

## UniSec

# Air-insulated medium voltage switchgear for secondary distribution up to 24 kV, 1250 A, 25 kA

### UniSec switchgear features

- Air insulation of all live parts
- SF<sub>6</sub> switch-disconnector
- Removable and withdrawable vacuum and SF<sub>6</sub> circuit-breakers for LSC2A service continuity panel
- Withdrawable vacuum contactor up to 12 kV and vacuum and SF<sub>6</sub> circuit-breaker for LSC2B service continuity panel
- Multi-function apparatus with integrated vacuum circuit-breaker and gas-insulated disconnector
- LSC2A-PM classification for panels with switch-disconnector, LSC2B-PM for panels with withdrawable contactor, circuit-breaker up to 17.5 kV and LSC2B-PI at 24 kV
- Complete range of functional units and accessories
- Wide choice of state-of-the-art protection relays, either integrated on circuit-breakers or mounted separately for protection, control and measurement functions

### Available versions

- Arc fault tested in accordance with standard IEC 62271-200 in the IAC AF arc proof version on front side at 12.5 kA and 16 kA, IAC AFL arc proof version on two sides (front and laterals) 12.5 kA and IAC AFLR arc proof version on three sides (front, laterals, rear) 12.5 kA, 16 kA and 21 kA; 25 kA for panels with LSC2B service continuity and at 12 kV for LSC2A units, high 2000 mm and wide 750 mm (further details at pag. 17)
- Seismic withstand version in accordance with standard IEEE 693<sup>(3)</sup>
- Marine version.

### Normal service conditions

- Storage temperature: -5 °C ... +70 °C<sup>(1)</sup>
- Range of ambient temperature: -5 °C ... +40 °C<sup>(1)</sup>
- Maximum relative humidity without condensation: 95 %
- Minimum relative humidity without condensation: 5 %
- Altitude: <1000 m above the sea level<sup>(1)</sup>.

### Degrees of protection<sup>(1)</sup>

- For IP 3X enclosure
- For IP 2X partition between compartments
- For IP 3X mechanical operating equipment.

As options:

- For IP 31 enclosure and mechanical operating equipment
- For IP 32 enclosure and mechanical operating equipment

<sup>(1)</sup> Contact ABB for -25 °C operating temperatures and -40 °C storage temperatures.

<sup>(1)</sup> For higher altitudes, contact ABB.

<sup>(1)</sup> In case of IP X1 or IP X2 to consider an extra height of 120 mm due to the additional roof on the unit.

<sup>(2)</sup> Please contact ABB.

<sup>(3)</sup> Please contact ABB to optimize switchgear configuration.



- For IP 4X enclosure and mechanical operating equipment
- For IP 41 enclosure and mechanical operating equipment
- For IP 42 enclosure and mechanical operating equipment

### Reference Standards

The switchgear and the main equipment it contains comply with the following standards:

- IEC 62271-1 for the general application
- IEC/EN 62271-200 for the switchgear. With reference to the classifications established by the standards, UniSec switchgear is defined as described below:
  - continuity of service classification: LSC2A and LSC2B
  - classification of the segregations: PM (metallic partition) and PI (insulation partition) for withdrawable circuit-breakers at 24 kV only
- IEC 62271-102 for the earthing switch
- IEC 62271-100 for the circuit-breakers
- IEC 60071-2 for insulation co-ordination
- IEC 62271-106 for the contactors
- IEC 62271-103 for the switch disconnectors
- IEC 60529 for the protection classes
- IEEE 693 Seismic qualification testing of the switchgear.
- IEC 62271-304 for severe climatic conditions<sup>(2)</sup>

### Applications

UniSec is suitable, according to maximum ratings and available technical solutions for a lot of applications: substations, utilities, commercial and residential buildings, Smart Grids, grid with distributed generations, light industry, hospital, renewable (solar, wind, small hydropower, etc.), marine, transportation, etc.

# Electrical characteristics

## 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	630/800/1250	630/800/1250	630/1250
Rated current of apparatus:				
– VD4/R-Sec - HD4/R-Sec - HD4/RE-Sec removable circuit-breaker	A	630/800	630/800	630
– VD4/R-Sec - HD4/R-Sec withdrawable circuit-breaker	A	630	630	630
– HySec multi-function apparatus	A	630	630	630
– GSec gas switch-disconnector	A	630/800	630/800	630
– Vmax/Sec withdrawable circuit-breaker	A	630/1250	630/1250	–
– VD4/Sec withdrawable circuit-breaker	A	–	–	630/1250
– HD4/Sec withdrawable circuit-breaker	A	630/1250	630/1250	630/1250
– VSC/P withdrawable vacuum contactor	A	400	–	–
Rated short time withstand current	kA (3s)	16 <sup>(4)</sup> /20 <sup>(3)</sup> /25 <sup>(1) (2)</sup>	16 <sup>(4)</sup> /20 <sup>(3)</sup> /25 <sup>(2)</sup>	16 <sup>(4)</sup> /20 <sup>(3)</sup>
Peak current	kA	40 <sup>(4)</sup> /50 <sup>(3)</sup> /62.5	40 <sup>(4)</sup> /50 <sup>(3)</sup> /62.5	40 <sup>(4)</sup> /50 <sup>(3)</sup>
Internal arc withstand current (up to IAC AFLR)	kA (1s)	12.5/16 <sup>(4)</sup> /21/25 <sup>(2) (5)</sup>	12.5/16 <sup>(4)</sup> /21/25 <sup>(2)</sup>	12.5/16 <sup>(4)</sup> /21

<sup>(1)</sup> 25 kA 2s for LSC2A service continuity classification

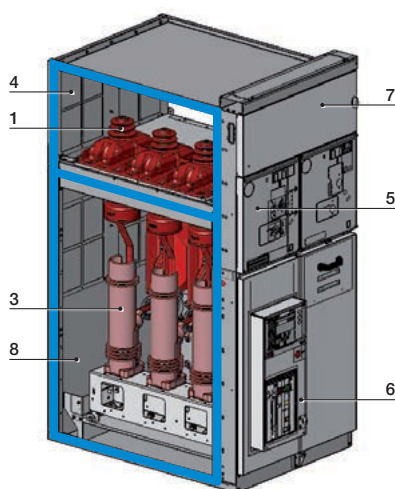
<sup>(2)</sup> For LSC2B service continuity classification

<sup>(3)</sup> Contact ABB for 21 kA/52.5 kAp

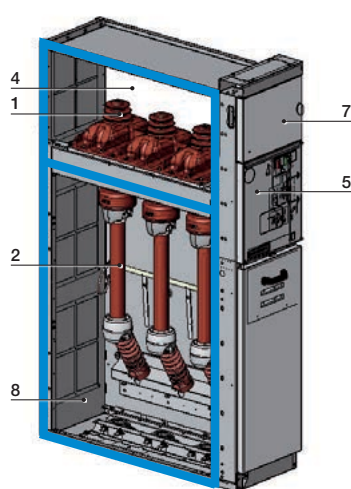
<sup>(4)</sup> For HySec 16 kA(1s)/40 kAp

<sup>(5)</sup> For LSC2A unit with gas duct at 12kV, high 2000 mm and wide 750 mm (further details at pag. 17)

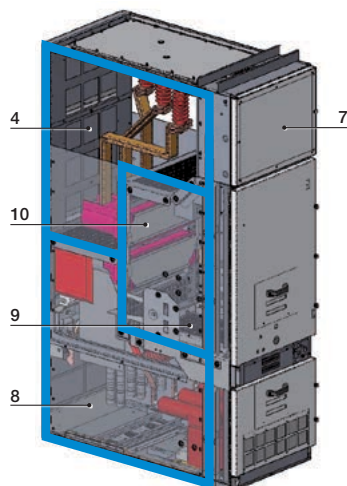
LSC2A



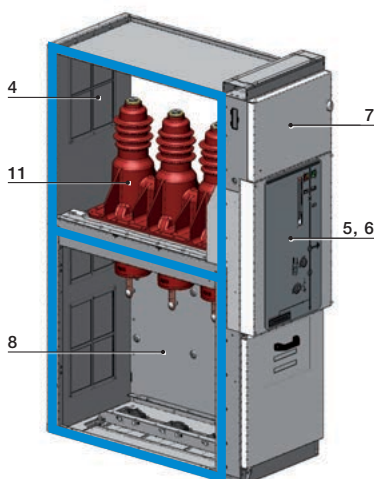
LSC2A



LSC2B



LSC2A



- 1 – Switch-disconnector
- 2 – Fuses
- 3 – Circuit-breaker
- 4 – Busbar compartment
- 5 – Mechanism compartment
- 6 – Circuit-breaker operating mechanism
- 7 – LV compartment for auxiliary circuits
- 8 – Cable compartment
- 9 – Apparatus compartment
- 10 – Metallic shutters for panels up to 17.5 kV and insulating shutters up to 24 kV
- 11 – Multi functional apparatus

# Main components

## GSec gas switch-disconnectors

GSec is a 3-position switch-disconnector (Line-Open-Earth). The GSec switch-disconnector actuator has separate lever couplings for the isolation and earthing operations.

