Ekip Dip LI        | 1SDA071211R1 |  | 1SDA071841R1 |  |
|       |      |                |             | E4.2H 4000 Ekip Dip LSI       | 1SDA071212R1 |  | 1SDA071842R1 |  |
|       |      |                |             | E4.2H 4000 Ekip Dip LSIG      | 1SDA071213R1 |  | 1SDA071843R1 |  |
|       |      |                |             | E4.2H 4000 Ekip Touch LI      | 1SDA071214R1 |  | 1SDA071844R1 |  |
|       |      |                |             | E4.2H 4000 Ekip Touch LSI     | 1SDA071215R1 |  | 1SDA071845R1 |  |
|       |      |                |             | E4.2H 4000 Ekip Touch LSIG    | 1SDA071216R1 |  | 1SDA071846R1 |  |
|       |      |                |             | E4.2H 4000 Ekip Hi-Touch LSI  | 1SDA071218R1 |  | 1SDA071848R1 |  |
|       |      |                |             | E4.2H 4000 Ekip Hi-Touch LSIG | 1SDA071219R1 |  | 1SDA071849R1 |  |
| E4.2V | 2000 | 150            | 100         | E4.2V 2000 Ekip Dip LI        | 1SDA071101R1 |  | 1SDA071731R1 |  |
|       |      |                |             | E4.2V 2000 Ekip Dip LSI       | 1SDA071102R1 |  | 1SDA071732R1 |  |
|       |      |                |             | E4.2V 2000 Ekip Dip LSIG      | 1SDA071103R1 |  | 1SDA071733R1 |  |
|       |      |                |             | E4.2V 2000 Ekip Touch LI      | 1SDA071104R1 |  | 1SDA071734R1 |  |
|       |      |                |             | E4.2V 2000 Ekip Touch LSI     | 1SDA071105R1 |  | 1SDA071735R1 |  |
|       |      |                |             | E4.2V 2000 Ekip Touch LSIG    | 1SDA071106R1 |  | 1SDA071736R1 |  |
|       |      |                |             | E4.2V 2000 Ekip Hi-Touch LSI  | 1SDA071108R1 |  | 1SDA071738R1 |  |
|       |      |                |             | E4.2V 2000 Ekip Hi-Touch LSIG | 1SDA071109R1 |  | 1SDA071739R1 |  |
|       | 2500 | 150            | 100         | E4.2V 2500 Ekip Dip LI        | 1SDA071121R1 |  | 1SDA071751R1 |  |
|       |      |                |             | E4.2V 2500 Ekip Dip LSI       | 1SDA071122R1 |  | 1SDA071752R1 |  |
|       |      |                |             | E4.2V 2500 Ekip Dip LSIG      | 1SDA071123R1 |  | 1SDA071753R1 |  |
|       |      |                |             | E4.2V 2500 Ekip Touch LI      | 1SDA071124R1 |  | 1SDA071754R1 |  |
|       |      |                |             | E4.2V 2500 Ekip Touch LSI     | 1SDA071125R1 |  | 1SDA071755R1 |  |
|       |      |                |             | E4.2V 2500 Ekip Touch LSIG    | 1SDA071126R1 |  | 1SDA071756R1 |  |
|       |      |                |             | E4.2V 2500 Ekip Hi-Touch LSI  | 1SDA071128R1 |  | 1SDA071758R1 |  |
|       |      |                |             | E4.2V 2500 Ekip Hi-Touch LSIG | 1SDA071129R1 |  | 1SDA071759R1 |  |
|       | 3200 | 150            | 100         | E4.2V 3200 Ekip Dip LI        | 1SDA071171R1 |  | 1SDA071801R1 |  |
|       |      |                |             | E4.2V 3200 Ekip Dip LSI       | 1SDA071172R1 |  | 1SDA071802R1 |  |
|       |      |                |             | E4.2V 3200 Ekip Dip LSIG      | 1SDA071173R1 |  | 1SDA071803R1 |  |
|       |      |                |             | E4.2V 3200 Ekip Touch LI      | 1SDA071174R1 |  | 1SDA071804R1 |  |
|       |      |                |             | E4.2V 3200 Ekip Touch LSI     | 1SDA071175R1 |  | 1SDA071805R1 |  |
|       |      |                |             | E4.2V 3200 Ekip Touch LSIG    | 1SDA071176R1 |  | 1SDA071806R1 |  |
|       |      |                |             | E4.2V 3200 Ekip Hi-Touch LSI  | 1SDA071178R1 |  | 1SDA071808R1 |  |
|       |      |                |             | E4.2V 3200 Ekip Hi-Touch LSIG | 1SDA071179R1 |  | 1SDA071809R1 |  |
|       | 4000 | 150            | 100         | E4.2V 4000 Ekip Dip LI        | 1SDA071221R1 |  | 1SDA071851R1 |  |
|       |      |                |             | E4.2V 4000 Ekip Dip LSI       | 1SDA071222R1 |  | 1SDA071852R1 |  |
|       |      |                |             | E4.2V 4000 Ekip Dip LSIG      | 1SDA071223R1 |  | 1SDA071853R1 |  |
|       |      |                |             | E4.2V 4000 Ekip Touch LI      | 1SDA071224R1 |  | 1SDA071854R1 |  |
|       |      |                |             | E4.2V 4000 Ekip Touch LSI     | 1SDA071225R1 |  | 1SDA071855R1 |  |
|       |      |                |             | E4.2V 4000 Ekip Touch LSIG    | 1SDA071226R1 |  | 1SDA071856R1 |  |
|       |      |                |             | E4.2V 4000 Ekip Hi-Touch LSI  | 1SDA071228R1 |  | 1SDA071858R1 |  |
|       |      |                |             | E4.2V 4000 Ekip Hi-Touch LSIG | 1SDA071229R1 |  | 1SDA071859R1 |  |



## SACE Emax E6.2H-V • Orientable rear terminals (HR)

| Size         | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      | 4 Poles      |
|--------------|------|----------------|-------------|-------------------------------|--------------|--------------|
|              |      |                |             |                               | Code         | Code         |
| <b>E6.2H</b> | 4000 | 100            | 100         | E6.2H 4000 Ekip Dip LI        | 1SDA071231R1 | 1SDA071861R1 |
|              |      |                |             | E6.2H 4000 Ekip Dip LSI       | 1SDA071232R1 | 1SDA071862R1 |
|              |      |                |             | E6.2H 4000 Ekip Dip LSIG      | 1SDA071233R1 | 1SDA071863R1 |
|              |      |                |             | E6.2H 4000 Ekip Touch LI      | 1SDA071234R1 | 1SDA071864R1 |
|              |      |                |             | E6.2H 4000 Ekip Touch LSI     | 1SDA071235R1 | 1SDA071865R1 |
|              |      |                |             | E6.2H 4000 Ekip Touch LSIG    | 1SDA071236R1 | 1SDA071866R1 |
|              |      |                |             | E6.2H 4000 Ekip Hi-Touch LSI  | 1SDA071238R1 | 1SDA071868R1 |
|              |      |                |             | E6.2H 4000 Ekip Hi-Touch LSIG | 1SDA071239R1 | 1SDA071869R1 |
|              | 5000 | 100            | 100         | E6.2H 5000 Ekip Dip LI        | 1SDA071261R1 | 1SDA071891R1 |
|              |      |                |             | E6.2H 5000 Ekip Dip LSI       | 1SDA071262R1 | 1SDA071892R1 |
|              |      |                |             | E6.2H 5000 Ekip Dip LSIG      | 1SDA071263R1 | 1SDA071893R1 |
|              |      |                |             | E6.2H 5000 Ekip Touch LI      | 1SDA071264R1 | 1SDA071894R1 |
|              |      |                |             | E6.2H 5000 Ekip Touch LSI     | 1SDA071265R1 | 1SDA071895R1 |
|              |      |                |             | E6.2H 5000 Ekip Touch LSIG    | 1SDA071266R1 | 1SDA071896R1 |
|              |      |                |             | E6.2H 5000 Ekip Hi-Touch LSI  | 1SDA071268R1 | 1SDA071898R1 |
|              |      |                |             | E6.2H 5000 Ekip Hi-Touch LSIG | 1SDA071269R1 | 1SDA071899R1 |
|              | 6300 | 100            | 100         | E6.2H 6300 Ekip Dip LI        | 1SDA071291R1 | 1SDA071921R1 |
|              |      |                |             | E6.2H 6300 Ekip Dip LSI       | 1SDA071292R1 | 1SDA071922R1 |
|              |      |                |             | E6.2H 6300 Ekip Dip LSIG      | 1SDA071293R1 | 1SDA071923R1 |
|              |      |                |             | E6.2H 6300 Ekip Touch LI      | 1SDA071294R1 | 1SDA071924R1 |
|              |      |                |             | E6.2H 6300 Ekip Touch LSI     | 1SDA071295R1 | 1SDA071925R1 |
|              |      |                |             | E6.2H 6300 Ekip Touch LSIG    | 1SDA071296R1 | 1SDA071926R1 |
|              |      |                |             | E6.2H 6300 Ekip Hi-Touch LSI  | 1SDA071298R1 | 1SDA071928R1 |
|              |      |                |             | E6.2H 6300 Ekip Hi-Touch LSIG | 1SDA071299R1 | 1SDA071929R1 |
| <b>E6.2V</b> | 4000 | 150            | 100         | E6.2V 4000 Ekip Dip LI        | 1SDA071241R1 | 1SDA071871R1 |
|              |      |                |             | E6.2V 4000 Ekip Dip LSI       | 1SDA071242R1 | 1SDA071872R1 |
|              |      |                |             | E6.2V 4000 Ekip Dip LSIG      | 1SDA071243R1 | 1SDA071873R1 |
|              |      |                |             | E6.2V 4000 Ekip Touch LI      | 1SDA071244R1 | 1SDA071874R1 |
|              |      |                |             | E6.2V 4000 Ekip Touch LSI     | 1SDA071245R1 | 1SDA071875R1 |
|              |      |                |             | E6.2V 4000 Ekip Touch LSIG    | 1SDA071246R1 | 1SDA071876R1 |
|              |      |                |             | E6.2V 4000 Ekip Hi-Touch LSI  | 1SDA071248R1 | 1SDA071878R1 |
|              |      |                |             | E6.2V 4000 Ekip Hi-Touch LSIG | 1SDA071249R1 | 1SDA071879R1 |
|              | 5000 | 150            | 100         | E6.2V 5000 Ekip Dip LI        | 1SDA071271R1 | 1SDA071901R1 |
|              |      |                |             | E6.2V 5000 Ekip Dip LSI       | 1SDA071272R1 | 1SDA071902R1 |
|              |      |                |             | E6.2V 5000 Ekip Dip LSIG      | 1SDA071273R1 | 1SDA071903R1 |
|              |      |                |             | E6.2V 5000 Ekip Touch LI      | 1SDA071274R1 | 1SDA071904R1 |
|              |      |                |             | E6.2V 5000 Ekip Touch LSI     | 1SDA071275R1 | 1SDA071905R1 |
|              |      |                |             | E6.2V 5000 Ekip Touch LSIG    | 1SDA071276R1 | 1SDA071906R1 |
|              |      |                |             | E6.2V 5000 Ekip Hi-Touch LSI  | 1SDA071278R1 | 1SDA071908R1 |
|              |      |                |             | E6.2V 5000 Ekip Hi-Touch LSIG | 1SDA071279R1 | 1SDA071909R1 |
|              | 6300 | 150            | 100         | E6.2V 6300 Ekip Dip LI        | 1SDA071301R1 | 1SDA071931R1 |
|              |      |                |             | E6.2V 6300 Ekip Dip LSI       | 1SDA071302R1 | 1SDA071932R1 |
|              |      |                |             | E6.2V 6300 Ekip Dip LSIG      | 1SDA071303R1 | 1SDA071933R1 |
|              |      |                |             | E6.2V 6300 Ekip Touch LI      | 1SDA071304R1 | 1SDA071934R1 |
|              |      |                |             | E6.2V 6300 Ekip Touch LSI     | 1SDA071305R1 | 1SDA071935R1 |
|              |      |                |             | E6.2V 6300 Ekip Touch LSIG    | 1SDA071306R1 | 1SDA071936R1 |
|              |      |                |             | E6.2V 6300 Ekip Hi-Touch LSI  | 1SDA071308R1 | 1SDA071938R1 |
|              |      |                |             | E6.2V 6300 Ekip Hi-Touch LSIG | 1SDA071309R1 | 1SDA071939R1 |

# Automatic circuit-breakers

## Fixed version for power distribution



1SDC200023D0205

### SACE Emax E6.2X • Orientable rear terminals (HR)

| Size  | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      |  | 4 Poles      |  |
|-------|------|----------------|-------------|-------------------------------|--------------|--|--------------|--|
|       |      |                |             |                               | Code         |  | Code         |  |
| E6.2X | 4000 | 150            | 120         | E6.2X 4000 Ekip Dip LI        | 1SDA071251R1 |  | 1SDA071881R1 |  |
|       |      |                |             | E6.2X 4000 Ekip Dip LSI       | 1SDA071252R1 |  | 1SDA071882R1 |  |
|       |      |                |             | E6.2X 4000 Ekip Dip LSIG      | 1SDA071253R1 |  | 1SDA071883R1 |  |
|       |      |                |             | E6.2X 4000 Ekip Touch LI      | 1SDA071254R1 |  | 1SDA071884R1 |  |
|       |      |                |             | E6.2X 4000 Ekip Touch LSI     | 1SDA071255R1 |  | 1SDA071885R1 |  |
|       |      |                |             | E6.2X 4000 Ekip Touch LSIG    | 1SDA071256R1 |  | 1SDA071886R1 |  |
|       |      |                |             | E6.2X 4000 Ekip Hi-Touch LSI  | 1SDA071258R1 |  | 1SDA071888R1 |  |
|       |      |                |             | E6.2X 4000 Ekip Hi-Touch LSIG | 1SDA071259R1 |  | 1SDA071889R1 |  |
|       | 5000 | 150            | 120         | E6.2X 5000 Ekip Dip LI        | 1SDA071281R1 |  | 1SDA071911R1 |  |
|       |      |                |             | E6.2X 5000 Ekip Dip LSI       | 1SDA071282R1 |  | 1SDA071912R1 |  |
|       |      |                |             | E6.2X 5000 Ekip Dip LSIG      | 1SDA071283R1 |  | 1SDA071913R1 |  |
|       |      |                |             | E6.2X 5000 Ekip Touch LI      | 1SDA071284R1 |  | 1SDA071914R1 |  |
|       |      |                |             | E6.2X 5000 Ekip Touch LSI     | 1SDA071285R1 |  | 1SDA071915R1 |  |
|       |      |                |             | E6.2X 5000 Ekip Touch LSIG    | 1SDA071286R1 |  | 1SDA071916R1 |  |
|       |      |                |             | E6.2X 5000 Ekip Hi-Touch LSI  | 1SDA071288R1 |  | 1SDA071918R1 |  |
|       |      |                |             | E6.2X 5000 Ekip Hi-Touch LSIG | 1SDA071289R1 |  | 1SDA071919R1 |  |
|       | 6300 | 150            | 120         | E6.2X 6300 Ekip Dip LI        | 1SDA071311R1 |  | 1SDA071941R1 |  |
|       |      |                |             | E6.2X 6300 Ekip Dip LSI       | 1SDA071312R1 |  | 1SDA071942R1 |  |
|       |      |                |             | E6.2X 6300 Ekip Dip LSIG      | 1SDA071313R1 |  | 1SDA071943R1 |  |
|       |      |                |             | E6.2X 6300 Ekip Touch LI      | 1SDA071314R1 |  | 1SDA071944R1 |  |
|       |      |                |             | E6.2X 6300 Ekip Touch LSI     | 1SDA071315R1 |  | 1SDA071945R1 |  |
|       |      |                |             | E6.2X 6300 Ekip Touch LSIG    | 1SDA071316R1 |  | 1SDA071946R1 |  |
|       |      |                |             | E6.2X 6300 Ekip Hi-Touch LSI  | 1SDA071318R1 |  | 1SDA071948R1 |  |
|       |      |                |             | E6.2X 6300 Ekip Hi-Touch LSIG | 1SDA071319R1 |  | 1SDA071949R1 |  |



1SDC20064F001

## SACE Emax E6.2H-V/f Full size • Orientable rear terminals (HR)

| Size           | Iu   | Icu (440V) | Icw (1s) | Type                            | 4 Poles<br>Code |  |
|----------------|------|------------|----------|---------------------------------|-----------------|--|
| <b>E6.2H/f</b> | 4000 | 100        | 100      | E6.2H/f 4000 Ekip Dip LI        | 1SDA071951R1    |  |
|                |      |            |          | E6.2H/f 4000 Ekip Dip LSI       | 1SDA071952R1    |  |
|                |      |            |          | E6.2H/f 4000 Ekip Dip LSIG      | 1SDA071953R1    |  |
|                |      |            |          | E6.2H/f 4000 Ekip Touch LI      | 1SDA071954R1    |  |
|                |      |            |          | E6.2H/f 4000 Ekip Touch LSI     | 1SDA071955R1    |  |
|                |      |            |          | E6.2H/f 4000 Ekip Touch LSIG    | 1SDA071956R1    |  |
|                |      |            |          | E6.2H/f 4000 Ekip Hi-Touch LSI  | 1SDA071958R1    |  |
|                |      |            |          | E6.2H/f 4000 Ekip Hi-Touch LSIG | 1SDA071959R1    |  |
|                | 5000 | 100        | 100      | E6.2H/f 5000 Ekip Dip LI        | 1SDA071981R1    |  |
|                |      |            |          | E6.2H/f 5000 Ekip Dip LSI       | 1SDA071982R1    |  |
|                |      |            |          | E6.2H/f 5000 Ekip Dip LSIG      | 1SDA071983R1    |  |
|                |      |            |          | E6.2H/f 5000 Ekip Touch LI      | 1SDA071984R1    |  |
|                |      |            |          | E6.2H/f 5000 Ekip Touch LSI     | 1SDA071985R1    |  |
|                |      |            |          | E6.2H/f 5000 Ekip Touch LSIG    | 1SDA071986R1    |  |
|                |      |            |          | E6.2H/f 5000 Ekip Hi-Touch LSI  | 1SDA071988R1    |  |
|                |      |            |          | E6.2H/f 5000 Ekip Hi-Touch LSIG | 1SDA071989R1    |  |
|                | 6300 | 100        | 100      | E6.2H/f 6300 Ekip Dip LI        | 1SDA072011R1    |  |
|                |      |            |          | E6.2H/f 6300 Ekip Dip LSI       | 1SDA072012R1    |  |
|                |      |            |          | E6.2H/f 6300 Ekip Dip LSIG      | 1SDA072013R1    |  |
|                |      |            |          | E6.2H/f 6300 Ekip Touch LI      | 1SDA072014R1    |  |
|                |      |            |          | E6.2H/f 6300 Ekip Touch LSI     | 1SDA072015R1    |  |
|                |      |            |          | E6.2H/f 6300 Ekip Touch LSIG    | 1SDA072016R1    |  |
|                |      |            |          | E6.2H/f 6300 Ekip Hi-Touch LSI  | 1SDA072018R1    |  |
|                |      |            |          | E6.2H/f 6300 Ekip Hi-Touch LSIG | 1SDA072019R1    |  |
| <b>E6.2V/f</b> | 4000 | 150        | 100      | E6.2V/f 4000 Ekip Dip LI        | 1SDA071961R1    |  |
|                |      |            |          | E6.2V/f 4000 Ekip Dip LSI       | 1SDA071962R1    |  |
|                |      |            |          | E6.2V/f 4000 Ekip Dip LSIG      | 1SDA071963R1    |  |
|                |      |            |          | E6.2V/f 4000 Ekip Touch LI      | 1SDA071964R1    |  |
|                |      |            |          | E6.2V/f 4000 Ekip Touch LSI     | 1SDA071965R1    |  |
|                |      |            |          | E6.2V/f 4000 Ekip Touch LSIG    | 1SDA071966R1    |  |
|                |      |            |          | E6.2V/f 4000 Ekip Hi-Touch LSI  | 1SDA071968R1    |  |
|                |      |            |          | E6.2V/f 4000 Ekip Hi-Touch LSIG | 1SDA071969R1    |  |
|                | 5000 | 150        | 100      | E6.2V/f 5000 Ekip Dip LI        | 1SDA071991R1    |  |
|                |      |            |          | E6.2V/f 5000 Ekip Dip LSI       | 1SDA071992R1    |  |
|                |      |            |          | E6.2V/f 5000 Ekip Dip LSIG      | 1SDA071993R1    |  |
|                |      |            |          | E6.2V/f 5000 Ekip Touch LI      | 1SDA071994R1    |  |
|                |      |            |          | E6.2V/f 5000 Ekip Touch LSI     | 1SDA071995R1    |  |
|                |      |            |          | E6.2V/f 5000 Ekip Touch LSIG    | 1SDA071996R1    |  |
|                |      |            |          | E6.2V/f 5000 Ekip Hi-Touch LSI  | 1SDA071998R1    |  |
|                |      |            |          | E6.2V/f 5000 Ekip Hi-Touch LSIG | 1SDA071999R1    |  |
|                | 6300 | 150        | 100      | E6.2V/f 6300 Ekip Dip LI        | 1SDA072021R1    |  |
|                |      |            |          | E6.2V/f 6300 Ekip Dip LSI       | 1SDA072022R1    |  |
|                |      |            |          | E6.2V/f 6300 Ekip Dip LSIG      | 1SDA072023R1    |  |
|                |      |            |          | E6.2V/f 6300 Ekip Touch LI      | 1SDA072024R1    |  |
|                |      |            |          | E6.2V/f 6300 Ekip Touch LSI     | 1SDA072025R1    |  |
|                |      |            |          | E6.2V/f 6300 Ekip Touch LSIG    | 1SDA072026R1    |  |
|                |      |            |          | E6.2V/f 6300 Ekip Hi-Touch LSI  | 1SDA072028R1    |  |
|                |      |            |          | E6.2V/f 6300 Ekip Hi-Touch LSIG | 1SDA072029R1    |  |

# Automatic circuit-breakers

## Fixed version for power distribution



SACE Emax E6.2X/f Full size • Orientable rear terminals (HR)

| Size    | Iu   | Icu (440V) | Icw (1s) | Type                            | 4 Poles Code |  |
|---------|------|------------|----------|---------------------------------|--------------|--|
| E6.2X/f | 4000 | 150        | 120      | E6.2X/f 4000 Ekip Dip LI        | 1SDA071971R1 |  |
|         |      |            |          | E6.2X/f 4000 Ekip Dip LSI       | 1SDA071972R1 |  |
|         |      |            |          | E6.2X/f 4000 Ekip Dip LSIG      | 1SDA071973R1 |  |
|         |      |            |          | E6.2X/f 4000 Ekip Touch LI      | 1SDA071974R1 |  |
|         |      |            |          | E6.2X/f 4000 Ekip Touch LSI     | 1SDA071975R1 |  |
|         |      |            |          | E6.2X/f 4000 Ekip Touch LSIG    | 1SDA071976R1 |  |
|         |      |            |          | E6.2X/f 4000 Ekip Hi-Touch LSI  | 1SDA071978R1 |  |
|         |      |            |          | E6.2X/f 4000 Ekip Hi-Touch LSIG | 1SDA071979R1 |  |
|         | 5000 | 150        | 120      | E6.2X/f 5000 Ekip Dip LI        | 1SDA072001R1 |  |
|         |      |            |          | E6.2X/f 5000 Ekip Dip LSI       | 1SDA072002R1 |  |
|         |      |            |          | E6.2X/f 5000 Ekip Dip LSIG      | 1SDA072003R1 |  |
|         |      |            |          | E6.2X/f 5000 Ekip Touch LI      | 1SDA072004R1 |  |
|         |      |            |          | E6.2X/f 5000 Ekip Touch LSI     | 1SDA072005R1 |  |
|         |      |            |          | E6.2X/f 5000 Ekip Touch LSIG    | 1SDA072006R1 |  |
|         |      |            |          | E6.2X/f 5000 Ekip Hi-Touch LSI  | 1SDA072008R1 |  |
|         |      |            |          | E6.2X/f 5000 Ekip Hi-Touch LSIG | 1SDA072009R1 |  |
|         | 6300 | 150        | 120      | E6.2X/f 6300 Ekip Dip LI        | 1SDA072031R1 |  |
|         |      |            |          | E6.2X/f 6300 Ekip Dip LSI       | 1SDA072032R1 |  |
|         |      |            |          | E6.2X/f 6300 Ekip Dip LSIG      | 1SDA072033R1 |  |
|         |      |            |          | E6.2X/f 6300 Ekip Touch LI      | 1SDA072034R1 |  |
|         |      |            |          | E6.2X/f 6300 Ekip Touch LSI     | 1SDA072035R1 |  |
|         |      |            |          | E6.2X/f 6300 Ekip Touch LSIG    | 1SDA072036R1 |  |
|         |      |            |          | E6.2X/f 6300 Ekip Hi-Touch LSI  | 1SDA072038R1 |  |
|         |      |            |          | E6.2X/f 6300 Ekip Hi-Touch LSIG | 1SDA072039R1 |  |

# Automatic circuit-breakers

## Withdrawable version for power distribution



### SACE Emax E1.2B • Mobile part of withdrawable circuit-breaker (MP)

| Size         | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      | 4 Poles      |
|--------------|------|----------------|-------------|-------------------------------|--------------|--------------|
|              |      |                |             |                               | Code         | Code         |
| <b>E1.2B</b> | 630  | 42             | 42          | E1.2B 630 Ekip Dip LI         | 1SDA072051R1 | 1SDA072681R1 |
|              |      |                |             | E1.2B 630 Ekip Dip LSI        | 1SDA072052R1 | 1SDA072682R1 |
|              |      |                |             | E1.2B 630 Ekip Dip LSIG       | 1SDA072053R1 | 1SDA072683R1 |
|              |      |                |             | E1.2B 630 Ekip Touch LI       | 1SDA072054R1 | 1SDA072684R1 |
|              |      |                |             | E1.2B 630 Ekip Touch LSI      | 1SDA072055R1 | 1SDA072685R1 |
|              |      |                |             | E1.2B 630 Ekip Touch LSIG     | 1SDA072056R1 | 1SDA072686R1 |
|              |      |                |             | E1.2B 630 Ekip Hi-Touch LSI   | 1SDA072058R1 | 1SDA072688R1 |
|              |      |                |             | E1.2B 630 Ekip Hi-Touch LSIG  | 1SDA072059R1 | 1SDA072689R1 |
|              | 800  | 42             | 42          | E1.2B 800 Ekip Dip LI         | 1SDA072091R1 | 1SDA072721R1 |
|              |      |                |             | E1.2B 800 Ekip Dip LSI        | 1SDA072092R1 | 1SDA072722R1 |
|              |      |                |             | E1.2B 800 Ekip Dip LSIG       | 1SDA072093R1 | 1SDA072723R1 |
|              |      |                |             | E1.2B 800 Ekip Touch LI       | 1SDA072094R1 | 1SDA072724R1 |
|              |      |                |             | E1.2B 800 Ekip Touch LSI      | 1SDA072095R1 | 1SDA072725R1 |
|              |      |                |             | E1.2B 800 Ekip Touch LSIG     | 1SDA072096R1 | 1SDA072726R1 |
|              |      |                |             | E1.2B 800 Ekip Hi-Touch LSI   | 1SDA072098R1 | 1SDA072728R1 |
|              |      |                |             | E1.2B 800 Ekip Hi-Touch LSIG  | 1SDA072099R1 | 1SDA072729R1 |
|              | 1000 | 42             | 42          | E1.2B 1000 Ekip Dip LI        | 1SDA072131R1 | 1SDA072761R1 |
|              |      |                |             | E1.2B 1000 Ekip Dip LSI       | 1SDA072132R1 | 1SDA072762R1 |
|              |      |                |             | E1.2B 1000 Ekip Dip LSIG      | 1SDA072133R1 | 1SDA072763R1 |
|              |      |                |             | E1.2B 1000 Ekip Touch LI      | 1SDA072134R1 | 1SDA072764R1 |
|              |      |                |             | E1.2B 1000 Ekip Touch LSI     | 1SDA072135R1 | 1SDA072765R1 |
|              |      |                |             | E1.2B 1000 Ekip Touch LSIG    | 1SDA072136R1 | 1SDA072766R1 |
|              |      |                |             | E1.2B 1000 Ekip Hi-Touch LSI  | 1SDA072138R1 | 1SDA072768R1 |
|              |      |                |             | E1.2B 1000 Ekip Hi-Touch LSIG | 1SDA072139R1 | 1SDA072769R1 |
|              | 1250 | 42             | 42          | E1.2B 1250 Ekip Dip LI        | 1SDA072171R1 | 1SDA072801R1 |
|              |      |                |             | E1.2B 1250 Ekip Dip LSI       | 1SDA072172R1 | 1SDA072802R1 |
|              |      |                |             | E1.2B 1250 Ekip Dip LSIG      | 1SDA072173R1 | 1SDA072803R1 |
|              |      |                |             | E1.2B 1250 Ekip Touch LI      | 1SDA072174R1 | 1SDA072804R1 |
|              |      |                |             | E1.2B 1250 Ekip Touch LSI     | 1SDA072175R1 | 1SDA072805R1 |
|              |      |                |             | E1.2B 1250 Ekip Touch LSIG    | 1SDA072176R1 | 1SDA072806R1 |
|              |      |                |             | E1.2B 1250 Ekip Hi-Touch LSI  | 1SDA072178R1 | 1SDA072808R1 |
|              |      |                |             | E1.2B 1250 Ekip Hi-Touch LSIG | 1SDA072179R1 | 1SDA072809R1 |
|              | 1600 | 42             | 42          | E1.2B 1600 Ekip Dip LI        | 1SDA072211R1 | 1SDA072841R1 |
|              |      |                |             | E1.2B 1600 Ekip Dip LSI       | 1SDA072212R1 | 1SDA072842R1 |
|              |      |                |             | E1.2B 1600 Ekip Dip LSIG      | 1SDA072213R1 | 1SDA072843R1 |
|              |      |                |             | E1.2B 1600 Ekip Touch LI      | 1SDA072214R1 | 1SDA072844R1 |
|              |      |                |             | E1.2B 1600 Ekip Touch LSI     | 1SDA072215R1 | 1SDA072845R1 |
|              |      |                |             | E1.2B 1600 Ekip Touch LSIG    | 1SDA072216R1 | 1SDA072846R1 |
|              |      |                |             | E1.2B 1600 Ekip Hi-Touch LSI  | 1SDA072218R1 | 1SDA072848R1 |
|              |      |                |             | E1.2B 1600 Ekip Hi-Touch LSIG | 1SDA072219R1 | 1SDA072849R1 |

# Automatic circuit-breakers

## Withdrawable version for power distribution



### SACE Emax E1.2C • Mobile part of withdrawable circuit-breaker (MP)

| Size  | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      | 4 Poles      |
|-------|------|----------------|-------------|-------------------------------|--------------|--------------|
|       |      |                |             |                               | Code         | Code         |
| E1.2C | 630  | 50             | 42          | E1.2C 630 Ekip Dip LI         | 1SDA072061R1 | 1SDA072691R1 |
|       |      |                |             | E1.2C 630 Ekip Dip LSI        | 1SDA072062R1 | 1SDA072692R1 |
|       |      |                |             | E1.2C 630 Ekip Dip LSIG       | 1SDA072063R1 | 1SDA072693R1 |
|       |      |                |             | E1.2C 630 Ekip Touch LI       | 1SDA072064R1 | 1SDA072694R1 |
|       |      |                |             | E1.2C 630 Ekip Touch LSI      | 1SDA072065R1 | 1SDA072695R1 |
|       |      |                |             | E1.2C 630 Ekip Touch LSIG     | 1SDA072066R1 | 1SDA072696R1 |
|       |      |                |             | E1.2C 630 Ekip Hi-Touch LSI   | 1SDA072068R1 | 1SDA072698R1 |
|       |      |                |             | E1.2C 630 Ekip Hi-Touch LSIG  | 1SDA072069R1 | 1SDA072699R1 |
|       | 800  | 50             | 42          | E1.2C 800 Ekip Dip LI         | 1SDA072101R1 | 1SDA072731R1 |
|       |      |                |             | E1.2C 800 Ekip Dip LSI        | 1SDA072102R1 | 1SDA072732R1 |
|       |      |                |             | E1.2C 800 Ekip Dip LSIG       | 1SDA072103R1 | 1SDA072733R1 |
|       |      |                |             | E1.2C 800 Ekip Touch LI       | 1SDA072104R1 | 1SDA072734R1 |
|       |      |                |             | E1.2C 800 Ekip Touch LSI      | 1SDA072105R1 | 1SDA072735R1 |
|       |      |                |             | E1.2C 800 Ekip Touch LSIG     | 1SDA072106R1 | 1SDA072736R1 |
|       |      |                |             | E1.2C 800 Ekip Hi-Touch LSI   | 1SDA072108R1 | 1SDA072738R1 |
|       |      |                |             | E1.2C 800 Ekip Hi-Touch LSIG  | 1SDA072109R1 | 1SDA072739R1 |
|       | 1000 | 50             | 42          | E1.2C 1000 Ekip Dip LI        | 1SDA072141R1 | 1SDA072771R1 |
|       |      |                |             | E1.2C 1000 Ekip Dip LSI       | 1SDA072142R1 | 1SDA072772R1 |
|       |      |                |             | E1.2C 1000 Ekip Dip LSIG      | 1SDA072143R1 | 1SDA072773R1 |
|       |      |                |             | E1.2C 1000 Ekip Touch LI      | 1SDA072144R1 | 1SDA072774R1 |
|       |      |                |             | E1.2C 1000 Ekip Touch LSI     | 1SDA072145R1 | 1SDA072775R1 |
|       |      |                |             | E1.2C 1000 Ekip Touch LSIG    | 1SDA072146R1 | 1SDA072776R1 |
|       |      |                |             | E1.2C 1000 Ekip Hi-Touch LSI  | 1SDA072148R1 | 1SDA072778R1 |
|       |      |                |             | E1.2C 1000 Ekip Hi-Touch LSIG | 1SDA072149R1 | 1SDA072779R1 |
|       | 1250 | 50             | 42          | E1.2C 1250 Ekip Dip LI        | 1SDA072181R1 | 1SDA072811R1 |
|       |      |                |             | E1.2C 1250 Ekip Dip LSI       | 1SDA072182R1 | 1SDA072812R1 |
|       |      |                |             | E1.2C 1250 Ekip Dip LSIG      | 1SDA072183R1 | 1SDA072813R1 |
|       |      |                |             | E1.2C 1250 Ekip Touch LI      | 1SDA072184R1 | 1SDA072814R1 |
|       |      |                |             | E1.2C 1250 Ekip Touch LSI     | 1SDA072185R1 | 1SDA072815R1 |
|       |      |                |             | E1.2C 1250 Ekip Touch LSIG    | 1SDA072186R1 | 1SDA072816R1 |
|       |      |                |             | E1.2C 1250 Ekip Hi-Touch LSI  | 1SDA072188R1 | 1SDA072818R1 |
|       |      |                |             | E1.2C 1250 Ekip Hi-Touch LSIG | 1SDA072189R1 | 1SDA072819R1 |
|       | 1600 | 50             | 42          | E1.2C 1600 Ekip Dip LI        | 1SDA072221R1 | 1SDA072851R1 |
|       |      |                |             | E1.2C 1600 Ekip Dip LSI       | 1SDA072222R1 | 1SDA072852R1 |
|       |      |                |             | E1.2C 1600 Ekip Dip LSIG      | 1SDA072223R1 | 1SDA072853R1 |
|       |      |                |             | E1.2C 1600 Ekip Touch LI      | 1SDA072224R1 | 1SDA072854R1 |
|       |      |                |             | E1.2C 1600 Ekip Touch LSI     | 1SDA072225R1 | 1SDA072855R1 |
|       |      |                |             | E1.2C 1600 Ekip Touch LSIG    | 1SDA072226R1 | 1SDA072856R1 |
|       |      |                |             | E1.2C 1600 Ekip Hi-Touch LSI  | 1SDA072228R1 | 1SDA072858R1 |
|       |      |                |             | E1.2C 1600 Ekip Hi-Touch LSIG | 1SDA072229R1 | 1SDA072859R1 |



