

DISTRIBUTION SOLUTIONS

UniSec for Smart Grid

Air-insulated medium voltage secondary distribution switchgear



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Electricity demand is growing faster than any other form of energy.

The challenge is to guarantee grid efficiency reducing pollution.

This is possible moving from a concept of huge power generation plants to several diffuse renewable power generation plants.

ABB technologies help to transform traditional power networks into smarter grids that can deliver renewable power over long distances, while maintaining reliability and efficiency.



Contents

004	Benefits
005-007	Standard levels
008	Monitoring & control
009	Measurements
010	Protection & logic selectivity
011	Ratings and options
012-013	Dimensions and installation information

UniSec for Smart Grid

Benefits



Safety and reliability

- Ensured safety for personnel
- Improved tools for the network operators and the field crews
- Less need to travel to locations with difficult access



Network protection

- Enhanced operational efficiency and network stability
- Fault analysis: density of fault, failure rate, criteria for the classification of the faults
- Improved maintenance, also proactive, activities



Minimize your investments

- Improved quality of the power supply
- Less and shorter outages and improved voltage quality
- Improved grid efficiency, reliability and availability



Flexible solution

- AIS solution with UniSec portfolio
- Wide possibilities for customization: panel portfolio and options
- Load Break Switch panel width of 500 mm (compact solution 375 mm available)
- Circuit Breaker panel width of 500 mm

The integrated Smart Grid functionalities which increase automation allow:

- Monitor: the fault in the grid can be remotely located.
- Control: reconfiguring network the faulty part can be quickly isolated. The energy loss is minimized and achieves savings for future investments.
- Diagnostic: improved protection, maintenance, condition monitoring.

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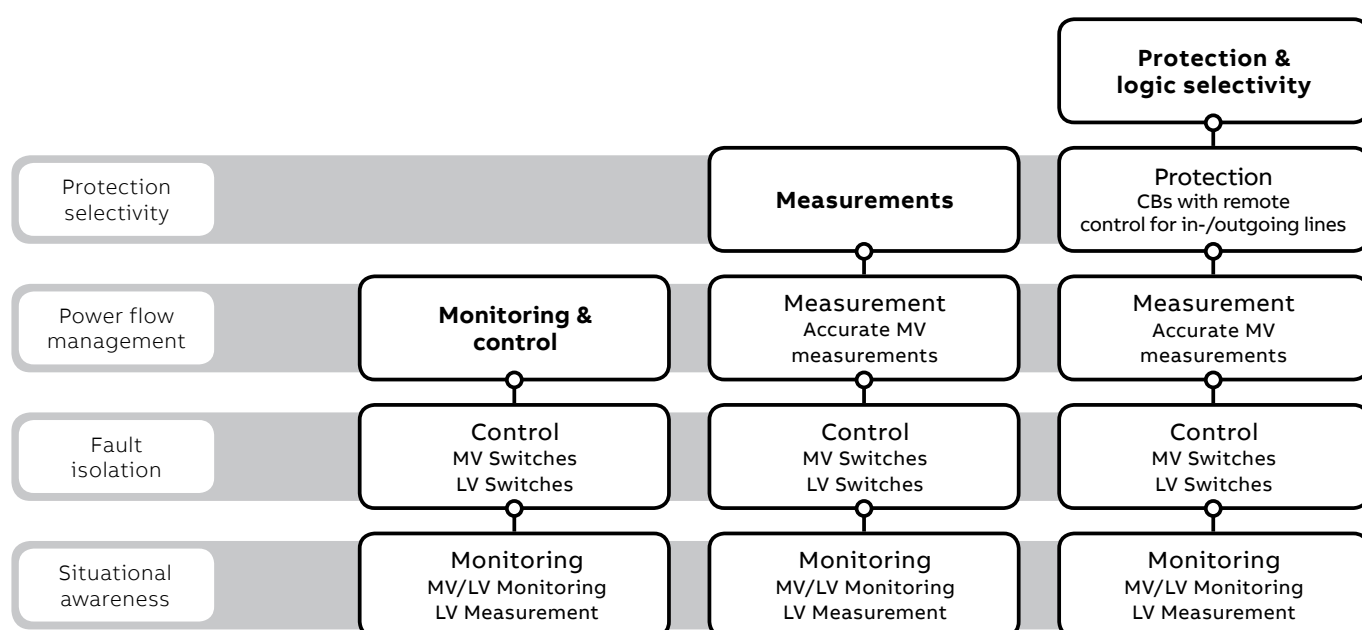
Standard levels

Depending on network complexity and automation degree , ABB proposes different technical solutions which are available as preconfigured switchgears.

