

— MEDIUM VOLTAGE



UNISEC Air 24kV

Air-insulated medium-voltage secondary distribution switchgear up to 24 kV. Compliant with IEC standards and the EU F-gas regulation (EU 2024/573).



INDEX

01 REFERENCE STANDARDS

02 MAIN CHARACTERISTICS

03 INTERNAL ARC WITHSTAND CAPACITY

04 GSEC AIR SWITCH-DISCONNECTOR

05 VACUUM CIRCUIT BREAKERS

06 EARTHING SWITCHES

07 TYPICAL UNITS

08 DIMENSIONAL DRAWINGS

09 WEIGHTS

10 SWITCHGEAR ROOM

REFERENCE STANDARDS

Reference Standards

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

- IEC 62271-1 for general application
- IEC/EN 62271-200 for switchgear. With reference to the classifications established by the standards, UniSec Air switchgear is defined as described below:

- continuity of service classifications: LSC1, LSC2, LSC2A and LSC2B

- classification of the segregations: PI for units with switch disconnector, disconnector and withdrawable circuit breaker at 24kV, PM for units with withdrawable circuit breaker up to 17.5kV

- IEC 62271-100 for alternating-current circuit-breakers
- IEC 62271-102 for alternating current disconnectors and earthing switches
- IEC 62271-103 for alternating current switches
- IEC 62272-105 for switch-fuse combinations
- IEC 62271-106 for alternating current contactors • IEC 60071-2 for insulation co-ordination
- IEC 60529 for the protection classes
- IEC 68169-2 for current transformers
- IEC 68169-3 for voltage transformers
- IEC 68169-10 for low-power passive voltage transformers (not inductive)
- IEC 68169-11 low power passive current transformers (not inductive)
- IEC 62262 for IK07 structure strength



MAIN CHARACTERISTICS



SWITCHGEAR ELECTRICAL CHARACTERISTICS

Rated voltage	kV	12	17.5	24
Test voltage (50 Hz x 1 min)	kV	28	38	50
Impulse withstand voltage	kV	75	95	125
Rated frequency	Hz	50	50	50
Rated main busbar current	A	630/1250	630/1250	630/1250
Rated short time withstand current	kA (3s)	16/20/25	16/20/25	16/20
Peak current	kA	40/50/62.5	40/50/62.5	40/50
Internal arc withstand current (up to IAC AFLR)	kA (1s)	16/20/25	16/20/25	16/20

Note: to have specific ratings for each typical units refer to chapter 4 or to our product configurator

UniSec Air offers the following features:

Air insulation of all live parts

- Dry air insulated switch-disconnector and disconnector
- LSC1, LSC2, LSC2A and LSC2B service continuity classifications, also in the same switchgear
- Removable and withdrawable vacuum circuit-breakers
- Withdrawable vacuum contactor for LSC2B service continuity
- Complete range of functional units and accessories
- Large selection of state-of-the-art protection relays, integrated into removable circuit-breakers or installed in LV compartments for protection, control and measurement functions.

MAIN CHARACTERISTICS

NORMAL SERVICE CONDITIONS

Storage temperature:	-5 °C ... +70 °C
Ambient temperature range:	-5 °C ... +40 °C
Maximum relative humidity without condensation:	95 %
Minimum relative humidity without condensation:	5 %
Altitude:	≤1000 m above sea level