1SDC200665FV01

## SACE Emax E1.2N • Mobile part of withdrawable circuit-breaker (MP)

| Size         | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      | 4 Poles      |
|--------------|------|----------------|-------------|-------------------------------|--------------|--------------|
|              |      |                |             |                               | Code         | Code         |
| <b>E1.2N</b> | 250  | 66             | 50          | E1.2N 250 Ekip Dip LI         | 1SDA072041R1 | 1SDA072671R1 |
|              |      |                |             | E1.2N 250 Ekip Dip LSI        | 1SDA072042R1 | 1SDA072672R1 |
|              |      |                |             | E1.2N 250 Ekip Dip LSIG       | 1SDA072043R1 | 1SDA072673R1 |
|              |      |                |             | E1.2N 250 Ekip Touch LI       | 1SDA072044R1 | 1SDA072674R1 |
|              |      |                |             | E1.2N 250 Ekip Touch LSI      | 1SDA072045R1 | 1SDA072675R1 |
|              |      |                |             | E1.2N 250 Ekip Touch LSIG     | 1SDA072046R1 | 1SDA072676R1 |
|              |      |                |             | E1.2N 250 Ekip Hi-Touch LSI   | 1SDA072048R1 | 1SDA072678R1 |
|              |      |                |             | E1.2N 250 Ekip Hi-Touch LSIG  | 1SDA072049R1 | 1SDA072679R1 |
|              | 630  | 66             | 50          | E1.2N 630 Ekip Dip LI         | 1SDA072071R1 | 1SDA072701R1 |
|              |      |                |             | E1.2N 630 Ekip Dip LSI        | 1SDA072072R1 | 1SDA072702R1 |
|              |      |                |             | E1.2N 630 Ekip Dip LSIG       | 1SDA072073R1 | 1SDA072703R1 |
|              |      |                |             | E1.2N 630 Ekip Touch LI       | 1SDA072074R1 | 1SDA072704R1 |
|              |      |                |             | E1.2N 630 Ekip Touch LSI      | 1SDA072075R1 | 1SDA072705R1 |
|              |      |                |             | E1.2N 630 Ekip Touch LSIG     | 1SDA072076R1 | 1SDA072706R1 |
|              |      |                |             | E1.2N 630 Ekip Hi-Touch LSI   | 1SDA072078R1 | 1SDA072708R1 |
|              |      |                |             | E1.2N 630 Ekip Hi-Touch LSIG  | 1SDA072079R1 | 1SDA072709R1 |
|              | 800  | 66             | 50          | E1.2N 800 Ekip Dip LI         | 1SDA072111R1 | 1SDA072741R1 |
|              |      |                |             | E1.2N 800 Ekip Dip LSI        | 1SDA072112R1 | 1SDA072742R1 |
|              |      |                |             | E1.2N 800 Ekip Dip LSIG       | 1SDA072113R1 | 1SDA072743R1 |
|              |      |                |             | E1.2N 800 Ekip Touch LI       | 1SDA072114R1 | 1SDA072744R1 |
|              |      |                |             | E1.2N 800 Ekip Touch LSI      | 1SDA072115R1 | 1SDA072745R1 |
|              |      |                |             | E1.2N 800 Ekip Touch LSIG     | 1SDA072116R1 | 1SDA072746R1 |
|              |      |                |             | E1.2N 800 Ekip Hi-Touch LSI   | 1SDA072118R1 | 1SDA072748R1 |
|              |      |                |             | E1.2N 800 Ekip Hi-Touch LSIG  | 1SDA072119R1 | 1SDA072749R1 |
|              | 1000 | 66             | 50          | E1.2N 1000 Ekip Dip LI        | 1SDA072151R1 | 1SDA072781R1 |
|              |      |                |             | E1.2N 1000 Ekip Dip LSI       | 1SDA072152R1 | 1SDA072782R1 |
|              |      |                |             | E1.2N 1000 Ekip Dip LSIG      | 1SDA072153R1 | 1SDA072783R1 |
|              |      |                |             | E1.2N 1000 Ekip Touch LI      | 1SDA072154R1 | 1SDA072784R1 |
|              |      |                |             | E1.2N 1000 Ekip Touch LSI     | 1SDA072155R1 | 1SDA072785R1 |
|              |      |                |             | E1.2N 1000 Ekip Touch LSIG    | 1SDA072156R1 | 1SDA072786R1 |
|              |      |                |             | E1.2N 1000 Ekip Hi-Touch LSI  | 1SDA072158R1 | 1SDA072788R1 |
|              |      |                |             | E1.2N 1000 Ekip Hi-Touch LSIG | 1SDA072159R1 | 1SDA072789R1 |
|              | 1250 | 66             | 50          | E1.2N 1250 Ekip Dip LI        | 1SDA072191R1 | 1SDA072821R1 |
|              |      |                |             | E1.2N 1250 Ekip Dip LSI       | 1SDA072192R1 | 1SDA072822R1 |
|              |      |                |             | E1.2N 1250 Ekip Dip LSIG      | 1SDA072193R1 | 1SDA072823R1 |
|              |      |                |             | E1.2N 1250 Ekip Touch LI      | 1SDA072194R1 | 1SDA072824R1 |
|              |      |                |             | E1.2N 1250 Ekip Touch LSI     | 1SDA072195R1 | 1SDA072825R1 |
|              |      |                |             | E1.2N 1250 Ekip Touch LSIG    | 1SDA072196R1 | 1SDA072826R1 |
|              |      |                |             | E1.2N 1250 Ekip Hi-Touch LSI  | 1SDA072198R1 | 1SDA072828R1 |
|              |      |                |             | E1.2N 1250 Ekip Hi-Touch LSIG | 1SDA072199R1 | 1SDA072829R1 |
|              | 1600 | 66             | 50          | E1.2N 1600 Ekip Dip LI        | 1SDA072231R1 | 1SDA072861R1 |
|              |      |                |             | E1.2N 1600 Ekip Dip LSI       | 1SDA072232R1 | 1SDA072862R1 |
|              |      |                |             | E1.2N 1600 Ekip Dip LSIG      | 1SDA072233R1 | 1SDA072863R1 |
|              |      |                |             | E1.2N 1600 Ekip Touch LI      | 1SDA072234R1 | 1SDA072864R1 |
|              |      |                |             | E1.2N 1600 Ekip Touch LSI     | 1SDA072235R1 | 1SDA072865R1 |
|              |      |                |             | E1.2N 1600 Ekip Touch LSIG    | 1SDA072236R1 | 1SDA072866R1 |
|              |      |                |             | E1.2N 1600 Ekip Hi-Touch LSI  | 1SDA072238R1 | 1SDA072868R1 |
|              |      |                |             | E1.2N 1600 Ekip Hi-Touch LSIG | 1SDA072239R1 | 1SDA072869R1 |

# Automatic circuit-breakers

## Withdrawable version for power distribution



1SDC20065F001

### SACE Emax E1.2L-B • Mobile part of withdrawable circuit-breaker (MP)

| Size  | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      | 4 Poles      |
|-------|------|----------------|-------------|-------------------------------|--------------|--------------|
|       |      |                |             |                               | Code         | Code         |
| E1.2L | 630  | 130            | 15          | E1.2L 630 Ekip Dip LI         | 1SDA072081R1 | 1SDA072711R1 |
|       |      |                |             | E1.2L 630 Ekip Dip LSI        | 1SDA072082R1 | 1SDA072712R1 |
|       |      |                |             | E1.2L 630 Ekip Dip LSIG       | 1SDA072083R1 | 1SDA072713R1 |
|       |      |                |             | E1.2L 630 Ekip Touch LI       | 1SDA072084R1 | 1SDA072714R1 |
|       |      |                |             | E1.2L 630 Ekip Touch LSI      | 1SDA072085R1 | 1SDA072715R1 |
|       |      |                |             | E1.2L 630 Ekip Touch LSIG     | 1SDA072086R1 | 1SDA072716R1 |
|       |      |                |             | E1.2L 630 Ekip Hi-Touch LSI   | 1SDA072088R1 | 1SDA072718R1 |
|       |      |                |             | E1.2L 630 Ekip Hi-Touch LSIG  | 1SDA072089R1 | 1SDA072719R1 |
|       | 800  | 130            | 15          | E1.2L 800 Ekip Dip LI         | 1SDA072121R1 | 1SDA072751R1 |
|       |      |                |             | E1.2L 800 Ekip Dip LSI        | 1SDA072122R1 | 1SDA072752R1 |
|       |      |                |             | E1.2L 800 Ekip Dip LSIG       | 1SDA072123R1 | 1SDA072753R1 |
|       |      |                |             | E1.2L 800 Ekip Touch LI       | 1SDA072124R1 | 1SDA072754R1 |
|       |      |                |             | E1.2L 800 Ekip Touch LSI      | 1SDA072125R1 | 1SDA072755R1 |
|       |      |                |             | E1.2L 800 Ekip Touch LSIG     | 1SDA072126R1 | 1SDA072756R1 |
|       |      |                |             | E1.2L 800 Ekip Hi-Touch LSI   | 1SDA072128R1 | 1SDA072758R1 |
|       |      |                |             | E1.2L 800 Ekip Hi-Touch LSIG  | 1SDA072129R1 | 1SDA072759R1 |
|       | 1000 | 130            | 15          | E1.2L 1000 Ekip Dip LI        | 1SDA072161R1 | 1SDA072791R1 |
|       |      |                |             | E1.2L 1000 Ekip Dip LSI       | 1SDA072162R1 | 1SDA072792R1 |
|       |      |                |             | E1.2L 1000 Ekip Dip LSIG      | 1SDA072163R1 | 1SDA072793R1 |
|       |      |                |             | E1.2L 1000 Ekip Touch LI      | 1SDA072164R1 | 1SDA072794R1 |
|       |      |                |             | E1.2L 1000 Ekip Touch LSI     | 1SDA072165R1 | 1SDA072795R1 |
|       |      |                |             | E1.2L 1000 Ekip Touch LSIG    | 1SDA072166R1 | 1SDA072796R1 |
|       |      |                |             | E1.2L 1000 Ekip Hi-Touch LSI  | 1SDA072168R1 | 1SDA072798R1 |
|       |      |                |             | E1.2L 1000 Ekip Hi-Touch LSIG | 1SDA072169R1 | 1SDA072799R1 |
|       | 1250 | 130            | 15          | E1.2L 1250 Ekip Dip LI        | 1SDA072201R1 | 1SDA072831R1 |
|       |      |                |             | E1.2L 1250 Ekip Dip LSI       | 1SDA072202R1 | 1SDA072832R1 |
|       |      |                |             | E1.2L 1250 Ekip Dip LSIG      | 1SDA072203R1 | 1SDA072833R1 |
|       |      |                |             | E1.2L 1250 Ekip Touch LI      | 1SDA072204R1 | 1SDA072834R1 |
|       |      |                |             | E1.2L 1250 Ekip Touch LSI     | 1SDA072205R1 | 1SDA072835R1 |
|       |      |                |             | E1.2L 1250 Ekip Touch LSIG    | 1SDA072206R1 | 1SDA072836R1 |
|       |      |                |             | E1.2L 1250 Ekip Hi-Touch LSI  | 1SDA072208R1 | 1SDA072838R1 |
|       |      |                |             | E1.2L 1250 Ekip Hi-Touch LSIG | 1SDA072209R1 | 1SDA072839R1 |
| E2.2B | 1600 | 42             | 42          | E2.2B 1600 Ekip Dip LI        | 1SDA072331R1 | 1SDA072961R1 |
|       |      |                |             | E2.2B 1600 Ekip Dip LSI       | 1SDA072332R1 | 1SDA072962R1 |
|       |      |                |             | E2.2B 1600 Ekip Dip LSIG      | 1SDA072333R1 | 1SDA072963R1 |
|       |      |                |             | E2.2B 1600 Ekip Touch LI      | 1SDA072334R1 | 1SDA072964R1 |
|       |      |                |             | E2.2B 1600 Ekip Touch LSI     | 1SDA072335R1 | 1SDA072965R1 |
|       |      |                |             | E2.2B 1600 Ekip Touch LSIG    | 1SDA072336R1 | 1SDA072966R1 |
|       |      |                |             | E2.2B 1600 Ekip Hi-Touch LSI  | 1SDA072338R1 | 1SDA072968R1 |
|       |      |                |             | E2.2B 1600 Ekip Hi-Touch LSIG | 1SDA072339R1 | 1SDA072969R1 |
|       | 2000 | 42             | 42          | E2.2B 2000 Ekip Dip LI        | 1SDA072371R1 | 1SDA073001R1 |
|       |      |                |             | E2.2B 2000 Ekip Dip LSI       | 1SDA072372R1 | 1SDA073002R1 |
|       |      |                |             | E2.2B 2000 Ekip Dip LSIG      | 1SDA072373R1 | 1SDA073003R1 |
|       |      |                |             | E2.2B 2000 Ekip Touch LI      | 1SDA072374R1 | 1SDA073004R1 |
|       |      |                |             | E2.2B 2000 Ekip Touch LSI     | 1SDA072375R1 | 1SDA073005R1 |
|       |      |                |             | E2.2B 2000 Ekip Touch LSIG    | 1SDA072376R1 | 1SDA073006R1 |
|       |      |                |             | E2.2B 2000 Ekip Hi-Touch LSI  | 1SDA072378R1 | 1SDA073008R1 |
|       |      |                |             | E2.2B 2000 Ekip Hi-Touch LSIG | 1SDA072379R1 | 1SDA073009R1 |



## SACE Emax E2.2N • Mobile part of withdrawable circuit-breaker (MP)

| Size  | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      | 4 Poles      |
|-------|------|----------------|-------------|-------------------------------|--------------|--------------|
|       |      |                |             |                               | Code         | Code         |
| E2.2N | 800  | 66             | 66          | E2.2N 800 Ekip Dip LI         | 1SDA072241R1 | 1SDA072871R1 |
|       |      |                |             | E2.2N 800 Ekip Dip LSI        | 1SDA072242R1 | 1SDA072872R1 |
|       |      |                |             | E2.2N 800 Ekip Dip LSIG       | 1SDA072243R1 | 1SDA072873R1 |
|       |      |                |             | E2.2N 800 Ekip Touch LI       | 1SDA072244R1 | 1SDA072874R1 |
|       |      |                |             | E2.2N 800 Ekip Touch LSI      | 1SDA072245R1 | 1SDA072875R1 |
|       |      |                |             | E2.2N 800 Ekip Touch LSIG     | 1SDA072246R1 | 1SDA072876R1 |
|       |      |                |             | E2.2N 800 Ekip Hi-Touch LSI   | 1SDA072248R1 | 1SDA072878R1 |
|       |      |                |             | E2.2N 800 Ekip Hi-Touch LSIG  | 1SDA072249R1 | 1SDA072879R1 |
|       | 1000 | 66             | 66          | E2.2N 1000 Ekip Dip LI        | 1SDA072271R1 | 1SDA072901R1 |
|       |      |                |             | E2.2N 1000 Ekip Dip LSI       | 1SDA072272R1 | 1SDA072902R1 |
|       |      |                |             | E2.2N 1000 Ekip Dip LSIG      | 1SDA072273R1 | 1SDA072903R1 |
|       |      |                |             | E2.2N 1000 Ekip Touch LI      | 1SDA072274R1 | 1SDA072904R1 |
|       |      |                |             | E2.2N 1000 Ekip Touch LSI     | 1SDA072275R1 | 1SDA072905R1 |
|       |      |                |             | E2.2N 1000 Ekip Touch LSIG    | 1SDA072276R1 | 1SDA072906R1 |
|       |      |                |             | E2.2N 1000 Ekip Hi-Touch LSI  | 1SDA072278R1 | 1SDA072908R1 |
|       |      |                |             | E2.2N 1000 Ekip Hi-Touch LSIG | 1SDA072279R1 | 1SDA072909R1 |
|       | 1250 | 66             | 66          | E2.2N 1250 Ekip Dip LI        | 1SDA072301R1 | 1SDA072931R1 |
|       |      |                |             | E2.2N 1250 Ekip Dip LSI       | 1SDA072302R1 | 1SDA072932R1 |
|       |      |                |             | E2.2N 1250 Ekip Dip LSIG      | 1SDA072303R1 | 1SDA072933R1 |
|       |      |                |             | E2.2N 1250 Ekip Touch LI      | 1SDA072304R1 | 1SDA072934R1 |
|       |      |                |             | E2.2N 1250 Ekip Touch LSI     | 1SDA072305R1 | 1SDA072935R1 |
|       |      |                |             | E2.2N 1250 Ekip Touch LSIG    | 1SDA072306R1 | 1SDA072936R1 |
|       |      |                |             | E2.2N 1250 Ekip Hi-Touch LSI  | 1SDA072308R1 | 1SDA072938R1 |
|       |      |                |             | E2.2N 1250 Ekip Hi-Touch LSIG | 1SDA072309R1 | 1SDA072939R1 |
|       | 1600 | 66             | 66          | E2.2N 1600 Ekip Dip LI        | 1SDA072341R1 | 1SDA072971R1 |
|       |      |                |             | E2.2N 1600 Ekip Dip LSI       | 1SDA072342R1 | 1SDA072972R1 |
|       |      |                |             | E2.2N 1600 Ekip Dip LSIG      | 1SDA072343R1 | 1SDA072973R1 |
|       |      |                |             | E2.2N 1600 Ekip Touch LI      | 1SDA072344R1 | 1SDA072974R1 |
|       |      |                |             | E2.2N 1600 Ekip Touch LSI     | 1SDA072345R1 | 1SDA072975R1 |
|       |      |                |             | E2.2N 1600 Ekip Touch LSIG    | 1SDA072346R1 | 1SDA072976R1 |
|       |      |                |             | E2.2N 1600 Ekip Hi-Touch LSI  | 1SDA072348R1 | 1SDA072978R1 |
|       |      |                |             | E2.2N 1600 Ekip Hi-Touch LSIG | 1SDA072349R1 | 1SDA072979R1 |
|       | 2000 | 66             | 66          | E2.2N 2000 Ekip Dip LI        | 1SDA072381R1 | 1SDA073011R1 |
|       |      |                |             | E2.2N 2000 Ekip Dip LSI       | 1SDA072382R1 | 1SDA073012R1 |
|       |      |                |             | E2.2N 2000 Ekip Dip LSIG      | 1SDA072383R1 | 1SDA073013R1 |
|       |      |                |             | E2.2N 2000 Ekip Touch LI      | 1SDA072384R1 | 1SDA073014R1 |
|       |      |                |             | E2.2N 2000 Ekip Touch LSI     | 1SDA072385R1 | 1SDA073015R1 |
|       |      |                |             | E2.2N 2000 Ekip Touch LSIG    | 1SDA072386R1 | 1SDA073016R1 |
|       |      |                |             | E2.2N 2000 Ekip Hi-Touch LSI  | 1SDA072388R1 | 1SDA073018R1 |
|       |      |                |             | E2.2N 2000 Ekip Hi-Touch LSIG | 1SDA072389R1 | 1SDA073019R1 |
|       | 2500 | 66             | 66          | E2.2N 2500 Ekip Dip LI        | 1SDA072411R1 | 1SDA073041R1 |
|       |      |                |             | E2.2N 2500 Ekip Dip LSI       | 1SDA072412R1 | 1SDA073042R1 |
|       |      |                |             | E2.2N 2500 Ekip Dip LSIG      | 1SDA072413R1 | 1SDA073043R1 |
|       |      |                |             | E2.2N 2500 Ekip Touch LI      | 1SDA072414R1 | 1SDA073044R1 |
|       |      |                |             | E2.2N 2500 Ekip Touch LSI     | 1SDA072415R1 | 1SDA073045R1 |
|       |      |                |             | E2.2N 2500 Ekip Touch LSIG    | 1SDA072416R1 | 1SDA073046R1 |
|       |      |                |             | E2.2N 2500 Ekip Hi-Touch LSI  | 1SDA072418R1 | 1SDA073048R1 |
|       |      |                |             | E2.2N 2500 Ekip Hi-Touch LSIG | 1SDA072419R1 | 1SDA073049R1 |

# Automatic circuit-breakers

## Withdrawable version for power distribution



SACE Emax E2.2S • Mobile part of withdrawable circuit-breaker (MP)

| Size  | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      | 4 Poles      |
|-------|------|----------------|-------------|-------------------------------|--------------|--------------|
|       |      |                |             |                               | Code         | Code         |
| E2.2S | 250  | 85             | 66          | E2.2S 250 Ekip Dip LI         | 1SDA073648R1 | 1SDA073658R1 |
|       |      |                |             | E2.2S 250 Ekip Dip LSI        | 1SDA073649R1 | 1SDA073659R1 |
|       |      |                |             | E2.2S 250 Ekip Dip LSIG       | 1SDA073650R1 | 1SDA073660R1 |
|       |      |                |             | E2.2S 250 Ekip Touch LI       | 1SDA073651R1 | 1SDA073661R1 |
|       |      |                |             | E2.2S 250 Ekip Touch LSI      | 1SDA073652R1 | 1SDA073662R1 |
|       |      |                |             | E2.2S 250 Ekip Touch LSIG     | 1SDA073653R1 | 1SDA073663R1 |
|       |      |                |             | E2.2S 250 Ekip Hi-Touch LSI   | 1SDA073655R1 | 1SDA073665R1 |
|       |      |                |             | E2.2S 250 Ekip Hi-Touch LSIG  | 1SDA073656R1 | 1SDA073666R1 |
|       | 800  | 85             | 66          | E2.2S 800 Ekip Dip LI         | 1SDA072251R1 | 1SDA072881R1 |
|       |      |                |             | E2.2S 800 Ekip Dip LSI        | 1SDA072252R1 | 1SDA072882R1 |
|       |      |                |             | E2.2S 800 Ekip Dip LSIG       | 1SDA072253R1 | 1SDA072883R1 |
|       |      |                |             | E2.2S 800 Ekip Touch LI       | 1SDA072254R1 | 1SDA072884R1 |
|       |      |                |             | E2.2S 800 Ekip Touch LSI      | 1SDA072255R1 | 1SDA072885R1 |
|       |      |                |             | E2.2S 800 Ekip Touch LSIG     | 1SDA072256R1 | 1SDA072886R1 |
|       |      |                |             | E2.2S 800 Ekip Hi-Touch LSI   | 1SDA072258R1 | 1SDA072888R1 |
|       |      |                |             | E2.2S 800 Ekip Hi-Touch LSIG  | 1SDA072259R1 | 1SDA072889R1 |
|       | 1000 | 85             | 66          | E2.2S 1000 Ekip Dip LI        | 1SDA072281R1 | 1SDA072911R1 |
|       |      |                |             | E2.2S 1000 Ekip Dip LSI       | 1SDA072282R1 | 1SDA072912R1 |
|       |      |                |             | E2.2S 1000 Ekip Dip LSIG      | 1SDA072283R1 | 1SDA072913R1 |
|       |      |                |             | E2.2S 1000 Ekip Touch LI      | 1SDA072284R1 | 1SDA072914R1 |
|       |      |                |             | E2.2S 1000 Ekip Touch LSI     | 1SDA072285R1 | 1SDA072915R1 |
|       |      |                |             | E2.2S 1000 Ekip Touch LSIG    | 1SDA072286R1 | 1SDA072916R1 |
|       |      |                |             | E2.2S 1000 Ekip Hi-Touch LSI  | 1SDA072288R1 | 1SDA072918R1 |
|       |      |                |             | E2.2S 1000 Ekip Hi-Touch LSIG | 1SDA072289R1 | 1SDA072919R1 |
|       | 1250 | 85             | 66          | E2.2S 1250 Ekip Dip LI        | 1SDA072311R1 | 1SDA072941R1 |
|       |      |                |             | E2.2S 1250 Ekip Dip LSI       | 1SDA072312R1 | 1SDA072942R1 |
|       |      |                |             | E2.2S 1250 Ekip Dip LSIG      | 1SDA072313R1 | 1SDA072943R1 |
|       |      |                |             | E2.2S 1250 Ekip Touch LI      | 1SDA072314R1 | 1SDA072944R1 |
|       |      |                |             | E2.2S 1250 Ekip Touch LSI     | 1SDA072315R1 | 1SDA072945R1 |
|       |      |                |             | E2.2S 1250 Ekip Touch LSIG    | 1SDA072316R1 | 1SDA072946R1 |
|       |      |                |             | E2.2S 1250 Ekip Hi-Touch LSI  | 1SDA072318R1 | 1SDA072948R1 |
|       |      |                |             | E2.2S 1250 Ekip Hi-Touch LSIG | 1SDA072319R1 | 1SDA072949R1 |



1SDC200066F001

## SACE Emax E2.2S • Mobile part of withdrawable circuit-breaker (MP)

| Size  | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      |  | 4 Poles      |  |
|-------|------|----------------|-------------|-------------------------------|--------------|--|--------------|--|
|       |      |                |             |                               | Code         |  | Code         |  |
| E2.2S | 1600 | 85             | 66          | E2.2S 1600 Ekip Dip LI        | 1SDA072351R1 |  | 1SDA072981R1 |  |
|       |      |                |             | E2.2S 1600 Ekip Dip LSI       | 1SDA072352R1 |  | 1SDA072982R1 |  |
|       |      |                |             | E2.2S 1600 Ekip Dip LSIG      | 1SDA072353R1 |  | 1SDA072983R1 |  |
|       |      |                |             | E2.2S 1600 Ekip Touch LI      | 1SDA072354R1 |  | 1SDA072984R1 |  |
|       |      |                |             | E2.2S 1600 Ekip Touch LSI     | 1SDA072355R1 |  | 1SDA072985R1 |  |
|       |      |                |             | E2.2S 1600 Ekip Touch LSIG    | 1SDA072356R1 |  | 1SDA072986R1 |  |
|       |      |                |             | E2.2S 1600 Ekip Hi-Touch LSI  | 1SDA072358R1 |  | 1SDA072988R1 |  |
|       |      |                |             | E2.2S 1600 Ekip Hi-Touch LSIG | 1SDA072359R1 |  | 1SDA072989R1 |  |
|       | 2000 | 85             | 66          | E2.2S 2000 Ekip Dip LI        | 1SDA072391R1 |  | 1SDA073021R1 |  |
|       |      |                |             | E2.2S 2000 Ekip Dip LSI       | 1SDA072392R1 |  | 1SDA073022R1 |  |
|       |      |                |             | E2.2S 2000 Ekip Dip LSIG      | 1SDA072393R1 |  | 1SDA073023R1 |  |
|       |      |                |             | E2.2S 2000 Ekip Touch LI      | 1SDA072394R1 |  | 1SDA073024R1 |  |
|       |      |                |             | E2.2S 2000 Ekip Touch LSI     | 1SDA072395R1 |  | 1SDA073025R1 |  |
|       |      |                |             | E2.2S 2000 Ekip Touch LSIG    | 1SDA072396R1 |  | 1SDA073026R1 |  |
|       |      |                |             | E2.2S 2000 Ekip Hi-Touch LSI  | 1SDA072398R1 |  | 1SDA073028R1 |  |
|       |      |                |             | E2.2S 2000 Ekip Hi-Touch LSIG | 1SDA072399R1 |  | 1SDA073029R1 |  |
|       | 2500 | 85             | 66          | E2.2S 2500 Ekip Dip LI        | 1SDA072421R1 |  | 1SDA073051R1 |  |
|       |      |                |             | E2.2S 2500 Ekip Dip LSI       | 1SDA072422R1 |  | 1SDA073052R1 |  |
|       |      |                |             | E2.2S 2500 Ekip Dip LSIG      | 1SDA072423R1 |  | 1SDA073053R1 |  |
|       |      |                |             | E2.2S 2500 Ekip Touch LI      | 1SDA072424R1 |  | 1SDA073054R1 |  |
|       |      |                |             | E2.2S 2500 Ekip Touch LSI     | 1SDA072425R1 |  | 1SDA073055R1 |  |
|       |      |                |             | E2.2S 2500 Ekip Touch LSIG    | 1SDA072426R1 |  | 1SDA073056R1 |  |
|       |      |                |             | E2.2S 2500 Ekip Hi-Touch LSI  | 1SDA072428R1 |  | 1SDA073058R1 |  |
|       |      |                |             | E2.2S 2500 Ekip Hi-Touch LSIG | 1SDA072429R1 |  | 1SDA073059R1 |  |

# Automatic circuit-breakers

## Withdrawable version for power distribution



1SDC20066F001

### SACE Emax E2.2H • Mobile part of withdrawable circuit-breaker (MP)

| Size  | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      |  | 4 Poles      |  |
|-------|------|----------------|-------------|-------------------------------|--------------|--|--------------|--|
|       |      |                |             |                               | Code         |  | Code         |  |
| E2.2H | 800  | 100            | 85          | E2.2H 800 Ekip Dip LI         | 1SDA072261R1 |  | 1SDA072891R1 |  |
|       |      |                |             | E2.2H 800 Ekip Dip LSI        | 1SDA072262R1 |  | 1SDA072892R1 |  |
|       |      |                |             | E2.2H 800 Ekip Dip LSIG       | 1SDA072263R1 |  | 1SDA072893R1 |  |
|       |      |                |             | E2.2H 800 Ekip Touch LI       | 1SDA072264R1 |  | 1SDA072894R1 |  |
|       |      |                |             | E2.2H 800 Ekip Touch LSI      | 1SDA072265R1 |  | 1SDA072895R1 |  |
|       |      |                |             | E2.2H 800 Ekip Touch LSIG     | 1SDA072266R1 |  | 1SDA072896R1 |  |
|       |      |                |             | E2.2H 800 Ekip Hi-Touch LSI   | 1SDA072268R1 |  | 1SDA072898R1 |  |
|       |      |                |             | E2.2H 800 Ekip Hi-Touch LSIG  | 1SDA072269R1 |  | 1SDA072899R1 |  |
|       | 1000 | 100            | 85          | E2.2H 1000 Ekip Dip LI        | 1SDA072291R1 |  | 1SDA072921R1 |  |
|       |      |                |             | E2.2H 1000 Ekip Dip LSI       | 1SDA072292R1 |  | 1SDA072922R1 |  |
|       |      |                |             | E2.2H 1000 Ekip Dip LSIG      | 1SDA072293R1 |  | 1SDA072923R1 |  |
|       |      |                |             | E2.2H 1000 Ekip Touch LI      | 1SDA072294R1 |  | 1SDA072924R1 |  |
|       |      |                |             | E2.2H 1000 Ekip Touch LSI     | 1SDA072295R1 |  | 1SDA072925R1 |  |
|       |      |                |             | E2.2H 1000 Ekip Touch LSIG    | 1SDA072296R1 |  | 1SDA072926R1 |  |
|       |      |                |             | E2.2H 1000 Ekip Hi-Touch LSI  | 1SDA072298R1 |  | 1SDA072928R1 |  |
|       |      |                |             | E2.2H 1000 Ekip Hi-Touch LSIG | 1SDA072299R1 |  | 1SDA072929R1 |  |
|       | 1250 | 100            | 85          | E2.2H 1250 Ekip Dip LI        | 1SDA072321R1 |  | 1SDA072951R1 |  |
|       |      |                |             | E2.2H 1250 Ekip Dip LSI       | 1SDA072322R1 |  | 1SDA072952R1 |  |
|       |      |                |             | E2.2H 1250 Ekip Dip LSIG      | 1SDA072323R1 |  | 1SDA072953R1 |  |
|       |      |                |             | E2.2H 1250 Ekip Touch LI      | 1SDA072324R1 |  | 1SDA072954R1 |  |
|       |      |                |             | E2.2H 1250 Ekip Touch LSI     | 1SDA072325R1 |  | 1SDA072955R1 |  |
|       |      |                |             | E2.2H 1250 Ekip Touch LSIG    | 1SDA072326R1 |  | 1SDA072956R1 |  |
|       |      |                |             | E2.2H 1250 Ekip Hi-Touch LSI  | 1SDA072328R1 |  | 1SDA072958R1 |  |
|       |      |                |             | E2.2H 1250 Ekip Hi-Touch LSIG | 1SDA072329R1 |  | 1SDA072959R1 |  |
|       | 1600 | 100            | 85          | E2.2H 1600 Ekip Dip LI        | 1SDA072361R1 |  | 1SDA072991R1 |  |
|       |      |                |             | E2.2H 1600 Ekip Dip LSI       | 1SDA072362R1 |  | 1SDA072992R1 |  |
|       |      |                |             | E2.2H 1600 Ekip Dip LSIG      | 1SDA072363R1 |  | 1SDA072993R1 |  |
|       |      |                |             | E2.2H 1600 Ekip Touch LI      | 1SDA072364R1 |  | 1SDA072994R1 |  |
|       |      |                |             | E2.2H 1600 Ekip Touch LSI     | 1SDA072365R1 |  | 1SDA072995R1 |  |
|       |      |                |             | E2.2H 1600 Ekip Touch LSIG    | 1SDA072366R1 |  | 1SDA072996R1 |  |
|       |      |                |             | E2.2H 1600 Ekip Hi-Touch LSI  | 1SDA072368R1 |  | 1SDA072998R1 |  |
|       |      |                |             | E2.2H 1600 Ekip Hi-Touch LSIG | 1SDA072369R1 |  | 1SDA072999R1 |  |
|       | 2000 | 100            | 85          | E2.2H 2000 Ekip Dip LI        | 1SDA072401R1 |  | 1SDA073031R1 |  |
|       |      |                |             | E2.2H 2000 Ekip Dip LSI       | 1SDA072402R1 |  | 1SDA073032R1 |  |
|       |      |                |             | E2.2H 2000 Ekip Dip LSIG      | 1SDA072403R1 |  | 1SDA073033R1 |  |
|       |      |                |             | E2.2H 2000 Ekip Touch LI      | 1SDA072404R1 |  | 1SDA073034R1 |  |
|       |      |                |             | E2.2H 2000 Ekip Touch LSI     | 1SDA072405R1 |  | 1SDA073035R1 |  |
|       |      |                |             | E2.2H 2000 Ekip Touch LSIG    | 1SDA072406R1 |  | 1SDA073036R1 |  |
|       |      |                |             | E2.2H 2000 Ekip Hi-Touch LSI  | 1SDA072408R1 |  | 1SDA073038R1 |  |
|       |      |                |             | E2.2H 2000 Ekip Hi-Touch LSIG | 1SDA072409R1 |  | 1SDA073039R1 |  |
|       | 2500 | 100            | 85          | E2.2H 2500 Ekip Dip LI        | 1SDA072431R1 |  | 1SDA073061R1 |  |
|       |      |                |             | E2.2H 2500 Ekip Dip LSI       | 1SDA072432R1 |  | 1SDA073062R1 |  |
|       |      |                |             | E2.2H 2500 Ekip Dip LSIG      | 1SDA072433R1 |  | 1SDA073063R1 |  |
|       |      |                |             | E2.2H 2500 Ekip Touch LI      | 1SDA072434R1 |  | 1SDA073064R1 |  |
|       |      |                |             | E2.2H 2500 Ekip Touch LSI     | 1SDA072435R1 |  | 1SDA073065R1 |  |
|       |      |                |             | E2.2H 2500 Ekip Touch LSIG    | 1SDA072436R1 |  | 1SDA073066R1 |  |
|       |      |                |             | E2.2H 2500 Ekip Hi-Touch LSI  | 1SDA072438R1 |  | 1SDA073068R1 |  |
|       |      |                |             | E2.2H 2500 Ekip Hi-Touch LSIG | 1SDA072439R1 |  | 1SDA073069R1 |  |