UniSec for Smart Grid is equipped with advanced feeder automation device, which in combination with additional devices (from Fault Passage Indicators up to ABB Relion multifunctional relays) provides various data to the remote control centers.

Grid automation devices are located in the LV compartment giving flexibility for additional customization requirements.

Standard packages for Smart Grid applications can provide monitoring, control, diagnostic and supervision functionalities including feeder automation devices with wired and/or wireless communication interfaces and power supply back-up. Thanks to UniSec portfolio's flexibility (20 different typical units), grid automation solutions can also be delivered with different switchgear configurations in addition to what described.



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Standard levels

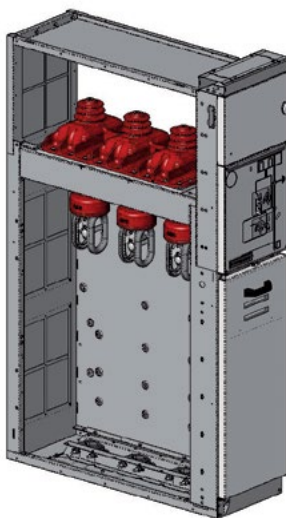


3 ways Swb SDC-SDC-SFC

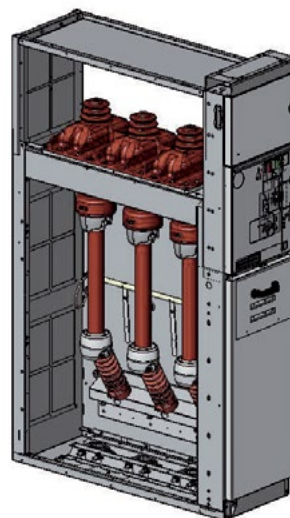
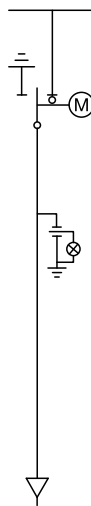
Suitable for monitoring, control and MV measurements

- N° 2 load break switch panels
- N° 1 fused load break switch panel

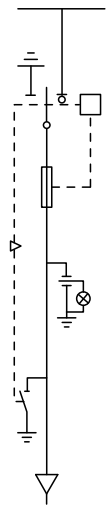
Width: 1.554 mm (including end covers)



SDC



SFC



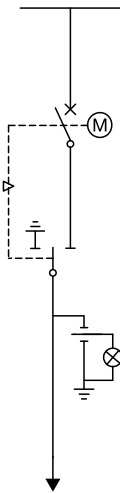
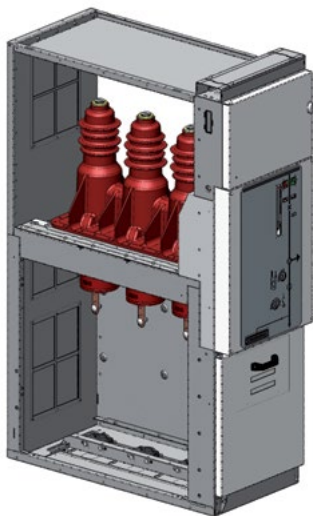


3 ways Swb HBC-HBC-SFC

Suitable also for protection and logic selectivity

- N° 2 circuit breaker panels
- N° 1 fused load break switch panel

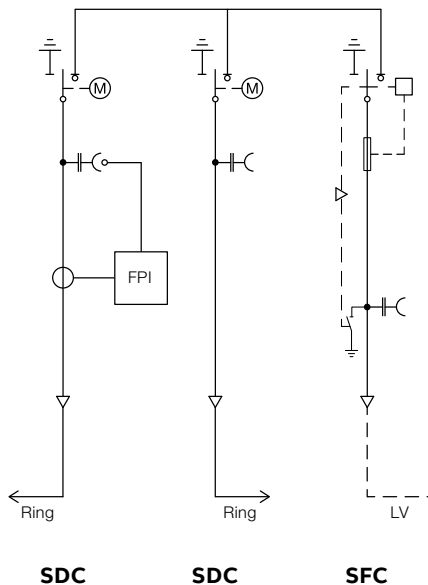
Width: 1.554 mm (including end covers)