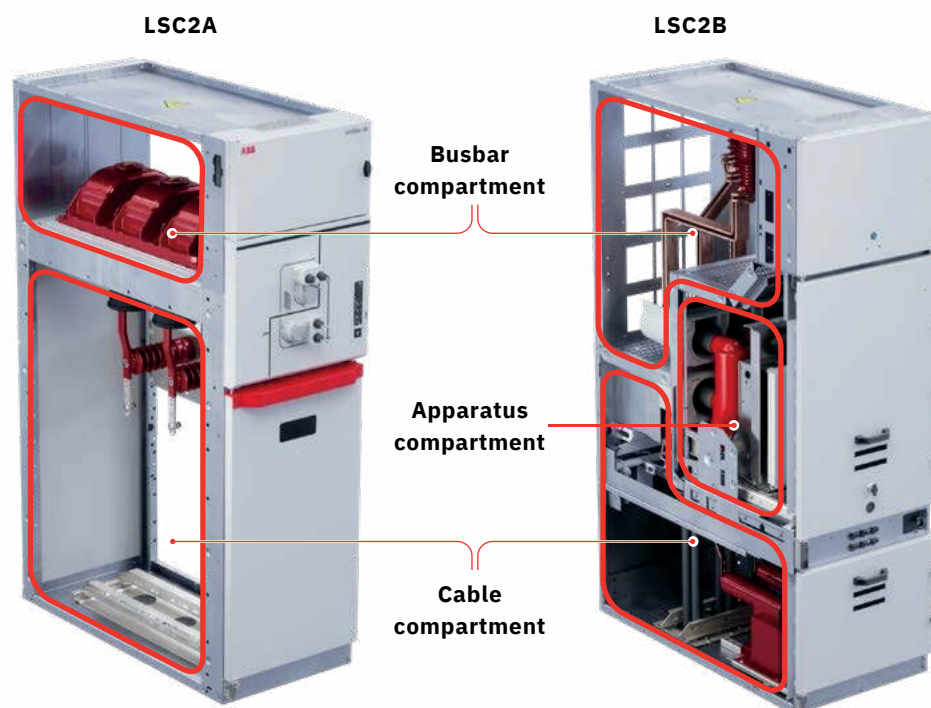
Design concept

Each unit is made entirely of pre-galvanized metal sheets. Each unit consists of specific compartments, which are described in the following sections.

The busbar compartment is situated along the entire length of the switchgear. Each unit has holes for fixing to the floor and is provided with a bottom closure fitted with openings for routing medium voltage cables.

All units fitted with a door have a mechanical interlock which only allows the door to be opened under safe conditions.

There is a metal wiring duct in each unit to segregate the low voltage circuits from the medium voltage circuits.



MAIN CHARACTERISTICS

Compartments

Each unit consists of several power compartments: cable compartment, busbar compartment and apparatus compartment.

The compartments are segregated from each other by means of the switch-disconnector, disconnector, or by means of shutters in the case of withdrawable circuit-breakers.

All the units are fitted with an auxiliary circuit compartment, where all the instruments and wiring are fitted.

All the units are accessible from the front, so maintenance and servicing operations can also be carried out when the switchgear is positioned in the proximity of a wall.

Main busbars

The busbar compartment contains the main busbar system connected to the fixed upper contacts of the switch-disconnector. The main busbars are made of electrolytic copper up to 1250 A. The system consists of flat busbars.

Interlocks

There are two types of safety interlocks in the unit:

- standard, envisaged by the standards and therefore required to guarantee the sequence of operations;
- locks provided on request. Their presence must comply with the established plant service and maintenance procedures.

Earthing busbar

The earthing busbar is made of electrolytic copper. It runs lengthwise right round the switchgear, thereby ensuring maximum safety for the personnel and plant. The section of the earthing busbars is 90mm² for LSC2A and LSC2B units.

MAIN CHARACTERISTICS

Cables

Up to a maximum of 2 single-pole cables can be used per phase, depending on the rated voltage, the dimensions of the unit and the cross section of the cables themselves.

Three-pole cables must be split under the floor so that they can be mounted on each phase.

The back side of the switchgear can be positioned in the proximity of the wall of the station since the cables can be easily accessed from the front and lateral sides during installation.

LV compartment for auxiliary circuits

All the units include an LV compartment in which the low voltage components, protection equipment, measuring, remote control and data transmission devices can be installed.

Different types of LV compartments can be selected for each panel, based on space, customization and engineering requirements.

Surface treatment

UniSec Air units are made of pre-galvanized sheet metal. The door for medium voltage compartment on the front of the panels are painted in grey RAL 7035 with gloss finish.

Protection classes

The protection classes of the switchgear comply with IEC 60529 standards.

UniSec Air switchgear is generally supplied with the following standard protection classes:

- IP 3X for enclosure (excluding operating seat)
- IP 2X for partition between compartments.

Optional for LSC2B units:

- IP 31 for enclosure and mechanical operating equipment
- IP 32 for enclosure and mechanical operating equipment
- IP 4X for enclosure and mechanical operating equipment
- IP 41 for enclosure and mechanical operating equipment
- IP 42 for enclosure and mechanical operating equipment.