## SACE Emax E4.2N-S-H • Mobile part of withdrawable circuit-breaker (MP)

| Size         | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      | 4 Poles      |
|--------------|------|----------------|-------------|-------------------------------|--------------|--------------|
|              |      |                |             |                               | Code         | Code         |
| <b>E4.2N</b> | 3200 | 66             | 66          | E4.2N 3200 Ekip Dip LI        | 1SDA072491R1 | 1SDA073121R1 |
|              |      |                |             | E4.2N 3200 Ekip Dip LSI       | 1SDA072492R1 | 1SDA073122R1 |
|              |      |                |             | E4.2N 3200 Ekip Dip LSIG      | 1SDA072493R1 | 1SDA073123R1 |
|              |      |                |             | E4.2N 3200 Ekip Touch LI      | 1SDA072494R1 | 1SDA073124R1 |
|              |      |                |             | E4.2N 3200 Ekip Touch LSI     | 1SDA072495R1 | 1SDA073125R1 |
|              |      |                |             | E4.2N 3200 Ekip Touch LSIG    | 1SDA072496R1 | 1SDA073126R1 |
|              |      |                |             | E4.2N 3200 Ekip Hi-Touch LSI  | 1SDA072498R1 | 1SDA073128R1 |
|              |      |                |             | E4.2N 3200 Ekip Hi-Touch LSIG | 1SDA072499R1 | 1SDA073129R1 |
|              | 4000 | 66             | 66          | E4.2N 4000 Ekip Dip LI        | 1SDA072541R1 | 1SDA073171R1 |
|              |      |                |             | E4.2N 4000 Ekip Dip LSI       | 1SDA072542R1 | 1SDA073172R1 |
|              |      |                |             | E4.2N 4000 Ekip Dip LSIG      | 1SDA072543R1 | 1SDA073173R1 |
|              |      |                |             | E4.2N 4000 Ekip Touch LI      | 1SDA072544R1 | 1SDA073174R1 |
|              |      |                |             | E4.2N 4000 Ekip Touch LSI     | 1SDA072545R1 | 1SDA073175R1 |
|              |      |                |             | E4.2N 4000 Ekip Touch LSIG    | 1SDA072546R1 | 1SDA073176R1 |
|              |      |                |             | E4.2N 4000 Ekip Hi-Touch LSI  | 1SDA072548R1 | 1SDA073178R1 |
|              |      |                |             | E4.2N 4000 Ekip Hi-Touch LSIG | 1SDA072549R1 | 1SDA073179R1 |
| <b>E4.2S</b> | 3200 | 85             | 66          | E4.2S 3200 Ekip Dip LI        | 1SDA072501R1 | 1SDA073131R1 |
|              |      |                |             | E4.2S 3200 Ekip Dip LSI       | 1SDA072502R1 | 1SDA073132R1 |
|              |      |                |             | E4.2S 3200 Ekip Dip LSIG      | 1SDA072503R1 | 1SDA073133R1 |
|              |      |                |             | E4.2S 3200 Ekip Touch LI      | 1SDA072504R1 | 1SDA073134R1 |
|              |      |                |             | E4.2S 3200 Ekip Touch LSI     | 1SDA072505R1 | 1SDA073135R1 |
|              |      |                |             | E4.2S 3200 Ekip Touch LSIG    | 1SDA072506R1 | 1SDA073136R1 |
|              |      |                |             | E4.2S 3200 Ekip Hi-Touch LSI  | 1SDA072508R1 | 1SDA073138R1 |
|              |      |                |             | E4.2S 3200 Ekip Hi-Touch LSIG | 1SDA072509R1 | 1SDA073139R1 |
|              | 4000 | 85             | 66          | E4.2S 4000 Ekip Dip LI        | 1SDA072551R1 | 1SDA073181R1 |
|              |      |                |             | E4.2S 4000 Ekip Dip LSI       | 1SDA072552R1 | 1SDA073182R1 |
|              |      |                |             | E4.2S 4000 Ekip Dip LSIG      | 1SDA072553R1 | 1SDA073183R1 |
|              |      |                |             | E4.2S 4000 Ekip Touch LI      | 1SDA072554R1 | 1SDA073184R1 |
|              |      |                |             | E4.2S 4000 Ekip Touch LSI     | 1SDA072555R1 | 1SDA073185R1 |
|              |      |                |             | E4.2S 4000 Ekip Touch LSIG    | 1SDA072556R1 | 1SDA073186R1 |
|              |      |                |             | E4.2S 4000 Ekip Hi-Touch LSI  | 1SDA072558R1 | 1SDA073188R1 |
|              |      |                |             | E4.2S 4000 Ekip Hi-Touch LSIG | 1SDA072559R1 | 1SDA073189R1 |
| <b>E4.2H</b> | 3200 | 100            | 85          | E4.2H 3200 Ekip Dip LI        | 1SDA072511R1 | 1SDA073141R1 |
|              |      |                |             | E4.2H 3200 Ekip Dip LSI       | 1SDA072512R1 | 1SDA073142R1 |
|              |      |                |             | E4.2H 3200 Ekip Dip LSIG      | 1SDA072513R1 | 1SDA073143R1 |
|              |      |                |             | E4.2H 3200 Ekip Touch LI      | 1SDA072514R1 | 1SDA073144R1 |
|              |      |                |             | E4.2H 3200 Ekip Touch LSI     | 1SDA072515R1 | 1SDA073145R1 |
|              |      |                |             | E4.2H 3200 Ekip Touch LSIG    | 1SDA072516R1 | 1SDA073146R1 |
|              |      |                |             | E4.2H 3200 Ekip Hi-Touch LSI  | 1SDA072518R1 | 1SDA073148R1 |
|              |      |                |             | E4.2H 3200 Ekip Hi-Touch LSIG | 1SDA072519R1 | 1SDA073149R1 |
|              | 4000 | 100            | 85          | E4.2H 4000 Ekip Dip LI        | 1SDA072561R1 | 1SDA073191R1 |
|              |      |                |             | E4.2H 4000 Ekip Dip LSI       | 1SDA072562R1 | 1SDA073192R1 |
|              |      |                |             | E4.2H 4000 Ekip Dip LSIG      | 1SDA072563R1 | 1SDA073193R1 |
|              |      |                |             | E4.2H 4000 Ekip Touch LI      | 1SDA072564R1 | 1SDA073194R1 |
|              |      |                |             | E4.2H 4000 Ekip Touch LSI     | 1SDA072565R1 | 1SDA073195R1 |
|              |      |                |             | E4.2H 4000 Ekip Touch LSIG    | 1SDA072566R1 | 1SDA073196R1 |
|              |      |                |             | E4.2H 4000 Ekip Hi-Touch LSI  | 1SDA072568R1 | 1SDA073198R1 |
|              |      |                |             | E4.2H 4000 Ekip Hi-Touch LSIG | 1SDA072569R1 | 1SDA073199R1 |

# Automatic circuit-breakers

## Withdrawable version for power distribution



SACE Emax E4.2V • Mobile part of withdrawable circuit-breaker (MP)

| Size  | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      |  | 4 Poles      |  |
|-------|------|----------------|-------------|-------------------------------|--------------|--|--------------|--|
|       |      |                |             |                               | Code         |  | Code         |  |
| E4.2V | 2000 | 150            | 100         | E4.2V 2000 Ekip Dip LI        | 1SDA072451R1 |  | 1SDA073081R1 |  |
|       |      |                |             | E4.2V 2000 Ekip Dip LSI       | 1SDA072452R1 |  | 1SDA073082R1 |  |
|       |      |                |             | E4.2V 2000 Ekip Dip LSIG      | 1SDA072453R1 |  | 1SDA073083R1 |  |
|       |      |                |             | E4.2V 2000 Ekip Touch LI      | 1SDA072454R1 |  | 1SDA073084R1 |  |
|       |      |                |             | E4.2V 2000 Ekip Touch LSI     | 1SDA072455R1 |  | 1SDA073085R1 |  |
|       |      |                |             | E4.2V 2000 Ekip Touch LSIG    | 1SDA072456R1 |  | 1SDA073086R1 |  |
|       |      |                |             | E4.2V 2000 Ekip Hi-Touch LSI  | 1SDA072458R1 |  | 1SDA073088R1 |  |
|       |      |                |             | E4.2V 2000 Ekip Hi-Touch LSIG | 1SDA072459R1 |  | 1SDA073089R1 |  |
|       | 2500 | 150            | 100         | E4.2V 2500 Ekip Dip LI        | 1SDA072471R1 |  | 1SDA073101R1 |  |
|       |      |                |             | E4.2V 2500 Ekip Dip LSI       | 1SDA072472R1 |  | 1SDA073102R1 |  |
|       |      |                |             | E4.2V 2500 Ekip Dip LSIG      | 1SDA072473R1 |  | 1SDA073103R1 |  |
|       |      |                |             | E4.2V 2500 Ekip Touch LI      | 1SDA072474R1 |  | 1SDA073104R1 |  |
|       |      |                |             | E4.2V 2500 Ekip Touch LSI     | 1SDA072475R1 |  | 1SDA073105R1 |  |
|       |      |                |             | E4.2V 2500 Ekip Touch LSIG    | 1SDA072476R1 |  | 1SDA073106R1 |  |
|       |      |                |             | E4.2V 2500 Ekip Hi-Touch LSI  | 1SDA072478R1 |  | 1SDA073108R1 |  |
|       |      |                |             | E4.2V 2500 Ekip Hi-Touch LSIG | 1SDA072479R1 |  | 1SDA073109R1 |  |
|       | 3200 | 150            | 100         | E4.2V 3200 Ekip Dip LI        | 1SDA072521R1 |  | 1SDA073151R1 |  |
|       |      |                |             | E4.2V 3200 Ekip Dip LSI       | 1SDA072522R1 |  | 1SDA073152R1 |  |
|       |      |                |             | E4.2V 3200 Ekip Dip LSIG      | 1SDA072523R1 |  | 1SDA073153R1 |  |
|       |      |                |             | E4.2V 3200 Ekip Touch LI      | 1SDA072524R1 |  | 1SDA073154R1 |  |
|       |      |                |             | E4.2V 3200 Ekip Touch LSI     | 1SDA072525R1 |  | 1SDA073155R1 |  |
|       |      |                |             | E4.2V 3200 Ekip Touch LSIG    | 1SDA072526R1 |  | 1SDA073156R1 |  |
|       |      |                |             | E4.2V 3200 Ekip Hi-Touch LSI  | 1SDA072528R1 |  | 1SDA073158R1 |  |
|       |      |                |             | E4.2V 3200 Ekip Hi-Touch LSIG | 1SDA072529R1 |  | 1SDA073159R1 |  |
|       | 4000 | 150            | 100         | E4.2V 4000 Ekip Dip LI        | 1SDA072571R1 |  | 1SDA073201R1 |  |
|       |      |                |             | E4.2V 4000 Ekip Dip LSI       | 1SDA072572R1 |  | 1SDA073202R1 |  |
|       |      |                |             | E4.2V 4000 Ekip Dip LSIG      | 1SDA072573R1 |  | 1SDA073203R1 |  |
|       |      |                |             | E4.2V 4000 Ekip Touch LI      | 1SDA072574R1 |  | 1SDA073204R1 |  |
|       |      |                |             | E4.2V 4000 Ekip Touch LSI     | 1SDA072575R1 |  | 1SDA073205R1 |  |
|       |      |                |             | E4.2V 4000 Ekip Touch LSIG    | 1SDA072576R1 |  | 1SDA073206R1 |  |
|       |      |                |             | E4.2V 4000 Ekip Hi-Touch LSI  | 1SDA072578R1 |  | 1SDA073208R1 |  |
|       |      |                |             | E4.2V 4000 Ekip Hi-Touch LSIG | 1SDA072579R1 |  | 1SDA073209R1 |  |



1SDC200689F001

## SACE Emax E6.2H-V • Mobile part of withdrawable circuit-breaker (MP)

| Size         | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      |  | 4 Poles      |  |
|--------------|------|----------------|-------------|-------------------------------|--------------|--|--------------|--|
|              |      |                |             |                               | Code         |  | Code         |  |
| <b>E6.2H</b> | 4000 | 100            | 100         | E6.2H 4000 Ekip Dip LI        | 1SDA072581R1 |  | 1SDA073211R1 |  |
|              |      |                |             | E6.2H 4000 Ekip Dip LSI       | 1SDA072582R1 |  | 1SDA073212R1 |  |
|              |      |                |             | E6.2H 4000 Ekip Dip LSIG      | 1SDA072583R1 |  | 1SDA073213R1 |  |
|              |      |                |             | E6.2H 4000 Ekip Touch LI      | 1SDA072584R1 |  | 1SDA073214R1 |  |
|              |      |                |             | E6.2H 4000 Ekip Touch LSI     | 1SDA072585R1 |  | 1SDA073215R1 |  |
|              |      |                |             | E6.2H 4000 Ekip Touch LSIG    | 1SDA072586R1 |  | 1SDA073216R1 |  |
|              |      |                |             | E6.2H 4000 Ekip Hi-Touch LSI  | 1SDA072588R1 |  | 1SDA073218R1 |  |
|              |      |                |             | E6.2H 4000 Ekip Hi-Touch LSIG | 1SDA072589R1 |  | 1SDA073219R1 |  |
|              | 5000 | 100            | 100         | E6.2H 5000 Ekip Dip LI        | 1SDA072611R1 |  | 1SDA073241R1 |  |
|              |      |                |             | E6.2H 5000 Ekip Dip LSI       | 1SDA072612R1 |  | 1SDA073242R1 |  |
|              |      |                |             | E6.2H 5000 Ekip Dip LSIG      | 1SDA072613R1 |  | 1SDA073243R1 |  |
|              |      |                |             | E6.2H 5000 Ekip Touch LI      | 1SDA072614R1 |  | 1SDA073244R1 |  |
|              |      |                |             | E6.2H 5000 Ekip Touch LSI     | 1SDA072615R1 |  | 1SDA073245R1 |  |
|              |      |                |             | E6.2H 5000 Ekip Touch LSIG    | 1SDA072616R1 |  | 1SDA073246R1 |  |
|              |      |                |             | E6.2H 5000 Ekip Hi-Touch LSI  | 1SDA072618R1 |  | 1SDA073248R1 |  |
|              |      |                |             | E6.2H 5000 Ekip Hi-Touch LSIG | 1SDA072619R1 |  | 1SDA073249R1 |  |
|              | 6300 | 100            | 100         | E6.2H 6300 Ekip Dip LI        | 1SDA072641R1 |  | 1SDA073271R1 |  |
|              |      |                |             | E6.2H 6300 Ekip Dip LSI       | 1SDA072642R1 |  | 1SDA073272R1 |  |
|              |      |                |             | E6.2H 6300 Ekip Dip LSIG      | 1SDA072643R1 |  | 1SDA073273R1 |  |
|              |      |                |             | E6.2H 6300 Ekip Touch LI      | 1SDA072644R1 |  | 1SDA073274R1 |  |
|              |      |                |             | E6.2H 6300 Ekip Touch LSI     | 1SDA072645R1 |  | 1SDA073275R1 |  |
|              |      |                |             | E6.2H 6300 Ekip Touch LSIG    | 1SDA072646R1 |  | 1SDA073276R1 |  |
|              |      |                |             | E6.2H 6300 Ekip Hi-Touch LSI  | 1SDA072648R1 |  | 1SDA073278R1 |  |
|              |      |                |             | E6.2H 6300 Ekip Hi-Touch LSIG | 1SDA072649R1 |  | 1SDA073279R1 |  |
| <b>E6.2V</b> | 4000 | 150            | 100         | E6.2V 4000 Ekip Dip LI        | 1SDA072591R1 |  | 1SDA073221R1 |  |
|              |      |                |             | E6.2V 4000 Ekip Dip LSI       | 1SDA072592R1 |  | 1SDA073222R1 |  |
|              |      |                |             | E6.2V 4000 Ekip Dip LSIG      | 1SDA072593R1 |  | 1SDA073223R1 |  |
|              |      |                |             | E6.2V 4000 Ekip Touch LI      | 1SDA072594R1 |  | 1SDA073224R1 |  |
|              |      |                |             | E6.2V 4000 Ekip Touch LSI     | 1SDA072595R1 |  | 1SDA073225R1 |  |
|              |      |                |             | E6.2V 4000 Ekip Touch LSIG    | 1SDA072596R1 |  | 1SDA073226R1 |  |
|              |      |                |             | E6.2V 4000 Ekip Hi-Touch LSI  | 1SDA072598R1 |  | 1SDA073228R1 |  |
|              |      |                |             | E6.2V 4000 Ekip Hi-Touch LSIG | 1SDA072599R1 |  | 1SDA073229R1 |  |
|              | 5000 | 150            | 100         | E6.2V 5000 Ekip Dip LI        | 1SDA072621R1 |  | 1SDA073251R1 |  |
|              |      |                |             | E6.2V 5000 Ekip Dip LSI       | 1SDA072622R1 |  | 1SDA073252R1 |  |
|              |      |                |             | E6.2V 5000 Ekip Dip LSIG      | 1SDA072623R1 |  | 1SDA073253R1 |  |
|              |      |                |             | E6.2V 5000 Ekip Touch LI      | 1SDA072624R1 |  | 1SDA073254R1 |  |
|              |      |                |             | E6.2V 5000 Ekip Touch LSI     | 1SDA072625R1 |  | 1SDA073255R1 |  |
|              |      |                |             | E6.2V 5000 Ekip Touch LSIG    | 1SDA072626R1 |  | 1SDA073256R1 |  |
|              |      |                |             | E6.2V 5000 Ekip Hi-Touch LSI  | 1SDA072628R1 |  | 1SDA073258R1 |  |
|              |      |                |             | E6.2V 5000 Ekip Hi-Touch LSIG | 1SDA072629R1 |  | 1SDA073259R1 |  |
|              | 6300 | 150            | 100         | E6.2V 6300 Ekip Dip LI        | 1SDA072651R1 |  | 1SDA073281R1 |  |
|              |      |                |             | E6.2V 6300 Ekip Dip LSI       | 1SDA072652R1 |  | 1SDA073282R1 |  |
|              |      |                |             | E6.2V 6300 Ekip Dip LSIG      | 1SDA072653R1 |  | 1SDA073283R1 |  |
|              |      |                |             | E6.2V 6300 Ekip Touch LI      | 1SDA072654R1 |  | 1SDA073284R1 |  |
|              |      |                |             | E6.2V 6300 Ekip Touch LSI     | 1SDA072655R1 |  | 1SDA073285R1 |  |
|              |      |                |             | E6.2V 6300 Ekip Touch LSIG    | 1SDA072656R1 |  | 1SDA073286R1 |  |
|              |      |                |             | E6.2V 6300 Ekip Hi-Touch LSI  | 1SDA072658R1 |  | 1SDA073288R1 |  |
|              |      |                |             | E6.2V 6300 Ekip Hi-Touch LSIG | 1SDA072659R1 |  | 1SDA073289R1 |  |

# Automatic circuit-breakers

## Withdrawable version for power distribution



### SACE Emax E6.2X • Mobile part of withdrawable circuit-breaker (MP)

| Size  | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                          | 3 Poles      | 4 Poles      |
|-------|------|----------------|-------------|-------------------------------|--------------|--------------|
|       |      |                |             |                               | Code         | Code         |
| E6.2X | 4000 | 150            | 120         | E6.2X 4000 Ekip Dip LI        | 1SDA072601R1 | 1SDA073231R1 |
|       |      |                |             | E6.2X 4000 Ekip Dip LSI       | 1SDA072602R1 | 1SDA073232R1 |
|       |      |                |             | E6.2X 4000 Ekip Dip LSIg      | 1SDA072603R1 | 1SDA073233R1 |
|       |      |                |             | E6.2X 4000 Ekip Touch LI      | 1SDA072604R1 | 1SDA073234R1 |
|       |      |                |             | E6.2X 4000 Ekip Touch LSI     | 1SDA072605R1 | 1SDA073235R1 |
|       |      |                |             | E6.2X 4000 Ekip Touch LSIg    | 1SDA072606R1 | 1SDA073236R1 |
|       |      |                |             | E6.2X 4000 Ekip Hi-Touch LSI  | 1SDA072608R1 | 1SDA073238R1 |
|       |      |                |             | E6.2X 4000 Ekip Hi-Touch LSIg | 1SDA072609R1 | 1SDA073239R1 |
|       | 5000 | 150            | 120         | E6.2X 5000 Ekip Dip LI        | 1SDA072631R1 | 1SDA073261R1 |
|       |      |                |             | E6.2X 5000 Ekip Dip LSI       | 1SDA072632R1 | 1SDA073262R1 |
|       |      |                |             | E6.2X 5000 Ekip Dip LSIg      | 1SDA072633R1 | 1SDA073263R1 |
|       |      |                |             | E6.2X 5000 Ekip Touch LI      | 1SDA072634R1 | 1SDA073264R1 |
|       |      |                |             | E6.2X 5000 Ekip Touch LSI     | 1SDA072635R1 | 1SDA073265R1 |
|       |      |                |             | E6.2X 5000 Ekip Touch LSIg    | 1SDA072636R1 | 1SDA073266R1 |
|       |      |                |             | E6.2X 5000 Ekip Hi-Touch LSI  | 1SDA072638R1 | 1SDA073268R1 |
|       |      |                |             | E6.2X 5000 Ekip Hi-Touch LSIg | 1SDA072639R1 | 1SDA073269R1 |
|       | 6300 | 150            | 120         | E6.2X 6300 Ekip Dip LI        | 1SDA072661R1 | 1SDA073291R1 |
|       |      |                |             | E6.2X 6300 Ekip Dip LSI       | 1SDA072662R1 | 1SDA073292R1 |
|       |      |                |             | E6.2X 6300 Ekip Dip LSIg      | 1SDA072663R1 | 1SDA073293R1 |
|       |      |                |             | E6.2X 6300 Ekip Touch LI      | 1SDA072664R1 | 1SDA073294R1 |
|       |      |                |             | E6.2X 6300 Ekip Touch LSI     | 1SDA072665R1 | 1SDA073295R1 |
|       |      |                |             | E6.2X 6300 Ekip Touch LSIg    | 1SDA072666R1 | 1SDA073296R1 |
|       |      |                |             | E6.2X 6300 Ekip Hi-Touch LSI  | 1SDA072668R1 | 1SDA073298R1 |
|       |      |                |             | E6.2X 6300 Ekip Hi-Touch LSIg | 1SDA072669R1 | 1SDA073299R1 |



1SDC200685R001

## SACE Emax E6.2H-V/f Full size • Mobile part of withdrawable circuit-breaker (MP)

| Size           | Iu   | Icu (440 V) | Icw (1s) | Type                            | 4 Poles<br>Code |  |
|----------------|------|-------------|----------|---------------------------------|-----------------|--|
| <b>E6.2H/f</b> | 4000 | 100         | 100      | E6.2H/f 4000 Ekip Dip LI        | 1SDA073301R1    |  |
|                |      |             |          | E6.2H/f 4000 Ekip Dip LSI       | 1SDA073302R1    |  |
|                |      |             |          | E6.2H/f 4000 Ekip Dip LSIG      | 1SDA073303R1    |  |
|                |      |             |          | E6.2H/f 4000 Ekip Touch LI      | 1SDA073304R1    |  |
|                |      |             |          | E6.2H/f 4000 Ekip Touch LSI     | 1SDA073305R1    |  |
|                |      |             |          | E6.2H/f 4000 Ekip Touch LSIG    | 1SDA073306R1    |  |
|                |      |             |          | E6.2H/f 4000 Ekip Hi-Touch LSI  | 1SDA073308R1    |  |
|                |      |             |          | E6.2H/f 4000 Ekip Hi-Touch LSIG | 1SDA073309R1    |  |
|                | 5000 | 100         | 100      | E6.2H/f 5000 Ekip Dip LI        | 1SDA073331R1    |  |
|                |      |             |          | E6.2H/f 5000 Ekip Dip LSI       | 1SDA073332R1    |  |
|                |      |             |          | E6.2H/f 5000 Ekip Dip LSIG      | 1SDA073333R1    |  |
|                |      |             |          | E6.2H/f 5000 Ekip Touch LI      | 1SDA073334R1    |  |
|                |      |             |          | E6.2H/f 5000 Ekip Touch LSI     | 1SDA073335R1    |  |
|                |      |             |          | E6.2H/f 5000 Ekip Touch LSIG    | 1SDA073336R1    |  |
|                |      |             |          | E6.2H/f 5000 Ekip Hi-Touch LSI  | 1SDA073338R1    |  |
|                |      |             |          | E6.2H/f 5000 Ekip Hi-Touch LSIG | 1SDA073339R1    |  |
|                | 6300 | 100         | 100      | E6.2H/f 6300 Ekip Dip LI        | 1SDA073361R1    |  |
|                |      |             |          | E6.2H/f 6300 Ekip Dip LSI       | 1SDA073362R1    |  |
|                |      |             |          | E6.2H/f 6300 Ekip Dip LSIG      | 1SDA073363R1    |  |
|                |      |             |          | E6.2H/f 6300 Ekip Touch LI      | 1SDA073364R1    |  |
|                |      |             |          | E6.2H/f 6300 Ekip Touch LSI     | 1SDA073365R1    |  |
|                |      |             |          | E6.2H/f 6300 Ekip Touch LSIG    | 1SDA073366R1    |  |
|                |      |             |          | E6.2H/f 6300 Ekip Hi-Touch LSI  | 1SDA073368R1    |  |
|                |      |             |          | E6.2H/f 6300 Ekip Hi-Touch LSIG | 1SDA073369R1    |  |
| <b>E6.2V/f</b> | 4000 | 150         | 100      | E6.2V/f 4000 Ekip Dip LI        | 1SDA073311R1    |  |
|                |      |             |          | E6.2V/f 4000 Ekip Dip LSI       | 1SDA073312R1    |  |
|                |      |             |          | E6.2V/f 4000 Ekip Dip LSIG      | 1SDA073313R1    |  |
|                |      |             |          | E6.2V/f 4000 Ekip Touch LI      | 1SDA073314R1    |  |
|                |      |             |          | E6.2V/f 4000 Ekip Touch LSI     | 1SDA073315R1    |  |
|                |      |             |          | E6.2V/f 4000 Ekip Touch LSIG    | 1SDA073316R1    |  |
|                |      |             |          | E6.2V/f 4000 Ekip Hi-Touch LSI  | 1SDA073318R1    |  |
|                |      |             |          | E6.2V/f 4000 Ekip Hi-Touch LSIG | 1SDA073319R1    |  |
|                | 5000 | 150         | 100      | E6.2V/f 5000 Ekip Dip LI        | 1SDA073341R1    |  |
|                |      |             |          | E6.2V/f 5000 Ekip Dip LSI       | 1SDA073342R1    |  |
|                |      |             |          | E6.2V/f 5000 Ekip Dip LSIG      | 1SDA073343R1    |  |
|                |      |             |          | E6.2V/f 5000 Ekip Touch LI      | 1SDA073344R1    |  |
|                |      |             |          | E6.2V/f 5000 Ekip Touch LSI     | 1SDA073345R1    |  |
|                |      |             |          | E6.2V/f 5000 Ekip Touch LSIG    | 1SDA073346R1    |  |
|                |      |             |          | E6.2V/f 5000 Ekip Hi-Touch LSI  | 1SDA073348R1    |  |
|                |      |             |          | E6.2V/f 5000 Ekip Hi-Touch LSIG | 1SDA073349R1    |  |
|                | 6300 | 150         | 100      | E6.2V/f 6300 Ekip Dip LI        | 1SDA073371R1    |  |
|                |      |             |          | E6.2V/f 6300 Ekip Dip LSI       | 1SDA073372R1    |  |
|                |      |             |          | E6.2V/f 6300 Ekip Dip LSIG      | 1SDA073373R1    |  |
|                |      |             |          | E6.2V/f 6300 Ekip Touch LI      | 1SDA073374R1    |  |
|                |      |             |          | E6.2V/f 6300 Ekip Touch LSI     | 1SDA073375R1    |  |
|                |      |             |          | E6.2V/f 6300 Ekip Touch LSIG    | 1SDA073376R1    |  |
|                |      |             |          | E6.2V/f 6300 Ekip Hi-Touch LSI  | 1SDA073378R1    |  |
|                |      |             |          | E6.2V/f 6300 Ekip Hi-Touch LSIG | 1SDA073379R1    |  |

# Automatic circuit-breakers

## Withdrawable version for power distribution



SACE Emax E6.2X/f Full size • Mobile part of withdrawable circuit-breaker (MP)

| Size    | Iu   | Icu (440 V) | Icw (1s) | Type                            | 4 Poles<br>Code |  |
|---------|------|-------------|----------|---------------------------------|-----------------|--|
| E6.2X/f | 4000 | 150         | 120      | E6.2X/f 4000 Ekip Dip LI        | 1SDA073321R1    |  |
|         |      |             |          | E6.2X/f 4000 Ekip Dip LSI       | 1SDA073322R1    |  |
|         |      |             |          | E6.2X/f 4000 Ekip Dip LSIG      | 1SDA073323R1    |  |
|         |      |             |          | E6.2X/f 4000 Ekip Touch LI      | 1SDA073324R1    |  |
|         |      |             |          | E6.2X/f 4000 Ekip Touch LSI     | 1SDA073325R1    |  |
|         |      |             |          | E6.2X/f 4000 Ekip Touch LSIG    | 1SDA073326R1    |  |
|         |      |             |          | E6.2X/f 4000 Ekip Hi-Touch LSI  | 1SDA073328R1    |  |
|         |      |             |          | E6.2X/f 4000 Ekip Hi-Touch LSIG | 1SDA073329R1    |  |
|         | 5000 | 150         | 120      | E6.2X/f 5000 Ekip Dip LI        | 1SDA073351R1    |  |
|         |      |             |          | E6.2X/f 5000 Ekip Dip LSI       | 1SDA073352R1    |  |
|         |      |             |          | E6.2X/f 5000 Ekip Dip LSIG      | 1SDA073353R1    |  |
|         |      |             |          | E6.2X/f 5000 Ekip Touch LI      | 1SDA073354R1    |  |
|         |      |             |          | E6.2X/f 5000 Ekip Touch LSI     | 1SDA073355R1    |  |
|         |      |             |          | E6.2X/f 5000 Ekip Touch LSIG    | 1SDA073356R1    |  |
|         |      |             |          | E6.2X/f 5000 Ekip Hi-Touch LSI  | 1SDA073358R1    |  |
|         |      |             |          | E6.2X/f 5000 Ekip Hi-Touch LSIG | 1SDA073359R1    |  |
|         | 6300 | 150         | 120      | E6.2X/f 6300 Ekip Dip LI        | 1SDA073381R1    |  |
|         |      |             |          | E6.2X/f 6300 Ekip Dip LSI       | 1SDA073382R1    |  |
|         |      |             |          | E6.2X/f 6300 Ekip Dip LSIG      | 1SDA073383R1    |  |
|         |      |             |          | E6.2X/f 6300 Ekip Touch LI      | 1SDA073384R1    |  |
|         |      |             |          | E6.2X/f 6300 Ekip Touch LSI     | 1SDA073385R1    |  |
|         |      |             |          | E6.2X/f 6300 Ekip Touch LSIG    | 1SDA073386R1    |  |
|         |      |             |          | E6.2X/f 6300 Ekip Hi-Touch LSI  | 1SDA073388R1    |  |
|         |      |             |          | E6.2X/f 6300 Ekip Hi-Touch LSIG | 1SDA073389R1    |  |

# Automatic circuit-breakers

## Fixed version for generators



### SACE Emax E1.2B-C-N-L • Front terminals (F)

| Size         | I <sub>u</sub> | I <sub>cu</sub><br>(440 V) | I <sub>cw</sub><br>(1s) | Type                            | 3 Poles      | 4 Poles      |
|--------------|----------------|----------------------------|-------------------------|---------------------------------|--------------|--------------|
|              |                |                            |                         |                                 | Code         | Code         |
| <b>E1.2B</b> | 630            | 42                         | 42                      | E1.2B 630 Ekip G Touch LSIG     | 1SDA070707R1 | 1SDA071337R1 |
|              |                |                            |                         | E1.2B 630 Ekip G Hi-Touch LSIG  | 1SDA070710R1 | 1SDA071340R1 |
|              | 800            | 42                         | 42                      | E1.2B 800 Ekip G Touch LSIG     | 1SDA070747R1 | 1SDA071377R1 |
|              |                |                            |                         | E1.2B 800 Ekip G Hi-Touch LSIG  | 1SDA070750R1 | 1SDA071380R1 |
|              | 1000           | 42                         | 42                      | E1.2B 1000 Ekip G Touch LSIG    | 1SDA070787R1 | 1SDA071417R1 |
|              |                |                            |                         | E1.2B 1000 Ekip G Hi-Touch LSIG | 1SDA070790R1 | 1SDA071420R1 |
|              | 1250           | 42                         | 42                      | E1.2B 1250 Ekip G Touch LSIG    | 1SDA070827R1 | 1SDA071457R1 |
|              |                |                            |                         | E1.2B 1250 Ekip G Hi-Touch LSIG | 1SDA070830R1 | 1SDA071460R1 |
|              | 1600           | 42                         | 42                      | E1.2B 1600 Ekip G Touch LSIG    | 1SDA070867R1 | 1SDA071497R1 |
|              |                |                            |                         | E1.2B 1600 Ekip G Hi-Touch LSIG | 1SDA070870R1 | 1SDA071500R1 |
| <b>E1.2C</b> | 630            | 50                         | 42                      | E1.2C 630 Ekip G Touch LSIG     | 1SDA070717R1 | 1SDA071347R1 |
|              |                |                            |                         | E1.2C 630 Ekip G Hi-Touch LSIG  | 1SDA070720R1 | 1SDA071350R1 |
|              | 800            | 50                         | 42                      | E1.2C 800 Ekip G Touch LSIG     | 1SDA070757R1 | 1SDA071387R1 |
|              |                |                            |                         | E1.2C 800 Ekip G Hi-Touch LSIG  | 1SDA070760R1 | 1SDA071390R1 |
|              | 1000           | 50                         | 42                      | E1.2C 1000 Ekip G Touch LSIG    | 1SDA070797R1 | 1SDA071427R1 |
|              |                |                            |                         | E1.2C 1000 Ekip G Hi-Touch LSIG | 1SDA070800R1 | 1SDA071430R1 |
|              | 1250           | 50                         | 42                      | E1.2C 1250 Ekip G Touch LSIG    | 1SDA070837R1 | 1SDA071467R1 |
|              |                |                            |                         | E1.2C 1250 Ekip G Hi-Touch LSIG | 1SDA070840R1 | 1SDA071470R1 |
|              | 1600           | 50                         | 42                      | E1.2C 1600 Ekip G Touch LSIG    | 1SDA070877R1 | 1SDA071507R1 |
|              |                |                            |                         | E1.2C 1600 Ekip G Hi-Touch LSIG | 1SDA070880R1 | 1SDA071510R1 |
| <b>E1.2N</b> | 250            | 66                         | 50                      | E1.2N 250 Ekip G Touch LSIG     | 1SDA070697R1 | 1SDA071327R1 |
|              |                |                            |                         | E1.2N 250 Ekip G Hi-Touch LSIG  | 1SDA070700R1 | 1SDA071330R1 |
|              | 630            | 66                         | 50                      | E1.2N 630 Ekip G Touch LSIG     | 1SDA070727R1 | 1SDA071357R1 |
|              |                |                            |                         | E1.2N 630 Ekip G Hi-Touch LSIG  | 1SDA070730R1 | 1SDA071360R1 |
|              | 800            | 66                         | 50                      | E1.2N 800 Ekip G Touch LSIG     | 1SDA070767R1 | 1SDA071397R1 |
|              |                |                            |                         | E1.2N 800 Ekip G Hi-Touch LSIG  | 1SDA070770R1 | 1SDA071400R1 |
|              | 1000           | 66                         | 50                      | E1.2N 1000 Ekip G Touch LSIG    | 1SDA070807R1 | 1SDA071437R1 |
|              |                |                            |                         | E1.2N 1000 Ekip G Hi-Touch LSIG | 1SDA070810R1 | 1SDA071440R1 |
|              | 1250           | 66                         | 50                      | E1.2N 1250 Ekip G Touch LSIG    | 1SDA070847R1 | 1SDA071477R1 |
|              |                |                            |                         | E1.2N 1250 Ekip G Hi-Touch LSIG | 1SDA070850R1 | 1SDA071480R1 |
|              | 1600           | 66                         | 50                      | E1.2N 1600 Ekip G Touch LSIG    | 1SDA070887R1 | 1SDA071517R1 |
|              |                |                            |                         | E1.2N 1600 Ekip G Hi-Touch LSIG | 1SDA070890R1 | 1SDA071520R1 |
| <b>E1.2L</b> | 630            | 130                        | 15                      | E1.2L 630 Ekip G Touch LSIG     | 1SDA070737R1 | 1SDA071367R1 |
|              |                |                            |                         | E1.2L 630 Ekip G Hi-Touch LSIG  | 1SDA070740R1 | 1SDA071370R1 |
|              | 800            | 130                        | 15                      | E1.2L 800 Ekip G Touch LSIG     | 1SDA070777R1 | 1SDA071407R1 |
|              |                |                            |                         | E1.2L 800 Ekip G Hi-Touch LSIG  | 1SDA070780R1 | 1SDA071410R1 |
|              | 1000           | 130                        | 15                      | E1.2L 1000 Ekip G Touch LSIG    | 1SDA070817R1 | 1SDA071447R1 |
|              |                |                            |                         | E1.2L 1000 Ekip G Hi-Touch LSIG | 1SDA070820R1 | 1SDA071450R1 |
|              | 1250           | 130                        | 15                      | E1.2L 1250 Ekip G Touch LSIG    | 1SDA070857R1 | 1SDA071487R1 |
|              |                |                            |                         | E1.2L 1250 Ekip G Hi-Touch LSIG | 1SDA070860R1 | 1SDA071490R1 |