GSec uses two different types of actuators:

- 1S - Single Spring. This can be operated by lever and by motor
- 2S - Double Spring. This can be operated by motor, by means of pushbuttons or shunt opening and closing releases and undervoltage release.



## Circuit-breakers

The UniSec panels can be fitted with circuit-breakers with lateral or front operating mechanism.

### VD4/R and HD4/R series of removable circuit-breakers with lateral operating mechanism

The UniSec panels classified LSC2A-PM are fitted with vacuum or gas circuit-breakers with lateral operating mechanism. They can be integrated with protection relays and current sensors and, if fitted with suitable electrical accessories, can be remotely controlled.

VD4/R-SEC



HD4/R-SEC



# Main components

## Multi-function apparatus with integrated vacuum circuit-breaker and gas-insulated disconnector HySec

The HBC panel is classified LSC2A-PM and it is fitted with multi-function apparatus HySec integrates both vacuum circuit-breaker and 3-positions gas-insulated disconnector (line-open-earth).

The operating mechanisms of the circuit-breaker and disconnector are mechanically interlocked, so that the disconnector can only be operated when the circuit-breaker contacts are in open position.

The HySec can be fitted with electrical accessories for remote control.

HySec



## Vmax and VD4 series of withdrawable vacuum circuit-breakers

The UniSec panels classified LSC2B-PM/PI can be fitted with withdrawable vacuum circuit-breakers with front operating mechanism. They differ from the removable circuit-breaker

version as they have a compartment containing the circuit-breaker complete with primary circuit segregation shutters. The Vmax series for 12-17.5 kV and VD4 series for 24 kV of circuit-breakers can be fitted with electrical accessories for remote control.

Vmax/Sec



VD4/Sec





#### VSC/P series of withdrawable vacuum contactors

The UniSec panels classified LSC2B-PM can be fitted with vacuum contactors with front operating mechanism and with protection fuses. The containment compartment is segregated and fitted with shutters.

VSC/P vacuum contactors are available with two operating command versions:

- SCO (Single Command Operated) opening and closing operations by means of auxiliary voltage and by simulating the behaviour of electrical latching
- DCO (Double Command Operated) opening and closing operations by impulse and by simulating the behaviour of mechanical latching.

VSC/P contactors are suitable for operating users such as motors, transformers and capacitor banks.

VSC/P



#### HD4 series of withdrawable gas circuit-breakers

The UniSec panels classified LSC2B-PM/PI can be also fitted with withdrawable gas circuit-breakers up to 24 kV with front operating mechanism. It differs from the removable circuit-breaker version as it has a compartment containing the circuit-breaker complete with primary circuit segregation shutters. The HD4 series can be fitted with electrical accessories for remote control.

HD4/Sec



# Main components

## Protection relays

ABB offers a complete series of protection and control products ranging from the simplest protection devices to advanced protection, monitoring and control solutions. The modern protection and control IEDs comply with the requirements of the new international IEC 61850 Standard for substation communication and distribution automation.

### REF601

REF601 is a digital feeder protection relay, designed for protection and control of utility and industrial power systems. The relay guarantees basic short-circuit, overcurrent and earth fault protection in networks with the neutral earthed directly, earthed by means of a resistance and in those with isolated neutral. The phase currents are measured by Rogowski coil type current sensors and earth-fault current can be internally calculated or measured with conventional current transformers.

The REF601 relay can be mounted on-board the VD4/R-Sec and HD4/R-Sec circuit-breaker or in the auxiliary contact compartment.

Two types of relay are available:

- REF601 according to the IEC standard
- REF601 according to the CEI 0-16 standard for the Italian market.

## Warning!

REF601 cannot be used for protecting systems characterized by the presence of high harmonic currents. For further information, please contact ABB.

### RE- 610 Series

The 610 series includes IEDs for line protection, motor protection and voltage monitoring of systems in general. The plug-in design of the 610 series facilitates switchgear commissioning and allows fast and safe insertion and withdrawal of the IED “plug-in” units.

The 610 series numerical feeder protection IEDs support a wide range of communication protocols, including IEC 61850, IEC 60870-5-103, Modbus and Profibus.

- REF610 is a protection relay mainly designed for protection of incoming and outgoing feeders in MV distribution substations. REF610 can also be used as back-up protection for motors, transformers and generators, in industrial as well as in utility applications. The integrated protection functions, including three-threshold overcurrent protection and a two-threshold non-directional earth-fault, make REF610 relay a valid protection system against overcurrent and earth faults.
- REM610 is an IED for protection, measurement and monitoring of medium-sized and large asynchronous LV motors and small and medium-sized HV asynchronous motors in the manufacturing and process industry. The REM610 is also used for protection of cable feeders and distribution transformers, providing the benefits of thermal overload protection as well as phase overcurrent, earth-fault and phase unbalance protection.
- REU610 is designed for distribution substation busbar overvoltage and undervoltage protection, feeder and power transformer overvoltage protection, motor undervoltage protection, and capacitor bank protection and monitoring. In power systems with isolated neutral, it is also used for non-discriminative earth-fault protection based on residual voltage measurement.

REF601



REF610



### RE- 615 Series

Fitted with the latest protection technology and complying with the IEC 61850 Standard for substation communication, the ABB 615 series of protection and control IEDs are the ideal choice for the protection and control of distribution substations. Strict implementation of the IEC 61850 substation communication Standard in the 615 series IEDs covers both vertical and horizontal communication, including GOOSE messaging and parameter setting according to the IEC 61850-8-1 Standard.

- REF615 provides general protection for overhead lines, cable feeders and distribution substation busbar systems. It can be adapted for both isolated neutral networks and networks with the neutral earthed by means of resistance or impedance.
- REM615 is a dedicated motor protection and control IED, perfectly aligned for protection, control, measurement and monitoring of asynchronous motors in the manufacturing and process industry.
- RET615 is a dedicated IED for protection and control of transformers designed for power transformers, unit and step-up transformers including power generator-transformer blocks in utility and industrial power distribution systems.
- RED615 is a line residual current IED which can, in particular, be used for applications requiring highly selective feeder protection (unit protection).

RED615 maintains selectivity even in cases where the fault current has a variable magnitude and can be fed from several sources. This usually occurs in closed loop, ring and meshed networks. In addition to protection, all 615 series IEDs offer the functionality needed for local and remote control of a circuit-breaker.

- REU615 is an IED available in two predefined configurations called A and B, destined for two of the most common applications. Configuration A is preset for protections based on voltage and frequency for applications in industrial and utility power systems, including distributed power generation networks. Configuration B is preset for automatic voltage adjustment functions for transformers fitted with an on load tap changer. Configurations A and B also allow circuit-breaker control with measurement and supervision functions.

Apart from protection, all the 615 series of IEDs offer the functionality required for local and remote circuit-breaker control.

### COM600 for high-end secondary distribution applications

COM600, the substation automation system, includes a communication gateway, an automation platform and a user interface for distribution substations at industrial and utility level. The gateway functionality guarantees seamless IEC 61850 connectivity between the substation IEDs and the control and management systems at network level. The automation platform with logic processor makes COM600 a flexible implementation platform for substation-level automation tasks. As a user interface, COM600 incorporates web technology based functionalities, ensuring access to the substation devices and processes via a human machine interface (HMI) based on the web browser. COM600 is only available on request.

REF615



COM600



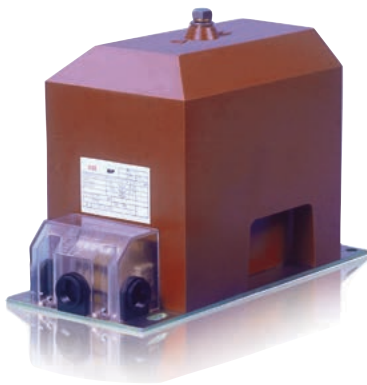
# Main components

## Transformers and sensors

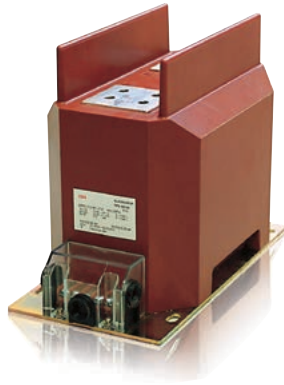
### Conventional instrument transformers

Conventional instrument transformer technology is well-known and extensively used in various applications. The design is appropriate for providing protection of metering systems against overcurrents, overvoltages or any other fault conditions in the network that need to be analyzed and processed. The current and voltage transformers for UniSec comply with the IEC 61869-2 and IEC 61869-3 standards. The dimensions are in accordance with the DIN 42600 standard.