MAIN CHARACTERISTICS

Units with switch-disconnector or disconnector

High electrical characteristics

Different types of units are available for every kind of purpose, from direct incoming panels to cable switches, protection panels and measuring panels. Our LSC2A units are available with the following electrical characteristics:

- nominal current up to 630A short circuit current up to 20kA for 3s
- nominal current up to 630A and short circuit current up to 25kA for 2s for SBC unit
- internal arc withstand capability up to 20kA for 1s with absorbent gas filters and duct.

Switch-disconnector and disconnector

The two compartments of an LSC2, LSC2A units are formed by GSec Air three position dry air- insulated switch-disconnector or disconnector.

The segregation between compartments is classified PI - Insulated Partition, according to Standard IEC 62271-200.

Earthing switch

Each incoming/outgoing unit can be equipped with an earthing switch for earthing the cables.

The same device can be used for earthing the busbar system. The earthing switch has short-circuit making capacity (with the exception of units with fuses). The earthing switch is operated from the front of the switchgear.

The position of the earthing switch can be checked from the front of the switchgear by means of a mechanical indicator.

Cable compartment

The cable compartment contains the terminals for connecting the power cables. The terminals are made of electrolytic copper and have flat busbars for the whole range of currents.



MAIN CHARACTERISTICS

Units with switch-disconnector or disconnector

Key interlocks

The use of key interlocks is very important in creating interlocking logics between units of the same switchgear, or of other medium, low and high voltage switchgear. The logic is created by means of key exchange boxes or by ringed keys.

The closing and the opening operations of line and earthing switch can be locked by means of key interlocks.

Padlocks

The apparatus and cable compartment doors can be locked in the closed position by padlocks. A padlock can be installed on the GSec Air switch-disconnector so as to lock the position on the line side and/or earth side.

The switchgear is pre-engineered for use of 4 to 8mm diameter padlocks.



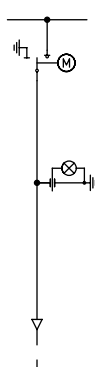
MAIN CHARACTERISTICS

LSC2A/LSC2/LSC1 typical units

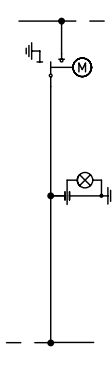
Units with switch-disconnector



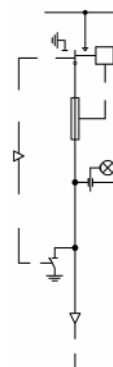
SDC
Incomer/feeder



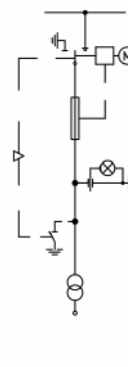
SDS
Bus coupler



SFC
Feeder with fuses



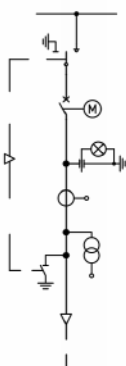
SFV
Busbar voltage
metering



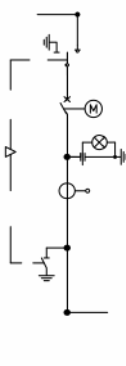
Units with disconnector and circuit breaker