# Automatic circuit-breakers

## Fixed version for generators



1SDC200023D0205

### SACE Emax E2.2B-N-S-H • Orientable rear terminals (HR)

| Size         | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                            | 3 Poles      |  | 4 Poles      |  |
|--------------|------|----------------|-------------|---------------------------------|--------------|--|--------------|--|
|              |      |                |             |                                 | Code         |  | Code         |  |
| <b>E2.2B</b> | 1600 | 42             | 42          | E2.2B 1600 Ekip G Touch LSIG    | 1SDA070987R1 |  | 1SDA071617R1 |  |
|              |      |                |             | E2.2B 1600 Ekip G Hi-Touch LSIG | 1SDA070990R1 |  | 1SDA071620R1 |  |
|              | 2000 | 42             | 42          | E2.2B 2000 Ekip G Touch LSIG    | 1SDA071027R1 |  | 1SDA071657R1 |  |
|              |      |                |             | E2.2B 2000 Ekip G Hi-Touch LSIG | 1SDA071030R1 |  | 1SDA071660R1 |  |
| <b>E2.2N</b> | 800  | 66             | 66          | E2.2N 800 Ekip G Touch LSIG     | 1SDA070897R1 |  | 1SDA071527R1 |  |
|              |      |                |             | E2.2N 800 Ekip G Hi-Touch LSIG  | 1SDA070900R1 |  | 1SDA071530R1 |  |
|              | 1000 | 66             | 66          | E2.2N 1000 Ekip G Touch LSIG    | 1SDA070927R1 |  | 1SDA071557R1 |  |
|              |      |                |             | E2.2N 1000 Ekip G Hi-Touch LSIG | 1SDA070930R1 |  | 1SDA071560R1 |  |
|              | 1250 | 66             | 66          | E2.2N 1250 Ekip G Touch LSIG    | 1SDA070957R1 |  | 1SDA071587R1 |  |
|              |      |                |             | E2.2N 1250 Ekip G Hi-Touch LSIG | 1SDA070960R1 |  | 1SDA071590R1 |  |
|              | 1600 | 66             | 66          | E2.2N 1600 Ekip G Touch LSIG    | 1SDA070997R1 |  | 1SDA071627R1 |  |
|              |      |                |             | E2.2N 1600 Ekip G Hi-Touch LSIG | 1SDA071000R1 |  | 1SDA071630R1 |  |
|              | 2000 | 66             | 66          | E2.2N 2000 Ekip G Touch LSIG    | 1SDA071037R1 |  | 1SDA071667R1 |  |
|              |      |                |             | E2.2N 2000 Ekip G Hi-Touch LSIG | 1SDA071040R1 |  | 1SDA071670R1 |  |
|              | 2500 | 66             | 66          | E2.2N 2500 Ekip G Touch LSIG    | 1SDA071067R1 |  | 1SDA071697R1 |  |
|              |      |                |             | E2.2N 2500 Ekip G Hi-Touch LSIG | 1SDA071070R1 |  | 1SDA071700R1 |  |
| <b>E2.2S</b> | 250  | 85             | 66          | E2.2S 250 Ekip G Touch LSIG     | 1SDA073634R1 |  | 1SDA073644R1 |  |
|              |      |                |             | E2.2S 250 Ekip G Hi-Touch LSIG  | 1SDA073637R1 |  | 1SDA073647R1 |  |
|              | 800  | 85             | 66          | E2.2S 800 Ekip G Touch LSIG     | 1SDA070907R1 |  | 1SDA071537R1 |  |
|              |      |                |             | E2.2S 800 Ekip G Hi-Touch LSIG  | 1SDA070910R1 |  | 1SDA071540R1 |  |
|              | 1000 | 85             | 66          | E2.2S 1000 Ekip G Touch LSIG    | 1SDA070937R1 |  | 1SDA071567R1 |  |
|              |      |                |             | E2.2S 1000 Ekip G Hi-Touch LSIG | 1SDA070940R1 |  | 1SDA071570R1 |  |
|              | 1250 | 85             | 66          | E2.2S 1250 Ekip G Touch LSIG    | 1SDA070967R1 |  | 1SDA071597R1 |  |
|              |      |                |             | E2.2S 1250 Ekip G Hi-Touch LSIG | 1SDA070970R1 |  | 1SDA071600R1 |  |
|              | 1600 | 85             | 66          | E2.2S 1600 Ekip G Touch LSIG    | 1SDA071007R1 |  | 1SDA071637R1 |  |
|              |      |                |             | E2.2S 1600 Ekip G Hi-Touch LSIG | 1SDA071010R1 |  | 1SDA071640R1 |  |
|              | 2000 | 85             | 66          | E2.2S 2000 Ekip G Touch LSIG    | 1SDA071047R1 |  | 1SDA071677R1 |  |
|              |      |                |             | E2.2S 2000 Ekip G Hi-Touch LSIG | 1SDA071050R1 |  | 1SDA071680R1 |  |
|              | 2500 | 85             | 66          | E2.2S 2500 Ekip G Touch LSIG    | 1SDA071077R1 |  | 1SDA071707R1 |  |
|              |      |                |             | E2.2S 2500 Ekip G Hi-Touch LSIG | 1SDA071080R1 |  | 1SDA071710R1 |  |
| <b>E2.2H</b> | 800  | 100            | 85          | E2.2H 800 Ekip G Touch LSIG     | 1SDA070917R1 |  | 1SDA071547R1 |  |
|              |      |                |             | E2.2H 800 Ekip G Hi-Touch LSIG  | 1SDA070920R1 |  | 1SDA071550R1 |  |
|              | 1000 | 100            | 85          | E2.2H 1000 Ekip G Touch LSIG    | 1SDA070947R1 |  | 1SDA071577R1 |  |
|              |      |                |             | E2.2H 1000 Ekip G Hi-Touch LSIG | 1SDA070950R1 |  | 1SDA071580R1 |  |
|              | 1250 | 100            | 85          | E2.2H 1250 Ekip G Touch LSIG    | 1SDA070977R1 |  | 1SDA071607R1 |  |
|              |      |                |             | E2.2H 1250 Ekip G Hi-Touch LSIG | 1SDA070980R1 |  | 1SDA071610R1 |  |
|              | 1600 | 100            | 85          | E2.2H 1600 Ekip G Touch LSIG    | 1SDA071017R1 |  | 1SDA071647R1 |  |
|              |      |                |             | E2.2H 1600 Ekip G Hi-Touch LSIG | 1SDA071020R1 |  | 1SDA071650R1 |  |
|              | 2000 | 100            | 85          | E2.2H 2000 Ekip G Touch LSIG    | 1SDA071057R1 |  | 1SDA071687R1 |  |
|              |      |                |             | E2.2H 2000 Ekip G Hi-Touch LSIG | 1SDA071060R1 |  | 1SDA071690R1 |  |
|              | 2500 | 100            | 85          | E2.2H 2500 Ekip G Touch LSIG    | 1SDA071087R1 |  | 1SDA071717R1 |  |
|              |      |                |             | E2.2H 2500 Ekip G Hi-Touch LSIG | 1SDA071090R1 |  | 1SDA071720R1 |  |



1SDC200631R001

### SACE Emax E4.2N-S-H-V • Orientable rear terminals (HR)

| Size         | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                            | 3 Poles      | 4 Poles      |
|--------------|------|----------------|-------------|---------------------------------|--------------|--------------|
|              |      |                |             |                                 | Code         | Code         |
| <b>E4.2N</b> | 3200 | 66             | 66          | E4.2N 3200 Ekip G Touch LSIG    | 1SDA071147R1 | 1SDA071777R1 |
|              |      |                |             | E4.2N 3200 Ekip G Hi-Touch LSIG | 1SDA071150R1 | 1SDA071780R1 |
|              | 4000 | 66             | 66          | E4.2N 4000 Ekip G Touch LSIG    | 1SDA071197R1 | 1SDA071827R1 |
|              |      |                |             | E4.2N 4000 Ekip G Hi-Touch LSIG | 1SDA071200R1 | 1SDA071830R1 |
| <b>E4.2S</b> | 3200 | 85             | 66          | E4.2S 3200 Ekip G Touch LSIG    | 1SDA071157R1 | 1SDA071787R1 |
|              |      |                |             | E4.2S 3200 Ekip G Hi-Touch LSIG | 1SDA071160R1 | 1SDA071790R1 |
|              | 4000 | 85             | 66          | E4.2S 4000 Ekip G Touch LSIG    | 1SDA071207R1 | 1SDA071837R1 |
|              |      |                |             | E4.2S 4000 Ekip G Hi-Touch LSIG | 1SDA071210R1 | 1SDA071840R1 |
| <b>E4.2H</b> | 3200 | 100            | 85          | E4.2H 3200 Ekip G Touch LSIG    | 1SDA071167R1 | 1SDA071797R1 |
|              |      |                |             | E4.2H 3200 Ekip G Hi-Touch LSIG | 1SDA071170R1 | 1SDA071800R1 |
|              | 4000 | 100            | 85          | E4.2H 4000 Ekip G Touch LSIG    | 1SDA071217R1 | 1SDA071847R1 |
|              |      |                |             | E4.2H 4000 Ekip G Hi-Touch LSIG | 1SDA071220R1 | 1SDA071850R1 |
| <b>E4.2V</b> | 2000 | 150            | 100         | E4.2V 2000 Ekip G Touch LSIG    | 1SDA071107R1 | 1SDA071737R1 |
|              |      |                |             | E4.2V 2000 Ekip G Hi-Touch LSIG | 1SDA071110R1 | 1SDA071740R1 |
|              | 2500 | 150            | 100         | E4.2V 2500 Ekip G Touch LSIG    | 1SDA071127R1 | 1SDA071757R1 |
|              |      |                |             | E4.2V 2500 Ekip G Hi-Touch LSIG | 1SDA071130R1 | 1SDA071760R1 |
|              | 3200 | 150            | 100         | E4.2V 3200 Ekip G Touch LSIG    | 1SDA071177R1 | 1SDA071807R1 |
|              |      |                |             | E4.2V 3200 Ekip G Hi-Touch LSIG | 1SDA071180R1 | 1SDA071810R1 |
|              | 4000 | 150            | 100         | E4.2V 4000 Ekip G Touch LSIG    | 1SDA071227R1 | 1SDA071857R1 |
|              |      |                |             | E4.2V 4000 Ekip G Hi-Touch LSIG | 1SDA071230R1 | 1SDA071860R1 |

# Automatic circuit-breakers

## Fixed version for generators



1SDC20064F001

### SACE Emax E6.2H-V-X • Orientable rear terminals (HR)

| Size         | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                            | 3 Poles      |  | 4 Poles      |  |
|--------------|------|----------------|-------------|---------------------------------|--------------|--|--------------|--|
|              |      |                |             |                                 | Code         |  | Code         |  |
| <b>E6.2H</b> | 4000 | 100            | 100         | E6.2H 4000 Ekip G Touch LSIG    | 1SDA071237R1 |  | 1SDA071867R1 |  |
|              |      |                |             | E6.2H 4000 Ekip G Hi-Touch LSIG | 1SDA071240R1 |  | 1SDA071870R1 |  |
|              | 5000 | 100            | 100         | E6.2H 5000 Ekip G Touch LSIG    | 1SDA071267R1 |  | 1SDA071897R1 |  |
|              |      |                |             | E6.2H 5000 Ekip G Hi-Touch LSIG | 1SDA071270R1 |  | 1SDA071900R1 |  |
|              | 6300 | 100            | 100         | E6.2H 6300 Ekip G Touch LSIG    | 1SDA071297R1 |  | 1SDA071927R1 |  |
|              |      |                |             | E6.2H 6300 Ekip G Hi-Touch LSIG | 1SDA071300R1 |  | 1SDA071930R1 |  |
| <b>E6.2V</b> | 4000 | 150            | 100         | E6.2V 4000 Ekip G Touch LSIG    | 1SDA071247R1 |  | 1SDA071877R1 |  |
|              |      |                |             | E6.2V 4000 Ekip G Hi-Touch LSIG | 1SDA071250R1 |  | 1SDA071880R1 |  |
|              | 5000 | 150            | 100         | E6.2V 5000 Ekip G Touch LSIG    | 1SDA071277R1 |  | 1SDA071907R1 |  |
|              |      |                |             | E6.2V 5000 Ekip G Hi-Touch LSIG | 1SDA071280R1 |  | 1SDA071910R1 |  |
|              | 6300 | 150            | 100         | E6.2V 6300 Ekip G Touch LSIG    | 1SDA071307R1 |  | 1SDA071937R1 |  |
|              |      |                |             | E6.2V 6300 Ekip G Hi-Touch LSIG | 1SDA071310R1 |  | 1SDA071940R1 |  |
| <b>E6.2X</b> | 4000 | 150            | 120         | E6.2X 4000 Ekip G Touch LSIG    | 1SDA071257R1 |  | 1SDA071887R1 |  |
|              |      |                |             | E6.2X 4000 Ekip G Hi-Touch LSIG | 1SDA071260R1 |  | 1SDA071890R1 |  |
|              | 5000 | 150            | 120         | E6.2X 5000 Ekip G Touch LSIG    | 1SDA071287R1 |  | 1SDA071917R1 |  |
|              |      |                |             | E6.2X 5000 Ekip G Hi-Touch LSIG | 1SDA071290R1 |  | 1SDA071920R1 |  |
|              | 6300 | 150            | 120         | E6.2X 6300 Ekip G Touch LSIG    | 1SDA071317R1 |  | 1SDA071947R1 |  |
|              |      |                |             | E6.2X 6300 Ekip G Hi-Touch LSIG | 1SDA071320R1 |  | 1SDA071950R1 |  |



### SACE Emax E6.2H-V-X/f Full size • Orientable rear terminals (HR)

| Size           | Iu   | Icu<br>(440 V) | Icw (1s) | Type                              | 4 Poles<br>Code |  |
|----------------|------|----------------|----------|-----------------------------------|-----------------|--|
| <b>E6.2H/f</b> | 4000 | 100            | 100      | E6.2H/f 4000 Ekip G Touch LSIG    | 1SDA071957R1    |  |
|                |      |                |          | E6.2H/f 4000 Ekip G Hi-Touch LSIG | 1SDA071960R1    |  |
|                | 5000 | 100            | 100      | E6.2H/f 5000 Ekip G Touch LSIG    | 1SDA071987R1    |  |
|                |      |                |          | E6.2H/f 5000 Ekip G Hi-Touch LSIG | 1SDA071990R1    |  |
|                | 6300 | 100            | 100      | E6.2H/f 6300 Ekip G Touch LSIG    | 1SDA072017R1    |  |
|                |      |                |          | E6.2H/f 6300 Ekip G Hi-Touch LSIG | 1SDA072020R1    |  |
| <b>E6.2V/f</b> | 4000 | 150            | 100      | E6.2V/f 4000 Ekip G Touch LSIG    | 1SDA071967R1    |  |
|                |      |                |          | E6.2V/f 4000 Ekip G Hi-Touch LSIG | 1SDA071970R1    |  |
|                | 5000 | 150            | 100      | E6.2V/f 5000 Ekip G Touch LSIG    | 1SDA071997R1    |  |
|                |      |                |          | E6.2V/f 5000 Ekip G Hi-Touch LSIG | 1SDA072000R1    |  |
|                | 6300 | 150            | 100      | E6.2V/f 6300 Ekip G Touch LSIG    | 1SDA072027R1    |  |
|                |      |                |          | E6.2V/f 6300 Ekip G Hi-Touch LSIG | 1SDA072030R1    |  |
| <b>E6.2X/f</b> | 4000 | 150            | 120      | E6.2X/f 4000 Ekip G Touch LSIG    | 1SDA071977R1    |  |
|                |      |                |          | E6.2X/f 4000 Ekip G Hi-Touch LSIG | 1SDA071980R1    |  |
|                | 5000 | 150            | 120      | E6.2X/f 5000 Ekip G Touch LSIG    | 1SDA072007R1    |  |
|                |      |                |          | E6.2X/f 5000 Ekip G Hi-Touch LSIG | 1SDA072010R1    |  |
|                | 6300 | 150            | 120      | E6.2X/f 6300 Ekip G Touch LSIG    | 1SDA072037R1    |  |
|                |      |                |          | E6.2X/f 6300 Ekip G Hi-Touch LSIG | 1SDA072040R1    |  |

# Automatic circuit-breakers

## Withdrawable version for generators



### SACE Emax E1.2B-C-N-L • Mobile part of withdrawable circuit-breaker (MP)

| Size         | I <sub>u</sub> | I <sub>cu</sub><br>(440 V) | I <sub>cw</sub><br>(1s) | Type                            | 3 Poles      |  | 4 Poles      |  |
|--------------|----------------|----------------------------|-------------------------|---------------------------------|--------------|--|--------------|--|
|              |                |                            |                         |                                 | Code         |  | Code         |  |
| <b>E1.2B</b> | 630            | 42                         | 42                      | E1.2B 630 Ekip G Touch LSIG     | 1SDA072057R1 |  | 1SDA072687R1 |  |
|              |                |                            |                         | E1.2B 630 Ekip G Hi-Touch LSIG  | 1SDA072060R1 |  | 1SDA072690R1 |  |
|              | 800            | 42                         | 42                      | E1.2B 800 Ekip G Touch LSIG     | 1SDA072097R1 |  | 1SDA072727R1 |  |
|              |                |                            |                         | E1.2B 800 Ekip G Hi-Touch LSIG  | 1SDA072100R1 |  | 1SDA072730R1 |  |
|              | 1000           | 42                         | 42                      | E1.2B 1000 Ekip G Touch LSIG    | 1SDA072137R1 |  | 1SDA072767R1 |  |
|              |                |                            |                         | E1.2B 1000 Ekip G Hi-Touch LSIG | 1SDA072140R1 |  | 1SDA072770R1 |  |
|              | 1250           | 42                         | 42                      | E1.2B 1250 Ekip G Touch LSIG    | 1SDA072177R1 |  | 1SDA072807R1 |  |
|              |                |                            |                         | E1.2B 1250 Ekip G Hi-Touch LSIG | 1SDA072180R1 |  | 1SDA072810R1 |  |
|              | 1600           | 42                         | 42                      | E1.2B 1600 Ekip G Touch LSIG    | 1SDA072217R1 |  | 1SDA072847R1 |  |
|              |                |                            |                         | E1.2B 1600 Ekip G Hi-Touch LSIG | 1SDA072220R1 |  | 1SDA072850R1 |  |
| <b>E1.2C</b> | 630            | 50                         | 42                      | E1.2C 630 Ekip G Touch LSIG     | 1SDA072067R1 |  | 1SDA072697R1 |  |
|              |                |                            |                         | E1.2C 630 Ekip G Hi-Touch LSIG  | 1SDA072070R1 |  | 1SDA072700R1 |  |
|              | 800            | 50                         | 42                      | E1.2C 800 Ekip G Touch LSIG     | 1SDA072107R1 |  | 1SDA072737R1 |  |
|              |                |                            |                         | E1.2C 800 Ekip G Hi-Touch LSIG  | 1SDA072110R1 |  | 1SDA072740R1 |  |
|              | 1000           | 50                         | 42                      | E1.2C 1000 Ekip G Touch LSIG    | 1SDA072147R1 |  | 1SDA072777R1 |  |
|              |                |                            |                         | E1.2C 1000 Ekip G Hi-Touch LSIG | 1SDA072150R1 |  | 1SDA072780R1 |  |
|              | 1250           | 50                         | 42                      | E1.2C 1250 Ekip G Touch LSIG    | 1SDA072187R1 |  | 1SDA072817R1 |  |
|              |                |                            |                         | E1.2C 1250 Ekip G Hi-Touch LSIG | 1SDA072190R1 |  | 1SDA072820R1 |  |
|              | 1600           | 50                         | 42                      | E1.2C 1600 Ekip G Touch LSIG    | 1SDA072227R1 |  | 1SDA072857R1 |  |
|              |                |                            |                         | E1.2C 1600 Ekip G Hi-Touch LSIG | 1SDA072230R1 |  | 1SDA072860R1 |  |
| <b>E1.2N</b> | 250            | 66                         | 50                      | E1.2N 250 Ekip G Touch LSIG     | 1SDA072047R1 |  | 1SDA072677R1 |  |
|              |                |                            |                         | E1.2N 250 Ekip G Hi-Touch LSIG  | 1SDA072050R1 |  | 1SDA072680R1 |  |
|              | 630            | 66                         | 50                      | E1.2N 630 Ekip G Touch LSIG     | 1SDA072077R1 |  | 1SDA072707R1 |  |
|              |                |                            |                         | E1.2N 630 Ekip G Hi-Touch LSIG  | 1SDA072080R1 |  | 1SDA072710R1 |  |
|              | 800            | 66                         | 50                      | E1.2N 800 Ekip G Touch LSIG     | 1SDA072117R1 |  | 1SDA072747R1 |  |
|              |                |                            |                         | E1.2N 800 Ekip G Hi-Touch LSIG  | 1SDA072120R1 |  | 1SDA072750R1 |  |
|              | 1000           | 66                         | 50                      | E1.2N 1000 Ekip G Touch LSIG    | 1SDA072157R1 |  | 1SDA072787R1 |  |
|              |                |                            |                         | E1.2N 1000 Ekip G Hi-Touch LSIG | 1SDA072160R1 |  | 1SDA072790R1 |  |
|              | 1250           | 66                         | 50                      | E1.2N 1250 Ekip G Touch LSIG    | 1SDA072197R1 |  | 1SDA072827R1 |  |
|              |                |                            |                         | E1.2N 1250 Ekip G Hi-Touch LSIG | 1SDA072200R1 |  | 1SDA072830R1 |  |
|              | 1600           | 66                         | 50                      | E1.2N 1600 Ekip G Touch LSIG    | 1SDA072237R1 |  | 1SDA072867R1 |  |
|              |                |                            |                         | E1.2N 1600 Ekip G Hi-Touch LSIG | 1SDA072240R1 |  | 1SDA072870R1 |  |
| <b>E1.2L</b> | 630            | 130                        | 15                      | E1.2L 630 Ekip G Touch LSIG     | 1SDA072087R1 |  | 1SDA072717R1 |  |
|              |                |                            |                         | E1.2L 630 Ekip G Hi-Touch LSIG  | 1SDA072090R1 |  | 1SDA072720R1 |  |
|              | 800            | 130                        | 15                      | E1.2L 800 Ekip G Touch LSIG     | 1SDA072127R1 |  | 1SDA072757R1 |  |
|              |                |                            |                         | E1.2L 800 Ekip G Hi-Touch LSIG  | 1SDA072130R1 |  | 1SDA072760R1 |  |
|              | 1000           | 130                        | 15                      | E1.2L 1000 Ekip G Touch LSIG    | 1SDA072167R1 |  | 1SDA072797R1 |  |
|              |                |                            |                         | E1.2L 1000 Ekip G Hi-Touch LSIG | 1SDA072170R1 |  | 1SDA072800R1 |  |
|              | 1250           | 130                        | 15                      | E1.2L 1250 Ekip G Touch LSIG    | 1SDA072207R1 |  | 1SDA072837R1 |  |
|              |                |                            |                         | E1.2L 1250 Ekip G Hi-Touch LSIG | 1SDA072210R1 |  | 1SDA072840R1 |  |



## SACE Emax E2.2B-N-S-H • Mobile part of withdrawable circuit-breaker (MP)

| Size         | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                            | 3 Poles      | 4 Poles      |
|--------------|------|----------------|-------------|---------------------------------|--------------|--------------|
|              |      |                |             |                                 | Code         | Code         |
| <b>E2.2B</b> | 1600 | 42             | 42          | E2.2B 1600 Ekip G Touch LSIG    | 1SDA072337R1 | 1SDA072967R1 |
|              |      |                |             | E2.2B 1600 Ekip G Hi-Touch LSIG | 1SDA072340R1 | 1SDA072970R1 |
|              | 2000 | 42             | 42          | E2.2B 2000 Ekip G Touch LSIG    | 1SDA072377R1 | 1SDA073007R1 |
|              |      |                |             | E2.2B 2000 Ekip G Hi-Touch LSIG | 1SDA072380R1 | 1SDA073010R1 |
| <b>E2.2N</b> | 800  | 66             | 66          | E2.2N 800 Ekip G Touch LSIG     | 1SDA072247R1 | 1SDA072877R1 |
|              |      |                |             | E2.2N 800 Ekip G Hi-Touch LSIG  | 1SDA072250R1 | 1SDA072880R1 |
|              | 1000 | 66             | 66          | E2.2N 1000 Ekip G Touch LSIG    | 1SDA072277R1 | 1SDA072907R1 |
|              |      |                |             | E2.2N 1000 Ekip G Hi-Touch LSIG | 1SDA072280R1 | 1SDA072910R1 |
|              | 1250 | 66             | 66          | E2.2N 1250 Ekip G Touch LSIG    | 1SDA072307R1 | 1SDA072937R1 |
|              |      |                |             | E2.2N 1250 Ekip G Hi-Touch LSIG | 1SDA072310R1 | 1SDA072940R1 |
|              | 1600 | 66             | 66          | E2.2N 1600 Ekip G Touch LSIG    | 1SDA072347R1 | 1SDA072977R1 |
|              |      |                |             | E2.2N 1600 Ekip G Hi-Touch LSIG | 1SDA072350R1 | 1SDA072980R1 |
|              | 2000 | 66             | 66          | E2.2N 2000 Ekip G Touch LSIG    | 1SDA072387R1 | 1SDA073017R1 |
|              |      |                |             | E2.2N 2000 Ekip G Hi-Touch LSIG | 1SDA072390R1 | 1SDA073020R1 |
|              | 2500 | 66             | 66          | E2.2N 2500 Ekip G Touch LSIG    | 1SDA072417R1 | 1SDA073047R1 |
|              |      |                |             | E2.2N 2500 Ekip G Hi-Touch LSIG | 1SDA072420R1 | 1SDA073050R1 |
| <b>E2.2S</b> | 250  | 85             | 66          | E2.2S 250 Ekip G Touch LSIG     | 1SDA073654R1 | 1SDA073664R1 |
|              |      |                |             | E2.2S 250 Ekip G Hi-Touch LSIG  | 1SDA073657R1 | 1SDA073667R1 |
|              | 800  | 85             | 66          | E2.2S 800 Ekip G Touch LSIG     | 1SDA072257R1 | 1SDA072887R1 |
|              |      |                |             | E2.2S 800 Ekip G Hi-Touch LSIG  | 1SDA072260R1 | 1SDA072890R1 |
|              | 1000 | 85             | 66          | E2.2S 1000 Ekip G Touch LSIG    | 1SDA072287R1 | 1SDA072917R1 |
|              |      |                |             | E2.2S 1000 Ekip G Hi-Touch LSIG | 1SDA072290R1 | 1SDA072920R1 |
|              | 1250 | 85             | 66          | E2.2S 1250 Ekip G Touch LSIG    | 1SDA072317R1 | 1SDA072947R1 |
|              |      |                |             | E2.2S 1250 Ekip G Hi-Touch LSIG | 1SDA072320R1 | 1SDA072950R1 |
|              | 1600 | 85             | 66          | E2.2S 1600 Ekip G Touch LSIG    | 1SDA072357R1 | 1SDA072987R1 |
|              |      |                |             | E2.2S 1600 Ekip G Hi-Touch LSIG | 1SDA072360R1 | 1SDA072990R1 |
|              | 2000 | 85             | 66          | E2.2S 2000 Ekip G Touch LSIG    | 1SDA072397R1 | 1SDA073027R1 |
|              |      |                |             | E2.2S 2000 Ekip G Hi-Touch LSIG | 1SDA072400R1 | 1SDA073030R1 |
|              | 2500 | 85             | 66          | E2.2S 2500 Ekip G Touch LSIG    | 1SDA072427R1 | 1SDA073057R1 |
|              |      |                |             | E2.2S 2500 Ekip G Hi-Touch LSIG | 1SDA072430R1 | 1SDA073060R1 |
| <b>E2.2H</b> | 800  | 100            | 85          | E2.2H 800 Ekip G Touch LSIG     | 1SDA072267R1 | 1SDA072897R1 |
|              |      |                |             | E2.2H 800 Ekip G Hi-Touch LSIG  | 1SDA072270R1 | 1SDA072900R1 |
|              | 1000 | 100            | 85          | E2.2H 1000 Ekip G Touch LSIG    | 1SDA072297R1 | 1SDA072927R1 |
|              |      |                |             | E2.2H 1000 Ekip G Hi-Touch LSIG | 1SDA072300R1 | 1SDA072930R1 |
|              | 1250 | 100            | 85          | E2.2H 1250 Ekip G Touch LSIG    | 1SDA072327R1 | 1SDA072957R1 |
|              |      |                |             | E2.2H 1250 Ekip G Hi-Touch LSIG | 1SDA072330R1 | 1SDA072960R1 |
|              | 1600 | 100            | 85          | E2.2H 1600 Ekip G Touch LSIG    | 1SDA072367R1 | 1SDA072997R1 |
|              |      |                |             | E2.2H 1600 Ekip G Hi-Touch LSIG | 1SDA072370R1 | 1SDA073000R1 |
|              | 2000 | 100            | 85          | E2.2H 2000 Ekip G Touch LSIG    | 1SDA072407R1 | 1SDA073037R1 |
|              |      |                |             | E2.2H 2000 Ekip G Hi-Touch LSIG | 1SDA072410R1 | 1SDA073040R1 |
|              | 2500 | 100            | 85          | E2.2H 2500 Ekip G Touch LSIG    | 1SDA072437R1 | 1SDA073067R1 |
|              |      |                |             | E2.2H 2500 Ekip G Hi-Touch LSIG | 1SDA072440R1 | 1SDA073070R1 |

# Automatic circuit-breakers

## Withdrawable version for generators



### SACE Emax E4.2N-S-H-V • Mobile part of withdrawable circuit-breaker (MP)

| Size         | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                            | 3 Poles      |  | 4 Poles      |  |
|--------------|------|----------------|-------------|---------------------------------|--------------|--|--------------|--|
|              |      |                |             |                                 | Code         |  | Code         |  |
| <b>E4.2N</b> | 3200 | 66             | 66          | E4.2N 3200 Ekip G Touch LSIG    | 1SDA072497R1 |  | 1SDA073127R1 |  |
|              |      |                |             | E4.2N 3200 Ekip G Hi-Touch LSIG | 1SDA072500R1 |  | 1SDA073130R1 |  |
|              | 4000 | 66             | 66          | E4.2N 4000 Ekip G Touch LSIG    | 1SDA072547R1 |  | 1SDA073177R1 |  |
|              |      |                |             | E4.2N 4000 Ekip G Hi-Touch LSIG | 1SDA072550R1 |  | 1SDA073180R1 |  |
| <b>E4.2S</b> | 3200 | 85             | 66          | E4.2S 3200 Ekip G Touch LSIG    | 1SDA072507R1 |  | 1SDA073137R1 |  |
|              |      |                |             | E4.2S 3200 Ekip G Hi-Touch LSIG | 1SDA072510R1 |  | 1SDA073140R1 |  |
|              | 4000 | 85             | 66          | E4.2S 4000 Ekip G Touch LSIG    | 1SDA072557R1 |  | 1SDA073187R1 |  |
|              |      |                |             | E4.2S 4000 Ekip G Hi-Touch LSIG | 1SDA072560R1 |  | 1SDA073190R1 |  |
| <b>E4.2H</b> | 3200 | 100            | 85          | E4.2H 3200 Ekip G Touch LSIG    | 1SDA072517R1 |  | 1SDA073147R1 |  |
|              |      |                |             | E4.2H 3200 Ekip G Hi-Touch LSIG | 1SDA072520R1 |  | 1SDA073150R1 |  |
|              | 4000 | 100            | 85          | E4.2H 4000 Ekip G Touch LSIG    | 1SDA072567R1 |  | 1SDA073197R1 |  |
|              |      |                |             | E4.2H 4000 Ekip G Hi-Touch LSIG | 1SDA072570R1 |  | 1SDA073200R1 |  |
| <b>E4.2V</b> | 2000 | 150            | 100         | E4.2V 2000 Ekip G Touch LSIG    | 1SDA072457R1 |  | 1SDA073087R1 |  |
|              |      |                |             | E4.2V 2000 Ekip G Hi-Touch LSIG | 1SDA072460R1 |  | 1SDA073090R1 |  |
|              | 2500 | 150            | 100         | E4.2V 2500 Ekip G Touch LSIG    | 1SDA072477R1 |  | 1SDA073107R1 |  |
|              |      |                |             | E4.2V 2500 Ekip G Hi-Touch LSIG | 1SDA072480R1 |  | 1SDA073110R1 |  |
|              | 3200 | 150            | 100         | E4.2V 3200 Ekip G Touch LSIG    | 1SDA072527R1 |  | 1SDA073157R1 |  |
|              |      |                |             | E4.2V 3200 Ekip G Hi-Touch LSIG | 1SDA072530R1 |  | 1SDA073160R1 |  |
|              | 4000 | 150            | 100         | E4.2V 4000 Ekip G Touch LSIG    | 1SDA072577R1 |  | 1SDA073207R1 |  |
|              |      |                |             | E4.2V 4000 Ekip G Hi-Touch LSIG | 1SDA072580R1 |  | 1SDA073210R1 |  |



1SDC200689F001

## SACE Emax E6.2H-V-X • Mobile part of withdrawable circuit-breaker (MP)

| Size         | Iu   | Icu<br>(440 V) | Icw<br>(1s) | Type                            | 3 Poles      | 4 Poles      |
|--------------|------|----------------|-------------|---------------------------------|--------------|--------------|
|              |      |                |             |                                 | Code         | Code         |
| <b>E6.2H</b> | 4000 | 100            | 100         | E6.2H 4000 Ekip G Touch LSIG    | 1SDA072587R1 | 1SDA073217R1 |
|              |      |                |             | E6.2H 4000 Ekip G Hi-Touch LSIG | 1SDA072590R1 | 1SDA073220R1 |
|              | 5000 | 100            | 100         | E6.2H 5000 Ekip G Touch LSIG    | 1SDA072617R1 | 1SDA073247R1 |
|              |      |                |             | E6.2H 5000 Ekip G Hi-Touch LSIG | 1SDA072620R1 | 1SDA073250R1 |
|              | 6300 | 100            | 100         | E6.2H 6300 Ekip G Touch LSIG    | 1SDA072647R1 | 1SDA073277R1 |
|              |      |                |             | E6.2H 6300 Ekip G Hi-Touch LSIG | 1SDA072650R1 | 1SDA073280R1 |
| <b>E6.2V</b> | 4000 | 150            | 100         | E6.2V 4000 Ekip G Touch LSIG    | 1SDA072597R1 | 1SDA073227R1 |
|              |      |                |             | E6.2V 4000 Ekip G Hi-Touch LSIG | 1SDA072600R1 | 1SDA073230R1 |
|              | 5000 | 150            | 100         | E6.2V 5000 Ekip G Touch LSIG    | 1SDA072627R1 | 1SDA073257R1 |
|              |      |                |             | E6.2V 5000 Ekip G Hi-Touch LSIG | 1SDA072630R1 | 1SDA073260R1 |
|              | 6300 | 150            | 100         | E6.2V 6300 Ekip G Touch LSIG    | 1SDA072657R1 | 1SDA073287R1 |
|              |      |                |             | E6.2V 6300 Ekip G Hi-Touch LSIG | 1SDA072660R1 | 1SDA073290R1 |
| <b>E6.2X</b> | 4000 | 150            | 120         | E6.2X 4000 Ekip G Touch LSIG    | 1SDA072607R1 | 1SDA073237R1 |
|              |      |                |             | E6.2X 4000 Ekip G Hi-Touch LSIG | 1SDA072610R1 | 1SDA073240R1 |
|              | 5000 | 150            | 120         | E6.2X 5000 Ekip G Touch LSIG    | 1SDA072637R1 | 1SDA073267R1 |
|              |      |                |             | E6.2X 5000 Ekip G Hi-Touch LSIG | 1SDA072640R1 | 1SDA073270R1 |
|              | 6300 | 150            | 120         | E6.2X 6300 Ekip G Touch LSIG    | 1SDA072667R1 | 1SDA073297R1 |
|              |      |                |             | E6.2X 6300 Ekip G Hi-Touch LSIG | 1SDA072670R1 | 1SDA073300R1 |