Voltage transformer



Current transformer



### Current and voltage sensors

The functionality of sensors is similar to that of conventional instrument transformers, but based on a higher level of standardization. The use of sensor technology can reduce environmental impact as well as optimising the safety and reliability of the application. Numerous sensor applications allowing combinations with different protection relays are available.

Current sensors



### Combined current and voltage sensors

Combisensors combine a current sensor (Rogowski coil) and a voltage sensor (resistive divider). Their characteristics and dimensions comply with the IEC and DIN Standards.

Combined current and voltage sensors



### Ring-type transformers with low voltage insulation

Ring-type transformers with low voltage insulation are a possible alternative to conventional transformers, especially in applications with purely functional requirements.

Ring-type current transformer with low voltage insulation



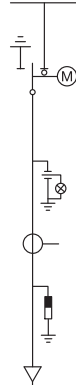
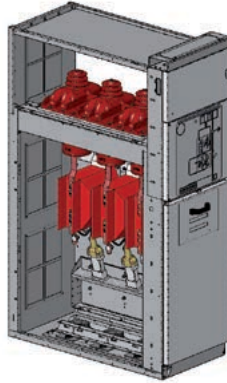


# Typical units

## SDC Unit with switch-disconnector

### Width

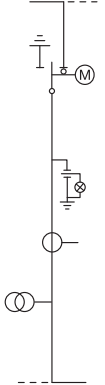
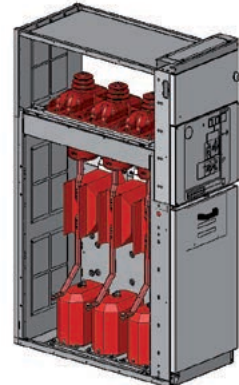
375 - 500 - 750 mm



## SDS Unit with switch-disconnector – isolation

### Width

375 - 500 mm



### Electrical characteristics

Un / kV	Ir / A	Ik / kA
12	630/800	12.5/16 <sup>(1)</sup> /20 <sup>(2)</sup> /25 <sup>(3)</sup> (3s)
17.5	630/800	12.5/16 <sup>(1)</sup> /20 <sup>(2)</sup> (3s)
24	630	12.5/16 <sup>(1)</sup> /20 <sup>(2)</sup> (3s)

<sup>(1)</sup> 630 A, 16 kA 3s for double spring operating mechanism

<sup>(2)</sup> Contact ABB for 21 kA

<sup>(3)</sup> 25 kA (2s)

### Electrical characteristics

Un / kV	Ir / A	Ik / kA
12	630/800	12.5/16 <sup>(1)</sup> /20 <sup>(2)</sup> /25 <sup>(3)</sup> (3s)
17.5	630/800	12.5/16 <sup>(1)</sup> /20 <sup>(2)</sup> (3s)
24	630	12.5/16 <sup>(1)</sup> /20 <sup>(2)</sup> (3s)

<sup>(1)</sup> 630 A, 16 kA 3s for double spring operating mechanism

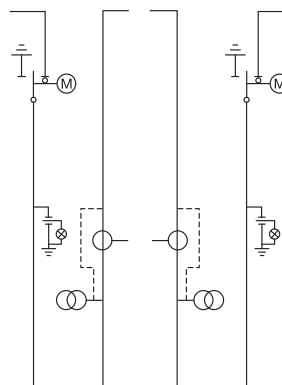
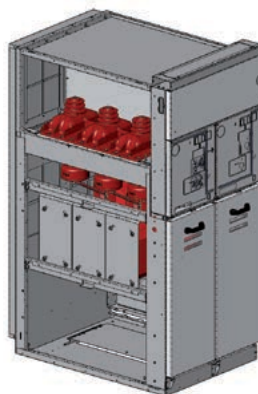
<sup>(2)</sup> Contact ABB for 21 kA

<sup>(3)</sup> 25 kA (2s)

## SDM Isolating unit with measurement with switch-disconnector

### Width

750 mm



### Electrical characteristics

Un / kV	Ir / A	Ik / kA
12	630/800	12.5/16/20 <sup>(1)</sup> /25 <sup>(2)</sup> (3s)
17.5	630/800	12.5/16/20 <sup>(1)</sup> (3s)
24	630	12.5/16/20 <sup>(1)</sup> (3s)

<sup>(1)</sup> Contact ABB for 21 kA

<sup>(2)</sup> 25 kA (2s)

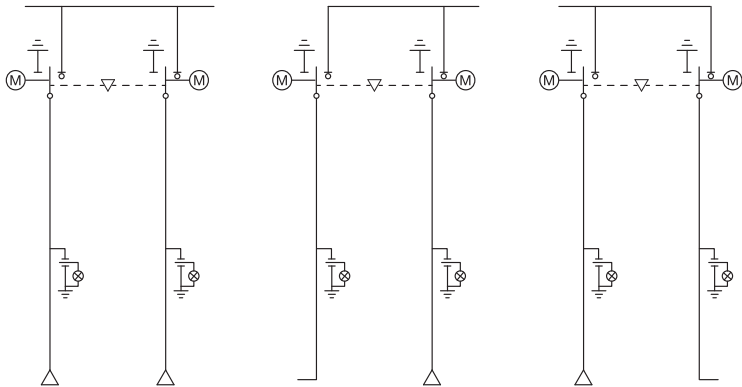
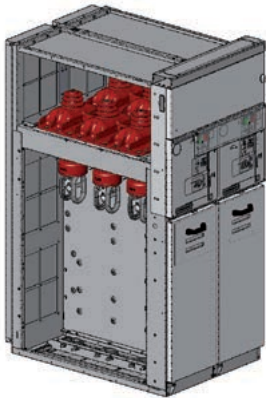
# Typical units

## SDD

Unit with double switch-disconnector

Width

750 mm



### Electrical characteristics

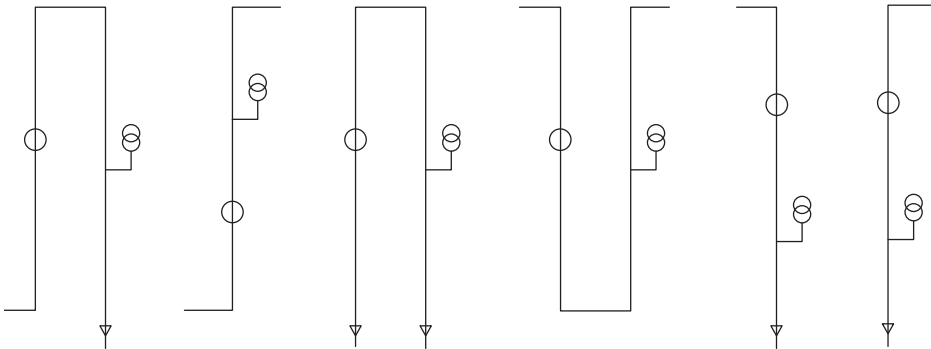
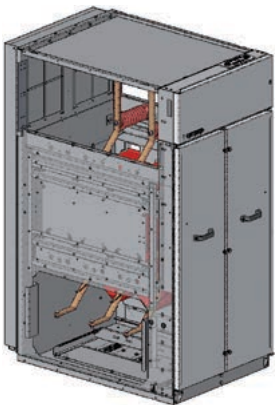
Un / kV	Ir / A	Ik / kA
12	630	12.5/16 (3s)
17.5	630	12.5/16 (3s)
24	630	12.5/16 (3s)

## UMP

Universal Metering Unit

Width

750 mm



### Electrical characteristics

Un / kV	Ir / A	Ik / kA
12	630/800	12.5/16/20 <sup>(1)</sup> /25 <sup>(2)</sup> (3s)
17.5	630/800	12.5/16/20 <sup>(1)</sup> (3s)
24	630	12.5/16/20 <sup>(1)</sup> (3s)

<sup>(1)</sup> Contact ABB for 21 kA

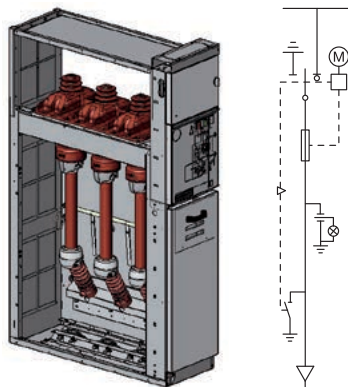
<sup>(2)</sup> 25 kA (2s)

## SFC

### Switch-disconnector with fuses

#### Width

375 - 500 - 750 mm



#### Electrical characteristics

Un / kV	Ik / kA	IkAp / kAp <sup>(1)</sup>	Fuses / A
12	12.5/16/20 <sup>(1)</sup> /25 <sup>(2)</sup> (3s)	5	125
17.5	12.5/16/20 <sup>(1)</sup> (3s)	5	80
24	12.5/16/20 <sup>(1)</sup> (3s)	5	80