HBC

UniSec for Smart Grid

Monitoring & control



REC603

Functions

1. Monitoring

- Indication of switch status
- Fault passage indication
- LV measurements
- Condition monitoring in substation

2. Control

- Remote control of switches
- Remote network configuration

Customer benefits

- Reduced outage time by means of remote fault localization
- Efficient use of manpower
- Grid topology supervision
- Fast restoration of healthy network area with remote control of the switches
- Increase of network efficiency

Devices

- UniSec Swb with n° 2 motorized switch disconnecter panels and n° 1 is fused switch disconnecter panel
- n° 1 REC603 (RTU & Communication)
- Battery and battery charger
- n° 1 Fault Passage Indicator (FPI)

REC603 functions

- Battery charger/management
- Up to 3 controlled devices (open and close switch disconnecter)
- 5/15 DI, 2/6 DO
- Hardwired status acquisition: fuse trip, switches position
- Modbus master from fault indication and measurement acquisition from FPI
- IEC 60870-5-101 gateway available for local devices
- IEC 60870-5-104 protocol for DMS communication
- Secure communication using VPN tunnelling
- Always-On GPRS Communication
- Battery charging and management

Option

- Add 2nd Fault Passage Indicator (FPI) on 2nd SDC panel to improve fault location

UniSec for Smart Grid Measurements



Functions

- 1. Same as monitoring & control**
- 2. High accuracy MV measurements**

Customer benefits

- Same as monitoring & control
- Power flow management
- Measurement monitoring for voltage stability even for intermitted distributed generation

Devices

- UniSec Swb with n° 2 Motorized Switch disconnecter panels and n° 1 is fused Switch disconnecter panel
- n° 1 RER601 (Communication)
- n° 1 REC615 (Control, Advantage FPI)
- n° 1 set of Combisensors Type KEVCR
- Battery and battery charger
- RIO600

RER601 functions

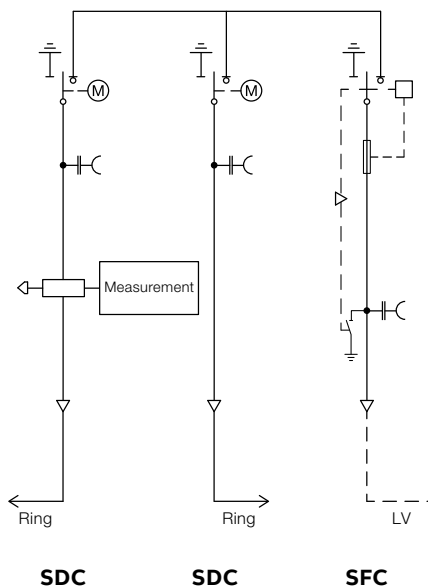
- IEC 60870-5-101 gateway available for local devices
- IEC 60870-5-104 protocol for DMS communication
- Secure communication using VPN tunneling
- Always-On GPRS Communication

REC615 functions

- Protections functions as FPI
- Local logics available
- Accurate MV measurement from current and voltage sensors

Option

- Add 2nd Set of Combisensors and 2nd REC615 on 2nd SDC panel to improve fault location