# Automatic circuit-breakers

## Withdrawable version per generators



SACE Emax E6.2H-V-X/f Full size • Mobile part of withdrawable circuit-breaker (MP)

| Size           | Iu   | Icu<br>(440 V) | Icw (1s) | Type                              | 4 Poles<br>Code |  |
|----------------|------|----------------|----------|-----------------------------------|-----------------|--|
| <b>E6.2H/f</b> | 4000 | 100            | 100      | E6.2H/f 4000 Ekip G Touch LSIG    | 1SDA073307R1    |  |
|                |      |                |          | E6.2H/f 4000 Ekip G Hi-Touch LSIG | 1SDA073310R1    |  |
|                | 5000 | 100            | 100      | E6.2H/f 5000 Ekip G Touch LSIG    | 1SDA073337R1    |  |
|                |      |                |          | E6.2H/f 5000 Ekip G Hi-Touch LSIG | 1SDA073340R1    |  |
|                | 6300 | 100            | 100      | E6.2H/f 6300 Ekip G Touch LSIG    | 1SDA073367R1    |  |
|                |      |                |          | E6.2H/f 6300 Ekip G Hi-Touch LSIG | 1SDA073370R1    |  |
| <b>E6.2V/f</b> | 4000 | 150            | 100      | E6.2V/f 4000 Ekip G Touch LSIG    | 1SDA073317R1    |  |
|                |      |                |          | E6.2V/f 4000 Ekip G Hi-Touch LSIG | 1SDA073320R1    |  |
|                | 5000 | 150            | 100      | E6.2V/f 5000 Ekip G Touch LSIG    | 1SDA073347R1    |  |
|                |      |                |          | E6.2V/f 5000 Ekip G Hi-Touch LSIG | 1SDA073350R1    |  |
|                | 6300 | 150            | 100      | E6.2V/f 6300 Ekip G Touch LSIG    | 1SDA073377R1    |  |
|                |      |                |          | E6.2V/f 6300 Ekip G Hi-Touch LSIG | 1SDA073380R1    |  |
| <b>E6.2X/f</b> | 4000 | 150            | 120      | E6.2X/f 4000 Ekip G Touch LSIG    | 1SDA073327R1    |  |
|                |      |                |          | E6.2X/f 4000 Ekip G Hi-Touch LSIG | 1SDA073330R1    |  |
|                | 5000 | 150            | 120      | E6.2X/f 5000 Ekip G Touch LSIG    | 1SDA073357R1    |  |
|                |      |                |          | E6.2X/f 5000 Ekip G Hi-Touch LSIG | 1SDA073360R1    |  |
|                | 6300 | 150            | 120      | E6.2X/f 6300 Ekip G Touch LSIG    | 1SDA073387R1    |  |
|                |      |                |          | E6.2X/f 6300 Ekip G Hi-Touch LSIG | 1SDA073390R1    |  |

# Switch-disconnectors

## Fixed version



SACE Emax E1.2B-N/MS • Front terminals (F)

| Size            | Iu   | Icw (1s) | Type          | 3 Poles      |  | 4 Poles      |  |
|-----------------|------|----------|---------------|--------------|--|--------------|--|
|                 |      |          |               | Code         |  | Code         |  |
| <b>E1.2B/MS</b> | 630  | 42       | E1.2B/MS 630  | 1SDA073392R1 |  | 1SDA073431R1 |  |
|                 | 800  | 42       | E1.2B/MS 800  | 1SDA073394R1 |  | 1SDA073433R1 |  |
|                 | 1000 | 42       | E1.2B/MS 1000 | 1SDA073396R1 |  | 1SDA073435R1 |  |
|                 | 1250 | 42       | E1.2B/MS 1250 | 1SDA073398R1 |  | 1SDA073437R1 |  |
|                 | 1600 | 42       | E1.2B/MS 1600 | 1SDA073400R1 |  | 1SDA073439R1 |  |
| <b>E1.2N/MS</b> | 250  | 50       | E1.2N/MS 250  | 1SDA073391R1 |  | 1SDA073430R1 |  |
|                 | 630  | 50       | E1.2N/MS 630  | 1SDA073393R1 |  | 1SDA073432R1 |  |
|                 | 800  | 50       | E1.2N/MS 800  | 1SDA073395R1 |  | 1SDA073434R1 |  |
|                 | 1000 | 50       | E1.2N/MS 1000 | 1SDA073397R1 |  | 1SDA073436R1 |  |
|                 | 1250 | 50       | E1.2N/MS 1250 | 1SDA073399R1 |  | 1SDA073438R1 |  |
|                 | 1600 | 50       | E1.2N/MS 1600 | 1SDA073401R1 |  | 1SDA073440R1 |  |



SACE Emax E2.2B-N-H/MS • Orientable rear terminals (HR)

| Size            | Iu   | Icw (1s) | Type          | 3 Poles      |  | 4 Poles      |  |
|-----------------|------|----------|---------------|--------------|--|--------------|--|
|                 |      |          |               | Code         |  | Code         |  |
| <b>E2.2B/MS</b> | 1600 | 42       | E2.2B/MS 1600 | 1SDA073408R1 |  | 1SDA073447R1 |  |
|                 | 2000 | 42       | E2.2B/MS 2000 | 1SDA073411R1 |  | 1SDA073450R1 |  |
| <b>E2.2N/MS</b> | 800  | 66       | E2.2N/MS 800  | 1SDA073402R1 |  | 1SDA073441R1 |  |
|                 | 1000 | 66       | E2.2N/MS 1000 | 1SDA073404R1 |  | 1SDA073443R1 |  |
|                 | 1250 | 66       | E2.2N/MS 1250 | 1SDA073406R1 |  | 1SDA073445R1 |  |
|                 | 1600 | 66       | E2.2N/MS 1600 | 1SDA073409R1 |  | 1SDA073448R1 |  |
|                 | 2000 | 66       | E2.2N/MS 2000 | 1SDA073412R1 |  | 1SDA073451R1 |  |
|                 | 2500 | 66       | E2.2N/MS 2500 | 1SDA073414R1 |  | 1SDA073453R1 |  |
| <b>E2.2H/MS</b> | 800  | 85       | E2.2H/MS 800  | 1SDA073403R1 |  | 1SDA073442R1 |  |
|                 | 1000 | 85       | E2.2H/MS 1000 | 1SDA073405R1 |  | 1SDA073444R1 |  |
|                 | 1250 | 85       | E2.2H/MS 1250 | 1SDA073407R1 |  | 1SDA073446R1 |  |
|                 | 1600 | 85       | E2.2H/MS 1600 | 1SDA073410R1 |  | 1SDA073449R1 |  |
|                 | 2000 | 85       | E2.2H/MS 2000 | 1SDA073413R1 |  | 1SDA073452R1 |  |
|                 | 2500 | 85       | E2.2H/MS 2500 | 1SDA073415R1 |  | 1SDA073454R1 |  |

# Switch-disconnectors

## Fixed version



SACE Emax E4.2N-H-V/MS • Orientable rear terminals (HR)

| Size     | Iu   | Icw (1s) | Type          | 3 Poles      |  | 4 Poles      |  |
|----------|------|----------|---------------|--------------|--|--------------|--|
|          |      |          |               | Code         |  | Code         |  |
| E4.2N/MS | 3200 | 66       | E4.2N/MS 3200 | 1SDA073418R1 |  | 1SDA073457R1 |  |
|          | 4000 | 66       | E4.2N/MS 4000 | 1SDA073421R1 |  | 1SDA073460R1 |  |
| E4.2H/MS | 3200 | 85       | E4.2H/MS 3200 | 1SDA073419R1 |  | 1SDA073458R1 |  |
|          | 4000 | 85       | E4.2H/MS 4000 | 1SDA073422R1 |  | 1SDA073461R1 |  |
| E4.2V/MS | 2000 | 100      | E4.2V/MS 2000 | 1SDA073416R1 |  | 1SDA073455R1 |  |
|          | 2500 | 100      | E4.2V/MS 2500 | 1SDA073417R1 |  | 1SDA073456R1 |  |
|          | 3200 | 100      | E4.2V/MS 3200 | 1SDA073420R1 |  | 1SDA073459R1 |  |
|          | 4000 | 100      | E4.2V/MS 4000 | 1SDA073423R1 |  | 1SDA073462R1 |  |



SACE Emax E6.2H-X/MS • Orientable rear terminals (HR)

| Size     | Iu   | Icw (1s) | Type          | 3 Poles      |  | 4 Poles      |  |
|----------|------|----------|---------------|--------------|--|--------------|--|
|          |      |          |               | Code         |  | Code         |  |
| E6.2H/MS | 4000 | 100      | E6.2H/MS 4000 | 1SDA073424R1 |  | 1SDA073463R1 |  |
|          | 5000 | 100      | E6.2H/MS 5000 | 1SDA073426R1 |  | 1SDA073465R1 |  |
|          | 6300 | 100      | E6.2H/MS 6300 | 1SDA073428R1 |  | 1SDA073467R1 |  |
| E6.2X/MS | 4000 | 120      | E6.2X/MS 4000 | 1SDA073425R1 |  | 1SDA073464R1 |  |
|          | 5000 | 120      | E6.2X/MS 5000 | 1SDA073427R1 |  | 1SDA073466R1 |  |
|          | 6300 | 120      | E6.2X/MS 6300 | 1SDA073429R1 |  | 1SDA073468R1 |  |



1SDC200672F001

## SACE Emax E6.2H-X/MS/f Full size • Orientable rear terminals (HR)

| Size              | Iu   | Icw (1s) | Type            | 4 Poles      |  |
|-------------------|------|----------|-----------------|--------------|--|
|                   |      |          |                 | Code         |  |
| <b>E6.2H/MS/f</b> | 4000 | 100      | E6.2H/MS/f 4000 | 1SDA073469R1 |  |
|                   | 5000 | 100      | E6.2H/MS/f 5000 | 1SDA073471R1 |  |
|                   | 6300 | 100      | E6.2H/MS/f 6300 | 1SDA073473R1 |  |
| <b>E6.2X/MS/f</b> | 4000 | 120      | E6.2X/MS/f 4000 | 1SDA073470R1 |  |
|                   | 5000 | 120      | E6.2X/MS/f 5000 | 1SDA073472R1 |  |
|                   | 6300 | 120      | E6.2X/MS/f 6300 | 1SDA073474R1 |  |

# Switch-disconnectors

## Withdrawable version



1SDC2006/3F001

### SACE Emax E1.2B-N/MS • Mobile part of withdrawable circuit-breaker (MP)

| Size            | Iu   | Icw (1s) | Type          | 3 Poles      |  | 4 Poles      |  |
|-----------------|------|----------|---------------|--------------|--|--------------|--|
|                 |      |          |               | Code         |  | Code         |  |
| <b>E1.2B/MS</b> | 630  | 42       | E1.2B/MS 630  | 1SDA073476R1 |  | 1SDA073515R1 |  |
|                 | 800  | 42       | E1.2B/MS 800  | 1SDA073478R1 |  | 1SDA073517R1 |  |
|                 | 1000 | 42       | E1.2B/MS 1000 | 1SDA073480R1 |  | 1SDA073519R1 |  |
|                 | 1250 | 42       | E1.2B/MS 1250 | 1SDA073482R1 |  | 1SDA073521R1 |  |
|                 | 1600 | 42       | E1.2B/MS 1600 | 1SDA073484R1 |  | 1SDA073523R1 |  |
| <b>E1.2N/MS</b> | 250  | 50       | E1.2N/MS 250  | 1SDA073475R1 |  | 1SDA073514R1 |  |
|                 | 630  | 50       | E1.2N/MS 630  | 1SDA073477R1 |  | 1SDA073516R1 |  |
|                 | 800  | 50       | E1.2N/MS 800  | 1SDA073479R1 |  | 1SDA073518R1 |  |
|                 | 1000 | 50       | E1.2N/MS 1000 | 1SDA073481R1 |  | 1SDA073520R1 |  |
|                 | 1250 | 50       | E1.2N/MS 1250 | 1SDA073483R1 |  | 1SDA073522R1 |  |
|                 | 1600 | 50       | E1.2N/MS 1600 | 1SDA073485R1 |  | 1SDA073524R1 |  |



1SDC2006/4F001

### SACE Emax E2.2B-N-H/MS • Mobile part of withdrawable circuit-breaker (MP)

| Size            | Iu   | Icw (1s) | Type          | 3 Poles      |  | 4 Poles      |  |
|-----------------|------|----------|---------------|--------------|--|--------------|--|
|                 |      |          |               | Code         |  | Code         |  |
| <b>E2.2B/MS</b> | 1600 | 42       | E2.2B/MS 1600 | 1SDA073492R1 |  | 1SDA073531R1 |  |
|                 | 2000 | 42       | E2.2B/MS 2000 | 1SDA073495R1 |  | 1SDA073534R1 |  |
| <b>E2.2N/MS</b> | 800  | 66       | E2.2N/MS 800  | 1SDA073486R1 |  | 1SDA073525R1 |  |
|                 | 1000 | 66       | E2.2N/MS 1000 | 1SDA073488R1 |  | 1SDA073527R1 |  |
|                 | 1250 | 66       | E2.2N/MS 1250 | 1SDA073490R1 |  | 1SDA073529R1 |  |
|                 | 1600 | 66       | E2.2N/MS 1600 | 1SDA073493R1 |  | 1SDA073532R1 |  |
|                 | 2000 | 66       | E2.2N/MS 2000 | 1SDA073496R1 |  | 1SDA073535R1 |  |
|                 | 2500 | 66       | E2.2N/MS 2500 | 1SDA073498R1 |  | 1SDA073537R1 |  |
| <b>E2.2H/MS</b> | 800  | 85       | E2.2H/MS 800  | 1SDA073487R1 |  | 1SDA073526R1 |  |
|                 | 1000 | 85       | E2.2H/MS 1000 | 1SDA073489R1 |  | 1SDA073528R1 |  |
|                 | 1250 | 85       | E2.2H/MS 1250 | 1SDA073491R1 |  | 1SDA073530R1 |  |
|                 | 1600 | 85       | E2.2H/MS 1600 | 1SDA073494R1 |  | 1SDA073533R1 |  |
|                 | 2000 | 85       | E2.2H/MS 2000 | 1SDA073497R1 |  | 1SDA073536R1 |  |
|                 | 2500 | 85       | E2.2H/MS 2500 | 1SDA073499R1 |  | 1SDA073538R1 |  |



1SDC200675F001

### SACE Emax E4.2N-H-V/MS • Mobile part of withdrawable circuit-breaker (MP)

| Size            | Iu   | Icw (1s) | Type          | 3 Poles      |  | 4 Poles      |  |
|-----------------|------|----------|---------------|--------------|--|--------------|--|
|                 |      |          |               | Code         |  | Code         |  |
| <b>E4.2N/MS</b> | 3200 | 66       | E4.2N/MS 3200 | 1SDA073502R1 |  | 1SDA073541R1 |  |
|                 | 4000 | 66       | E4.2N/MS 4000 | 1SDA073505R1 |  | 1SDA073544R1 |  |
| <b>E4.2H/MS</b> | 3200 | 85       | E4.2H/MS 3200 | 1SDA073503R1 |  | 1SDA073542R1 |  |
|                 | 4000 | 85       | E4.2H/MS 4000 | 1SDA073506R1 |  | 1SDA073545R1 |  |
| <b>E4.2V/MS</b> | 2000 | 100      | E4.2V/MS 2000 | 1SDA073500R1 |  | 1SDA073539R1 |  |
|                 | 2500 | 100      | E4.2V/MS 2500 | 1SDA073501R1 |  | 1SDA073540R1 |  |
|                 | 3200 | 100      | E4.2V/MS 3200 | 1SDA073504R1 |  | 1SDA073543R1 |  |
|                 | 4000 | 100      | E4.2V/MS 4000 | 1SDA073507R1 |  | 1SDA073546R1 |  |



1SDC200678F001

### SACE Emax E6.2H-X/MS • Mobile part of withdrawable circuit-breaker (MP)

| Size            | Iu   | Icw (1s) | Type          | 3 Poles      |  | 4 Poles      |  |
|-----------------|------|----------|---------------|--------------|--|--------------|--|
|                 |      |          |               | Code         |  | Code         |  |
| <b>E6.2H/MS</b> | 4000 | 100      | E6.2H/MS 4000 | 1SDA073508R1 |  | 1SDA073547R1 |  |
|                 | 5000 | 100      | E6.2H/MS 5000 | 1SDA073510R1 |  | 1SDA073549R1 |  |
|                 | 6300 | 100      | E6.2H/MS 6300 | 1SDA073512R1 |  | 1SDA073551R1 |  |
| <b>E6.2X/MS</b> | 4000 | 120      | E6.2X/MS 4000 | 1SDA073509R1 |  | 1SDA073548R1 |  |
|                 | 5000 | 120      | E6.2X/MS 5000 | 1SDA073511R1 |  | 1SDA073550R1 |  |
|                 | 6300 | 120      | E6.2X/MS 6300 | 1SDA073513R1 |  | 1SDA073552R1 |  |

### SACE Emax E6.2H-X/MS/f Full size • Mobile part of withdrawable circuit-breaker (MP)

| Size              | Iu   | Icw (1s) | Type            | 4 Poles      |  |
|-------------------|------|----------|-----------------|--------------|--|
|                   |      |          |                 | Code         |  |
| <b>E6.2H/MS/f</b> | 4000 | 100      | E6.2H/MS/f 4000 | 1SDA073553R1 |  |
|                   | 5000 | 100      | E6.2H/MS/f 5000 | 1SDA073555R1 |  |
|                   | 6300 | 100      | E6.2H/MS/f 6300 | 1SDA073557R1 |  |
| <b>E6.2X/MS/f</b> | 4000 | 120      | E6.2X/MS/f 4000 | 1SDA073554R1 |  |
|                   | 5000 | 120      | E6.2X/MS/f 5000 | 1SDA073556R1 |  |
|                   | 6300 | 120      | E6.2X/MS/f 6300 | 1SDA073558R1 |  |

# Automatic circuit-breakers and switch-disconnectors

## Version for applications up to 1150V AC

| Size    | Iu   | Icu<br>(1150 V) | Icw<br>(1s) | Type                              | 3 Poles      |  | 4 Poles      |  |
|---------|------|-----------------|-------------|-----------------------------------|--------------|--|--------------|--|
|         |      |                 |             |                                   | Code         |  | Code         |  |
| E1.2N/E | 630  | 25              | 25          | E1.2N/E 630 Upgrade Kit 1150V AC  | 1SDA074316R1 |  | 1SDA074321R1 |  |
| E1.2N/E | 800  | 25              | 25          | E1.2N/E 800 Upgrade Kit 1150V AC  | 1SDA074317R1 |  | 1SDA074322R1 |  |
| E1.2N/E | 1000 | 25              | 25          | E1.2N/E 1000 Upgrade Kit 1150V AC | 1SDA074318R1 |  | 1SDA074323R1 |  |
| E1.2N/E | 1250 | 25              | 25          | E1.2N/E 1250 Upgrade Kit 1150V AC | 1SDA074319R1 |  | 1SDA074324R1 |  |
| E1.2N/E | 1600 | 25              | 25          | E1.2N/E 1600 Upgrade Kit 1150V AC | 1SDA074320R1 |  | 1SDA074325R1 |  |
| E2.2H/E | 800  | 30              | 30          | E2.2H/E 800 Upgrade Kit 1150V AC  | 1SDA074326R1 |  | 1SDA074332R1 |  |
| E2.2H/E | 1000 | 30              | 30          | E2.2H/E 1000 Upgrade Kit 1150V AC | 1SDA074327R1 |  | 1SDA074333R1 |  |
| E2.2H/E | 1250 | 30              | 30          | E2.2H/E 1250 Upgrade Kit 1150V AC | 1SDA074328R1 |  | 1SDA074334R1 |  |
| E2.2H/E | 1600 | 30              | 30          | E2.2H/E 1600 Upgrade Kit 1150V AC | 1SDA074329R1 |  | 1SDA074335R1 |  |
| E2.2H/E | 2000 | 30              | 30          | E2.2H/E 2000 Upgrade Kit 1150V AC | 1SDA074330R1 |  | 1SDA074336R1 |  |
| E2.2H/E | 2500 | 30              | 30          | E2.2H/E 2500 Upgrade Kit 1150V AC | 1SDA074331R1 |  | 1SDA074337R1 |  |
| E4.2H/E | 3200 | 50              | 50          | E4.2H/E 3200 Upgrade Kit 1150V AC | 1SDA074338R1 |  | 1SDA074340R1 |  |
| E4.2H/E | 4000 | 50              | 50          | E4.2H/E 4000 Upgrade Kit 1150V AC | 1SDA074339R1 |  | 1SDA074341R1 |  |
| E6.2X/E | 4000 | 65              | 65          | E6.2X/E 4000 Upgrade Kit 1150V AC | 1SDA074342R1 |  | 1SDA074345R1 |  |
| E6.2X/E | 5000 | 65              | 65          | E6.2X/E 5000 Upgrade Kit 1150V AC | 1SDA074343R1 |  | 1SDA074346R1 |  |
| E6.2X/E | 6300 | 65              | 65          | E6.2X/E 6300 Upgrade Kit 1150V AC | 1SDA074344R1 |  | 1SDA074347R1 |  |

# Switch-disconnectors

Fixed version for applications up to 1000V DC

| Size               | Iu   | Icu<br>(1000 V) | Icw<br>(1s) | Type                           | 3 Poles      |  | 4 Poles      |  |
|--------------------|------|-----------------|-------------|--------------------------------|--------------|--|--------------|--|
|                    |      |                 |             |                                | Code         |  | Code         |  |
| <b>E1.2N/DC/MS</b> | 800  |                 |             | E1.2N/DC/MS 800A 750-1000V DC  | 1SDA074381R1 |  | 1SDA074382R1 |  |
| <b>E1.2N/DC/MS</b> | 1250 |                 |             | E1.2N/DC/MS 1250A 750-1000V DC | 1SDA074383R1 |  | 1SDA074384R1 |  |
| <b>E2.2S/DC/MS</b> | 1250 |                 |             | E2.2S/DC/MS 1250A 750-1000V DC | 1SDA074389R1 |  | 1SDA074390R1 |  |
| <b>E2.2S/DC/MS</b> | 1600 |                 |             | E2.2S/DC/MS 1600A 750-1000V DC | 1SDA074391R1 |  | 1SDA074392R1 |  |
| <b>E2.2S/DC/MS</b> | 2000 |                 |             | E2.2S/DC/MS 2000A 750-1000V DC | 1SDA074393R1 |  | 1SDA074394R1 |  |
| <b>E2.2S/DC/MS</b> | 2500 |                 |             | E2.2S/DC/MS 2500A 750-1000V DC | 1SDA074395R1 |  | 1SDA074396R1 |  |
| <b>E4.2H/DC/MS</b> | 1250 |                 |             | E4.2H/DC/MS 1250A 750-1000V DC | 1SDA074405R1 |  | 1SDA074406R1 |  |
| <b>E4.2H/DC/MS</b> | 1600 |                 |             | E4.2H/DC/MS 1600A 750-1000V DC | 1SDA074407R1 |  | 1SDA074408R1 |  |
| <b>E4.2H/DC/MS</b> | 2000 |                 |             | E4.2H/DC/MS 2000A 750-1000V DC | 1SDA074409R1 |  | 1SDA074410R1 |  |
| <b>E4.2H/DC/MS</b> | 2500 |                 |             | E4.2H/DC/MS 2500A 750-1000V DC | 1SDA074411R1 |  | 1SDA074412R1 |  |
| <b>E4.2H/DC/MS</b> | 3200 |                 |             | E4.2H/DC/MS 3200A 750-1000V DC | 1SDA074413R1 |  | 1SDA074414R1 |  |
| <b>E4.2H/DC/MS</b> | 4000 |                 |             | E4.2H/DC/MS 4000A 750-1000V DC | 1SDA074415R1 |  | 1SDA074416R1 |  |
| <b>E6.2X/DC/MS</b> | 4000 |                 |             | E6.2X/DC/MS 4000A 750-1000V DC | 1SDA074429R1 |  | 1SDA074430R1 |  |
| <b>E6.2X/DC/MS</b> | 5000 |                 |             | E6.2X/DC/MS 5000A 750-1000V DC | 1SDA074431R1 |  | 1SDA074432R1 |  |
| <b>E6.2X/DC/MS</b> | 6300 |                 |             | E6.2X/DC/MS 6300A 750-1000V DC | 1SDA074433R1 |  | 1SDA074434R1 |  |

# Switch-disconnectors

## Withdrawable version for applications up to 1000V DC

### Withdrawable version - Mobile part

| Size        | Iu   | Icu<br>(1000 V) | Icw<br>(1s) | Type                          | 3 Poles      |  | 4 Poles      |  |
|-------------|------|-----------------|-------------|-------------------------------|--------------|--|--------------|--|
|             |      |                 |             |                               | Code         |  | Code         |  |
| E1.2N/DC/MS | 800  |                 |             | E1.2N/DC/MS 800A 750-1000VDC  | 1SDA074385R1 |  | 1SDA074386R1 |  |
| E1.2N/DC/MS | 1250 |                 |             | E1.2N/DC/MS 1250A 750-1000VDC | 1SDA074387R1 |  | 1SDA074388R1 |  |
| E2.2S/DC/MS | 1250 |                 |             | E2.2S/DC/MS 1250A 750-1000VDC | 1SDA074397R1 |  | 1SDA074398R1 |  |
| E2.2S/DC/MS | 1600 |                 |             | E2.2S/DC/MS 1600A 750-1000VDC | 1SDA074399R1 |  | 1SDA074400R1 |  |
| E2.2S/DC/MS | 2000 |                 |             | E2.2S/DC/MS 2000A 750-1000VDC | 1SDA074401R1 |  | 1SDA074402R1 |  |
| E2.2S/DC/MS | 2500 |                 |             | E2.2S/DC/MS 2500A 750-1000VDC | 1SDA074403R1 |  | 1SDA074404R1 |  |
| E4.2H/DC/MS | 1250 |                 |             | E4.2H/DC/MS 1250A 750-1000VDC | 1SDA074417R1 |  | 1SDA074418R1 |  |
| E4.2H/DC/MS | 1600 |                 |             | E4.2H/DC/MS 1600A 750-1000VDC | 1SDA074419R1 |  | 1SDA074420R1 |  |
| E4.2H/DC/MS | 2000 |                 |             | E4.2H/DC/MS 2000A 750-1000VDC | 1SDA074421R1 |  | 1SDA074422R1 |  |
| E4.2H/DC/MS | 2500 |                 |             | E4.2H/DC/MS 2500A 750-1000VDC | 1SDA074423R1 |  | 1SDA074424R1 |  |
| E4.2H/DC/MS | 3200 |                 |             | E4.2H/DC/MS 3200A 750-1000VDC | 1SDA074425R1 |  | 1SDA074426R1 |  |
| E4.2H/DC/MS | 4000 |                 |             | E4.2H/DC/MS 4000A 750-1000VDC | 1SDA074427R1 |  | 1SDA074428R1 |  |
| E6.2X/DC/MS | 4000 |                 |             | E6.2X/DC/MS 4000A 750-1000VDC | 1SDA074435R1 |  | 1SDA074436R1 |  |
| E6.2X/DC/MS | 5000 |                 |             | E6.2X/DC/MS 5000A 750-1000VDC | 1SDA074437R1 |  | 1SDA074438R1 |  |
| E6.2X/DC/MS | 6300 |                 |             | E6.2X/DC/MS 6300A 750-1000VDC | 1SDA074439R1 |  | 1SDA074440R1 |  |

### Withdrawable version - Fixed part

| Size             | Iu   | Type of terminal | Type                                   | 3 Poles      |  | 4 Poles      |  |
|------------------|------|------------------|----------------------------------------|--------------|--|--------------|--|
|                  |      |                  |                                        | Code         |  | Code         |  |
| E1.2             | 1600 | HR - HR          | E1.2DC W FP Iu=1600 HR HR              | 1SDA073923R1 |  | 1SDA073924R1 |  |
| E2.2             | 2000 | HR - HR          | E2.2DC W FP Iu=2000 HR HR              | 1SDA073925R1 |  | 1SDA073926R1 |  |
| E2.2             | 2500 | HR - HR          | E2.2DC W FP Iu=2500 HR HR              | 1SDA073927R1 |  | 1SDA073928R1 |  |
| E4.2             | 3200 | HR - HR          | E4.2DC W FP Iu=3200 HR HR              | 1SDA073929R1 |  | 1SDA073930R1 |  |
| E4.2 / E4.2V     | 4000 | HR - HR          | E4.2DC W FP Iu=4000 or V HR HR version | 1SDA073931R1 |  | 1SDA073932R1 |  |
| E6.2             | 5000 | HR - HR          | E6.2DC W FP Iu=5000 HR HR              | 1SDA073933R1 |  |              |  |
| E6.2/f           | 5000 | HR - HR          | E6.2DC W FP Iu=5000 HR HR              |              |  | 1SDA073935R1 |  |
| E6.2 / E6.2X     | 6300 | HR - HR          | E6.2DC W FP Iu=6300 HR HR              | 1SDA073936R1 |  |              |  |
| E6.2/f / E6.2X/f | 6300 | HR - HR          | E6.2DC W FP Iu=6300 HR HR              |              |  | 1SDA073938R1 |  |

## Derived versions

### Sectionalizing truck - CS

| Size             | lu   | Type              | 3 poles      | 4 poles      |  |
|------------------|------|-------------------|--------------|--------------|--|
|                  |      |                   | Code         | Code         |  |
| <b>E2.2/CS</b>   | 2000 | E2.2/CS 2000 MP   | 1SDA081778R1 | 1SDA081779R1 |  |
| <b>E2.2/CS</b>   | 2500 | E2.2/CS 2500 MP   | 1SDA074348R1 | 1SDA074349R1 |  |
| <b>E4.2/CS</b>   | 3200 | E4.2/CS 3200 MP   | 1SDA081780R1 | 1SDA081781R1 |  |
| <b>E4.2/CS</b>   | 4000 | E4.2/CS 4000 MP   | 1SDA074350R1 | 1SDA074351R1 |  |
| <b>E6.2/CS</b>   | 6300 | E6.2/CS 6300 MP   | 1SDA074352R1 | 1SDA074353R1 |  |
| <b>E6.2/CS/f</b> | 6300 | E6.2/CS/f 6300 MP | -            | 1SDA082504R1 |  |

### Earthing truck - MT

| Size             | lu   | Type                                                    | 3 poles      | 4 poles      |  |
|------------------|------|---------------------------------------------------------|--------------|--------------|--|
|                  |      |                                                         | Code         | Code         |  |
| <b>E2.2/MT</b>   | 2000 | E2.2/MT 2000 MP Earth connection from upper terminals   | 1SDA081782R1 | 1SDA081783R1 |  |
| <b>E2.2/MT</b>   | 2500 | E2.2/MT 2500 MP Earth connection from upper terminals   | 1SDA074354R1 | 1SDA074355R1 |  |
| <b>E4.2/MT</b>   | 3200 | E4.2/MT 3200 MP Earth connection from upper terminals   | 1SDA081784R1 | 1SDA081785R1 |  |
| <b>E4.2/MT</b>   | 4000 | E4.2/MT 4000 MP Earth connection from upper terminals   | 1SDA074356R1 | 1SDA074357R1 |  |
| <b>E6.2/MT</b>   | 6300 | E6.2/MT 6300 MP Earth connection from upper terminals   | 1SDA074358R1 | 1SDA074359R1 |  |
| <b>E2.2/MT</b>   | 2000 | E2.2/MT 2000 MP Earth connection from lower terminals   | 1SDA081786R1 | 1SDA081787R1 |  |
| <b>E2.2/MT</b>   | 2500 | E2.2/MT 2500 MP Earth connection from lower terminals   | 1SDA074360R1 | 1SDA074361R1 |  |
| <b>E4.2/MT</b>   | 3200 | E4.2/MT 3200 MP Earth connection from lower terminals   | 1SDA081788R1 | 1SDA081789R1 |  |
| <b>E4.2/MT</b>   | 4000 | E4.2/MT 4000 MP Earth connection from lower terminals   | 1SDA074362R1 | 1SDA074363R1 |  |
| <b>E6.2/MT</b>   | 6300 | E6.2/MT 6300 MP Earth connection from lower terminals   | 1SDA074364R1 | 1SDA074365R1 |  |
| <b>E6.2/MT/f</b> | 6300 | E6.2/MT/f 6300 MP Earth connection from upper terminals | -            | 1SDA082505R1 |  |
| <b>E6.2/MT/f</b> | 6300 | E6.2/MT/f 6300 MP Earth connection from lower terminals | -            | 1SDA082506R1 |  |

### Earthing switch with making capacity - MTP

| Size              | lu   | Type                                                     | 3 poles      | 4 poles      |  |
|-------------------|------|----------------------------------------------------------|--------------|--------------|--|
|                   |      |                                                          | Code         | Code         |  |
| <b>E2.2/MTP</b>   | 2000 | E2.2/MTP 2000 MP Earth connection from upper terminals   | 1SDA081790R1 | 1SDA081791R1 |  |
| <b>E2.2/MTP</b>   | 2500 | E2.2/MTP 2500 MP Earth connection from upper terminals   | 1SDA074366R1 | 1SDA074367R1 |  |
| <b>E4.2/MTP</b>   | 3200 | E4.2/MTP 3200 MP Earth connection from upper terminals   | 1SDA081792R1 | 1SDA081793R1 |  |
| <b>E4.2/MTP</b>   | 4000 | E4.2/MTP 4000 MP Earth connection from upper terminals   | 1SDA074368R1 | 1SDA074369R1 |  |
| <b>E6.2/MTP</b>   | 6300 | E6.2/MTP 6300 MP Earth connection from upper terminals   | 1SDA074370R1 | 1SDA074371R1 |  |
| <b>E2.2/MTP</b>   | 2000 | E2.2/MTP 2000 MP Earth connection from lower terminals   | 1SDA081794R1 | 1SDA081795R1 |  |
| <b>E2.2/MTP</b>   | 2500 | E2.2/MTP 2500 MP Earth connection from lower terminals   | 1SDA074372R1 | 1SDA074373R1 |  |
| <b>E4.2/MTP</b>   | 3200 | E4.2/MTP 3200 MP Earth connection from lower terminals   | 1SDA081796R1 | 1SDA081797R1 |  |
| <b>E4.2/MTP</b>   | 4000 | E4.2/MTP 4000 MP Earth connection from lower terminals   | 1SDA074374R1 | 1SDA074375R1 |  |
| <b>E6.2/MTP</b>   | 6300 | E6.2/MTP 6300 MP Earth connection from lower terminals   | 1SDA074376R1 | 1SDA074377R1 |  |
| <b>E6.2/MTP/f</b> | 6300 | E6.2/MTP/f 6300 MP Earth connection from upper terminals | -            | 1SDA082507R1 |  |
| <b>E6.2/MTP/f</b> | 6300 | E6.2/MTP/f 6300 MP Earth connection from lower terminals | -            | 1SDA082508R1 |  |

### Accessories for MT and MTP

| Size             | Type                                    | Code         |  |
|------------------|-----------------------------------------|--------------|--|
| <b>E2.2</b>      | Grounding clamp PF E2.2 for MT/MTP      | 1SDA074378R1 |  |
| <b>E4.2-E6.2</b> | Grounding clamp PF E4.2-E6.2 for MT/MTP | 1SDA074379R1 |  |

Grounding clamps must be installed in every fixed parts in which a MT/MTP mobile parts is foreseen. otherwise the standard fixed parts can not accept MT/MTP device.