<sup>(1)</sup> Making capacity of the earthing switch downstream EF 230 (Ik = 2 kA)

<sup>(1)</sup> Contact ABB for 21 kA

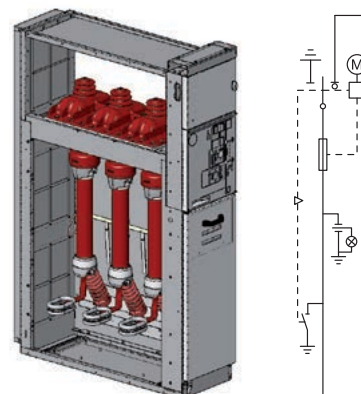
<sup>(2)</sup> 25 kA (2s)

## SFS

### Switch-disconnector with fuses – isolation

#### Width

375 - 500 mm



#### Electrical characteristics

Un / kV	Ik / kA	IkAp / kAp <sup>(1)</sup>	Fuses / A
12	12.5/16/20 <sup>(1)</sup> /25 <sup>(2)</sup> (3s)	5	125
17.5	12.5/16/20 <sup>(1)</sup> (3s)	5	80
24	12.5/16/20 <sup>(1)</sup> (3s)	5	80

<sup>(1)</sup> Making capacity of the earthing switch downstream EF 230 (Ik = 2 kA)

<sup>(1)</sup> Contact ABB for 21 kA

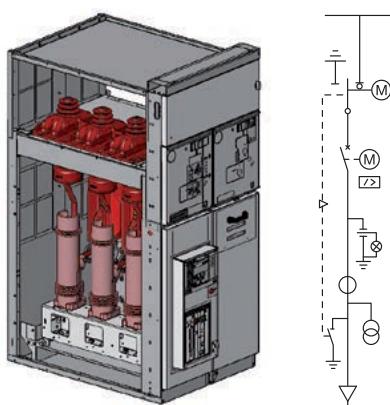
<sup>(2)</sup> 25 kA (2s)

## SBC

### Circuit-breaker with switch-disconnector

#### Width

750 mm



#### Electrical characteristics

Un / kV	Ir / A	Ik / kA	IkAp / kAp <sup>(1)</sup>
12	630/800	12.5/16/20 <sup>(1)</sup> /25 <sup>(2)</sup> (3s)	31.5/40/50 <sup>(1)</sup> /63
17.5	630/800	12.5/16/20 <sup>(1)</sup> (3s)	31.5/40/50 <sup>(1)</sup>
24	630	12.5/16/20 <sup>(1)</sup> (3s)	31.5/40/50 <sup>(1)</sup>

<sup>(1)</sup> Making capacity of the earthing switch downstream EF 230

<sup>(1)</sup> Contact ABB for 21 kA

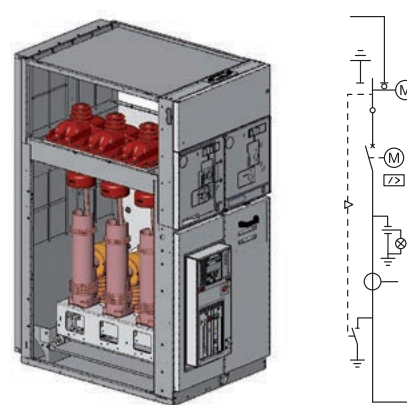
<sup>(2)</sup> 25 kA (2s)

## SBS

### Circuit-breaker with switch-disconnector – isolation

#### Width

750 mm



#### Electrical characteristics

Un / kV	Ir / A	Ik / kA	IkAp / kAp <sup>(1)</sup>
12	630/800	12.5/16/20 <sup>(1)</sup> /25 <sup>(2)</sup> (3s)	31.5/40/50 <sup>(1)</sup> /63
17.5	630/800	12.5/16/20 <sup>(1)</sup> (3s)	31.5/40/50 <sup>(1)</sup>
24	630	12.5/16/20 <sup>(1)</sup> (3s)	31.5/40/50 <sup>(1)</sup>

<sup>(1)</sup> Making capacity of the earthing switch downstream EF 230

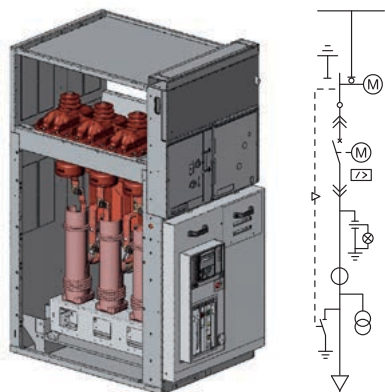
<sup>(1)</sup> Contact ABB for 21 kA

<sup>(2)</sup> 25 kA (2s)

# Typical units

## SBC-W Circuit-breaker- Withdrawable with switch-disconnector

Width  
750 mm



### Electrical characteristics

Un / kV	Ir / A	Ik / kA	IkAp / kAp <sup>(1)</sup>
12	630	12.5/16/20 <sup>(1)</sup> /25 <sup>(2)</sup> (3s)	31.5/40/50 <sup>(1)</sup> /63
17.5	630	12.5/16/20 <sup>(1)</sup> (3s)	31.5/40/50 <sup>(1)</sup>
24	630	12.5/16/20 <sup>(1)</sup> (3s)	31.5/40/50 <sup>(1)</sup>

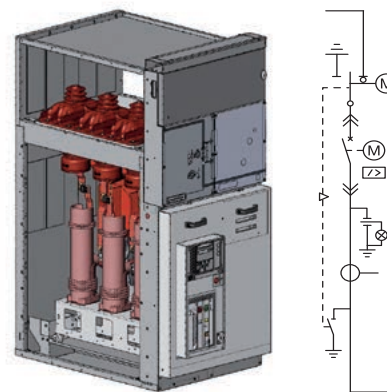
<sup>(1)</sup> Making capacity of the earthing switch downstream EF 230

<sup>(1)</sup> Contact ABB for 21 kA

<sup>(2)</sup> 25 kA (2s)

## SBS-W Circuit-breaker- Withdrawable with switch-disconnector – isolation

Width  
750 mm



### Electrical characteristics

Un / kV	Ir / A	Ik / kA	IkAp / kAp <sup>(1)</sup>
12	630	12.5/16/20 <sup>(1)</sup> /25 <sup>(2)</sup> (3s)	31.5/40/50 <sup>(1)</sup> /63
17.5	630	12.5/16/20 <sup>(1)</sup> (3s)	31.5/40/50 <sup>(1)</sup>
24	630	12.5/16/20 <sup>(1)</sup> (3s)	31.5/40/50 <sup>(1)</sup>

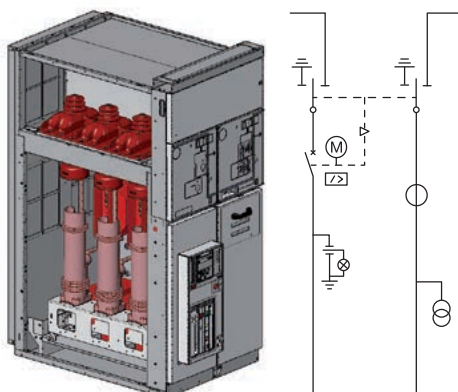
<sup>(1)</sup> Making capacity of the earthing switch downstream EF 230

<sup>(1)</sup> Contact ABB for 21 kA

<sup>(2)</sup> 25 kA (2s)

## SBM Isolating unit with measure- ments, circuit- breaker and double switch- disconnecter

Width  
750 mm



### Electrical characteristics

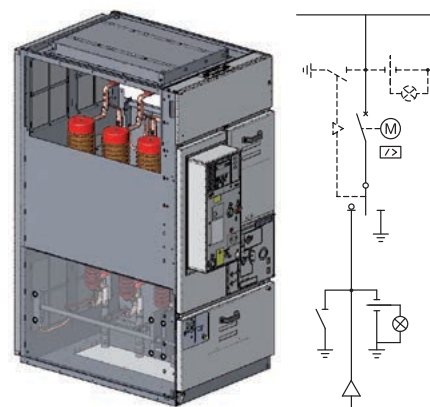
Un / kV	Ir / A	Ik / kA
12	630/800	12.5/16/20 <sup>(1)</sup> /25 <sup>(2)</sup> (3s)
17.5	630/800	12.5/16/20 <sup>(1)</sup> (3s)
24	630	12.5/16/20 <sup>(1)</sup> (3s)

<sup>(1)</sup> Contact ABB for 21 kA

<sup>(2)</sup> 25 kA (2s)