RER601



REC615



RIO600

UniSec for Smart Grid

Protection & logic selectivity



Functions

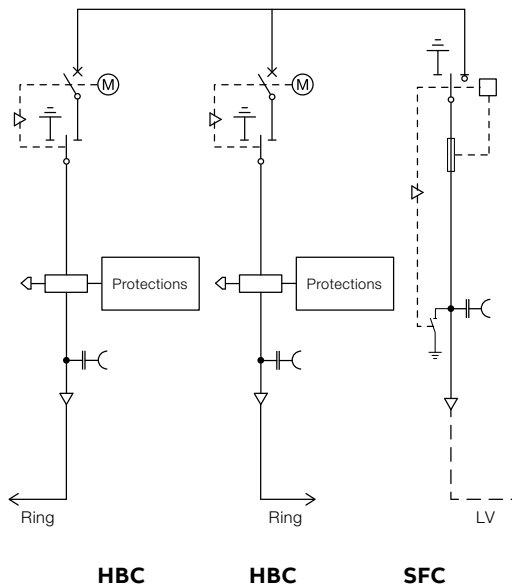
- 1. Same as monitoring & control**
- 2. Same as measurements**
- 3. Protection & logic selectivity**

Customer Benefits

- Same as monitoring & control
- Same as measurements
- Reduced number of outages

Devices

- UniSec Swb with n° 2 Circuit Breaker panels and n° 1 Fused Switch disconnecter panel
- n° 1 RER601 (Communication)
- n° 2 REC615 (Control, Protections)
- Battery and battery charger



RER601 functions

- IEC 60870-5-101 gateway available for local devices
- IEC 60870-5-104 protocol for DMS communication
- Secure communication using VPN tunneling
- Always-On GPRS Communication
- Data acquisition from REC615

REC615 functions

- Full protections functions
- Local logics available
- Accurate MV measurement from current and voltage sensors
- Possibility to use logic selectivity trough GOOSE (require an high speed network)



RER601



REC615

UniSec for Smart Grid

Ratings and options

In case standard solution proposed cannot satisfy a special requirement, the complete UniSec panel portfolio can be proposed up to 1.250 A @ 25 KA.

Additional information is available in UniSec product catalogue 1VFM200003.

Switchgear electrical characteristics

Rated voltage	kV	12	17.5	24
Test voltage (50-60 Hz x 1 min)	kV	28	38	50
Impulse withstand voltage	kV	75	95	125
Rated frequency	Hz	50-60	50-60	50-60
Rated main busbar current	A	630/800	630/800	630
Rated current of apparatus:				
- HySec multi-function apparatus	A	630	630	630
- GSec gas switch-disconnector	A	630/800	630/800	630
Rated short time withstand current	kA (3s)	16 ⁽¹⁾ /20 ⁽²⁾ /25 ⁽³⁾	16 ⁽¹⁾ /20 ⁽²⁾	16 ⁽¹⁾ /20 ⁽²⁾
Peak current	kA	40 ⁽²⁾ /50/62,5	40 ⁽²⁾ /50	40 ⁽²⁾ /50
Internal arc withstand current (up to IAC AFLR)	kA (1s)	12,5/16 ⁽¹⁾ /21/25 ⁽⁴⁾	12,5/16 ⁽¹⁾ /21	12,5/16 ⁽¹⁾ /21

⁽¹⁾ For HySec 16 kA(1s)/40 kAp

⁽²⁾ Contact ABB for 21 kA/52.5 kAp

⁽³⁾ 25 kA 2s

⁽⁴⁾ Only units at 12 kV, height 2000 mm and width 750 mm (excluding units SBC-W, SBS-W, SDD, UMP and SBR)

List of available units

Code	Description	Width				
		190 mm	375 mm	500 mm	600 mm	750 mm
SDC	Unit with switch-disconnector		•	•		•
SDS	Unit with switch-disconnector – isolation		•	•		•
SDD	Unit with double switch-disconnector					•
SDM	Isolating unit with measurement with switch-disconnector					•
UMP	Universal Metering Unit					•
DRC	Direct incoming unit with measurement and busbar earthing		•	•		
DRS	Riser unit – measurement		•	•		
SFV	Switch-disconnector with fuses – measurement			•		
SFC	Switch-disconnector with fuses		•	•		•
SFS	Switch-disconnector with fuses – isolation		•	•		
SBC	Unit with removable circuit-breaker with switch-disconnector					•
SBC-W	Circuit-breaker-Withdrawable with switch-disconnector					•
SBS	Unit with removable circuit-breaker with switch-disconnector – isolation					•
SBS-W	Circuit-breaker-Withdrawable with switch-disconnector – isolation					•
SBM	Isolating unit with measurements, circuit-breaker and double switch-disconnector					•
SBR	Reversed circuit-breaker unit					•
HBC	Unit with circuit-breaker and disconnector integrated			•		
RLC/RRC	Lateral, left and right-hand cable riser	•				
WBC	Unit with withdrawable circuit-breaker				• (*)	• (**)
WBS	Unit with withdrawable circuit-breaker – isolation				• (*)	• (**)
BME	Busbar measuring and earthing unit				• (*)	