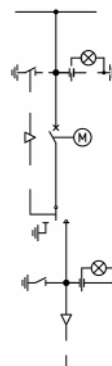
SBC
Incomer/Feeder



SBS
Bus coupler



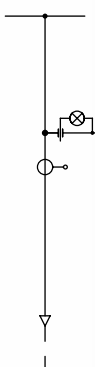
SBR
Reverse Incomer



Direct incomer



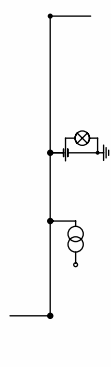
DRC
Direct incomer/feeder



Bus riser



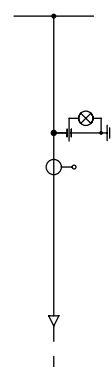
DRS
Bus Riser



Cable Riser

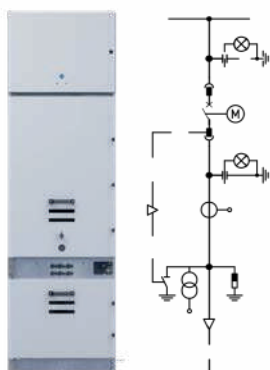


DLR
Cable Riser

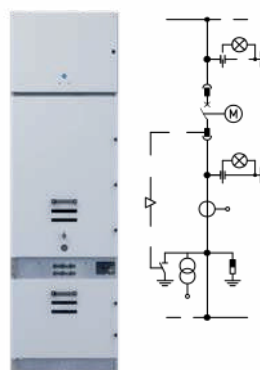


MAIN CHARACTERISTICS

Units with withdrawable circuit breaker

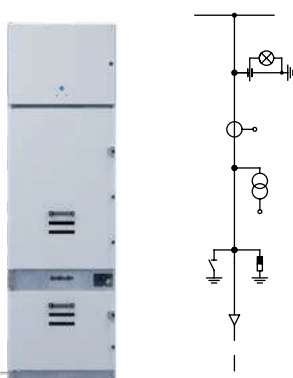


WBC
Incomer/Feeder



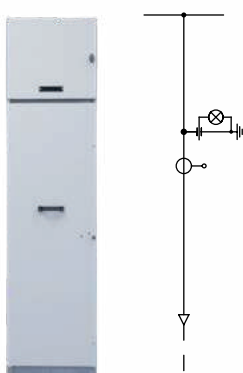
WBS
Bus coupler

Metering panel



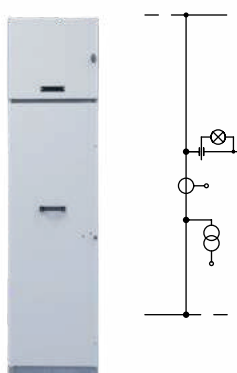
BME
Metering/Direct incomer

Direct incomer



DRC
Incomer/Feeder

Bus riser



DRS
Bus Riser

INTERNAL ARC WITHSTAND CAPACITY

UniSec Air is rigorously developed and tested to guarantee safe conditions.

Internal arc faults are extremely rare occurrences, but can still occur due to human errors, faulty apparatus, insulation worn through age or other exceptional reasons. When UniSec Air switchgear was designed, special attention was paid to ensure personnel safety during internal arc situations. The switchgear features extremely high mechanical strength since it is able to withstand pressure and thermal effects caused by even the highest internal arc currents. Switchgear design also notably reduces the probability of an internal arc occurring in the first place.

Internal arc testing and classification

- Although theoretically an internal arc is a very improbable fault, it can be caused by these various factors:
 - defective insulation owing to deteriorated components. This can be due to adverse environmental conditions and a strongly polluted atmosphere
 - overvoltage of atmospheric origin or caused by the operation of some component or other
 - inadequately trained personnel
 - breakage or tampering with the safety interlocks
 - overheating in the contact zones due to the presence of corrosive substances or loose connections
 - intrusion of small animals into the switchgear (e.g. through the cable input)
 - materials left inside the switchgear during maintenance work.
- The characteristics of UniSec Air switchgear strongly reduce the probability of such faults occurring. However, some cannot be completely prevented.

The energy produced by an internal arc produces the following phenomena:

 - increased internal pressure
 - temperature rise
 - visual and acoustic effects
 - mechanical stress on the switchgear structure melting, decomposition and vaporization of the materials.

Internal arc testing and classification

UniSec Air switchgear has been subjected to internal arc tests according to Standard IEC 62271-200, Annex A.

The test to check that the switchgear protection is able to effectively protect people against internal arcs, is performed by assessing the dynamic pressure and thermal effects.

UniSec Air complies with all the 5 acceptance criteria established by the standard. Internal arc withstand tests have been conducted in the busbar and cable compartments, as well as in the switch-disconnector enclosure. UniSec Air offers various Internal Arc Classified (IAC) solutions.

- Internal arc resistance tests are conducted to

make sure that the panel doors remain closed, that none of the components detach from the switchgear even when the pressure is very high and that incandescent gas or flames are unable to escape, thereby guaranteeing safe conditions for the personnel who work near the switchgear.

- The test is also performed in order to ensure that holes are not made in the accessible external parts of the enclosure and, lastly, that all the connections to the earthing circuit continue to be efficient and able to guarantee safe conditions for persons who access the switchgear after a fault.