## SBR Reversed circuit-breaker unit

Width  
750 mm



### Electrical characteristics

Un / kV	Ir / A	Ik / kA	IkAp / kAp <sup>(1)</sup>	IkAp / kAp <sup>(2)</sup>
12	630	12.5/16 (1s)	31.5/40	5
17.5	630	12.5/16 (1s)	31.5/40	5
24	630	12.5/16 (1s)	31.5/40	5

<sup>(1)</sup> Making capacity of the earthing switch upstream ESB230-U

<sup>(2)</sup> Making capacity of the earthing switch downstream ESB230-L

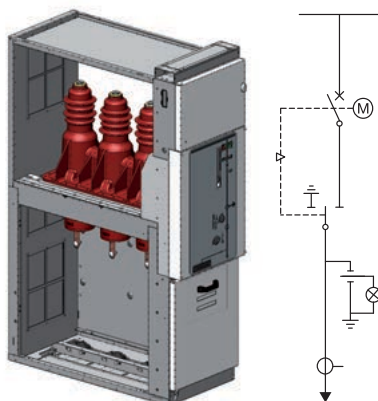


### HBC

Unit with integrated circuit-breaker and disconnector

Width

500 mm

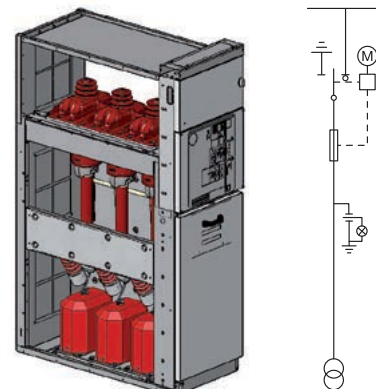


### SFV

Switch-disconnector with fuses – measurement

Width

500 mm



#### Electrical characteristics

Un / kV	Ir / A	Ik / kA
12	630	12.5/16 (1s)
17.5	630	12.5/16 (1s)
24	630	12.5/16 (1s)

#### Electrical characteristics

Un / kV	Ik / kA	Fuses / A
12	12.5/16/20 <sup>(1)</sup> /25 <sup>(2)</sup> (3s)	2 to 6
17.5	12.5/16/20 <sup>(1)</sup> (3s)	2 to 6
24	12.5/16/20 <sup>(1)</sup> (3s)	2 to 6

<sup>(1)</sup> Contact ABB for 21 kA

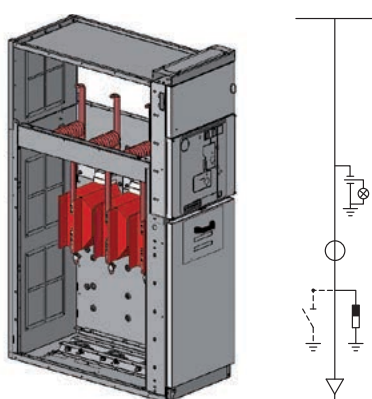
<sup>(2)</sup> 25 kA (2s)

### DRC

Direct incoming unit with measurement and busbar earthing

Width

375 - 500 mm

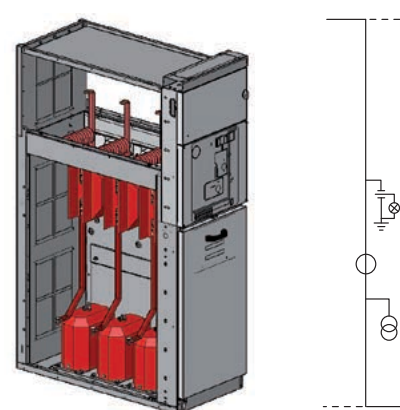


### DRS

Riser unit – measurement

Width

375 - 500 mm



#### Electrical characteristics

Un / kV	Ir / A	Ik / kA	IkAp / kAp <sup>(1)</sup>
12	630/800/1250	12.5/16/20 <sup>(1)</sup> /25 <sup>(2)</sup> (3s)	31,5/40/50 <sup>(1)</sup> /63
17.5	630/800/1250	12.5/16/20 <sup>(1)</sup> (3s)	31,5/40/50 <sup>(1)</sup>
24	630/1250 <sup>(3)</sup>	12.5/16/20 <sup>(1)</sup> (3s)	31,5/40/50 <sup>(1)</sup>

<sup>(1)</sup> Making capacity ES-230 N

<sup>(1)</sup> Contact ABB for 21 kA

<sup>(2)</sup> 25 kA (2s)

<sup>(3)</sup> Only for H = 2000 mm

#### Electrical characteristics

Un / kV	Ir / A	Ik / kA
12	630/800/1250	12.5/16/20 <sup>(2)</sup> /25 <sup>(3)</sup> (3s) <sup>(4)</sup>
17.5	630/800/1250	12.5/16/20 <sup>(2)</sup> (3s) <sup>(4)</sup>
24	630/1250 <sup>(1)</sup>	12.5/16/20 <sup>(2)</sup> (3s) <sup>(4)</sup>

<sup>(1)</sup> Only for H = 2000 mm

<sup>(2)</sup> Contact ABB for 21 kA

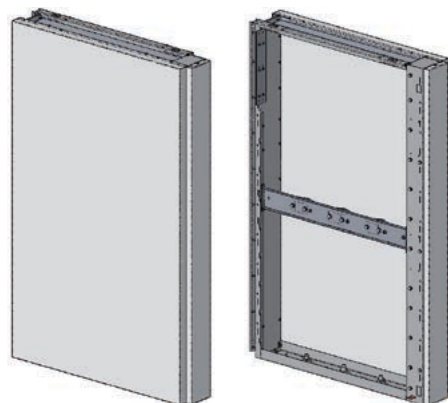
<sup>(3)</sup> 25 kA (2s)

<sup>(4)</sup> 25 kA, 3s DRS coupled to WBC/WBS

# Typical units

## RLC/RRC Lateral, left and right-hand cable riser

Width  
190 mm



RLC

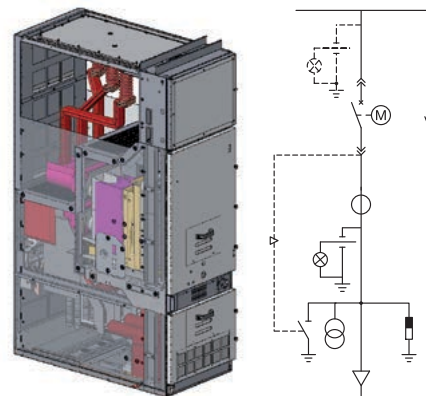
RRC

### Electrical characteristics

Un / kV	Ir / A	Ik / kA
12	630	12/16 (1s)
17.5	630	12/16 (1s)
24	630	12/16 (1s)

## WBC Withdrawable frontal breaker unit

Width  
600 - 750 mm



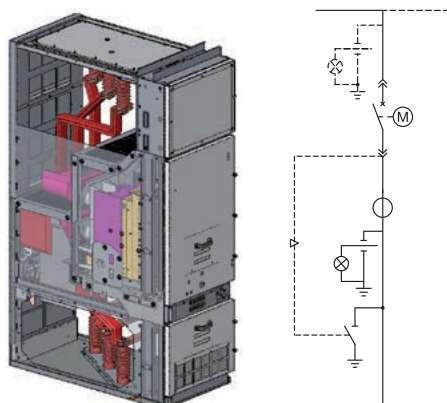
### Electrical characteristics

Un / kV	Ir / A	Ik / kA	IkAp / kAp <sup>(1)</sup>
12	400 <sup>(1)</sup> /630/1250	16/20 <sup>(2)</sup> /25 (3s)	40/50 <sup>(2)</sup> /63
17.5	630/1250	16/20 <sup>(2)</sup> /25 (3s)	40/50 <sup>(2)</sup> /63
24	630/1250	16/20 <sup>(2)</sup>	40/50 <sup>(2)</sup>

<sup>(1)</sup> Making capacity ESWB-150  
<sup>(1)</sup> Solution with VSC/P contactor  
<sup>(2)</sup> Contact ABB for 21 kA

## WBS Withdrawable frontal breaker unit

Width  
600 - 750 mm



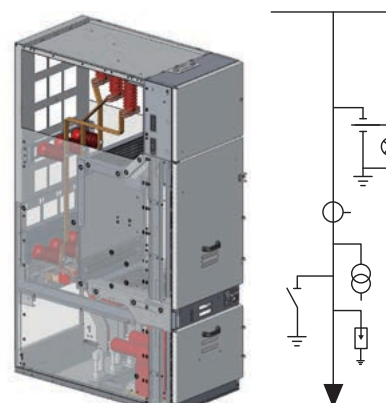
### Electrical characteristics

Un / kV	Ir / A	Ik / kA	IkAp / kAp <sup>(1)</sup>
12	630/1250	16/20 <sup>(1)</sup> /25 (3s)	40/50 <sup>(1)</sup> /63
17.5	630/1250	16/20 <sup>(1)</sup> /25 (3s)	40/50 <sup>(1)</sup> /63
24	630/1250	16/20 <sup>(1)</sup>	40/50 <sup>(1)</sup>

<sup>(1)</sup> Making capacity ESWB-150  
<sup>(1)</sup> Contact ABB for 21 kA

## BME Busbar measuring and earthing unit

Width  
600 mm



### Electrical characteristics

Un / kV	Ik / kA	IkAp / kAp <sup>(1)</sup>
12	16/20 <sup>(1)</sup> /25 (3s)	40/50 <sup>(1)</sup> /63
17.5	16/20 <sup>(1)</sup> /25 (3s)	40/50 <sup>(1)</sup> /63

<sup>(1)</sup> Making capacity ESWB-150  
<sup>(1)</sup> Contact ABB for 21 kA

# Coupling to panels with withdrawable frontal breaker unit and switch-disconnector (GSec)

The different design of the panels WBC/WBS/BME and the different height of busbars not allowed direct coupling with the panels with switch-disconnector and/or removable circuit breaker both H = 1700 mm and H = 2000 mm. Adapter panels have been created for this type of compartment so as to allow the busbars to be connected.