### Fixed or Mobile Part with neutral on right side

| Size               | Type                                                        | Code         |  |
|--------------------|-------------------------------------------------------------|--------------|--|
| <b>E1.2...E6.2</b> | Installation with neutral on right side sequence L1,L2,L3,N | 1SDA076153R1 |  |

# Fixed parts



| Size    | Performance | Iu range   | Type of terminal | Type                                 | 3 Poles      | 4 Poles      |
|---------|-------------|------------|------------------|--------------------------------------|--------------|--------------|
|         |             |            |                  |                                      | Code         | Code         |
| E1.2    | B, C, N, L  | 250 - 1600 | HR - HR          | E1.2 W FP Iu=1600 HR HR              | 1SDA073907R1 | 1SDA073908R1 |
| E2.2    | B, N, S, H  | 250 - 2000 | HR - HR          | E2.2 W FP Iu=2000 HR HR              | 1SDA073909R1 | 1SDA073910R1 |
| E2.2    | N, S, H     | 2500       | HR - HR          | E2.2 W FP Iu=2500 HR HR              | 1SDA073911R1 | 1SDA073912R1 |
| E4.2    | N, S, H     | 3200       | HR - HR          | E4.2 W FP Iu=3200 HR HR              | 1SDA073913R1 | 1SDA073914R1 |
| E4.2    | N, S, H     | 4000       | HR - HR          | E4.2 W FP Iu=4000 or V version HR HR | 1SDA073915R1 | 1SDA073916R1 |
| E4.2    | V           | 2000-4000  | HR - HR          | E4.2 W FP Iu=4000 or V version HR HR | 1SDA073915R1 | 1SDA073916R1 |
| E6.2    | H, V        | 4000-5000  | HR - HR          | E6.2 W FP Iu=5000 HR HR              | 1SDA073917R1 | 1SDA073918R1 |
| E6.2/f  | H, V        | 4000-5000  | HR - HR          | E6.2 W FP Iu=5000 HR HR              |              | 1SDA073919R1 |
| E6.2*   | H, V, X     | 4000-6300  | HR - HR          | E6.2 W FP Iu=6300 or X version HR HR | 1SDA073920R1 | 1SDA073921R1 |
| E6.2/f* | H, V, X     | 4000-6300  | HR - HR          | E6.2 W FP Iu=6300 or X version HR HR |              | 1SDA073922R1 |

\*These types of fixed parts are suitable for all types of E6.2 mobile parts from 4000A to 6300A (all Icu performance level)  
NOTE: the standard fixed parts can not accept MT/MTP device. In order to allow the utilization of MT/MTP mobile parts is mandatory to install the grounding clamps on fixed parts. Accessorizing only in the factory

# Accessories

## Electrical accessories



### First and second opening release - YO

| Size       | Type                         | Code         |  |
|------------|------------------------------|--------------|--|
| E1.2..E6.2 | YO E1.2..E6.2 24V AC/DC      | 1SDA073668R1 |  |
| E1.2..E6.2 | YO E1.2..E6.2 30V AC/DC      | 1SDA073669R1 |  |
| E1.2..E6.2 | YO E1.2..E6.2 48V AC/DC      | 1SDA073670R1 |  |
| E1.2..E6.2 | YO E1.2..E6.2 60V AC/DC      | 1SDA073671R1 |  |
| E1.2..E6.2 | YO E1.2..E6.2 110-120V AC/DC | 1SDA073672R1 |  |
| E1.2..E6.2 | YO E1.2..E6.2 120-127V AC/DC | 1SDA073673R1 |  |
| E1.2..E6.2 | YO E1.2..E6.2 220-240V AC/DC | 1SDA073674R1 |  |
| E1.2..E6.2 | YO E1.2..E6.2 240-250V AC/DC | 1SDA073675R1 |  |
| E1.2..E6.2 | YO E1.2..E6.2 277V AC        | 1SDA073676R1 |  |
| E1.2..E6.2 | YO E1.2..E6.2 380-400V AC    | 1SDA073677R1 |  |
| E1.2..E6.2 | YO E1.2..E6.2 415-440V AC    | 1SDA073678R1 |  |
| E1.2..E6.2 | YO E1.2..E6.2 480-500V AC    | 1SDA073679R1 |  |

### First and second closing release- YC

| Size       | Type                         | Code         |  |
|------------|------------------------------|--------------|--|
| E1.2..E6.2 | YC E1.2..E6.2 24V AC/DC      | 1SDA073681R1 |  |
| E1.2..E6.2 | YC E1.2..E6.2 30V AC/DC      | 1SDA073682R1 |  |
| E1.2..E6.2 | YC E1.2..E6.2 48V AC/DC      | 1SDA073683R1 |  |
| E1.2..E6.2 | YC E1.2..E6.2 60V AC/DC      | 1SDA073684R1 |  |
| E1.2..E6.2 | YC E1.2..E6.2 110-120V AC/DC | 1SDA073685R1 |  |
| E1.2..E6.2 | YC E1.2..E6.2 120-127V AC/DC | 1SDA073686R1 |  |
| E1.2..E6.2 | YC E1.2..E6.2 220-240V AC/DC | 1SDA073687R1 |  |
| E1.2..E6.2 | YC E1.2..E6.2 240-250V AC/DC | 1SDA073688R1 |  |
| E1.2..E6.2 | YC E1.2..E6.2 277V AC        | 1SDA073689R1 |  |
| E1.2..E6.2 | YC E1.2..E6.2 380-400V AC    | 1SDA073690R1 |  |
| E1.2..E6.2 | YC E1.2..E6.2 415-440V AC    | 1SDA073691R1 |  |
| E1.2..E6.2 | YC E1.2..E6.2 480-500V AC    | 1SDA073692R1 |  |

### YO/YC test unit

| Size         | Type                        | Code         |  |
|--------------|-----------------------------|--------------|--|
| E1.2...E6.2* | YO/YC test unit E1.2...E6.2 | 1SDA082751R1 |  |

\*Only as loose part

### Undervoltage release - YU

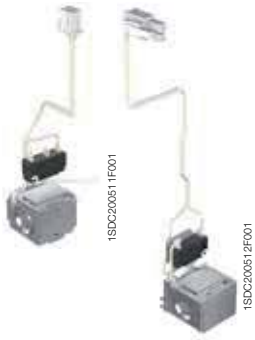
| Size       | Type                         | Code         |  |
|------------|------------------------------|--------------|--|
| E1.2..E6.2 | YU E1.2..E6.2 24V AC/DC      | 1SDA073694R1 |  |
| E1.2..E6.2 | YU E1.2..E6.2 30V AC/DC      | 1SDA073695R1 |  |
| E1.2..E6.2 | YU E1.2..E6.2 48V AC/DC      | 1SDA073696R1 |  |
| E1.2..E6.2 | YU E1.2..E6.2 60V AC/DC      | 1SDA073697R1 |  |
| E1.2..E6.2 | YU E1.2..E6.2 110-120V AC/DC | 1SDA073698R1 |  |
| E1.2..E6.2 | YU E1.2..E6.2 120-127V AC/DC | 1SDA073699R1 |  |
| E1.2..E6.2 | YU E1.2..E6.2 220-240V AC/DC | 1SDA073700R1 |  |
| E1.2..E6.2 | YU E1.2..E6.2 240-250V AC/DC | 1SDA073701R1 |  |
| E1.2..E6.2 | YU E1.2..E6.2 277V AC        | 1SDA073702R1 |  |
| E1.2..E6.2 | YU E1.2..E6.2 380-400V AC    | 1SDA073703R1 |  |
| E1.2..E6.2 | YU E1.2..E6.2 415-440V AC    | 1SDA073704R1 |  |
| E1.2..E6.2 | YU E1.2..E6.2 480-500V AC    | 1SDA073705R1 |  |

### Electronic time-delay device for undervoltage release - UVD

| Size        | Type             | Code         |  |
|-------------|------------------|--------------|--|
| E1.2...E6.2 | 24...30V DC      | 1SDA038316R1 |  |
| E1.2...E6.2 | 48V AC/DC        | 1SDA038317R1 |  |
| E1.2...E6.2 | 60V AC/DC        | 1SDA038318R1 |  |
| E1.2...E6.2 | 110...127V AC/DC | 1SDA038319R1 |  |
| E1.2...E6.2 | 220...250V AC/DC | 1SDA038320R1 |  |

# Accessories

## Electrical accessories



### Remote Reset - YR

| Size                | Type                      | Code         |  |
|---------------------|---------------------------|--------------|--|
| <b>E1.2</b>         | YR 24V DC E1.2            | 1SDA073744R1 |  |
| <b>E1.2</b>         | YR 110V AC/DC E1.2        | 1SDA073745R1 |  |
| <b>E1.2</b>         | YR 220V AC/DC E1.2        | 1SDA073746R1 |  |
| <b>E2.2...E6.2</b>  | YR 24V DC E2.2...E6.2     | 1SDA073747R1 |  |
| <b>E2.2...E6.2*</b> | YR 110V AC/DC E2.2...E6.2 | 1SDA073748R1 |  |
| <b>E2.2...E6.2*</b> | YR 220V AC/DC E2.2...E6.2 | 1SDA073749R1 |  |

\* when YR is used in DC, the activation of YR must be done with a maximum impulse time of 50ms. The YR cannot be powered permanently.



### Motor - M

| Size               | Type                                          | Code         |  |
|--------------------|-----------------------------------------------|--------------|--|
| <b>E1.2</b>        | M E1.2 24-30V AC/DC+S33 M/2 250V              | 1SDA073708R1 |  |
| <b>E1.2</b>        | M E1.2 48-60V AC/DC+S33 M/2 250V              | 1SDA073709R1 |  |
| <b>E1.2</b>        | M E1.2 100-130V AC/DC+S33 M/2 250V            | 1SDA073710R1 |  |
| <b>E1.2</b>        | M E1.2 220-250V AC/DC+S33 M/2 250V            | 1SDA073711R1 |  |
| <b>E1.2</b>        | M E1.2 380-415V AC+S33 M/2 250V               | 1SDA073713R1 |  |
| <b>E2.2...E6.2</b> | M E2.2...E6.2 24-30V AC/DC+S33 M/2 400V       | 1SDA073722R1 |  |
| <b>E2.2...E6.2</b> | M E2.2...E6.2 48-60V AC/DC+S33 M/2 400V       | 1SDA073723R1 |  |
| <b>E2.2...E6.2</b> | M E2.2...E6.2 100-130V AC/DC+S33 M/2 400V     | 1SDA073724R1 |  |
| <b>E2.2...E6.2</b> | M E2.2...E6.2 220-250V AC/DC+S33 M/2 400V     | 1SDA073725R1 |  |
| <b>E2.2...E6.2</b> | M E2.2...E6.2 380-415V AC+S33 M/2 400V        | 1SDA073727R1 |  |
| <b>E2.2...E6.2</b> | M E2.2...E6.2 440-480V AC+S33 M/2 400V        | 1SDA073728R1 |  |
| <b>E1.2</b>        | M E1.2 24-30V AC/DC + S33 M/2 24V DC          | 1SDA073715R1 |  |
| <b>E1.2</b>        | M E1.2 48-60V AC/DC + S33 M/2 24V DC          | 1SDA073716R1 |  |
| <b>E1.2</b>        | M E1.2 100-130V AC/DC + S33 M/2 24V DC        | 1SDA073717R1 |  |
| <b>E1.2</b>        | M E1.2 220-250V AC/DC + S33 M/2 24V DC        | 1SDA073718R1 |  |
| <b>E1.2</b>        | M E1.2 380-415V AC + S33 M/2 24V DC           | 1SDA073720R1 |  |
| <b>E2.2...E6.2</b> | M E2.2...E6.2 24-30V AC/DC + S33 M/2 24V DC   | 1SDA073729R1 |  |
| <b>E2.2...E6.2</b> | M E2.2...E6.2 48-60V AC/DC + S33 M/2 24V DC   | 1SDA073730R1 |  |
| <b>E2.2...E6.2</b> | M E2.2...E6.2 100-130V AC/DC + S33 M/2 24V DC | 1SDA073731R1 |  |
| <b>E2.2...E6.2</b> | M E2.2...E6.2 220-250V AC/DC + S33 M/2 24V DC | 1SDA073732R1 |  |
| <b>E2.2...E6.2</b> | M E2.2...E6.2 380-415V AC + S33 M/2 24V DC    | 1SDA073734R1 |  |
| <b>E2.2...E6.2</b> | M E2.2...E6.2 440-480V AC + S33 M/2 24V DC    | 1SDA073735R1 |  |



9

### Current sensor for neutral conductor outside the circuit-breaker

| Size                | Type                         | Code         |  |
|---------------------|------------------------------|--------------|--|
| <b>E1.2 - E2.2*</b> | Ext CS N E1.2 E2.2 2000A     | 1SDA073736R1 |  |
| <b>E2.2*</b>        | Ext CS N E2.2 2500A          | 1SDA073737R1 |  |
| <b>E4.2*</b>        | Ext CS N E4.2 3200A          | 1SDA073738R1 |  |
| <b>E4.2 - E6.2*</b> | Ext CS N E4.2 4000A E6.2 50% | 1SDA073739R1 |  |
| <b>E6.2*</b>        | Ext CS N E6.2                | 1SDA073740R1 |  |

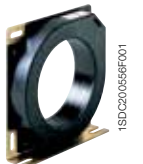
\*Only as loose part



### Homopolar toroid for the earthing conductor of main power supply

| Size                | Type                                | Code         |  |
|---------------------|-------------------------------------|--------------|--|
| <b>E1.2...E6.2*</b> | Homopolar toroid E1.2 ... E6.2 100A | 1SDA073743R1 |  |
| <b>E1.2...E6.2*</b> | Homopolar toroid E1.2 ... E6.2 250A | 1SDA076248R1 |  |
| <b>E1.2...E6.2*</b> | Homopolar toroid E1.2 ... E6.2 400A | 1SDA076249R1 |  |
| <b>E1.2...E6.2*</b> | Homopolar toroid E1.2 ... E6.2 800A | 1SDA076250R1 |  |

\*Only as loose part



### Toroid for differential protection

| Size                   | Type                       | Code         |  |
|------------------------|----------------------------|--------------|--|
| <b>E1.2 - E2.2 3p*</b> | Toroid RC E1.2, E2.2 3p    | 1SDA073741R1 |  |
| <b>E2.2 4p - E4.2*</b> | Toroid RC E2.2 4p, E4.2 3p | 1SDA073742R1 |  |

\*Only as loose part





1SDC200503F001



1SDC200504F001



1SDC200505F001



1SDC200506F001



1SDC200507F001



1SDC200685F001



1SDC200681F001

## Open/closed auxiliary contacts - AUX

| Size                 | Type                                                                                         | Code         |  |
|----------------------|----------------------------------------------------------------------------------------------|--------------|--|
| <b>E1.2**</b>        | AUX 4Q 400V E1.2                                                                             | 1SDA073750R1 |  |
| <b>E1.2</b>          | AUX 4Q 24V E1.2                                                                              | 1SDA073751R1 |  |
| <b>E1.2</b>          | AUX 2Q 400V + 2Q 24V E1.2                                                                    | 1SDA073752R1 |  |
| <b>E2.2...E6.2**</b> | AUX 4Q 400V E2.2...E6.2                                                                      | 1SDA073753R1 |  |
| <b>E2.2...E6.2</b>   | AUX 4Q 24V E2.2...E6.2                                                                       | 1SDA073754R1 |  |
| <b>E2.2...E6.2</b>   | AUX 2Q 400V + 2Q 24V E2.2...E6.2                                                             | 1SDA073755R1 |  |
| <b>E2.2...E6.2</b>   | AUX 6Q 400V E2.2...E6.2                                                                      | 1SDA073756R1 |  |
| <b>E2.2...E6.2</b>   | AUX 6Q 24V E2.2...E6.2                                                                       | 1SDA073757R1 |  |
| <b>E2.2...E6.2</b>   | AUX 3Q 400V AC + 3Q 24V DC E2.2...E6.2                                                       | 1SDA075973R1 |  |
| <b>E1.2*</b>         | AUX 15Q 400V E1.2                                                                            | 1SDA073758R1 |  |
| <b>E1.2*</b>         | AUX 15Q 24V E1.2                                                                             | 1SDA073759R1 |  |
| <b>E2.2...E6.2*</b>  | AUX 15Q 400V (for fixed/withdrawable with signalling in racked in) E2.2...E6.2               | 1SDA073760R1 |  |
| <b>E2.2...E6.2*</b>  | AUX 15Q 24V (for fixed/withdrawable with signalling in racked in) E2.2...E6.2                | 1SDA073761R1 |  |
| <b>E2.2...E6.2*</b>  | AUX 15Q 400V (for fixed/withdrawable with signalling in racked in/test isolated) E2.2...E6.2 | 1SDA073846R1 |  |
| <b>E2.2...E6.2*</b>  | AUX 15Q 24V (for fixed/withdrawable with signalling in racked in/test isolated) E2.2...E6.2  | 1SDA073847R1 |  |

\* not compatible with mechanical locks on compartment doors or mechanical interlocks.

For E1.2 you need to order also one of the following items:

|                                 |              |
|---------------------------------|--------------|
| Plate for fixed - floor mounted | 1SDA079783R1 |
| Plate for fixed - wall mounted  | 1SDA079782R1 |
| Plate for withdrawable          | 1SDA079784R1 |

\*\* Standard supply with automatic circuit-breakers

## Auxiliary position contacts - AUP

| Size               | Type                                                                | Code         |  |
|--------------------|---------------------------------------------------------------------|--------------|--|
| <b>E1.2</b>        | AUP 6 contacts 400V E1.2                                            | 1SDA073762R1 |  |
| <b>E1.2</b>        | AUP 6 contacts 24V E1.2                                             | 1SDA073763R1 |  |
| <b>E2.2...E6.2</b> | AUP 5 contacts 400V E2.2...E6.2 - left set                          | 1SDA073764R1 |  |
| <b>E2.2...E6.2</b> | AUP 5 contacts 24V E2.2...E6.2 - left set                           | 1SDA073765R1 |  |
| <b>E2.2...E6.2</b> | AUP 5 suppl. contacts 400V E2.2...E6.2 - right set                  | 1SDA073766R1 |  |
| <b>E2.2...E6.2</b> | AUP 5 suppl. contacts 24V E2.2...E6.2 - right set                   | 1SDA073767R1 |  |
| <b>E2.2...E6.2</b> | AUP 5 suppl. contacts 400V E2.2...E6.2 - 1in 3test 1out - right set | 1SDA082749R1 |  |
| <b>E1.2...E6.2</b> | AUP Ekip auxiliary position contact E1.2...E6.2                     | 1SDA073768R1 |  |

## Ready to close signalling contact- RTC

| Size               | Type                     | Code         |  |
|--------------------|--------------------------|--------------|--|
| <b>E1.2</b>        | RTC 250V E1.2            | 1SDA073770R1 |  |
| <b>E1.2</b>        | RTC 24V E1.2             | 1SDA073771R1 |  |
| <b>E1.2</b>        | RTC Ekip 24V E1.2        | 1SDA073772R1 |  |
| <b>E2.2...E6.2</b> | RTC 250V E2.2...E6.2     | 1SDA073773R1 |  |
| <b>E2.2...E6.2</b> | RTC 24V E2.2...E6.2      | 1SDA073774R1 |  |
| <b>E2.2...E6.2</b> | RTC Ekip 24V E2.2...E6.2 | 1SDA073775R1 |  |

## Contact signalling tripping of Ekip protection trip unit - S51

| Size               | Type                 | Code         |  |
|--------------------|----------------------|--------------|--|
| <b>E1.2</b>        | S51 250V E1.2        | 1SDA073776R1 |  |
| <b>E1.2</b>        | S51 24V E1.2         | 1SDA073777R1 |  |
| <b>E2.2...E6.2</b> | S51 250V E2.2...E6.2 | 1SDA073778R1 |  |
| <b>E2.2...E6.2</b> | S51 24V E2.2...E6.2  | 1SDA073779R1 |  |

## Terminals for auxiliary connection

| Size               | Type             | Code         |  |
|--------------------|------------------|--------------|--|
| <b>E1.2...E6.2</b> | Terminals 10 pcs | 1SDA073906R1 |  |

# Accessories

## Mechanical accessories



1SDC200514F001

### Mechanical operation counter - MOC

| Size        | Type                             | Code         |  |
|-------------|----------------------------------|--------------|--|
| E1.2*       | MOC Mechanical operation counter | 1SDA073780R1 |  |
| E2.2...E6.2 | MOC Mechanical operation counter | 1SDA073781R1 |  |

\* only available with Motor



1SDC200515F001

### Key lock in open position - KLC

| Size            | Type                                           | Code         |  |
|-----------------|------------------------------------------------|--------------|--|
| E1.2            | KLC-D Key lock open E1.2                       | 1SDA073782R1 |  |
| E1.2            | KLC-S Key lock open N.20005 E1.2               | 1SDA073783R1 |  |
| E1.2            | KLC-S Key lock open N.20006 E1.2               | 1SDA073784R1 |  |
| E1.2            | KLC-S Key lock open N.20007 E1.2               | 1SDA073785R1 |  |
| E1.2            | KLC-S Key lock open N.20008 E1.2               | 1SDA073786R1 |  |
| E1.2            | KLC-S Key lock open N.20009 E1.2               | 1SDA073787R1 |  |
| E1.2**          | KLC-A Castell key lock open E1.2               | 1SDA073788R1 |  |
| E1.2**          | KLC-A Kirk key lock open E1.2                  | 1SDA073789R1 |  |
| E1.2**          | KLC-A Ronis Profalux key lock open E1.2        | 1SDA073790R1 |  |
| E2.2...E6.2     | KLC-D Key lock open E2.2...E6.2                | 1SDA073791R1 |  |
| E2.2...E6.2     | KLC-S key lock open N.20005 E2.2...E6.2        | 1SDA073792R1 |  |
| E2.2...E6.2     | KLC-S key lock open N.20006 E2.2...E6.2        | 1SDA073793R1 |  |
| E2.2...E6.2     | KLC-S key lock open N.20007 E2.2...E6.2        | 1SDA073794R1 |  |
| E2.2...E6.2     | KLC-S key lock open N.20008 E2.2...E6.2        | 1SDA073795R1 |  |
| E2.2...E6.2     | KLC-S key lock open N.20009 E2.2...E6.2        | 1SDA073796R1 |  |
| E2.2...E6.2* ** | KLC-A Castell key lock open E2.2...E6.2        | 1SDA073797R1 |  |
| E2.2...E6.2**   | KLC-A Kirk key lock open E2.2...E6.2           | 1SDA073798R1 |  |
| E2.2...E6.2**   | KLC-A Ronis Profalux key lock open E2.2...E6.2 | 1SDA073799R1 |  |

\* you need to order also the cover. Please select the suitable one at pag. 9/72; \*\* arrangement only



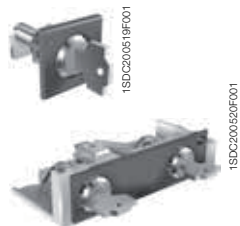
1SDC200517F001

### Padlocks in open position - PLC

| Size        | Type                                            | Code         |  |
|-------------|-------------------------------------------------|--------------|--|
| E1.2        | PLC E1.2 Padlocks in open position D=4mm        | 1SDA073800R1 |  |
| E1.2        | PLC E1.2 Padlocks in open position D=7mm        | 1SDA073801R1 |  |
| E1.2        | PLC E1.2 Padlocks in open position D=8mm        | 1SDA073802R1 |  |
| E2.2...E6.2 | PLC E2.2...E6.2 Padlocks in open position D=4mm | 1SDA073803R1 |  |
| E2.2...E6.2 | PLC E2.2...E6.2 Padlocks in open position D=7mm | 1SDA073804R1 |  |
| E2.2...E6.2 | PLC E2.2...E6.2 Padlocks in open position D=8mm | 1SDA073805R1 |  |

### Floor fixing plate - F

| Size | Type                              | Code         |  |
|------|-----------------------------------|--------------|--|
| E1.2 | Floor fixing plate for fixed unit | 1SDA076020R1 |  |



### Key lock in racked-in / test / racked-out position- KLP

| Size            | Type                                                  | Code         |  |
|-----------------|-------------------------------------------------------|--------------|--|
| E1.2            | KLP-D Bl. Racked in/out E1.2 1st key                  | 1SDA073822R1 |  |
| E1.2            | KLP-S Bl. Racked in/out N.20005 E1.2 1st key          | 1SDA073823R1 |  |
| E1.2            | KLP-S Bl. Racked in/out N.20006 E1.2 1st key          | 1SDA073824R1 |  |
| E1.2            | KLP-S Bl. Racked in/out N.20007 E1.2 1st key          | 1SDA073825R1 |  |
| E1.2            | KLP-S Bl. Racked in/out N.20008 E1.2 1st key          | 1SDA073826R1 |  |
| E1.2            | KLP-S Bl. Racked in/out N.20009 E1.2 1st key          | 1SDA073827R1 |  |
| E1.2            | KLP-D Bl. Racked in/out E1.2 2nd key                  | 1SDA073828R1 |  |
| E1.2            | KLP-S Bl. Racked in/out N.20005 E1.2 2nd key          | 1SDA073829R1 |  |
| E1.2            | KLP-S Bl. Racked in/out N.20006 E1.2 2nd key          | 1SDA073830R1 |  |
| E1.2            | KLP-S Bl. Racked in/out N.20007 E1.2 2nd key          | 1SDA073831R1 |  |
| E1.2            | KLP-S Bl. Racked in/out N.20008 E1.2 2nd key          | 1SDA073832R1 |  |
| E1.2            | KLP-S Bl. Racked in/out N.20009 E1.2 2nd key          | 1SDA073833R1 |  |
| E1.2**          | KLP-A Bl. Racked in/out RonProf Kirk E1.2 1st key     | 1SDA073834R1 |  |
| E1.2**          | KLP-A Bl. Racked in/out RonProf Kirk E1.2 2nd key     | 1SDA073835R1 |  |
| E1.2* **        | KLP-A Bl. Racked in/out Castell E1.2 1st key          | 1SDA073836R1 |  |
| E1.2* **        | KLP-A Bl. Racked in/out Castell E1.2 2nd key          | 1SDA073837R1 |  |
| E2.2...E6.2     | KLP-D Bl. Racked in/out E2.2...E6.2 1st key           | 1SDA073806R1 |  |
| E2.2...E6.2     | KLP-S Bl. Racked in/out N.20005 E2.2...E6.2 1st key   | 1SDA073807R1 |  |
| E2.2...E6.2     | KLP-S Bl. Racked in/out N.20006 E2.2...E6.2 1st key   | 1SDA073808R1 |  |
| E2.2...E6.2     | KLP-S Bl. Racked in/out N.20007 E2.2...E6.2 1st key   | 1SDA073809R1 |  |
| E2.2...E6.2     | KLP-S Bl. Racked in/out N.20008 E2.2...E6.2 1st key   | 1SDA073810R1 |  |
| E2.2...E6.2     | KLP-S Bl. Racked in/out N.20009 E2.2...E6.2 1st key   | 1SDA073811R1 |  |
| E2.2...E6.2     | KLP-D Bl. Racked in/out E2.2...E6.2 2nd key           | 1SDA073812R1 |  |
| E2.2...E6.2     | KLP-S Bl. Racked in/out N.20005 E2.2...E6.2 2nd key   | 1SDA073813R1 |  |
| E2.2...E6.2     | KLP-S Bl. Racked in/out N.20006 E2.2...E6.2 2nd key   | 1SDA073814R1 |  |
| E2.2...E6.2     | KLP-S Bl. Racked in/out N.20007 E2.2...E6.2 2nd key   | 1SDA073815R1 |  |
| E2.2...E6.2     | KLP-S Bl. Racked in/out N.20008 E2.2...E6.2 2nd key   | 1SDA073816R1 |  |
| E2.2...E6.2     | KLP-S Bl. Racked in/out N.20009 E2.2...E6.2 2nd key   | 1SDA073817R1 |  |
| E2.2...E6.2**   | KLP-A Bl. Racked in/out RoProKirk E2.2...E6.2 1st key | 1SDA073818R1 |  |
| E2.2...E6.2**   | KLP-A Bl. Racked in/out RoProKirk E2.2...E6.2 2nd key | 1SDA073819R1 |  |
| E2.2...E6.2* ** | KLP-A Bl. Racked in/out Castell E2.2...E6.2 1st key   | 1SDA073820R1 |  |
| E2.2...E6.2* ** | KLP-A Bl. Racked in/out Castell E2.2...E6.2 2nd key   | 1SDA073821R1 |  |

When the PLP is already present, you have to order the KLP 2<sup>nd</sup> key and not the KLP 1<sup>st</sup> key

\* only mounted. For loose supply contact ABB SACE; \*\* arrangement only

### Accessory for supplementary lock in racked-out position

| Size        | Type                                   | Code         |  |
|-------------|----------------------------------------|--------------|--|
| E1.2        | Suppl. locks in racked-out E1.2        | 1SDA073838R1 |  |
| E2.2...E6.2 | Suppl. locks in racked-out E2.2...E6.2 | 1SDA073839R1 |  |



### Padlock in racked-in / test / racked-out position - PLP

| Size        | Type                                                 | Code         |  |
|-------------|------------------------------------------------------|--------------|--|
| E1.2        | PLP Bl. padlocks Racked in/out D=4/6/8mm E1.2        | 1SDA073840R1 |  |
| E2.2...E6.2 | PLP Bl. padlocks Racked in/out D=4/6/8mm E2.2...E6.2 | 1SDA073841R1 |  |

# Accessories

## Mechanical accessories



1SDC20088F001

### Lock for racking in / racking out the mobile part when the door is open - DLR

| Size                | Type            | Code         |  |
|---------------------|-----------------|--------------|--|
| <b>E2.2...E6.2*</b> | DLR E2.2...E6.2 | 1SDA073845R1 |  |

\*Only as loose part



1SDC200523F001

### Lock to prevent door opening when circuit-breaker is in racked-in / test position - DLP

| Size                | Type            | Code         |  |
|---------------------|-----------------|--------------|--|
| <b>E2.2...E6.2*</b> | DLP E2.2...E6.2 | 1SDA073849R1 |  |

\*Only as loose part

### Lock to prevent door opening when circuit-breaker is in closed position - DLC

| Size                | Type                                                       | Code         |  |
|---------------------|------------------------------------------------------------|--------------|--|
| <b>E1.2</b>         | DLC Interlock cable door for fixed to wall E1.2            | 1SDA081032R1 |  |
| <b>E1.2</b>         | DLC Interlock cable door for fixed to floor E1.2           | 1SDA081033R1 |  |
| <b>E1.2</b>         | DLC Interlock cable door for fixed part withdrawable E1.2  | 1SDA081034R1 |  |
| <b>E1.2</b>         | DLC Interlock direct door for fixed to wall E1.2           | 1SDA079779R1 |  |
| <b>E1.2</b>         | DLC Interlock direct door for fixed to floor E1.2          | 1SDA079780R1 |  |
| <b>E1.2</b>         | DLC Interlock direct door for fixed part withdrawable E1.2 | 1SDA079781R1 |  |
| <b>E2.2...E6.2*</b> | DLC Interlock cable door E2.2...E6.2                       | 1SDA073852R1 |  |
| <b>E2.2...E6.2*</b> | DLC Interlock direct door E2.2...E6.2                      | 1SDA073853R1 |  |

\* To be ordered with lever for interlock [group 2] and support for interlock [1SDA073895R1]



1SDC200925F001

### Protection device for opening and closing pushbuttons - PBC

| Size               | Type                                          | Code         |  |
|--------------------|-----------------------------------------------|--------------|--|
| <b>E1.2</b>        | PBC Prot. Pushbuttons AP/CH E1.2              | 1SDA073854R1 |  |
| <b>E1.2</b>        | PBC Prot. Pushbuttons AP/CH D=4mm E1.2        | 1SDA073855R1 |  |
| <b>E1.2</b>        | PBC Prot. Pushbuttons AP/CH D=7mm E1.2        | 1SDA073856R1 |  |
| <b>E1.2</b>        | PBC Prot. Pushbuttons AP/CH D=8mm E1.2        | 1SDA073857R1 |  |
| <b>E2.2...E6.2</b> | PBC Prot. Pushbuttons AP/CH E2.2...E6.2       | 1SDA073858R1 |  |
| <b>E2.2...E6.2</b> | PBC Prot. Pushbuttons AP/CH D=4mm E2.2...E6.2 | 1SDA073859R1 |  |
| <b>E2.2...E6.2</b> | PBC Prot. Pushbuttons AP/CH D=7mm E2.2...E6.2 | 1SDA073860R1 |  |
| <b>E2.2...E6.2</b> | PBC Prot. Pushbuttons AP/CH D=8mm E2.2...E6.2 | 1SDA073861R1 |  |



1SDC200527F001

1SDC200528F001

1SDC200529F001

### Circuit-breaker flange

| Size                | Type                                   | Code         |  |
|---------------------|----------------------------------------|--------------|--|
| <b>E1.2</b>         | IP30 Flange E1.2 F                     | 1SDA073862R1 |  |
| <b>E1.2</b>         | IP30 Flange E1.2 W                     | 1SDA073863R1 |  |
| <b>E2.2...E6.2</b>  | IP30 Flange E2.2...E6.2 F              | 1SDA073864R1 |  |
| <b>E2.2...E6.2</b>  | IP30 Flange E2.2...E6.2 W              | 1SDA073865R1 |  |
| <b>E1.2*</b>        | IP54 Flange different keys E1.2        | 1SDA073866R1 |  |
| <b>E2.2...E6.2*</b> | IP54 Flange different keys E2.2...E6.2 | 1SDA073867R1 |  |
| <b>E1.2*</b>        | IP54 Flange key No. 20005 E1.2         | 1SDA073868R1 |  |
| <b>E2.2...E6.2*</b> | IP54 Flange key No. 20005 E2.2...E6.2  | 1SDA073869R1 |  |
| <b>E2.2...E6.2</b>  | Sealable trip unit cover               | 1SDA073870R1 |  |

\*Only as loose part

# Accessories

## Mechanical interlock



1SDC200509F001



1SDC200631F001

### High or low terminal covers- HTC/LTC

| Size | Type                                | 3 poles      | 4 poles      |  |
|------|-------------------------------------|--------------|--------------|--|
|      |                                     | Code         | Code         |  |
| E1.2 | HTC high terminal covers E1.2 2pcs  | 1SDA073871R1 | 1SDA073872R1 |  |
| E1.2 | LTC low terminal covers E1.2 F 2pcs | 1SDA073873R1 | 1SDA073874R1 |  |

### Separators - PB\*

| Size        | Type                                   | Code         |  |
|-------------|----------------------------------------|--------------|--|
| E1.2        | PB Separators H=100mm 4pz E1.2 F 3P    | 1SDA073877R1 |  |
| E1.2        | PB Separators H=100mm 6pz E1.2 F 4P    | 1SDA073878R1 |  |
| E1.2        | PB Separators H=200mm 4pz E1.2 F 3P    | 1SDA073879R1 |  |
| E1.2        | PB Separators H=200mm 6pz E1.2 F 4P    | 1SDA073880R1 |  |
| E1.2        | PB Separators 2 pz E1.2 W FP 3P        | 1SDA076164R1 |  |
| E1.2        | PB Separators 3 pz E1.2 W FP 4P        | 1SDA076165R1 |  |
| E2.2...E6.2 | PB Separators 2 pz E2.2...E6.2 F 3P    | 1SDA076166R1 |  |
| E2.2...E6.2 | PB Separators 3 pz E2.2...E6.2 F 4P    | 1SDA076167R1 |  |
| E2.2...E6.2 | PB Separators 2 pz E2.2...E6.2 W FP 3P | 1SDA076168R1 |  |
| E2.2...E6.2 | PB Separators 3 pz E2.2...E6.2 W FP 4P | 1SDA076169R1 |  |

\*Only as loose part

### Cables for mechanical interlock [Group 1]

| Size        | Type                  | Code         |  |
|-------------|-----------------------|--------------|--|
| E1.2...E6.2 | Type A horizontal     | 1SDA073881R1 |  |
| E2.2...E6.2 | Type B,C,D horizontal | 1SDA073882R1 |  |
| E1.2...E6.2 | Type A vertical       | 1SDA073885R1 |  |
| E2.2...E6.2 | Type B,C,D vertical   | 1SDA073886R1 |  |

Order one type of cable for each interlock. The cable must be ordered on the fixed circuit-breaker or on the fixed part of withdrawable circuit-breaker.

### Lever for mechanical interlock of fixed circuit-breaker or mobile part [Group 2]

| Size | Type                           | 3 Poles      | 4 Poles      |  |
|------|--------------------------------|--------------|--------------|--|
|      |                                | Code         | Code         |  |
| E2.2 | Lever for mechanical interlock | 1SDA073889R1 | 1SDA073889R1 |  |
| E4.2 | Lever for mechanical interlock | 1SDA073890R1 | 1SDA073890R1 |  |
| E6.2 | Lever for mechanical interlock | 1SDA073891R1 | 1SDA073892R1 |  |

The lever for mechanical interlock is not required for E1.2

### Support for mechanical interlock of fixed circuit-breaker [Group 3]

| Size          | Type                   | Code         |  |
|---------------|------------------------|--------------|--|
| E1.2          | Type A - floor mounted | 1SDA073893R1 |  |
| E1.2          | Type A - wall mounted  | 1SDA073894R1 |  |
| E2.2 ... E6.2 | Type A / B / D         | 1SDA073895R1 |  |
| E2.2 ... E6.2 | Type C                 | 1SDA073897R1 |  |

### Support for mechanical interlock of fixed part [Group 4]

| Size          | Type           | Code         |  |
|---------------|----------------|--------------|--|
| E1.2          | Type A         | 1SDA073896R1 |  |
| E2.2 ... E6.2 | Type A / B / D | 1SDA073895R1 |  |
| E2.2 ... E6.2 | Type C         | 1SDA073897R1 |  |

### Automatic transfer switch

| Size        | Type   | Code         |  |
|-------------|--------|--------------|--|
| E1.2...E6.2 | ATS021 | 1SDA065523R1 |  |
| E1.2...E6.2 | ATS022 | 1SDA065524R1 |  |



1SDC200637F001



1SDC200638F001

# Accessories

## Ekip modules



1SDC200446F001



1SDC200466F001



1SDC200486F001



1SDC200475F001



1SDC200476F001

### Ekip electrical trip units - loose supply

| Size           | Type                        | Code         |  |
|----------------|-----------------------------|--------------|--|
| E1.2..E6.2     | Ekip Dip LI                 | 1SDA074194R1 |  |
| E1.2..E6.2     | Ekip Dip LSI                | 1SDA074195R1 |  |
| E1.2..E6.2     | Ekip Dip LSIG               | 1SDA074196R1 |  |
| E1.2..E6.2*    | Ekip Touch LI               | 1SDA074197R1 |  |
| E1.2..E6.2*    | Ekip Touch LSI              | 1SDA074198R1 |  |
| E1.2..E6.2*    | Ekip Touch LSIG             | 1SDA074199R1 |  |
| E1.2..E6.2* ** | Ekip G Touch LSIG           | 1SDA074200R1 |  |
| E1.2..E6.2* ** | Ekip Hi-Touch LSI           | 1SDA074201R1 |  |
| E1.2..E6.2* ** | Ekip Hi-Touch LSIG          | 1SDA074202R1 |  |
| E1.2..E6.2* ** | Ekip G Hi-Touch LSIG        | 1SDA074203R1 |  |
| E1.2..E6.2* ** | Ekip LCD LI                 | 1SDA074204R1 |  |
| E1.2..E6.2* ** | Ekip LCD LSI                | 1SDA074205R1 |  |
| E1.2..E6.2* ** | Ekip LCD LSIG               | 1SDA074206R1 |  |
| E1.2..E6.2* ** | Ekip G LCD LSIG             | 1SDA074207R1 |  |
| E1.2..E6.2* ** | Ekip Hi-LCD LSI             | 1SDA074208R1 |  |
| E1.2..E6.2* ** | Ekip Hi-LCD LSIG            | 1SDA074209R1 |  |
| E1.2..E6.2* ** | Ekip G Hi-LCD LSIG          | 1SDA074210R1 |  |
| E1.2..E6.2     | Battery for Ekip trip units | 1SDA074193R1 |  |

\* Ekip TT standard supply; \*\* provided without Ekip Measuring/Ekip Measuring Pro.

