



# New SACE Emax 2 for UL 1066 From Circuit Breaker to Power Manager



# Circuit breakers switch power SACE Emax 2 manages it.

SACE Emax 2 is the new benchmark of power circuit breakers. Efficient and simple to use, the range offers innovative solutions for today's needs, while anticipating those of tomorrow.

The power circuit breaker becomes a Power Manager with the unique ability to control electrical installations. It is simply integrated into all projects: from standard systems to the most complex and automated networks. Lighting up the future of energy.



# Efficiency and control The power needed, when needed.



SACE Emax 2 power circuit breakers up to 6000A have been designed to increase efficiency in all installations: from industrial and naval applications to traditional and renewable power generation installations, buildings, data centers and shopping centers. Reliable protection and systems managed with competence.



Thanks to the exclusive **Power Controller** function, power can now be utilized more efficiently; saving energy, money and contributing to your “Green Initiative”. The Power Controller, patented by ABB, disconnects non-priority loads during the times when consumption limits need to be respected and connects them again as soon as it is appropriate. When required, Emax 2 can also automatically activate auxiliary power supplies such as generator sets.

The Ekip Touch trip units measure power and energy with precision and save the most recent alarms, events and measurements in order to prevent faults to the installation or trip effectively when necessary.

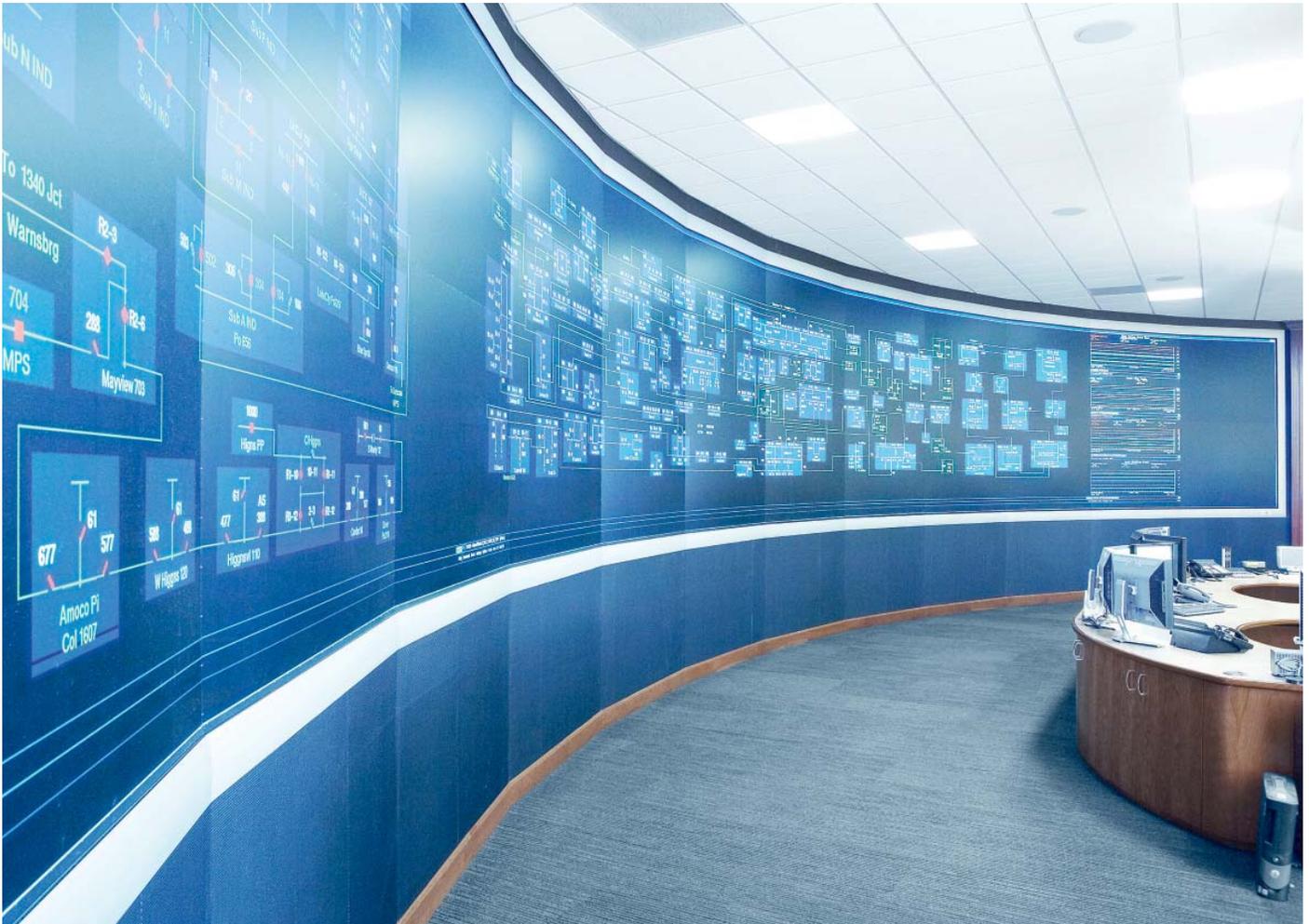


The exclusive **Network Analyzer** function controls the quality of energy in real time and is in alignment with IEEE 1250; Guide for Identifying and Improving Voltage Quality in Power Systems.