(*) 12-17,5 kV

(**) 24 kV

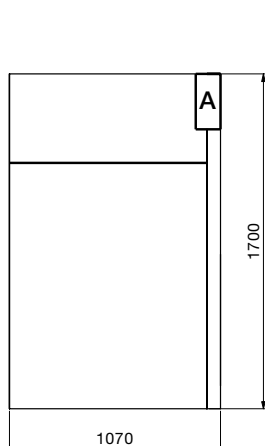
UniSec for Smart Grid

Dimensions and installation information

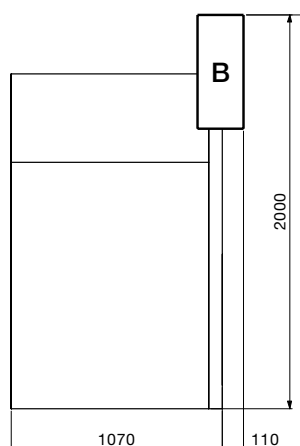


The installation room must be prepared according to the switchgear dimensions and version. Observance of the distances indicated guarantees correct and safe operation of the equipments.

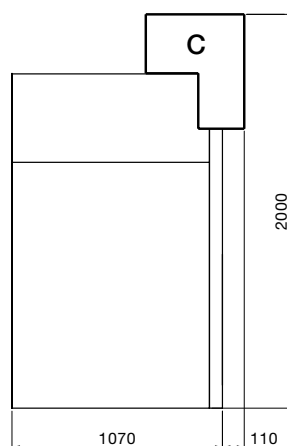
For installation conditions other than those indicated, please consult ABB.