The height of the adapter panel is 2000 mm.

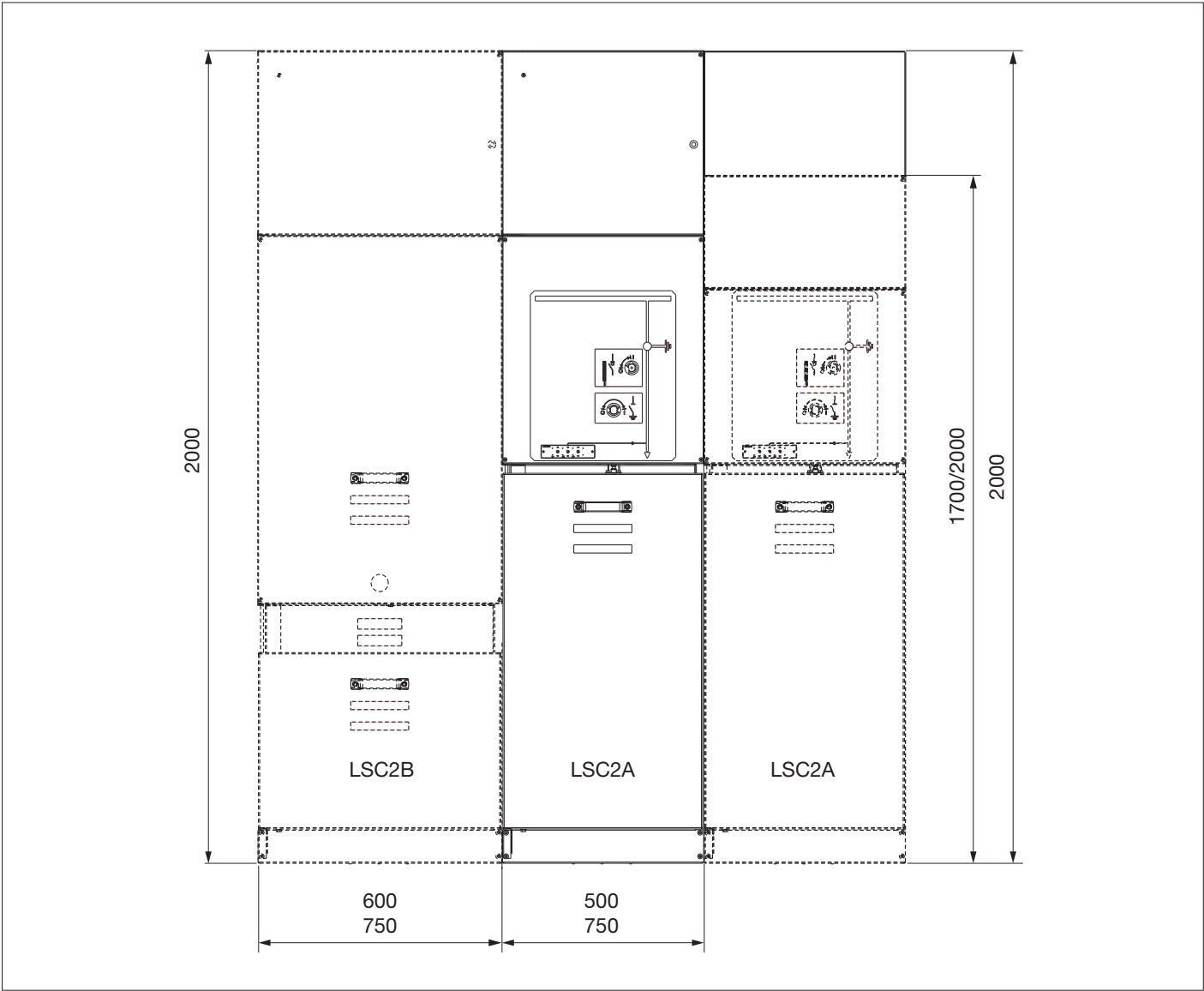
The adapter panel keeps all the characteristics of a standard panel and can therefore be used as an incoming/outgoing unit.

The available adapter panels are:

Unit	Width (mm)	Weight <sup>(1)</sup> (kg)
SDC	500	220
SFC	500	225
SFV	500	225
SBC <sup>(1)</sup>	750	380
DRC	500	145
DRS	500	150
SDS	500	185

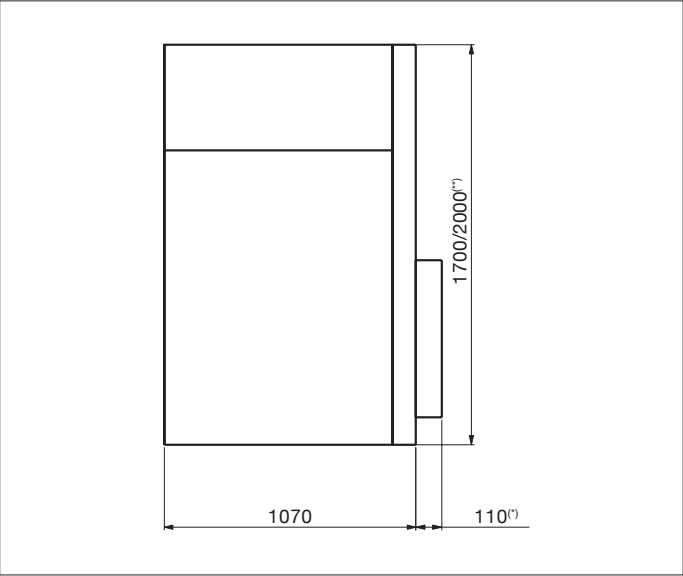
<sup>(1)</sup> Estimated weight, considering the base unit with 630 A busbars, without TA, TV and fuses

<sup>(1)</sup> Can be coupled only on the left side of WBC/WBS/BME units with withdrawable circuit-breakers



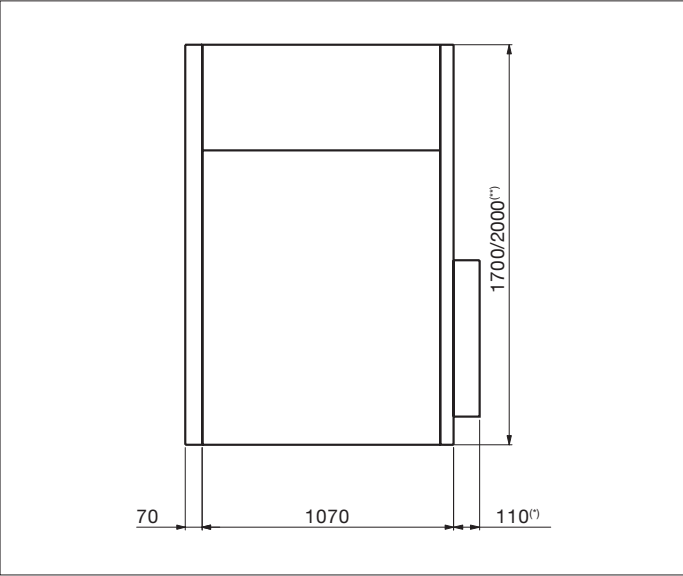
# Dimensional drawings

Side view IAC A-F 16 kA Base solution and IAC A-FL 12.5 kA (solution completely against the wall)