Standard IEC 62271-200 establishes the methods for performing the test and the criteria with which the switchgear must comply.

- UniSec Air switchgear fully conforms to all the five criteria indicated in the IEC standard.

According to the specifications of each individual installation, elimination of hot gas and incandescent particles must be checked with particular care so as to guarantee and maintain safe conditions for the personnel.

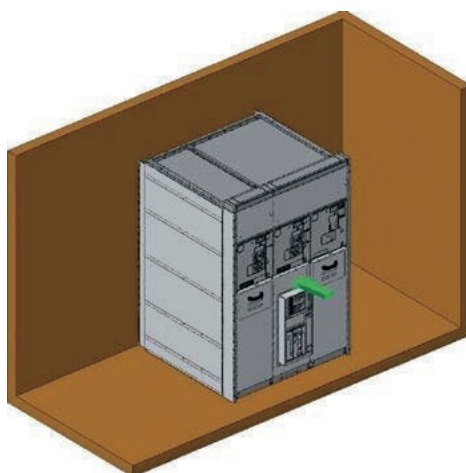
All solutions are class A (authorized personnel only). UniSec Air switchgear can be accessed from different sides (F for front, L for lateral and R for rear) and complies with all 5 of the IEC standard criteria. UniSec Air switchgear ensures high-level of safety for personnel in the arc-proof version.

UniSec Air classifications:

- IAC AF up to 16 kA 1s
- IAC AFLR up to 20 kA 1s.

INTERNAL ARC WITHSTAND CAPACITY

—
Setup for an internal arc
withstand test



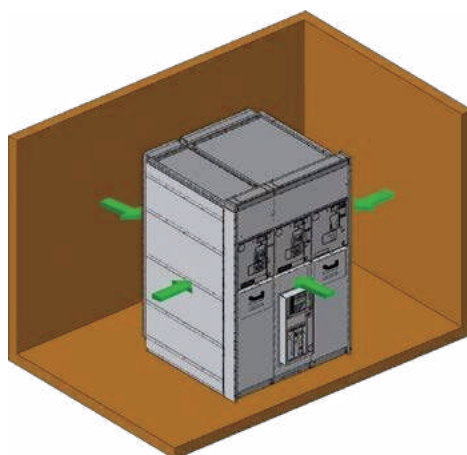
IAC AF up to 16 kA 1s^{(1) (2)}

This switchgear version has to be positioned against a wall. Internal arc fault protection is guaranteed on the front side. The gas produced by the arc is exhausted into the switchgear room. The switchgear structure provides protection against internal arcs on the front of the panel.

(1) WARNING: No access to rear and lateral sides of switchgear while in service

(2) For detailed drawings refer to chapter 5.6

INTERNAL ARC WITHSTAND CAPACITY

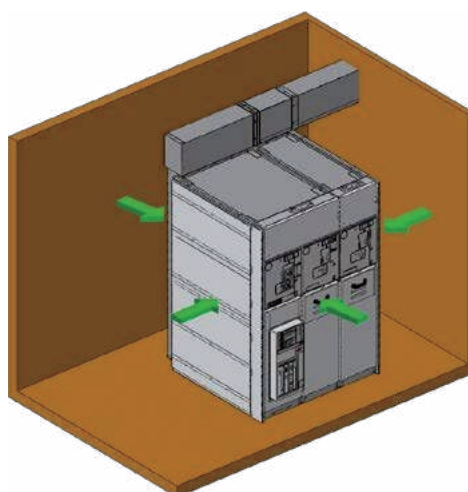


IAC AFLR up to 20 kA 1s and AFLR up to 25 kA 1s⁽³⁾

Solution with gas absorbers

In this case, the switchgear can be positioned in the proximity of a wall or in the middle of the room. Internal arc fault protection is guaranteed on 4 sides. The gas produced by the arc is exhausted into the switchgear room. An efficient absorption structure for the gases produced by the arc ensures that they are cooled to a considerable degree and that their pressure is reduced before they enter the switchgear room. This guarantees internal arc protection up to a fault current of 20 kA and 25 kA⁽²⁾. These absorbers are installed behind each switchgear unit. Additional work is not required on site.