A = Standard



B = Wide



C = Big

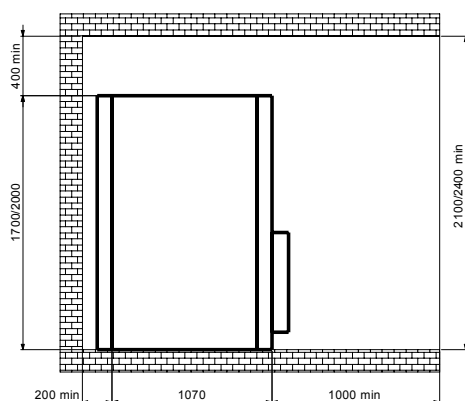


HBC panel with Filter and REC615 fit on Wide LV Compartment

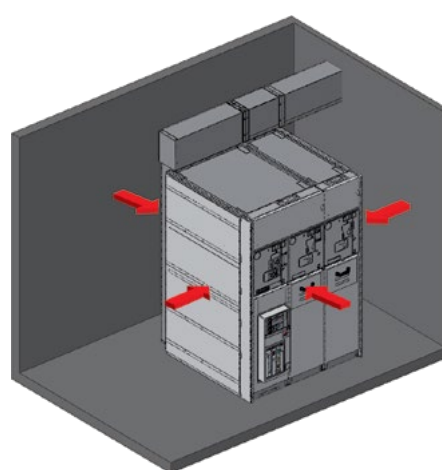
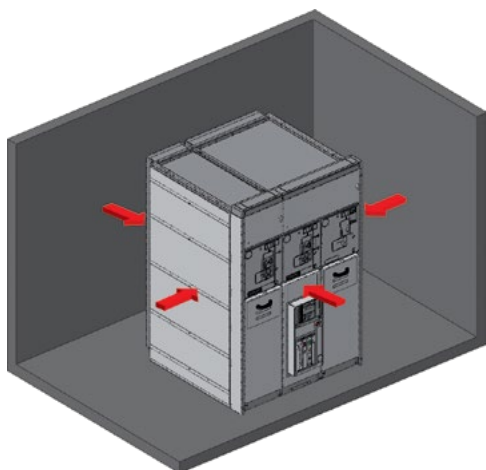
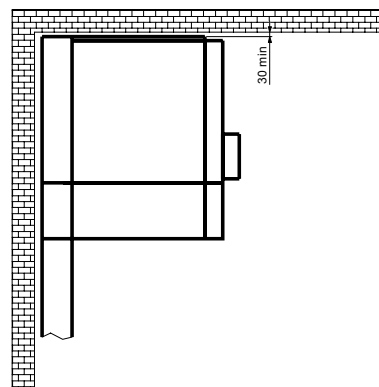
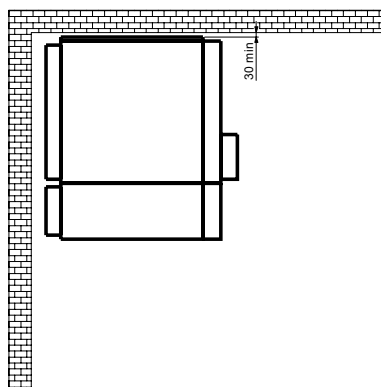
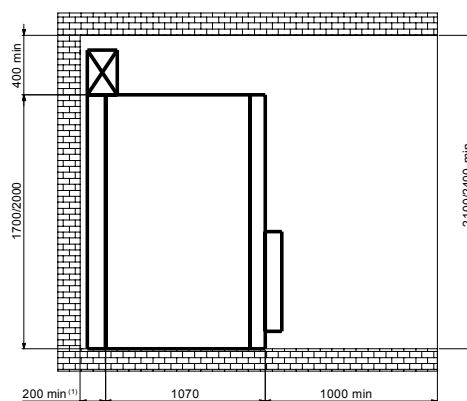
Descriptions	Monitoring & control	Measurement	Protection & logic selectivity
Panel Type	SDC-SDC-SFC	SDC-SDC-SFC	HBC-HBC-SFC
LV Compartment Type	Big-Std-Std	Big-Std-Std	Big-Wide-Std
Swb. Width [mm]	1.554	1.554	1.554
Swb. Depth [mm]	Base panel with Filters IAC AFLR up to 16KA	1.170	1.170
	Base panel with Gas Duct IAC AFLR up to 21KA	1.190	1.190
Swb. Height [mm]	Base panel with Filters / Including LV compartment	1.700 / 2.000	1.700 / 2.000
	Base panel with Gas Duct / Including LV compartment	2.020 / 2.000	2.020 / 2.000
Minimum Swbroom Height [mm]	2.100	2.100	2.100

Room layout

Minimum distances from the walls of the installation room, solution IAC A-FLR 16 kA 1s with filters installed on each unit



Minimum distances from the walls of the installation room, solution IAC A-FLR 21(*)/25(2) kA 1s with gas exhaust ducts



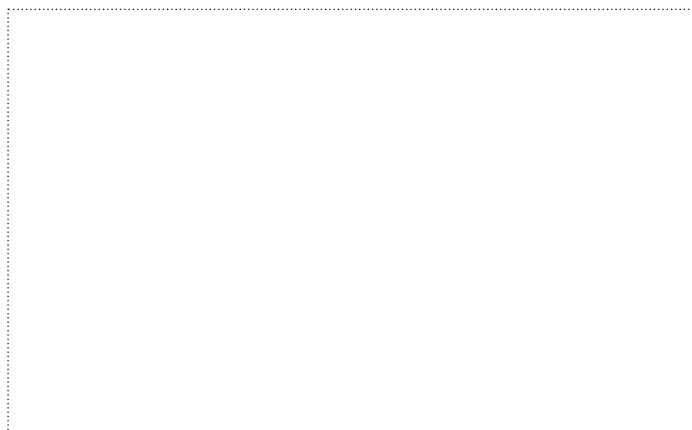
(*) 16 kA if with HBC panel

(1) For a shorter distance, please contact ABB

(2) Only units at 12 kV, height 2000 mm and width 750 mm (excluding units SBC-W, SBS-W, SDD, UMP and SBR)



For more information please contact:



More product information:

abb.com/mediumvoltage

Your contact center:

abb.com/contactcenters

More service information:

abb.com/service