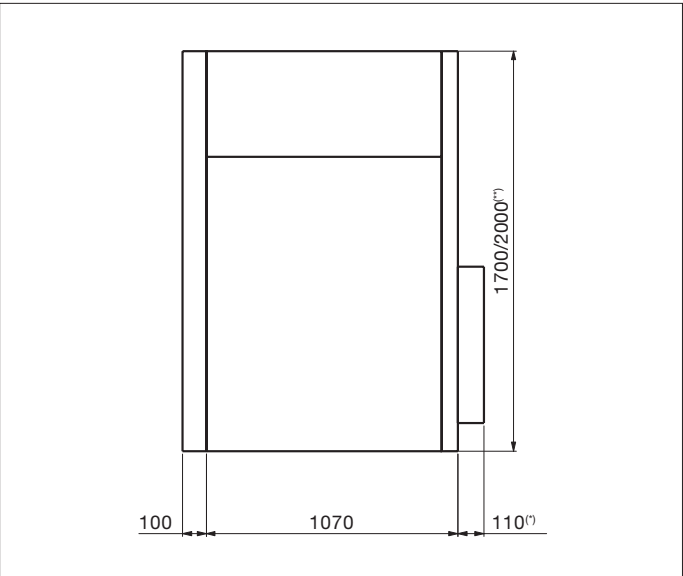
<sup>(\*)</sup> For panels with removable circuit-breakers  
<sup>(\*\*)</sup> Not available for panels SBR and UMP

Side view IAC A-FL 12.5 kA, with filters



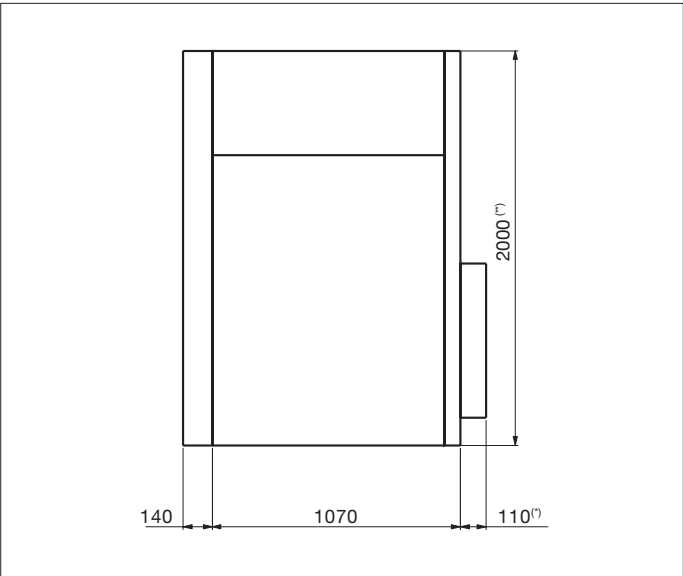
<sup>(\*)</sup> For panels with removable circuit-breakers  
<sup>(\*\*)</sup> Not available for panels SBR and UMP

Side view IAC A-FLR 16 kA, with filters



<sup>(\*)</sup> For panels with removable circuit-breakers  
<sup>(\*\*)</sup> Not available for panels SBR and UMP

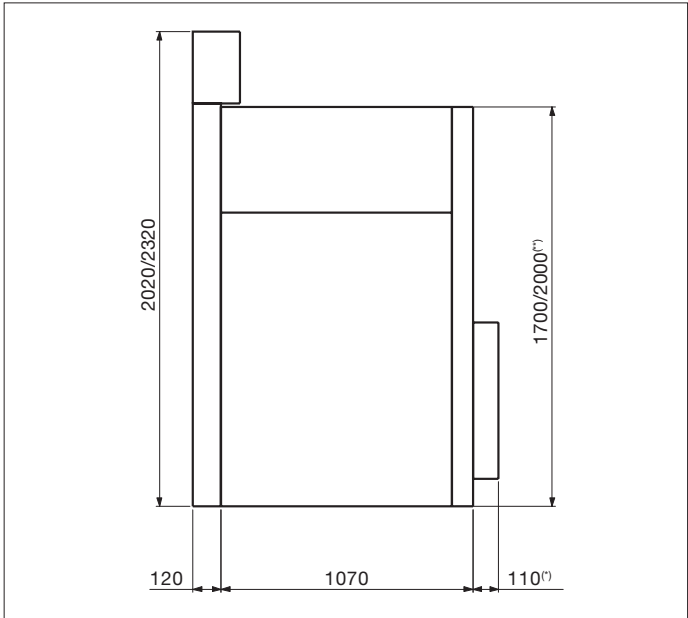
Side view IAC A-FL 21 kA, with filters



<sup>(\*)</sup> For panels with removable circuit-breakers  
<sup>(\*\*)</sup> Not available for panels SBR and UMP

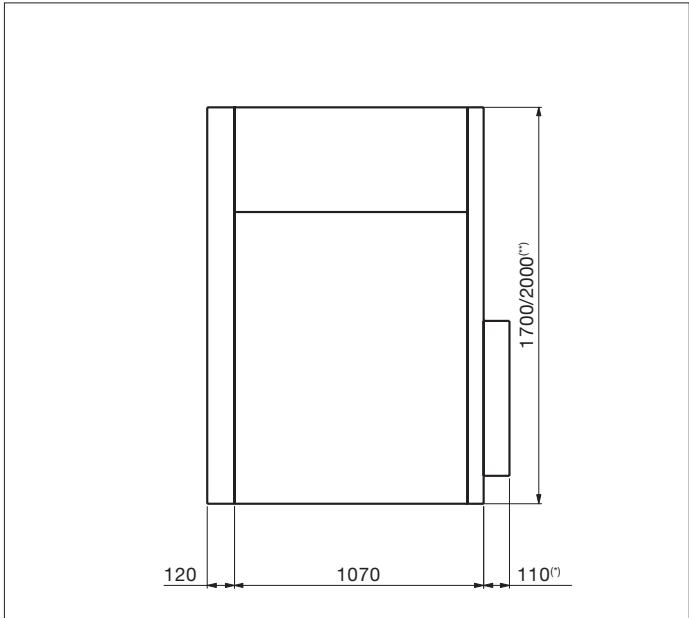


Side view IAC A-FLR 21 and 25<sup>(1)</sup> kA, with duct



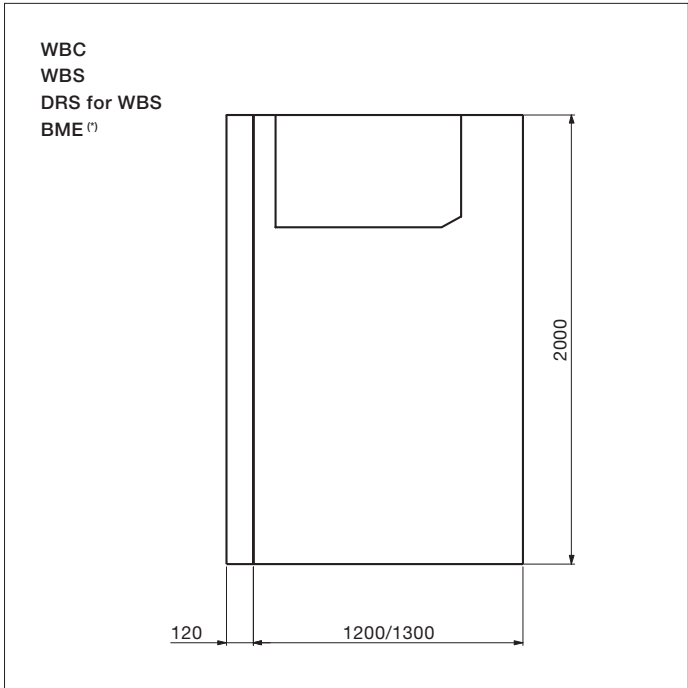
<sup>(1)</sup> For panels with removable circuit-breakers  
<sup>(2)</sup> Not available for panels SBR and UMP  
<sup>(3)</sup> Only for LSC2A units at 12 kV, high 2000 mm and wide 750 mm (except SBC-W, SBS-W, SDD, UMP and SBR unit)

Side view IAC A-FLR 21 kA, with downward gas duct



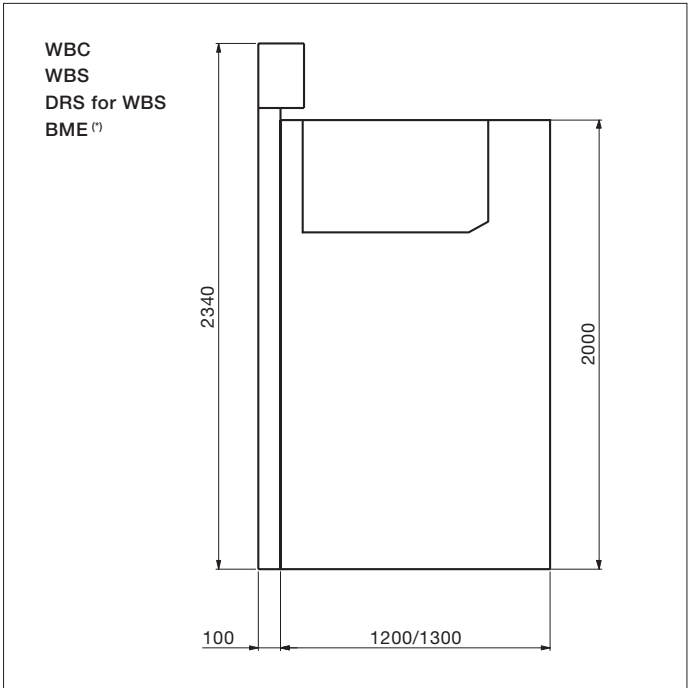
<sup>(1)</sup> For panels with removable and withdrawable circuit-breakers  
<sup>(2)</sup> Not available for panels SBR and UMP