(3) Only for LSC2B unit up to 17.5 kV



IAC AFLR up to 20 kA 1s and AFLR up to 25 kA 1s

Solution with gas exhaust duct

The switchgear can be positioned against a wall or in the middle of the room. Internal arc fault protection is guaranteed on 4 sides up to a fault current of 20 kA and 25 kA.

The switchgear is supplied with at least 1-meter of extension duct between it and the wall, so as to exhaust the gas out of the installation room. Contact ABB if longer ducts are required. The solution is available with extension duct on the right, left, rear and in a raised position. Also available the solution with duct with downstream gas exhausting in the cable trench.

GSEC AIR SWITCH-DISCONNECTOR



GSec Air is a general purpose, SF₆-free three position switch disconnector or disconnector and earthing switch for secondary distribution up to 24 kV, 630A,

20 kA, using dry air as the insulation medium and a vacuum interrupter for breaking capacity. With a global warming potential (GWP) of zero, it is fully compliant with the EU Fluorinated Greenhouse Gas Regulation (EU) 2024/573 and fits in a safe, compact enclosure under 25 liters.

GSec Air features three positions in one device: LINE – OPEN – EARTH according to IEC 62217-102 / IEC 62271-103 and IEC 62271-105 standards. It is suitable for typical applications including line supply, transformer protection, and ring networks, and can be efficiently implemented in smart grids. GSec Air is a highly flexible solution for line incoming/outgoing panels, in combination with circuit breakers or fuses.

Electrical characteristics	GSec Air/T1 and GSec Air/IB			
Rated voltage	kV	12	17.5	24
Power frequency withstand voltage (50/60 Hz, 1 min)				
- Line to line and line to earth	kV	28	3	5
- Between open contacts	kV	32	8	0
Lightning impulse withstand voltage (BIL 1.2/50 μs)			4	6
- Line to line and line to earth	kV	75	95	125
- Between open contacts	kV	85	110	145
Rated frequency	Hz	50	50	50
Rated current (40 °C)	A	630	630	630
Rated short-time withstand current	kA	20 (3s)	20 (3s)	20 (3s)
Making capacity line/earth contact ⁽¹⁾	kAp	20	20	20
Making capacity line/earth contact (peak current) ⁽¹⁾	kAp	52	52	52
Breaking capacity acc. to ed. 2011 IEC 62271-103 ⁽¹⁾				
- Active load	A	630	630	630
- Line charging (No-load lines)	A	25	25	25
- Cable charging (No-load cables)	A	50	50	50
- Closed loop (Ring circuits)	A	630	630	630
- Earth fault current	A	150	150	150
- Cable and line charging current under Earth fault	A	87	87	87

ES 230 20 kA Earthing switch (GSec/IB separate earthing switch)

Rated short-time withstand current (3sec.)	20 kA
Rated short-time peak withstand current (3sec.)	50 kAp
Making capacity (peak current)	50 kAp
Making capacity class	E2 (up to 5 making op.)

GSEC AIR SWITCH-DISCONNECTOR

Electrical characteristics		GSec Air/T2		
Rated voltage	kV	12	17.5	24
Power frequency withstand voltage (50/60 Hz, 1 min)				
- Line to line and line to earth	kV	28	38	5
- Between open contacts	kV	32	45	0
Lightning impulse withstand voltage (BIL 1.2/50 µs)				
- Line to line and line to earth	kV	75	95	125
- Between open contacts	kV	85	110	145
Rated frequency	Hz	50	50	50
Rated thermal current (40 °C)	A	630	630	630
Rated short-time withstand current	kA	16 (3s)	16 (3s)	16 (3s)
Making capacity line/earth contact	kAp	16	16	16
Making capacity line/earth contact (peak current)	kAp	41,6	41,6	41,6
Breaking capacity acc. to ed. 2021 IEC 62271-103				
- Active load	A	630	630	630
- Line charging (No-load lines)	A	25	25	25
- Cable charging (No-load cables)	A	50	50	50
- Closed loop (Ring circuits)	A	630	630	630
- Earth fault current	A	150	150	150
- Cable and line charging current under Earth fault	A	87	87	87