### Options for Ekip electrical trip units

| Size       | Type                                                       | Code         |  |
|------------|------------------------------------------------------------|--------------|--|
| E1.2..E6.2 | Ekip LCD Installed                                         | 1SDA074211R1 |  |
| E1.2..E6.2 | Ekip Power Controller                                      | 1SDA074212R1 |  |
| E1.2..E6.2 | Upper internal installed voltage outlets                   | 1SDA074216R1 |  |
| E1.2..E6.2 | External installed voltage outlets                         | 1SDA074217R1 |  |
| E1.2..E6.2 | Arrangement for cables with lower internal voltage outlets | 1SDA074213R1 |  |
| E1.2..E6.2 | Arrangement for cables with upper internal voltage outlets | 1SDA074214R1 |  |
| E1.2..E6.2 | Arrangement for cables with external voltage outlets       | 1SDA074215R1 |  |

### Power Supply modules

| Size       | Type                       | Code         |  |
|------------|----------------------------|--------------|--|
| E1.2..E6.2 | Ekip Supply 110-240V AC/DC | 1SDA074172R1 |  |
| E1.2..E6.2 | Ekip Supply 24-48V DC      | 1SDA074173R1 |  |

### Connectivity modules

| Size       | Type                     | Code         |  |
|------------|--------------------------|--------------|--|
| E1.2..E6.2 | Ekip Com Modbus RS-485   | 1SDA074150R1 |  |
| E1.2..E6.2 | Ekip Com Modbus TCP      | 1SDA074151R1 |  |
| E1.2..E6.2 | Ekip Com Profibus        | 1SDA074152R1 |  |
| E1.2..E6.2 | Ekip Com Profinet        | 1SDA074153R1 |  |
| E1.2..E6.2 | Ekip Com DeviceNet™      | 1SDA074154R1 |  |
| E1.2..E6.2 | Ekip Com EtherNet/IP™    | 1SDA074155R1 |  |
| E1.2..E6.2 | Ekip Com IEC61850        | 1SDA074156R1 |  |
| E1.2..E6.2 | Ekip Com Hub             | 1SDA082894R1 |  |
| E1.2..E6.2 | Ekip Com R Modbus RS-485 | 1SDA074157R1 |  |
| E1.2..E6.2 | Ekip Com R Modbus TCP    | 1SDA074158R1 |  |
| E1.2..E6.2 | Ekip Com R Profibus      | 1SDA074159R1 |  |
| E1.2..E6.2 | Ekip Com R Profinet      | 1SDA074160R1 |  |
| E1.2..E6.2 | Ekip Com R DeviceNet™    | 1SDA074161R1 |  |
| E1.2..E6.2 | Ekip Com R EtherNet/IP™  | 1SDA074162R1 |  |
| E1.2..E6.2 | Ekip Com R IEC61850      | 1SDA076170R1 |  |
| E1.2..E6.2 | Ekip Link                | 1SDA074163R1 |  |
| E1.2..E6.2 | Ekip Bluetooth           | 1SDA074164R1 |  |
| E1.2..E6.2 | Ekip Com GPRS-M          | 1SDA074165R1 |  |
| E1.2..E6.2 | Ekip Com Actuator        | 1SDA074166R1 |  |



1SDC200539F001



1SDC200546F001



1SDC200541F001



1SDC200544R001



1SDC200548R001



1SDC200688R001



1SDC200559R001



1SDC200559R001

## Signalling modules

| Size               | Type                 | Code         |  |
|--------------------|----------------------|--------------|--|
| <b>E1.2..E6.2</b>  | Ekip Signalling 2K-1 | 1SDA074167R1 |  |
| <b>E1.2..E6.2</b>  | Ekip Signalling 2K-2 | 1SDA074168R1 |  |
| <b>E1.2..E6.2</b>  | Ekip Signalling 2K-3 | 1SDA074169R1 |  |
| <b>E2.2..E6.2</b>  | Ekip Signalling 4K   | 1SDA074170R1 |  |
| <b>E1.2..E6.2*</b> | Ekip Signalling 10K  | 1SDA074171R1 |  |

\*Only as loose part

## Measuring and Measuring Pro modules

| Size         | Type                                                       | Code         |  |
|--------------|------------------------------------------------------------|--------------|--|
| <b>E1.2</b>  | Ekip Measuring                                             | 1SDA074184R1 |  |
| <b>E1.2</b>  | Ekip Measuring Pro                                         | 1SDA074185R1 |  |
| <b>E2.2</b>  | Ekip Measuring                                             | 1SDA074186R1 |  |
| <b>E2.2</b>  | Ekip Measuring Pro                                         | 1SDA074187R1 |  |
| <b>E4.2</b>  | Ekip Measuring                                             | 1SDA074188R1 |  |
| <b>E4.2</b>  | Ekip Measuring Pro                                         | 1SDA074189R1 |  |
| <b>E6.2</b>  | Ekip Measuring                                             | 1SDA074190R1 |  |
| <b>E6.2</b>  | Ekip Measuring Pro                                         | 1SDA074191R1 |  |
| <b>E1.2*</b> | Voltage socket for neutral on right side L1 L2 L3 N - E1.2 | 1SDA076244R1 |  |
| <b>E2.2*</b> | Voltage socket for neutral on right side L1 L2 L3 N - E2.2 | 1SDA076245R1 |  |
| <b>E4.2*</b> | Voltage socket for neutral on right side L1 L2 L3 N - E4.2 | 1SDA076246R1 |  |
| <b>E6.2*</b> | Voltage socket for neutral on right side L1 L2 L3 N - E6.2 | 1SDA076247R1 |  |

\*use only with circuit breakers with neutral on right side L1 L2 L3 N

## Synchrocheck modules

| Size              | Type              | Code         |  |
|-------------------|-------------------|--------------|--|
| <b>E1.2..E6.2</b> | Ekip Synchrocheck | 1SDA074183R1 |  |

## Displaying and supervision systems

| Size               | Type                                              | Code         |  |
|--------------------|---------------------------------------------------|--------------|--|
| <b>E1.2..E6.2</b>  | Ekip T&P - Programming and Test unit              | 1SDA066989R1 |  |
| <b>E1.2..E6.2</b>  | Ekip TT - Trip Test unit                          | 1SDA066988R1 |  |
| <b>E1.2..E6.2</b>  | Ekip Programming                                  | 1SDA076154R1 |  |
| <b>E1.2..E6.2*</b> | Ekip Multimeter Display on front of switchgear    | 1SDA074192R1 |  |
| <b>E1.2..E6.2</b>  | Ekip Control Panel for 10 circuit-breakers        | 1SDA074311R1 |  |
| <b>E1.2..E6.2</b>  | Ekip control panel for 30 circuit-breakers        | 1SDA074312R1 |  |
| <b>E1.2..E6.2</b>  | Ekip View Software for 30 circuit-breakers        | 1SDA074298R1 |  |
| <b>E1.2..E6.2</b>  | Ekip View software for 60 circuit-breakers        | 1SDA074299R1 |  |
| <b>E1.2..E6.2</b>  | Ekip View software for unlimited circuit-breakers | 1SDA074300R1 |  |

\*Only as loose part

Accessories

Ekip modules

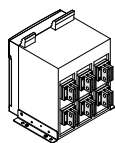


Rating plug for Ekip trip units

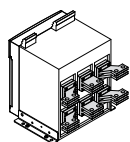
| Size       | Type                    | Code<br>(loose supply) |  | Code<br>(installed) |  |
|------------|-------------------------|------------------------|--|---------------------|--|
| E1.2..E2.2 | Rating Plug 100A        | 1SDA074218R1           |  | 1SDA074258R1        |  |
| E1.2..E2.2 | Rating Plug 200A        | 1SDA074219R1           |  | 1SDA074259R1        |  |
| E1.2..E2.2 | Rating Plug 250A        | 1SDA074220R1           |  | 1SDA074260R1        |  |
| E1.2..E6.2 | Rating Plug 400A        | 1SDA074221R1           |  | 1SDA074261R1        |  |
| E1.2..E6.2 | Rating Plug 630A        | 1SDA074222R1           |  | 1SDA074262R1        |  |
| E1.2..E6.2 | Rating Plug 800A        | 1SDA074223R1           |  | 1SDA074263R1        |  |
| E1.2..E6.2 | Rating Plug 1000A       | 1SDA074224R1           |  | 1SDA074264R1        |  |
| E1.2..E6.2 | Rating Plug 1250A       | 1SDA074225R1           |  | 1SDA074265R1        |  |
| E1.2..E6.2 | Rating Plug 1600A       | 1SDA074226R1           |  | 1SDA074266R1        |  |
| E2.2..E6.2 | Rating Plug 2000A       | 1SDA074227R1           |  | 1SDA074267R1        |  |
| E2.2..E6.2 | Rating Plug 2500A       | 1SDA074228R1           |  | 1SDA074268R1        |  |
| E4.2..E6.2 | Rating Plug 3200A       | 1SDA074229R1           |  | 1SDA074269R1        |  |
| E4.2..E6.2 | Rating Plug 4000A       | 1SDA074230R1           |  | 1SDA074270R1        |  |
| E6.2       | Rating Plug 5000A       | 1SDA074231R1           |  | 1SDA074271R1        |  |
| E6.2       | Rating Plug 6300A       | 1SDA074232R1           |  | -                   |  |
| E1.2..E2.2 | Rating Plug 100A L OFF  | 1SDA074233R1           |  | 1SDA074273R1        |  |
| E1.2..E2.2 | Rating Plug 200A L OFF  | 1SDA074234R1           |  | 1SDA074274R1        |  |
| E1.2..E2.2 | Rating Plug 250A L OFF  | 1SDA074235R1           |  | 1SDA074275R1        |  |
| E1.2..E6.2 | Rating Plug 400A L OFF  | 1SDA074236R1           |  | 1SDA074276R1        |  |
| E1.2..E6.2 | Rating Plug 630A L OFF  | 1SDA074237R1           |  | 1SDA074277R1        |  |
| E1.2..E6.2 | Rating Plug 800A L OFF  | 1SDA074238R1           |  | 1SDA074278R1        |  |
| E1.2..E6.2 | Rating Plug 1000A L OFF | 1SDA074239R1           |  | 1SDA074279R1        |  |
| E1.2..E6.2 | Rating Plug 1250A L OFF | 1SDA074240R1           |  | 1SDA074280R1        |  |
| E1.2..E6.2 | Rating Plug 1600A L OFF | 1SDA074241R1           |  | 1SDA074281R1        |  |
| E2.2..E6.2 | Rating Plug 2000A L OFF | 1SDA074242R1           |  | 1SDA074282R1        |  |
| E2.2..E6.2 | Rating Plug 2500A L OFF | 1SDA074243R1           |  | 1SDA074283R1        |  |
| E4.2..E6.2 | Rating Plug 3200A L OFF | 1SDA074244R1           |  | 1SDA074284R1        |  |
| E4.2..E6.2 | Rating Plug 4000A L OFF | 1SDA074245R1           |  | 1SDA074285R1        |  |
| E6.2       | Rating Plug 5000A L OFF | 1SDA074246R1           |  | 1SDA074286R1        |  |
| E6.2       | Rating Plug 6300A L OFF | 1SDA074247R1           |  | 1SDA074287R1        |  |
| E1.2..E2.2 | Rating Plug RC 100A     | 1SDA074248R1           |  | 1SDA074288R1        |  |
| E1.2..E2.2 | Rating Plug RC 200A     | 1SDA074249R1           |  | 1SDA074289R1        |  |
| E1.2..E2.2 | Rating Plug RC 250A     | 1SDA074250R1           |  | 1SDA074290R1        |  |
| E1.2..E6.2 | Rating Plug RC 400A     | 1SDA074251R1           |  | 1SDA074291R1        |  |
| E1.2..E6.2 | Rating Plug RC 630A     | 1SDA074252R1           |  | 1SDA074292R1        |  |
| E1.2..E6.2 | Rating Plug RC 800A     | 1SDA074253R1           |  | 1SDA074293R1        |  |
| E1.2..E6.2 | Rating Plug RC 1250A    | 1SDA074254R1           |  | 1SDA074294R1        |  |
| E2.2..E6.2 | Rating Plug RC 2000A    | 1SDA074255R1           |  | 1SDA074295R1        |  |
| E4.2..E6.2 | Rating Plug RC 3200A    | 1SDA074256R1           |  | 1SDA074296R1        |  |
| E4.2..E6.2 | Rating Plug RC 4000A    | 1SDA074257R1           |  | 1SDA074297R1        |  |

# Accessories

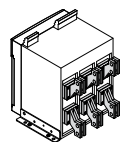
## Terminals



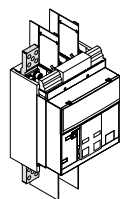
Rear orientable terminal - HR VR



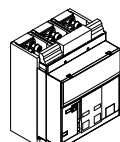
Horizontal rear spread terminal - SHR



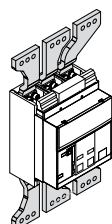
Vertical rear spread terminal - SVR



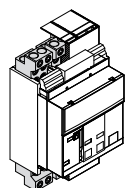
Extended front terminal - EF



Front terminal - F



Front spread terminal - ES



Terminal for cable FcCuAl  
4x240mm<sup>2</sup> - Fc CuAl

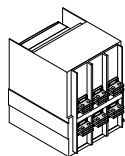
### Kit for terminals - installed for fixed circuit-breaker

| Size    | Version | I <sub>u</sub> max | Type                                    | 3 Poles<br>Code | 4 Poles<br>Code |
|---------|---------|--------------------|-----------------------------------------|-----------------|-----------------|
| E1.2*   | F       | 1600               | Kit EF Upper                            | 1SDA073963R1    | 1SDA073964R1    |
| E1.2*   | F       | 1600               | Kit EF Lower                            | 1SDA073965R1    | 1SDA073966R1    |
| E1.2*   | F       | 1600               | Kit ES Upper                            | 1SDA073975R1    | 1SDA073976R1    |
| E1.2*   | F       | 1600               | Kit ES Lower                            | 1SDA073977R1    | 1SDA073978R1    |
| E1.2*   | F       | 1600               | Kit HR Upper                            | 1SDA073981R1    | 1SDA073982R1    |
| E1.2*   | F       | 1600               | Kit HR Lower                            | 1SDA073983R1    | 1SDA073984R1    |
| E1.2*   | F       | 1600               | Kit VR Upper                            | 1SDA073985R1    | 1SDA073986R1    |
| E1.2*   | F       | 1600               | Kit VR Lower                            | 1SDA073987R1    | 1SDA073988R1    |
| E1.2*   | F       | 1600               | Kit FC CuAl 4x240 mm <sup>2</sup> Upper | 1SDA073997R1    | 1SDA073998R1    |
| E1.2*   | F       | 1600               | Kit FC CuAl 4x240 mm <sup>2</sup> Lower | 1SDA073999R1    | 1SDA074000R1    |
| E2.2    | F       | 2000               | Kit VR Upper                            | 1SDA074003R1    | 1SDA074004R1    |
| E2.2    | F       | 2000               | Kit VR Lower                            | 1SDA074005R1    | 1SDA074006R1    |
| E2.2    | F       | 2500               | Kit VR Upper                            | 1SDA074009R1    | 1SDA074010R1    |
| E2.2    | F       | 2500               | Kit VR Lower                            | 1SDA074011R1    | 1SDA074012R1    |
| E2.2    | F       | 2000               | Kit SHR Upper                           | 1SDA074045R1    | 1SDA074046R1    |
| E2.2    | F       | 2000               | Kit SHR Lower                           | 1SDA074047R1    | 1SDA074048R1    |
| E2.2    | F       | 2500               | Kit SHR Upper                           | 1SDA074051R1    | 1SDA074052R1    |
| E2.2    | F       | 2500               | Kit SHR Lower                           | 1SDA074053R1    | 1SDA074054R1    |
| E2.2    | F       | 2000               | Kit SVR Upper                           | 1SDA074057R1    | 1SDA074058R1    |
| E2.2    | F       | 2000               | Kit SVR Lower                           | 1SDA074059R1    | 1SDA074060R1    |
| E2.2    | F       | 2500               | Kit SVR Upper                           | 1SDA074063R1    | 1SDA074064R1    |
| E2.2    | F       | 2500               | Kit SVR Lower                           | 1SDA074065R1    | 1SDA074066R1    |
| E2.2*   | F       | 2500               | Kit F Upper                             | 1SDA074118R1    | 1SDA074119R1    |
| E2.2*   | F       | 2500               | Kit F Lower                             | 1SDA074120R1    | 1SDA074121R1    |
| E4.2    | F       | 3200               | Kit VR Upper                            | 1SDA074015R1    | 1SDA074016R1    |
| E4.2    | F       | 3200               | Kit VR Lower                            | 1SDA074017R1    | 1SDA074018R1    |
| E4.2    | F       | 3200               | Kit SHR Upper                           | 1SDA082816R1    | 1SDA082817R1    |
| E4.2    | F       | 3200               | Kit SHR Lower                           | 1SDA082818R1    | 1SDA082819R1    |
| E4.2    | F       | 3200               | Kit SVR Upper                           | 1SDA082828R1    | 1SDA082829R1    |
| E4.2    | F       | 3200               | Kit SVR Lower                           | 1SDA082830R1    | 1SDA082831R1    |
| E4.2    | F       | 4000               | Kit VR Upper                            | 1SDA074021R1    | 1SDA074022R1    |
| E4.2    | F       | 4000               | Kit VR Lower                            | 1SDA074023R1    | 1SDA074024R1    |
| E4.2*   | F       | 4000               | Kit F Upper                             | 1SDA074126R1    | 1SDA074127R1    |
| E4.2*   | F       | 4000               | Kit F Lower                             | 1SDA074128R1    | 1SDA074129R1    |
| E4.2    | F       | 4000               | Kit SHR Upper                           | 1SDA082822R1    | 1SDA082823R1    |
| E4.2    | F       | 4000               | Kit SHR Lower                           | 1SDA082824R1    | 1SDA082825R1    |
| E4.2    | F       | 4000               | Kit SVR Upper                           | 1SDA082834R1    | 1SDA082835R1    |
| E4.2    | F       | 4000               | Kit SVR Lower                           | 1SDA082836R1    | 1SDA082837R1    |
| E6.2    | F       | 5000               | Kit VR Upper                            | 1SDA074027R1    | 1SDA074028R1    |
| E6.2    | F       | 5000               | Kit VR Lower                            | 1SDA074030R1    | 1SDA074031R1    |
| E6.2/f  | F       | 5000               | Kit VR Upper                            |                 | 1SDA074029R1    |
| E6.2/f  | F       | 5000               | Kit VR Lower                            |                 | 1SDA074032R1    |
| E6.2    | F       | 5000               | Kit SHR Upper                           | 1SDA082856R1    | 1SDA082857R1    |
| E6.2    | F       | 5000               | Kit SHR Lower                           | 1SDA082859R1    | 1SDA082860R1    |
| E6.2/f  | F       | 5000               | Kit SHR Upper                           |                 | 1SDA082858R1    |
| E6.2/f  | F       | 5000               | Kit SHR Lower                           |                 | 1SDA082861R1    |
| E6.2*   | F       | 6300               | Kit F Upper                             | 1SDA074134R1    | 1SDA074135R1    |
| E6.2*   | F       | 6300               | Kit F Lower                             | 1SDA074137R1    | 1SDA074138R1    |
| E6.2/f* | F       | 6300               | Kit F Upper                             |                 | 1SDA074136R1    |
| E6.2/f* | F       | 6300               | Kit F Lower                             |                 | 1SDA074139R1    |
| E6.2    | F       | 6300               | Kit VR Upper                            | 1SDA074036R1    | 1SDA074037R1    |
| E6.2    | F       | 6300               | Kit VR Lower                            | 1SDA074039R1    | 1SDA074040R1    |
| E6.2/f  | F       | 6300               | Kit VR Upper                            |                 | 1SDA074038R1    |
| E6.2/f  | F       | 6300               | Kit VR Lower                            |                 | 1SDA074041R1    |
| E6.2    | F       | 6300               | Kit SHR Upper                           | 1SDA082865R1    | 1SDA082866R1    |
| E6.2    | F       | 6300               | Kit SHR Lower                           | 1SDA082868R1    | 1SDA082869R1    |
| E6.2/f  | F       | 6300               | Kit SHR Upper                           |                 | 1SDA082867R1    |
| E6.2/f  | F       | 6300               | Kit SHR Lower                           |                 | 1SDA082870R1    |

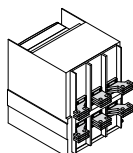
\* terminals supplied, but not physically installed

# Accessories

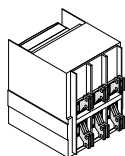
## Terminals



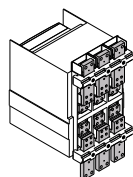
Rear adjustable terminal - HR VR



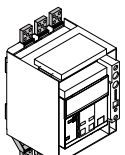
Horizontal rear terminal - SHR



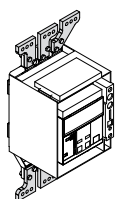
Vertical rear spread terminal - SVR



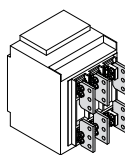
Front terminal - F



Extended front terminal - EF



Front spread terminal - ES



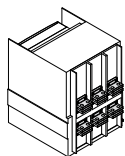
Terminal for cable FcCuAl  
4x240mm<sup>2</sup> - Fc CuAl

### Kit for terminals - installed for fixed part of withdrawable circuit-breaker

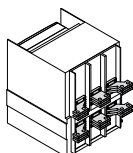
| Size     | Version | Iu max | Type              | 3 Poles      |  | 4 Poles      |  |
|----------|---------|--------|-------------------|--------------|--|--------------|--|
|          |         |        |                   | Code         |  | Code         |  |
| E1.2**   | W       | 1600   | Kit EF Upper      | 1SDA073939R1 |  | 1SDA073940R1 |  |
| E1.2**   | W       | 1600   | Kit EF Lower      | 1SDA073941R1 |  | 1SDA073942R1 |  |
| E1.2**   | W       | 1600   | Kit VR Upper      | 1SDA073945R1 |  | 1SDA073946R1 |  |
| E1.2**   | W       | 1600   | Kit VR Lower      | 1SDA073947R1 |  | 1SDA073948R1 |  |
| E1.2* ** | W       | 1600   | Kit ES Upper      | 1SDA073951R1 |  | 1SDA073952R1 |  |
| E1.2* ** | W       | 1600   | Kit ES Lower      | 1SDA073953R1 |  | 1SDA073954R1 |  |
| E1.2**   | W       | 1600   | Kit SHR Upper     | 1SDA073957R1 |  | 1SDA073958R1 |  |
| E1.2**   | W       | 1600   | Kit SHR Lower     | 1SDA073959R1 |  | 1SDA073960R1 |  |
| E1.2**   | W       | 1600   | Kit FC CuAl Upper | 1SDA073991R1 |  | 1SDA073993R1 |  |
| E1.2**   | W       | 1600   | Kit FC CuAl Lower | 1SDA073992R1 |  | 1SDA073994R1 |  |
| E2.2     | W       | 2000   | Kit FL Upper      | 1SDA081120R1 |  | 1SDA081121R1 |  |
| E2.2     | W       | 2000   | Kit FL Lower      | 1SDA081122R1 |  | 1SDA081123R1 |  |
| E2.2     | W       | 2000   | Kit VR Upper      | 1SDA074577R1 |  | 1SDA074578R1 |  |
| E2.2     | W       | 2000   | Kit VR Lower      | 1SDA074579R1 |  | 1SDA074580R1 |  |
| E2.2     | W       | 2500   | Kit VR Upper      | 1SDA074581R1 |  | 1SDA074582R1 |  |
| E2.2     | W       | 2500   | Kit VR Lower      | 1SDA074583R1 |  | 1SDA074584R1 |  |
| E2.2     | W       | 2000   | Kit SHR Upper     | 1SDA074585R1 |  | 1SDA074586R1 |  |
| E2.2     | W       | 2000   | Kit SHR Lower     | 1SDA074587R1 |  | 1SDA074588R1 |  |
| E2.2     | W       | 2500   | Kit SHR Upper     | 1SDA074589R1 |  | 1SDA074590R1 |  |
| E2.2     | W       | 2500   | Kit SHR Lower     | 1SDA074591R1 |  | 1SDA074592R1 |  |
| E2.2     | W       | 2000   | Kit SVR Upper     | 1SDA074593R1 |  | 1SDA074594R1 |  |
| E2.2     | W       | 2000   | Kit SVR Lower     | 1SDA074595R1 |  | 1SDA074596R1 |  |
| E2.2     | W       | 2500   | Kit SVR Upper     | 1SDA074597R1 |  | 1SDA074598R1 |  |
| E2.2     | W       | 2500   | Kit SVR Lower     | 1SDA074599R1 |  | 1SDA074600R1 |  |
| E2.2     | W       | 2500   | Kit FL Upper      | 1SDA074069R1 |  | 1SDA074070R1 |  |
| E2.2     | W       | 2500   | Kit FL Lower      | 1SDA074071R1 |  | 1SDA074072R1 |  |
| E2.2**   | W       | 2500   | Kit F Upper       | 1SDA074090R1 |  | 1SDA074091R1 |  |
| E2.2**   | W       | 2500   | Kit F Lower       | 1SDA074092R1 |  | 1SDA074093R1 |  |
| E4.2     | W       | 3200   | Kit FL Upper      | 1SDA081125R1 |  | 1SDA081127R1 |  |
| E4.2     | W       | 3200   | Kit FL Lower      | 1SDA081128R1 |  | 1SDA081129R1 |  |
| E4.2     | W       | 3200   | Kit VR Upper      | 1SDA074601R1 |  | 1SDA074602R1 |  |
| E4.2     | W       | 3200   | Kit VR Lower      | 1SDA074603R1 |  | 1SDA074604R1 |  |
| E4.2     | W       | 3200   | Kit SHR Upper     | 1SDA082840R1 |  | 1SDA082841R1 |  |
| E4.2     | W       | 3200   | Kit SHR Lower     | 1SDA082842R1 |  | 1SDA082843R1 |  |
| E4.2     | W       | 3200   | Kit SVR Upper     | 1SDA082848R1 |  | 1SDA082849R1 |  |
| E4.2     | W       | 3200   | Kit SVR Lower     | 1SDA082850R1 |  | 1SDA082851R1 |  |
| E4.2     | W       | 4000   | Kit VR Upper      | 1SDA074605R1 |  | 1SDA074606R1 |  |
| E4.2     | W       | 4000   | Kit VR Lower      | 1SDA074607R1 |  | 1SDA074608R1 |  |
| E4.2**   | W       | 4000   | Kit F Upper       | 1SDA074098R1 |  | 1SDA074099R1 |  |
| E4.2**   | W       | 4000   | Kit F Lower       | 1SDA074100R1 |  | 1SDA074101R1 |  |
| E4.2     | W       | 4000   | Kit FL Upper      | 1SDA074075R1 |  | 1SDA074076R1 |  |
| E4.2     | W       | 4000   | Kit FL Lower      | 1SDA074077R1 |  | 1SDA074078R1 |  |
| E4.2     | W       | 4000   | Kit HR Upper      | 1SDA076878R1 |  | 1SDA076879R1 |  |
| E4.2     | W       | 4000   | Kit HR Lower      | 1SDA076880R1 |  | 1SDA076881R1 |  |
| E4.2     | W       | 4000   | Kit SHR Upper     | 1SDA082844R1 |  | 1SDA082845R1 |  |
| E4.2     | W       | 4000   | Kit SHR Lower     | 1SDA082846R1 |  | 1SDA082847R1 |  |
| E4.2     | W       | 4000   | Kit SVR Upper     | 1SDA082852R1 |  | 1SDA082853R1 |  |
| E4.2     | W       | 4000   | Kit SVR Lower     | 1SDA082854R1 |  | 1SDA082855R1 |  |

\* can be ordered only if the fixed part has EF terminals.

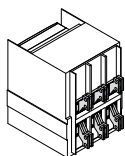
\*\* terminals supplied, but not physically installed.



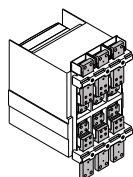
Rear adjustable terminal - HR VR



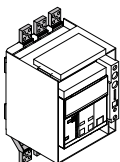
Horizontal rear terminal - SHR



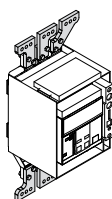
Vertical rear spread terminal - SVR



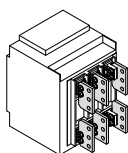
Front terminal - F



Extended front terminal - EF



Front spread terminal - ES



Terminal for cable FcCuAl  
4x240mm<sup>2</sup> - Fc CuAl

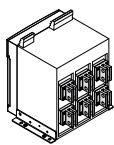
### Kit for terminals - installed for fixed part of withdrawable circuit-breaker

| Size     | Version | I <sub>u</sub> max | Type          | 3 Poles      | 4 Poles      |
|----------|---------|--------------------|---------------|--------------|--------------|
|          |         |                    |               | Code         | Code         |
| E6.2     | W       | 5000               | Kit VR Upper  | 1SDA074609R1 | 1SDA074610R1 |
| E6.2     | W       | 5000               | Kit VR Lower  | 1SDA074612R1 | 1SDA074613R1 |
| E6.2/f   | W       | 5000               | Kit VR Upper  |              | 1SDA074611R1 |
| E6.2/f   | W       | 5000               | Kit VR Lower  |              | 1SDA074614R1 |
| E6.2     | W       | 5000               | Kit SHR Upper | 1SDA082874R1 | 1SDA082875R1 |
| E6.2     | W       | 5000               | Kit SHR Lower | 1SDA082877R1 | 1SDA082878R1 |
| E6.2/f   | W       | 5000               | Kit SHR Upper |              | 1SDA082876R1 |
| E6.2/f   | W       | 5000               | Kit SHR Lower |              | 1SDA082879R1 |
| E6.2     | W       | 6300               | Kit VR Upper  | 1SDA074615R1 | 1SDA074616R1 |
| E6.2     | W       | 6300               | Kit VR Lower  | 1SDA074618R1 | 1SDA074619R1 |
| E6.2/f   | W       | 6300               | Kit VR Upper  |              | 1SDA074617R1 |
| E6.2/f   | W       | 6300               | Kit VR Lower  |              | 1SDA074620R1 |
| E6.2**   | W       | 6300               | Kit F Upper   | 1SDA074106R1 | 1SDA074107R1 |
| E6.2**   | W       | 6300               | Kit F Lower   | 1SDA074109R1 | 1SDA074110R1 |
| E6.2/f** | W       | 6300               | Kit F Upper   |              | 1SDA074108R1 |
| E6.2/f** | W       | 6300               | Kit F Lower   |              | 1SDA074111R1 |
| E6.2     | W       | 6300               | Kit FL Upper  | 1SDA074081R1 | 1SDA074082R1 |
| E6.2     | W       | 6300               | Kit FL Lower  | 1SDA074084R1 | 1SDA074085R1 |
| E6.2/f   | W       | 6300               | Kit FL Upper  |              | 1SDA074083R1 |
| E6.2/f   | W       | 6300               | Kit FL Lower  |              | 1SDA074086R1 |
| E6.2     | W       | 6300               | Kit SHR Upper | 1SDA082880R1 | 1SDA082881R1 |
| E6.2     | W       | 6300               | Kit SHR Lower | 1SDA082883R1 | 1SDA082884R1 |
| E6.2/f   | W       | 6300               | Kit SHR Upper |              | 1SDA082882R1 |
| E6.2/f   | W       | 6300               | Kit SHR Lower |              | 1SDA082885R1 |

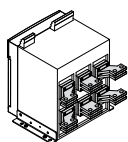
\*\* terminals supplied, but not physically installed.