The innovative **Ekip Touch** and **Hi Touch** protection trip units in the G version include all functions of generator protection switchgear. They respect the parameters and settings detailed in IEEE 242; IEEE Recommended Practice for Protection and Coordination of Industrial and Power Systems and IEEE C37.102; IEEE Guide for AC Generator Protection, and offer a safe control solution that is ready to use and requires no external devices, wiring or inspections.

**Productivity, efficiency, and savings, are guaranteed.**

# Connectivity Integration is easy. Even from afar.



SACE Emax 2 series circuit breakers have been designed to be integrated directly into all types of switchgear, automation and energy management systems to improve productivity and energy consumption. Complete integration into smart grids, in buildings and industrial plants is possible.



All circuit breakers can be equipped with communication units for use with Modbus, Profibus and Devicenet protocols and with the modern Modbus TCP, Profinet and Ethernet IP protocols. The modules can be installed directly on the terminal box at any time.

The integrated IEC61850 communication module enables connection to automation systems and intelligent networks (Smart Grids).

Accurate measurements of current, voltage, power and energy are all available by means of the communication modules and allow the trip units to be used as multimeters. All circuit breaker functions are also accessible via the Inter-

net, 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.

# Performance

## A size for every requirement.



SACE Emax 2 series power circuit breakers offer tailored performance to meet the demands of today's installations. Four sizes are available for creating switchgear and switchboards of compact dimensions and high performance, with busbars of optimized length and cross-sections.

E1.2



E2.2



E4.2



E6.2



**E1.2** offers 1200A with an interrupting rating up to 65kA at 508V and a short-time withstand rating of 50kA. It enables switchgear of 65kA to be built in widths of 16 inches, which are indispensable in places where reduced dimensions are essential, such as in naval and offshore installations.

**E2.2** enables ratings of up to 2000A to be achieved in switchgear with a width of 16 inches. In addition, it provides an interrupting rating up to 100kA at 508V and a short-time withstand of 85kA.

**E4.2** is the new standard for circuit breakers up to 3200A. It is designed for interrupting rating up to 200kA at 508V and short-time withstand currents of up to 100kA without the need for particular precautions.

**E6.2** is the top of the range model with an interrupting rating of up to 200kA, a short-time withstand of 100kA and a structure that allows 6000A to be reached in switchgear, even in complex installation conditions.

The sizes from E2.2 to E6.2 have the same height and depth. In addition, to further optimize space, drawout versions of E2.2 to E6.2 up to 150kA at 508V and 100kA at 635V can be installed in cubicles with a near zero height clearance requirement.

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 a 30% savings at the same performance can be obtained.

# Ease of use and safety Everything under control and problem free.



Simplified installation and maintenance. SACE Emax 2 series circuit breakers are equipped with protection trip units containing a large, color touch-screen display for maximum ease of use. Productivity is increased while all stages, from design to daily operations, are simplified.



Emax 2 offers double insulation between the front of the switchgear and live parts. In addition, essential performance and identification information is clearly available on the front central area of the shield to ensure operation in complete safety.

Access from the front, without having to remove the shield, simplifies maintenance.

The drawout circuit breaker can be inserted and removed via dedicated guide rails that simplify movement.

The correct movement from the “racked-out” position to the “test” position and then to the “racked-in” position is guaranteed by a lock in each position. The shutters of the fixed part can be locked, even from the front, for maximum safety 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.

SACE Emax 2 circuit breakers use the same protection trip units, auxiliary connections and main accessories throughout the range.

The **Ekip Touch protection trip units** are equipped with a large, color touch-screen display that ensures safe and intuitive operation. The Ekip units can also be easily programmed and consulted from a tablet, smart phone or portable PC via the Ekip Connect application.

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

# Product conformity Approvals and certification.



The SACE Emax 2 circuit breakers and their accessories conform with ANSI C37.13, C37.16, C37.17 and C37.50 standards and are UL 1066 certified. The UL 1066 certification allows Emax 2 to be used in UL 1558 switchgear, UL 891 switchboards and CSA C22.2 no. 31 switchgear assemblies. In addition, SACE Emax 2 also consists of a line that is compliant with the international IEC 60947, EN 60947 (harmonized in 30 CENELEC countries), CEI EN 60947 and IEC 61000 Standards, and conforms to EC "Low Voltage Directives" (LVD) and "Electromagnetic Compatibility Directive" (EMC).