Electrical characteristics		GSec Air/T2F		
Rated voltage	kV	12	17.5	24
Power frequency withstand voltage (50/60 Hz, 1 min)				
- Line to line and line to earth	kV	28	3	5
- Between open contacts	kV	32	8	0
Lightning impulse withstand voltage (BIL 1.2/50 µs)				
- Line to line and line to earth	kV	75	5	125
- Between open contacts	kV	85	110	145
Rated frequency	Hz	50	50	50
Rated thermal current (40 °C)	A	110 ⁽²⁾	85 ⁽²⁾	100 ⁽¹⁾
Rated short-time withstand current ⁽¹⁾	kA	-	-	-
Making capacity line/earth contact	kAp	20 ⁽¹⁾ 52 ⁽¹⁾	20 ⁽¹⁾	20 ⁽¹⁾
Making capacity line/earth contact (peak current)	kAp	52 ⁽¹⁾	52 ⁽¹⁾	52 ⁽¹⁾
Breaking capacity acc. to ed. 2021 IEC 62271-103				
- Active load	A	630 ⁽¹⁾	630 ⁽¹⁾	630 ⁽¹⁾
- Line charging (No-load lines)	A	25 ⁽¹⁾	25 ⁽¹⁾ 50	25 ⁽¹⁾ 50
- Cable charging (No-load cables)	A	50 ⁽¹⁾	(1)	(1)
- Closed loop (Ring circuits)	A	630 ⁽¹⁾	630 ⁽¹⁾	630 ⁽¹⁾
- Earth fault current	A	150 ⁽¹⁾	150 ⁽¹⁾	150 ⁽¹⁾
- Cable and line charging current under Earth fault	A	87 ⁽¹⁾	87 ⁽¹⁾	87 ⁽¹⁾

1) The maximum value is related to the rating of the fuse.

2) The maximum value is related to the rating of the fuse with a derating:

12 kV: 110A with 160A ABB CEF fuse, for lower CEF rated currents apply a derating of 75% (for instance 125A fuse can be used with a 93A Thermal current.
17 kV: 85A with 125A ABB CEF fuse, for lower CEF rated currents apply a derating of 75% (for instance 100A fuse can be used with a 75A Thermal current.

EF 230 Earthing switch (GSec/T2F separate earthing switch)	
Rated short-time withstand current (1sec.)	2 kA
Rated short-time peak withstand current (1sec.)	5 kAp
Making capacity (peak current)	5 kAp
Making capacity class	E2 (up to 5 makings)

VACUUM CIRCUIT BREAKERS

VD4/R-Sec removable circuit breakers



Overview

The VD4/R-Sec vacuum circuit-breakers is designed for UniSec Air switchgear fully in compliance with IEC 62271-100, providing robust performance under normal and fault conditions. It is ideal for power systems requiring frequent operations, ensuring high reliability and long life.

Benefits

High Reliability: Equipped with a stored-energy spring operating mechanism, suitable for both normal and auto-reclosing sequences (O-0.3s-CO-15s-CO), ensuring consistent performance.

Durability: Vacuum interrupters in tubular epoxy resin insulators offer long-lasting operation and minimal maintenance.

Efficient Breaking Technique: The vacuum arc quenching process ensures effective current interruption, reducing contact wear and preventing oxidation and contamination.

Apparatus-operator interface

The front part of the circuit-breaker provides the user interface.

It features the following equipment:

- ON and OFF push buttons
- Operation counter
- Spring status indication
- Manual charging operating mechanism springs

Standard Equipment

User-Friendly Controls: Includes closing and opening push buttons, operation counter, and mechanical indicators for easy monitoring and operation. **Manual Operation:** Features a manual spring loading crank lever and mechanical indicator for the loaded/ discharged state of the closing springs.

Auxiliary Contacts: Kit 1 provides five open/closed auxiliary contacts ($U_n = 24...250 \text{ V AC-DC}$) for versatile connectivity.

Remote Operation: Kit 2 includes a shunt opening release (M01) for remote control, enhancing operational flexibility.

Security: Kit 3 offers a key lock in the open position with different or identical keys for added safety.