Side view for panels with withdrawable circuit-breakers, IAC A-FLR 25 kA, 1 sec up to 17.5 kV and IAC A-FLR 16 kA, 1s at 24 kV with filters



<sup>(1)</sup> Only 12-17.5 kV

Side view for panels with withdrawable circuit-breakers, IAC A-FLR 25 kA, 1 sec with duct up to 17.5 kV and IAC A-FLR 21 kA, 1s at 24 kV with duct

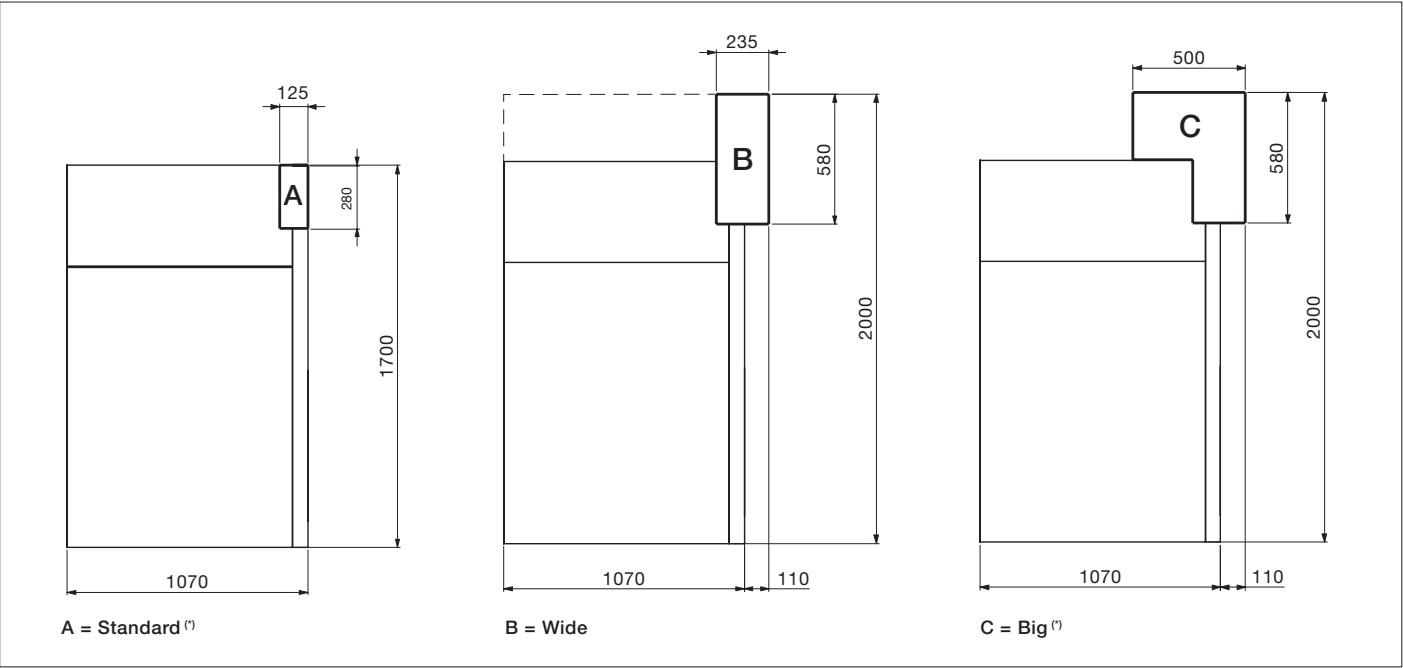


<sup>(1)</sup> Only 12-17.5 kV

# Dimensional drawings

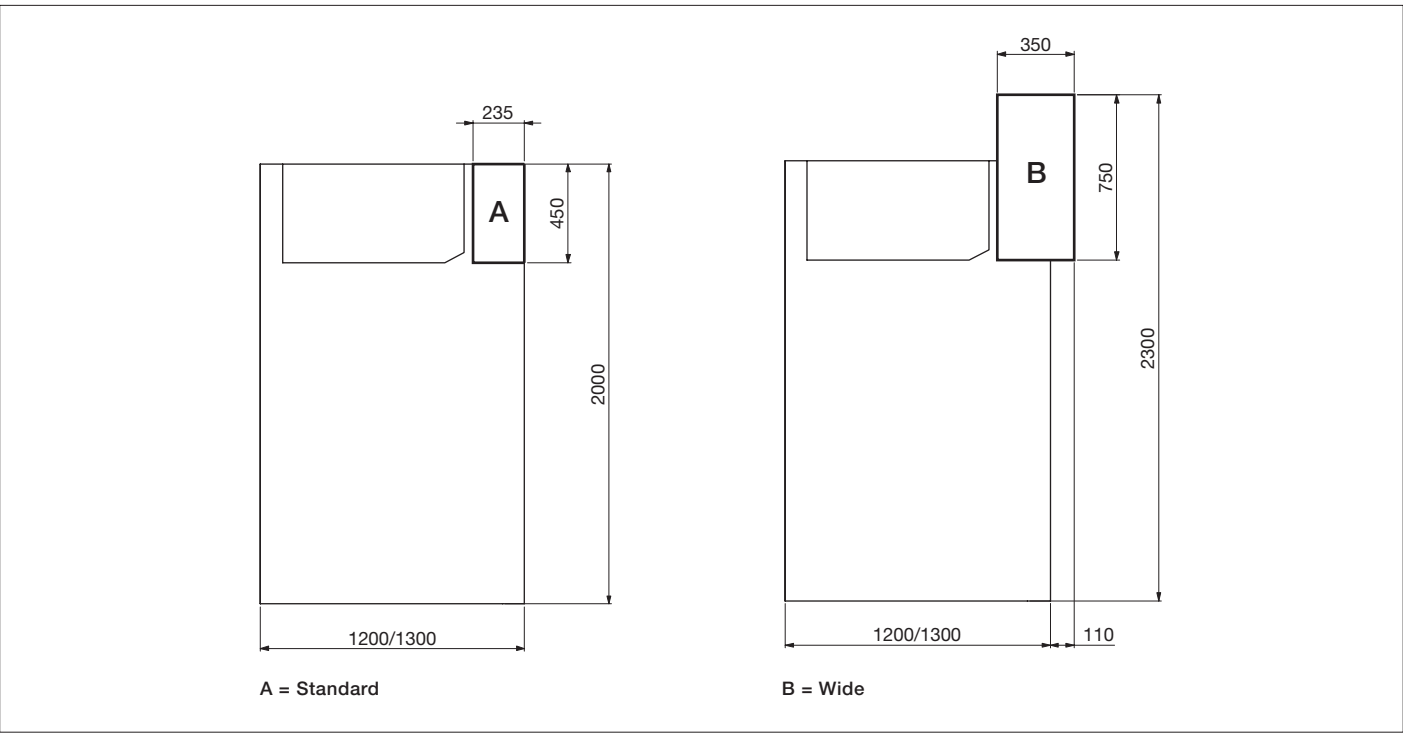
## Low voltage compartments available

### Solutions for panels with GSec



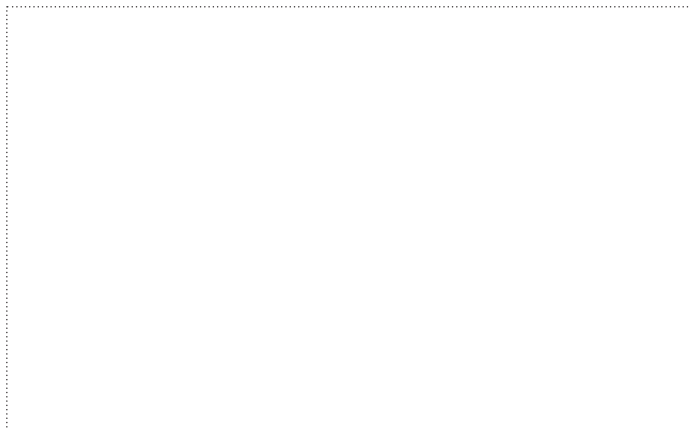
<sup>(\*)</sup> Not available for panels H = 2000 mm

### Solutions for panels with withdrawable circuit-breakers





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