The main versions of the IEC devices are approved by the following shipping registers: RINA, Lloyd's Register of Shipping, ABS Germanischer Lloyd, Bureau Veritas, Det Norske Veritas, Russian Maritime Register of Shipping, CCS and NKK.

The SACE Emax 2 IEC line also includes certification by the Russian certification body GOST (Russia Certificate of Conformity) and has achieved China CCC Certification (China Compulsory Certification).

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

# Quality and Sustainability Company efficiency and integrated management systems.



Throughout its history, ABB has worked to involve all departments and create an organized system of processes in order to develop, implement, and certify management systems in compliance with the international standards listed below:

- 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.

A further commitment aimed at safeguarding the environment has been achieved by assessing the products' life cycle (LCA, [Life Cycle Assessment](#)). This includes assessment and improvement of the environmental performance of the products throughout their entire life cycle, beginning from the initial design stage.

The materials, processes and packaging are chosen so that the real environmental impact of the product is optimized, including considerations for their energy efficiency and recyclability.

# SACE Emax 2 for UL 1066

## Electrical characteristics.

Common data		
Rated maximum voltage	[M]	635V AC
Rated voltage	[M]	600V AC
Frequency	[Hz]	50 - 60
Number of poles		3 - 4
Version		Fixed - Drawout

### SACE Emax 2 for ANSI / UL 1066

#### Performance levels

Continuous current rating		[A]
		[A]
Neutral pole current-carrying capacity for 4p		[% rtd current]
Interrupting current rating	254V AC	[kA]
	508V AC	[kA]
	635V AC	[kA]
Short-time withstand current		[kA]
Dimensions - Fixed	H	[in/mm]
	D	[in/mm]
	W 3p	[in/mm]
	W 4p-4pf	[in/mm]
Dimensions - Drawout	H	[in/mm]
	D	[in/mm]
	W 3p	[in/mm]
	W 4p-4pf	[in/mm]

\* Version not yet available. Contact ABB.

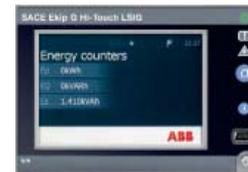


#### Protection trip units

Application	Ekip Dip
Distribution	Protection
Power control	—
Generators	—



E1.2			E2.2					E4.2					E6.2			
B-A	N-A	S-A	B-A	N-A	S-A	H-A	V-A	S-A	H-A	V-A	L-A	X-A <sup>(*)</sup>	H-A	V-A	L-A	X-A <sup>(*)</sup>
-	-	-	-	-	-	-	250	-	-	-	-	-	-	-	-	-
-	-	250	-	-	-	-	400	-	-	800	800	-	4000	4000	4000	4000
-	-	400	-	-	800	800	800	-	-	1600	1600	1600	5000	5000	5000	5000
800	800	800	-	-	1200	1200	1200	-	-	2000	2000	2000	6000 <sup>(*)</sup>	6000 <sup>(*)</sup>	6000 <sup>(*)</sup>	6000 <sup>(*)</sup>
1200	1200	1200	1600	1600	1600	1600	1600	2500	2500	2500	2500	2500	-	-	-	-
-	-	-	-	2000	2000	2000	2000	3200	3200	3200	3200	3200	-	-	-	-
100	100	100	100	100	100	100	100	100	100	100	100	100	50-100	50-100	50-100	50-100
42	50	65	42	50	65	85	100	65	85	100	125	200	85	100	150	200
42	50	65	42	50	65	85	100	65	85	100	125	200	85	100	150	200
42	42	42	42	50	65	85	85	65	85	100	100	200	85	100	100	200
42	50	50	42	50	65	85	85	65	85	85	100	50	85	100	100	100
11.65/296			14.61/371					14.61/371					14.61/371			
7.20/183			10.63/270					10.63/270					10.63/270			
8.27/210			10.87/276					15.12/384					30.00/762			
11.02/280			14.41/366					20.08/510					34.96/888 - 39.92/1014			
14.33/363.5			16.73/425					16.73/425					16.73/425			
11.06/281			15.47/393					15.47/393					15.47/393			
10.94/278			12.48/317					16.73/425					31.61/803			
13.70/348			407/16.02					21.69/551					36.57/929 - 42.09/1069			



Ekip Touch	Ekip Hi-Touch	Ekip G Touch	Ekip G Hi-Touch
Protection and Measurement	Protection, Measurement and Network Analyzer	—	—
Protection, Measurement, Load control	Protection, Measurement, Load control and Network Analyzer	Protection, Measurement, Load control	Protection, Measurement, Load control and Network Analyzer
—	—	Protection and Measurement	Protection, Measurement and Network Analyzer

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