# Accessories

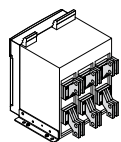
## Terminals



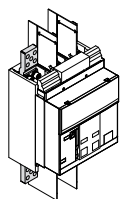
Rear adjustable terminal - HR VR



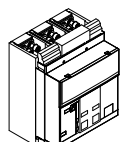
Horizontal rear spread terminal - SHR



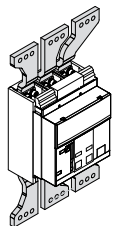
Vertical rear spread terminal - SVR



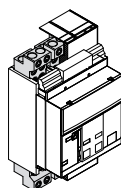
Extended front terminal - EF



Front terminal - F



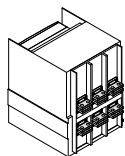
Front spread terminal - ES



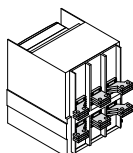
Terminal for cable FcCuAl  
4x240mm² - Fc CuAl

### Kit for terminals - loose supply for fixed circuit-breaker

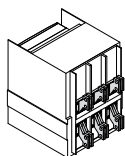
| Size   | Version | I <sub>u</sub> max | Type                              | Code         | Pieces | Code         | Pieces |
|--------|---------|--------------------|-----------------------------------|--------------|--------|--------------|--------|
| E1.2   | F       | 1600               | Kit EF                            | 1SDA073967R1 | 3      | 1SDA073968R1 | 4      |
| E1.2   | F       | 1600               | Kit F                             | 1SDA073973R1 | 3      | 1SDA073974R1 | 4      |
| E1.2   | F       | 1600               | Kit ES                            | 1SDA073979R1 | 3      | 1SDA073980R1 | 4      |
| E1.2   | F       | 1600               | Kit Adjustable HR/VR              | 1SDA073989R1 | 3      | 1SDA073990R1 | 4      |
| E1.2   | F       | 1600               | Kit FC CuAl 4x240 mm <sup>2</sup> | 1SDA074001R1 | 3      | 1SDA074002R1 | 4      |
| E2.2   | F       | 2000               | Kit Adjustable HR/VR              | 1SDA074007R1 | 3      | 1SDA074008R1 | 4      |
| E2.2   | F       | 2500               | Kit Adjustable HR/VR              | 1SDA074013R1 | 3      | 1SDA074014R1 | 4      |
| E2.2   | F       | 2000               | Kit SHR                           | 1SDA074049R1 | 3      | 1SDA074050R1 | 4      |
| E2.2   | F       | 2500               | Kit SHR                           | 1SDA074055R1 | 3      | 1SDA074056R1 | 4      |
| E2.2   | F       | 2000               | Kit SVR                           | 1SDA074061R1 | 3      | 1SDA074062R1 | 4      |
| E2.2   | F       | 2500               | Kit SVR                           | 1SDA074067R1 | 3      | 1SDA074068R1 | 4      |
| E2.2   | F       | 2500               | Kit F Upper                       | 1SDA074122R1 | 3      | 1SDA074123R1 | 4      |
| E2.2   | F       | 2500               | Kit F Lower                       | 1SDA074124R1 | 3      | 1SDA074125R1 | 4      |
| E4.2   | F       | 3200               | Kit Adjustable HR/VR              | 1SDA074019R1 | 3      | 1SDA074020R1 | 4      |
| E4.2   | F       | 3200               | Kit SHR                           | 1SDA082820R1 | 3      | 1SDA082821R1 | 4      |
| E4.2   | F       | 3200               | Kit SVR                           | 1SDA082832R1 | 3      | 1SDA082833R1 | 4      |
| E4.2   | F       | 4000               | Kit Adjustable HR/VR              | 1SDA074025R1 | 3      | 1SDA074026R1 | 4      |
| E4.2   | F       | 4000               | Kit F Upper                       | 1SDA074130R1 | 3      | 1SDA074131R1 | 4      |
| E4.2   | F       | 4000               | Kit F Lower                       | 1SDA074132R1 | 3      | 1SDA074133R1 | 4      |
| E4.2   | F       | 4000               | Kit SHR                           | 1SDA082826R1 | 3      | 1SDA082827R1 | 4      |
| E4.2   | F       | 4000               | Kit SVR                           | 1SDA082838R1 | 3      | 1SDA082839R1 | 4      |
| E6.2   | F       | 5000               | Kit Adjustable HR/VR              | 1SDA081672R1 | 6      | 1SDA081673R1 | 7      |
| E6.2/f | F       | 5000               | Kit Adjustable HR/VR              |              |        | 1SDA081674R1 | 8      |
| E6.2   | F       | 5000               | Kit SHR                           | 1SDA082862R1 | 6      | 1SDA082863R1 | 7      |
| E6.2/f | F       | 5000               | Kit SHR                           |              |        | 1SDA082864R1 | 8      |
| E6.2   | F       | 6300               | Kit Adjustable HR/VR              | 1SDA074042R1 | 6      | 1SDA074043R1 | 7      |
| E6.2/f | F       | 6300               | Kit Adjustable HR/VR              |              |        | 1SDA074044R1 | 8      |
| E6.2   | F       | 6300               | Kit F Upper                       | 1SDA074140R1 | 6      | 1SDA074141R1 | 7      |
| E6.2   | F       | 6300               | Kit F Lower                       | 1SDA074143R1 | 6      | 1SDA074144R1 | 7      |
| E6.2/f | F       | 6300               | Kit F Upper                       |              |        | 1SDA074142R1 | 8      |
| E6.2/f | F       | 6300               | Kit F Lower                       |              |        | 1SDA074145R1 | 8      |
| E6.2   | F       | 6300               | Kit SHR                           | 1SDA082871R1 | 6      | 1SDA082872R1 | 7      |
| E6.2/f | F       | 6300               | Kit SHR                           |              |        | 1SDA082873R1 | 8      |



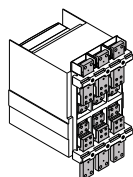
Rear orientable terminal - HR VR



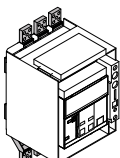
Horizontal rear terminal - SHR



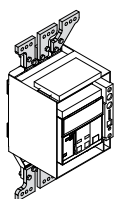
Vertical rear spread terminal - SVR



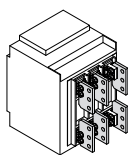
Front terminal - F



Extended front terminal - EF



Front spread terminal - ES



Terminal for cable FcCuAl  
4x240mm<sup>2</sup> - Fc CuAl

### Kit for terminals - loose supply for fixed part of withdrawable circuit-breaker

| Size   | Version | I <sub>u</sub> max | Type                 | Code         | Pieces | Code         | Pieces |
|--------|---------|--------------------|----------------------|--------------|--------|--------------|--------|
| E1.2   | W       | 1600               | Kit EF               | 1SDA073943R1 | 3      | 1SDA073944R1 | 4      |
| E1.2   | W       | 1600               | Kit Adjustable HR/VR | 1SDA073949R1 | 3      | 1SDA073950R1 | 4      |
| E1.2   | W       | 1600               | Kit ES               | 1SDA073955R1 | 3      | 1SDA073956R1 | 4      |
| E1.2   | W       | 1600               | Kit SHR              | 1SDA073961R1 | 3      | 1SDA073962R1 | 4      |
| E1.2   | W       | 1600               | Kit FC CuAl          | 1SDA073995R1 | 3      | 1SDA073996R1 | 4      |
| E2.2   | W       | 2000               | Kit Adjustable HR/VR | 1SDA074007R1 | 3      | 1SDA074008R1 | 4      |
| E2.2   | W       | 2500               | Kit Adjustable HR/VR | 1SDA074013R1 | 3      | 1SDA074014R1 | 4      |
| E2.2   | W       | 2000               | Kit SHR              | 1SDA074049R1 | 3      | 1SDA074050R1 | 4      |
| E2.2   | W       | 2500               | Kit SHR              | 1SDA074055R1 | 3      | 1SDA074056R1 | 4      |
| E2.2   | W       | 2000               | Kit SVR              | 1SDA074061R1 | 3      | 1SDA074062R1 | 4      |
| E2.2   | W       | 2500               | Kit SVR              | 1SDA074067R1 | 3      | 1SDA074068R1 | 4      |
| E2.2   | W       | 2500               | Kit F Upper          | 1SDA074094R1 | 3      | 1SDA074095R1 | 4      |
| E2.2   | W       | 2500               | Kit F Lower          | 1SDA074096R1 | 3      | 1SDA074097R1 | 4      |
| E4.2   | W       | 3200               | Kit Adjustable HR/VR | 1SDA074019R1 | 3      | 1SDA074020R1 | 4      |
| E4.2   | W       | 3200               | Kit SHR              | 1SDA082820R1 | 3      | 1SDA082821R1 | 4      |
| E4.2   | W       | 3200               | Kit SVR              | 1SDA082832R1 | 3      | 1SDA082833R1 | 4      |
| E4.2   | W       | 4000               | Kit Adjustable HR/VR | 1SDA074025R1 | 3      | 1SDA074026R1 | 4      |
| E4.2   | W       | 4000               | Kit F Upper          | 1SDA074102R1 | 3      | 1SDA074103R1 | 4      |
| E4.2   | W       | 4000               | Kit F Lower          | 1SDA074104R1 | 3      | 1SDA074105R1 | 4      |
| E4.2   | W       | 4000               | Kit SHR              | 1SDA082826R1 | 3      | 1SDA082827R1 | 4      |
| E4.2   | W       | 4000               | Kit SVR              | 1SDA082838R1 | 3      | 1SDA082839R1 | 4      |
| E6.2   | W       | 5000               | Kit Adjustable HR/VR | 1SDA074033R1 | 6      | 1SDA074034R1 | 7      |
| E6.2/f | W       | 5000               | Kit Adjustable HR/VR |              |        | 1SDA074035R1 | 8      |
| E6.2   | W       | 5000               | Kit SHR              | 1SDA082862R1 | 6      | 1SDA082863R1 | 7      |
| E6.2/f | W       | 5000               | Kit SHR              |              |        | 1SDA082864R1 | 8      |
| E6.2   | W       | 6300               | Kit Adjustable HR/VR | 1SDA074042R1 | 6      | 1SDA074043R1 | 7      |
| E6.2/f | W       | 6300               | Kit Adjustable HR/VR |              |        | 1SDA074044R1 | 8      |
| E6.2   | W       | 6300               | Kit F Upper          | 1SDA074112R1 | 6      | 1SDA074113R1 | 7      |
| E6.2   | W       | 6300               | Kit F Lower          | 1SDA074115R1 | 6      | 1SDA074116R1 | 7      |
| E6.2/f | W       | 6300               | Kit F Upper          |              |        | 1SDA074114R1 | 8      |
| E6.2/f | W       | 6300               | Kit F Lower          |              |        | 1SDA074117R1 | 8      |
| E6.2   | W       | 6300               | Kit SHR              | 1SDA082871R1 | 6      | 1SDA082872R1 | 7      |
| E6.2/f | W       | 6300               | Kit SHR              |              |        | 1SDA082873R1 | 8      |

# Accessories Service



## Extended warranty

| Size               | Type                          | Code***      |  |
|--------------------|-------------------------------|--------------|--|
| <b>E1.2...E6.2</b> | Warranty 2 years E1.2...E6.2* | 1SDA082413R1 |  |
| <b>E1.2</b>        | Warranty 4 years E1.2**       | 1SDA082414R1 |  |
| <b>E2.2</b>        | Warranty 4 years E2.2**       | 1SDA082415R1 |  |
| <b>E4.2</b>        | Warranty 4 years E4.2**       | 1SDA082416R1 |  |
| <b>E6.2</b>        | Warranty 4 years E6.2**       | 1SDA082417R1 |  |
| <b>E1.2</b>        | Warranty 5 years E1.2**       | 1SDA082418R1 |  |
| <b>E2.2</b>        | Warranty 5 years E2.2**       | 1SDA082419R1 |  |
| <b>E4.2</b>        | Warranty 5 years E4.2**       | 1SDA082420R1 |  |
| <b>E6.2</b>        | Warranty 5 years E6.2**       | 1SDA082421R1 |  |

The registration in the Extended Warranty online tool is mandatory

\* Free-of-charge with site details entered

\*\* Warranty durations:

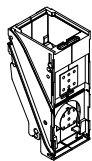
- 4 years when site details not entered into the Extended Warranty online tool
- 5 years when site details entered into the Extended Warranty online tool

\*\*\* Order only with the circuit breaker. Specify Registration code in the order to activate the warranty.

Note: Warranty periods are measured from the date the circuit breaker leaves the factory.

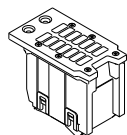
# Accessories

## Spare parts



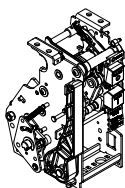
### Single phase pole

| Size                                      | Poles        | IEC/UL | Version   | Code         | Type spare | Min quantity |
|-------------------------------------------|--------------|--------|-----------|--------------|------------|--------------|
| <b>E2.2 - <math>I_u \leq 2000A</math></b> | 3p; 4p       | IEC    | F; W (MP) | 1SDA081187R1 | A          | 3 or 4       |
| <b>E2.2 - <math>I_u = 2500A</math></b>    | 3p; 4p       | IEC    | F; W (MP) | 1SDA081188R1 | A          | 3 or 4       |
| <b>E4.2</b>                               | 3p; 4p       | IEC    | F; W (MP) | 1SDA081189R1 | A          | 3 or 4       |
| <b>E6.2 - Half phase</b>                  | 3p; 4p; 4p/f | IEC    | F; W (MP) | 1SDA081190R1 | A          | 6 or 7 or 8  |



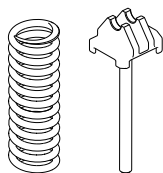
### Arching chamber

| Size              | Poles  | IEC/UL | Version   | Code         | Type spare | Min quantity                             |
|-------------------|--------|--------|-----------|--------------|------------|------------------------------------------|
| <b>E2.2</b>       | 3p; 4p | IEC    | F; W (MP) | 1SDA081430R1 |            | 3 or 4                                   |
| <b>E4.2; E6.2</b> | 3p; 4p | IEC    | F; W (MP) | 1SDA081431R1 |            | 3 or 4 for E4.2,<br>6 or 7 or 8 for E6.2 |



### Operating mechanism

| Size        | Poles  | IEC/UL | Version   | Code         | Type spare | Min quantity |
|-------------|--------|--------|-----------|--------------|------------|--------------|
| <b>E2.2</b> | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081191R1 | A          | 1            |
| <b>E4.2</b> | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081192R1 | A          | 1            |
| <b>E6.2</b> | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081193R1 | A          | 1            |
| <b>E6.2</b> | 4p/f   | IEC/UL | F; W (MP) | 1SDA081194R1 | A          | 1            |



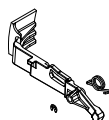
### Closing Spring

| Size                                         | Poles    | IEC/UL | Version   | Code         | Type spare | Min quantity |
|----------------------------------------------|----------|--------|-----------|--------------|------------|--------------|
| <b>E2.2 - <math>I_u \leq 2000A</math></b>    | 3p       | IEC/UL | F; W (MP) | 1SDA081207R1 | A          | 1            |
| <b>E2.2 - <math>I_u \leq 2000A</math></b>    | 4p       | IEC/UL | F; W (MP) | 1SDA081208R1 | A          | 1            |
| <b>E2.2 - <math>I_u = 2500A</math>; E4.2</b> | 3p       | IEC/UL | F; W (MP) | 1SDA081208R1 | A          | 1            |
| <b>E2.2 - <math>I_u = 2500A</math>; E4.2</b> | 4p       | IEC/UL | F; W (MP) | 1SDA081209R1 | A          | 1            |
| <b>E6.2</b>                                  | 3p       | IEC/UL | F; W (MP) | 1SDA081210R1 | A          | 1            |
| <b>E6.2</b>                                  | 4p; 4p/f | IEC/UL | F; W (MP) | 1SDA081211R1 | A          | 1            |



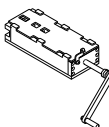
### Spring Charging lever

| Size                    | Poles  | IEC/UL | Version   | Code         | Type spare | Min quantity |
|-------------------------|--------|--------|-----------|--------------|------------|--------------|
| <b>E2.2; E4.2; E6.2</b> | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081217R1 | A          | 1            |



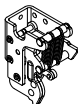
### Signalling charged spring lever

| Size                    | Poles  | IEC/UL | Version   | Code         | Type spare | Min quantity |
|-------------------------|--------|--------|-----------|--------------|------------|--------------|
| <b>E2.2; E4.2; E6.2</b> | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081242R1 | A          | 1            |



### Spring charging device

| Size                    | Poles  | IEC/UL | Version  | Code         | Type spare | Min quantity |
|-------------------------|--------|--------|----------|--------------|------------|--------------|
| <b>E2.2; E4.2; E6.2</b> | 3p; 4p | IEC    | F; W(MP) | 1SDA082230R1 | A          | 1            |



### Tripping mechanism

| Size                    | Poles  | IEC/UL | Version   | Code         | Type spare | Min quantity |
|-------------------------|--------|--------|-----------|--------------|------------|--------------|
| <b>E2.2; E4.2; E6.2</b> | 3p; 4p | IEC    | F; W (MP) | 1SDA082187R1 | A          | 1            |



### Fixing screws kit - 50 pcs

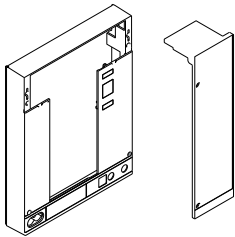
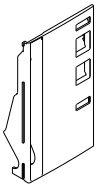
| Size                        | Poles  | IEC/UL | Version   | Code         | Type spare | Min quantity |
|-----------------------------|--------|--------|-----------|--------------|------------|--------------|
| <b>E1.2 - wall mounted</b>  | 3p; 4p | IEC/UL | F         | 1SDA081179R1 |            | 1            |
| <b>E1.2 - floor mounted</b> | 3p; 4p | IEC/UL | F         | 1SDA081413R1 |            | 1            |
| <b>E1.2 - floor mounted</b> | 3p; 4p | IEC/UL | W (FP)    | 1SDA081414R1 |            | 1            |
| <b>E2.2; E4.2; E6.2</b>     | 3p; 4p | IEC/UL | F; W (FP) | 1SDA081467R1 |            | 1            |

Min quantity = min quantity to complete a circuit-breaker: The quantity is related to the number of phases (3 or 4 poles) of the circuit-breaker (E6.2 has half phases so quantities are double)

Type A Spare part = only for ABB L3 technicians

# Accessories

## Spare parts



### Safety cover

| Size                    | Poles  | IEC/UL | Version   | Code         |  | Type spare | Min quantity |
|-------------------------|--------|--------|-----------|--------------|--|------------|--------------|
| <b>E1.2</b>             | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081402R1 |  |            | 1            |
| <b>E2.2; E4.2; E6.2</b> | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081432R1 |  |            | 1            |

For each part ordered, specify the Serial number of the circuit-breaker it is intended for.

### Accessories Cover

| Size                                   | Poles  | IEC/UL | Version   | Code         |  | Type spare | Min quantity |
|----------------------------------------|--------|--------|-----------|--------------|--|------------|--------------|
| <b>E1.2</b>                            | 3p     | IEC/UL | F; W (MP) | 1SDA081403R1 |  |            | 1            |
| <b>E1.2</b>                            | 4p     | IEC/UL | F; W (MP) | 1SDA081404R1 |  |            | 1            |
| <b>E2.2</b>                            | 3p     | IEC/UL | F         | 1SDA081433R1 |  |            | 1            |
| <b>E2.2</b>                            | 4p     | IEC/UL | F         | 1SDA081434R1 |  |            | 1            |
| <b>E2.2</b>                            | 3p     | IEC/UL | W (MP)    | 1SDA081435R1 |  |            | 1            |
| <b>E2.2</b>                            | 4p     | IEC/UL | W (MP)    | 1SDA081436R1 |  |            | 1            |
| <b>E4.2</b>                            | 3p     | IEC/UL | F         | 1SDA081437R1 |  |            | 1            |
| <b>E4.2</b>                            | 4p     | IEC/UL | F         | 1SDA081438R1 |  |            | 1            |
| <b>E4.2</b>                            | 3p     | IEC/UL | W (MP)    | 1SDA081439R1 |  |            | 1            |
| <b>E4.2</b>                            | 4p     | IEC/UL | W (MP)    | 1SDA081440R1 |  |            | 1            |
| <b>E6.2</b>                            | 3p     | IEC/UL | F         | 1SDA081441R1 |  |            | 1            |
| <b>E6.2</b>                            | 4p     | IEC/UL | F         | 1SDA081442R1 |  |            | 1            |
| <b>E6.2</b>                            | 3p     | IEC/UL | W (MP)    | 1SDA081443R1 |  |            | 1            |
| <b>E6.2</b>                            | 4p     | IEC/UL | W (MP)    | 1SDA081444R1 |  |            | 1            |
| <b>E6.2</b>                            | 4p/f   | IEC/UL | F         | 1SDA081445R1 |  |            | 1            |
| <b>E6.2</b>                            | 4p/f   | IEC/UL | W (MP)    | 1SDA081446R1 |  |            | 1            |
| <b>E1.2 - Castell*</b>                 | 3p; 4p | IEC    | F; W (MP) | 1SDA082145R1 |  |            | 1            |
| <b>E2.2...E6.2 - Castell*</b>          | 3p; 4p | IEC    | F         | 1SDA082146R1 |  |            | 1            |
| <b>E2.2...E6.2 - Castell* KLC</b>      | 3p; 4p | IEC    | W (MP)    | 1SDA082149R1 |  |            | 1            |
| <b>E2.2...E6.2 - Castell* KLC+ KLP</b> | 3p; 4p | IEC    | W (MP)    | 1SDA082150R1 |  |            | 1            |
| <b>E2.2...E6.2 - Castell* KLP</b>      | 3p; 4p | IEC    | W (MP)    | 1SDA082151R1 |  |            | 1            |

\* The lock is not included

### Transparent cover for trip unit

| Size                          | Poles  | IEC/UL | Version   | Code         |  | Type spare | Min quantity |
|-------------------------------|--------|--------|-----------|--------------|--|------------|--------------|
| <b>E1.2 DIP</b>               | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081405R1 |  |            | 1            |
| <b>E1.2 Touch</b>             | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081406R1 |  |            | 1            |
| <b>E2.2; E4.2; E6.2 DIP</b>   | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081447R1 |  |            | 1            |
| <b>E2.2; E4.2; E6.2 Touch</b> | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081448R1 |  |            | 1            |

### Kit front cover plugs

| Size                    | Poles  | IEC/UL | Version   | Code         |  | Type spare | Min quantity |
|-------------------------|--------|--------|-----------|--------------|--|------------|--------------|
| <b>E1.2</b>             | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081415R1 |  |            | 1            |
| <b>E2.2; E4.2; E6.2</b> | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081471R1 |  |            | 1            |

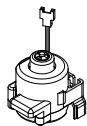
### Sliding contact for Moving Part

| Size                         | Poles  | IEC/UL | Version | Code         |  | Type spare | Min quantity |
|------------------------------|--------|--------|---------|--------------|--|------------|--------------|
| <b>E1.2</b>                  | 3p     | IEC/UL | W (MP)  | 1SDA081167R1 |  | A          | 1            |
| <b>E1.2</b>                  | 4p     | IEC/UL | W (MP)  | 1SDA081168R1 |  | A          | 1            |
| <b>E2.2; E4.2; E6.2</b>      | 3p; 4p | IEC/UL | W (MP)  | 1SDA081212R1 |  | A          | 1            |
| <b>E2.2; E4.2; E6.2 - MS</b> | 3p; 4p | IEC/UL | W (MP)  | 1SDA081213R1 |  | A          | 1            |

### Terminal box connection interface

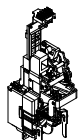
| Size                         | Poles  | IEC/UL | Version   | Code         |  | Type spare | Min quantity |
|------------------------------|--------|--------|-----------|--------------|--|------------|--------------|
| <b>E1.2</b>                  | 3p; 4p | IEC/UL | F         | 1SDA081409R1 |  | A          | 1            |
| <b>E2.2; E4.2; E6.2</b>      | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081451R1 |  | A          | 1            |
| <b>E2.2; E4.2; E6.2 - MS</b> | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081452R1 |  | A          | 1            |

Type A Spare part = only for ABB L3 technicians



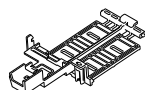
### Trip coil

| Size             | Poles  | IEC/UL | Version   | Code         | Type spare | Min quantity |
|------------------|--------|--------|-----------|--------------|------------|--------------|
| E1.2             | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081407R1 |            | 1            |
| E2.2; E4.2; E6.2 | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081449R1 |            | 1            |



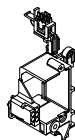
### Right plate for accessories (Right MID)

| Size                  | Poles  | IEC/UL | Version   | Code         | Type spare | Min quantity |
|-----------------------|--------|--------|-----------|--------------|------------|--------------|
| E2.2; E4.2; E6.2      | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081214R1 | A          | 1            |
| E2.2; E4.2; E6.2 - MS | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081215R1 | A          | 1            |



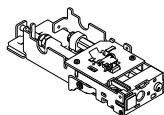
### Cover for right plate for accessories (Right MID Cover)

| Size             | Poles  | IEC/UL | Version   | Code         | Type spare | Min quantity |
|------------------|--------|--------|-----------|--------------|------------|--------------|
| E2.2; E4.2; E6.2 | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081466R1 |            | 1            |



### Left plate for accessories (Left MID)

| Size             | Poles  | IEC/UL | Version   | Code         | Type spare | Min quantity |
|------------------|--------|--------|-----------|--------------|------------|--------------|
| E1.2             | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081170R1 |            | 1            |
| E2.2; E4.2; E6.2 | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081453R1 |            | 1            |



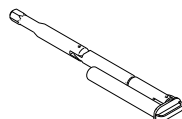
### Racked in and out device (CD)

| Size             | Poles  | IEC/UL | Version | Code         | Type spare | Min quantity |
|------------------|--------|--------|---------|--------------|------------|--------------|
| E2.2; E4.2; E6.2 | 3p; 4p | IEC/UL | W (MP)  | 1SDA081216R1 | A          | 1            |



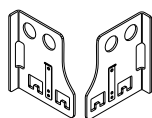
### CD lock lever

| Size             | Poles  | IEC/UL | Version | Code         | Type spare | Min quantity |
|------------------|--------|--------|---------|--------------|------------|--------------|
| E2.2; E4.2; E6.2 | 3p; 4p | IEC/UL | W (MP)  | 1SDA081256R1 | A          | 1            |



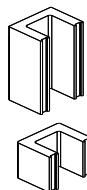
### Racking in and out lever

| Size             | Poles  | IEC/UL | Version | Code         | Type spare | Min quantity |
|------------------|--------|--------|---------|--------------|------------|--------------|
| E1.2             | 3p; 4p | IEC/UL | W (MP)  | 1SDA081410R1 |            | 1            |
| E2.2; E4.2; E6.2 | 3p; 4p | IEC/UL | W (MP)  | 1SDA081455R1 |            | 1            |



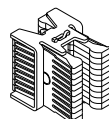
### Lifting plates

| Size             | Poles  | IEC/UL | Version   | Code         | Type spare | Min quantity |
|------------------|--------|--------|-----------|--------------|------------|--------------|
| E2.2; E4.2; E6.2 | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081454R1 |            | 1            |



### Moving part Terminals

| Size            | Poles    | IEC/UL | Version | Code         | Type spare | Min quantity |
|-----------------|----------|--------|---------|--------------|------------|--------------|
| E2.2 - Iu<2000A | 3p; 4p   | IEC    | W (MP)  | 1SDA081243R1 | A          | 3 or 4       |
| E2.2 - Iu=2500A | 3p; 4p   | IEC    | W (MP)  | 1SDA081244R1 | A          | 3 or 4       |
| E4.2 - Iu<3200A | 3p; 4p   | IEC    | W (MP)  | 1SDA081245R1 | A          | 3 or 4       |
| E4.2 - Iu=4000A | 3p; 4p   | IEC    | W (MP)  | 1SDA081246R1 | A          | 3 or 4       |
| E6.2            | 3p; 4p/f | IEC    | W (MP)  | 1SDA081247R1 | A          | 6 or 7 or 8  |



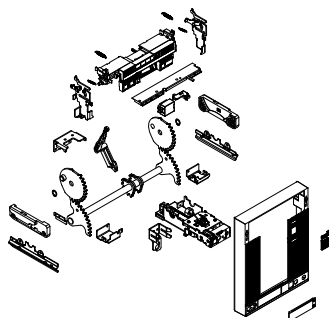
### Jaw contacts

| Size            | Poles        | IEC/UL | Version | Code         | Type spare | Min quantity |
|-----------------|--------------|--------|---------|--------------|------------|--------------|
| E1.2            | 3p; 4p       | IEC    | W (FP)  | 1SDA081164R1 | A          | 3 or 4       |
| E2.2 - Iu<2000A | 3p; 4p       | IEC    | W (FP)  | 1SDA081195R1 | A          | 3 or 4       |
| E2.2 - Iu=2500A | 3p; 4p       | IEC    | W (FP)  | 1SDA081196R1 | A          | 3 or 4       |
| E4.2 - Iu<3200A | 3p; 4p       | IEC    | W (FP)  | 1SDA081197R1 | A          | 3 or 4       |
| E4.2 - Iu=4000A | 3p; 4p       | IEC    | W (FP)  | 1SDA081198R1 | A          | 3 or 4       |
| E6.2            | 3p; 4p; 4p/f | IEC    | W (FP)  | 1SDA081199R1 | A          | 6 or 7 or 8  |

Type A Spare part = only for ABB L3 technicians

# Accessories

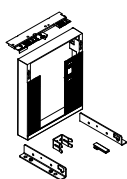
## Spare parts



### Conversion kit from Fixed to Moving part

| Size | Poles | IEC/UL | Version | Code         | Type spare | Min quantity |
|------|-------|--------|---------|--------------|------------|--------------|
| E1.2 | 3p    | IEC    | F       | 1SDA081176R1 | A          | 1            |
| E1.2 | 4p    | IEC    | F       | 1SDA081177R1 | A          | 1            |
| E2.2 | 3p    | IEC    | F       | 1SDA081234R1 | A          | 1            |
| E2.2 | 4p    | IEC    | F       | 1SDA081235R1 | A          | 1            |
| E4.2 | 3p    | IEC    | F       | 1SDA081236R1 | A          | 1            |
| E4.2 | 4p    | IEC    | F       | 1SDA081237R1 | A          | 1            |
| E6.2 | 3p    | IEC    | F       | 1SDA081238R1 | A          | 1            |
| E6.2 | 4p    | IEC    | F       | 1SDA081239R1 | A          | 1            |
| E6.2 | 4p/f  | IEC    | F       | 1SDA081240R1 | A          | 1            |

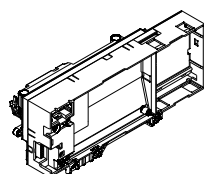
For each part ordered, specify the Serial number of the circuit-breaker it is intended for.



### Conversion kit from Moving Part into Fixed Version

| Size                 | Poles  | IEC/UL | Version | Code         | Type spare | Min quantity |
|----------------------|--------|--------|---------|--------------|------------|--------------|
| E1.2 - wall mounted  | 3p; 4p | IEC/UL | W (MP)  | 1SDA081178R1 | A          | 1            |
| E1.2 - floor mounted | 3p; 4p | IEC/UL | W (MP)  | 1SDA082303R1 | A          | 1            |
| E2.2; E4.2; E6.2     | 3p; 4p | IEC/UL | W (MP)  | 1SDA081241R1 | A          | 1            |

For each part ordered, it is mandatory to specify the Serial number of the circuit-breaker it is intended for.



### Main board

| Size             | Poles  | IEC/UL | Version   | Code         | Type spare | Min quantity |
|------------------|--------|--------|-----------|--------------|------------|--------------|
| E1.2             | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081408R1 |            | 1            |
| E2.2; E4.2; E6.2 | 3p; 4p | IEC/UL | F; W (MP) | 1SDA081450R1 |            | 1            |

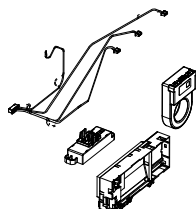
For each part ordered, it is mandatory to specify the Serial number of the circuit-breaker it is intended for.

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### Trip Unit Battery

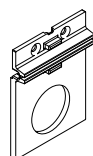
| Size                   | Poles  | IEC/UL | Version   | Code         | Type spare | Min quantity |
|------------------------|--------|--------|-----------|--------------|------------|--------------|
| E1.2; E2.2; E4.2; E6.2 | 3p; 4p | IEC/UL | F; W (MP) | 1SDA074193R1 |            | 1            |



### Main board + Sensors + cables

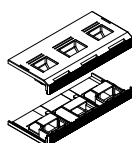
| Size | Poles | IEC/UL | Version   | Code         | Type spare | Min quantity |
|------|-------|--------|-----------|--------------|------------|--------------|
| E2.2 | 3p    | IEC/UL | F; W (MP) | 1SDA081200R1 | A          | 1            |
| E2.2 | 4p    | IEC/UL | F; W (MP) | 1SDA081201R1 | A          | 1            |
| E4.2 | 3p    | IEC/UL | F; W (MP) | 1SDA081202R1 | A          | 1            |
| E4.2 | 4p    | IEC/UL | F; W (MP) | 1SDA081203R1 | A          | 1            |
| E6.2 | 3p    | IEC/UL | F; W (MP) | 1SDA081204R1 | A          | 1            |
| E6.2 | 4p    | IEC/UL | F; W (MP) | 1SDA081205R1 | A          | 1            |
| E6.2 | 4p/f  | IEC/UL | F; W (MP) | 1SDA081206R1 | A          | 1            |

For each part ordered, it is mandatory to specify the Serial number of the circuit-breaker it is intended for.



### Sensors plastic covers

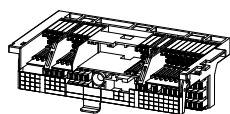
| Size | Poles        | IEC/UL | Version   | Code         | Type spare | Min quantity |
|------|--------------|--------|-----------|--------------|------------|--------------|
| E2.2 | 3p; 4p       | IEC/UL | F; W (MP) | 1SDA081468R1 |            | 1            |
| E4.2 | 3p; 4p       | IEC/UL | F; W (MP) | 1SDA081469R1 |            | 1            |
| E6.2 | 3p; 4p; 4p/f | IEC/UL | F; W (MP) | 1SDA081470R1 |            | 1            |



### Terminal covers

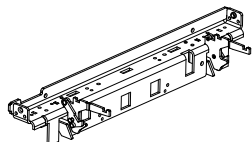
| Size | Poles | IEC/UL | Version   | Code         | Type spare | Min quantity |
|------|-------|--------|-----------|--------------|------------|--------------|
| E1.2 | 3p    | IEC/UL | F; W (MP) | 1SDA081182R1 |            | 1            |
| E1.2 | 4p    | IEC/UL | F; W (MP) | 1SDA081183R1 |            | 1            |

Type A Spare part = only for ABB L3 technicians



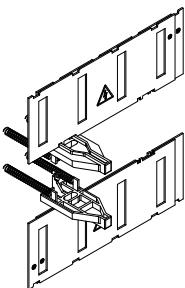
#### Terminal box fixed part

| Size       | Poles        | IEC/UL | Version | Code         | Type spare | Min quantity |
|------------|--------------|--------|---------|--------------|------------|--------------|
| E1.2       | 3p; 4p       | IEC/UL | W (FP)  | 1SDA081180R1 | A          | 1            |
| E2.2; E4.2 | 3p; 4p       | IEC    | W (FP)  | 1SDA082152R1 | A          | 1            |
| E6.2       | 3p; 4p; 4p/f | IEC    | W (FP)  | 1SDA082153R1 | A          | 1            |



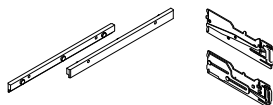
#### Support for terminal box of Fixed Part

| Size | Poles | IEC/UL | Version | Code         | Type spare | Min quantity |
|------|-------|--------|---------|--------------|------------|--------------|
| E1.2 | 3p    | IEC/UL | W (FP)  | 1SDA082237R1 | A          | 1            |
| E1.2 | 4p    | IEC/UL | W (FP)  | 1SDA082238R1 | A          | 1            |
| E2.2 | 3p    | IEC/UL | W (FP)  | 1SDA081249R1 | A          | 1            |
| E2.2 | 4p    | IEC/UL | W (FP)  | 1SDA081250R1 | A          | 1            |
| E4.2 | 3p    | IEC/UL | W (FP)  | 1SDA081251R1 | A          | 1            |
| E4.2 | 4p    | IEC/UL | W (FP)  | 1SDA081252R1 | A          | 1            |
| E6.2 | 3p    | IEC/UL | W (FP)  | 1SDA081253R1 | A          | 1            |
| E6.2 | 4p    | IEC/UL | W (FP)  | 1SDA081254R1 | A          | 1            |
| E6.2 | 4p/f  | IEC/UL | W (FP)  | 1SDA081255R1 | A          | 1            |



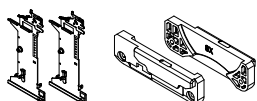
#### Safety shutters for fixed part

| Size | Poles | IEC/UL | Version | Code         | Type spare | Min quantity |
|------|-------|--------|---------|--------------|------------|--------------|
| E1.2 | 3p    | IEC    | W (FP)  | 1SDA081411R1 |            | 1            |
| E1.2 | 4p    | IEC    | W (FP)  | 1SDA081412R1 |            | 1            |
| E2.2 | 3p    | IEC    | W (FP)  | 1SDA081457R1 |            | 1            |
| E2.2 | 4p    | IEC    | W (FP)  | 1SDA081458R1 |            | 1            |
| E4.2 | 3p    | IEC    | W (FP)  | 1SDA081459R1 |            | 1            |
| E4.2 | 4p    | IEC    | W (FP)  | 1SDA081460R1 |            | 1            |
| E6.2 | 3p    | IEC    | W (FP)  | 1SDA081461R1 |            | 1            |
| E6.2 | 4p    | IEC    | W (FP)  | 1SDA081462R1 |            | 1            |
| E6.2 | 4p/f  | IEC    | W (FP)  | 1SDA081463R1 |            | 1            |



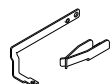
#### Lateral guides for fixed part

| Size             | Poles  | IEC/UL | Version | Code         | Type spare | Min quantity |
|------------------|--------|--------|---------|--------------|------------|--------------|
| E2.2; E4.2; E6.2 | 3p; 4p | IEC    | W (FP)  | 1SDA082154R1 | A          | 1            |



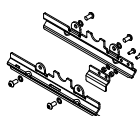
#### Lateral guides for Moving part

| Size             | Poles  | IEC/UL | Version | Code         | Type spare | Min quantity |
|------------------|--------|--------|---------|--------------|------------|--------------|
| E1.2             | 3p; 4p | IEC    | W (MP)  | 1SDA082188R1 | A          | 1            |
| E2.2; E4.2; E6.2 | 3p; 4p | IEC    | W (MP)  | 1SDA082302R1 | A          | 1            |



#### Earth sliding contact for Fixed Part

| Size             | Poles  | IEC/UL | Version | Code         | Type spare | Min quantity |
|------------------|--------|--------|---------|--------------|------------|--------------|
| E2.2; E4.2; E6.2 | 3p; 4p | IEC/UL | W (FP)  | 1SDA081465R1 |            | 1            |



#### Earth sliding contact for Moving Part and supports

| Size             | Poles  | IEC/UL | Version | Code         | Type spare | Min quantity |
|------------------|--------|--------|---------|--------------|------------|--------------|
| E2.2; E4.2; E6.2 | 3p; 4p | IEC/UL | W (MP)  | 1SDA081464R1 |            | 1            |

The complete ordering codes for original and guaranteed spare parts are available in the ABB SACE Spare Parts Catalogue – 1SDC001007D0204.

Type A Spare part = only for ABB L3 technicians

# Contact us

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