VD4/R-SEC

Rated voltage	12 kV	17.5 kV	24 kV
Rated frequency	[Hz] 50	50	50
Rated impulse withstand voltage	[kV] 75	95	125
Rated test voltage at power frequency	[kV] 28	38	50
Rated current	[A] 630	630	630
Breaking capacity	[kA] 16x3s / 20x3s	16x3s / 20x3s	16x3s / 20x3s
Making capacity	[kA] 30/40/50	3 0/4 0/5 0	3 0/4 0/5 0
Short-circuit duration	[s] 3	3	3
Pole center distance	[mm] 230	230	230

VACUUM CIRCUIT BREAKERS

Vacuum circuit-breaker accessories

Spring loading motor operator (MAS)

This device automatically loads the operating mechanism springs after the closing operation.

Shunt closing release (MBC)

This is an electromechanical device which, after an electromagnet has been energized, activates the operating mechanism lever making the circuit-breaker close.

Additional shunt opening release (MB02)

This is an electromechanical device which, after an electromagnet has been energized, activates the operating mechanism lever making the circuit-breaker open.

Undervoltage release (MBU)

This release opens the circuit-breaker when there is a sharp reduction or cut in the power supply voltage.

VACUUM CIRCUIT BREAKERS

VD4/Sec and VD4/P withdrawable vacuum circuit- breaker



Overview

VD4/Sec and VD4/P are withdrawable vacuum circuit-breakers designed for UniSec Air switchgear fully in compliance with IEC 62271-100 dedicated to highly demanding applications with their capabilities to make and break current up to 1250A and when the maximum loss of service continuity (LSC2B) is crucial to reduce time of out service and have the fastest solution for replacing.

Benefits

High Reliability: Equipped with a stored-energy spring operating mechanism, suitable for both normal and auto-reclosing sequences (0-0.3s-CO-15s-CO), ensuring consistent performance. **Durability:** Vacuum interrupters in epoxy resin poles offer long-lasting operation and minimal maintenance.

Efficient Breaking Technique: The vacuum arc quenching process ensures effective current interruption, reducing contact wear and preventing oxidation and contamination.

Apparatus-operator interface

The front part of the circuit-breaker provides the user interface. It features the following equipment:

- ON and OFF push buttons
- Operation counter
- Spring status indication
- Manual charging operating mechanism springs

Standard Equipment

Auxiliary Contacts: Kit 1 provides five open/closed auxiliary contacts ($U_n = 24...250$ V AC-DC) for versatile connectivity. **Remote Operation:** Kit 2 includes a shunt opening release (M01) for remote control, enhancing operational flexibility.

Security: Kit 3 offers a key lock in the open position with different or identical keys for added safety.

Truck

The poles with a elastic contact arm and operating mechanism are fixed onto a metal support and truck. The truck is provided with an helical shaft allows the operations for racking the apparatus into and out of the switchgear to be performed with the door closed. The truck allows the circuit breaker to be efficiently earthed by means of the metallic structure of the switchgear unit.

When the circuit breaker is raked-out a system close all the shutters inside the compartment to make operation safe and protected against hazards and electrical risks.

VD4/P (12-17.5 kV) AND VD4/SEC (24 kV) ELECTRICAL CHARACTERISTICS

Rated voltage	12 kV	17.5 kV	24 kV
Rated frequency	[Hz] 50/60	50/60	50/60
Rated impulse withstand voltage	[kV] 75 [kV]	95	125
Rated test voltage at power frequency	28	38	50
Rated current	[A] 630/1250	630/1250	630/1250
Breaking capacity	[kA] 16/20/25	16/20/25	16/20 ⁽¹⁾
Making capacity	[kA] 40/50/62.5	40/50/62.5	40/50
Short-circuit duration	[s] 3	3	3
Pole center distance	[mm] 150	150	210

⁽¹⁾ Contact ABB for 21kA

VACUUM CIRCUIT BREAKERS

VD4/Sec and VD4/P circuit-breaker accessories

Shuntopening release (MB01)

This device allows the apparatus to be opened by remote control. Its electrical characteristics and operation are given in table 1.

Shunt closing release (MBC)

Electromechanical device which, after an electromagnet has been energized, activates the operating mechanism lever making the circuit-breaker close. Its electrical characteristics and operation are given in table 1.

Additional shunt opening release (MB02)

Electromechanical device which, after an electromagnet has been energized, activates the operating mechanism lever making the circuit-breaker open. Its electrical characteristics and operation are given in table 1.

Undervoltage release (MBU)

This release opens the circuit-breaker when there is a sharp reduction or cut in the power supply voltage. Its electrical characteristics and operation are given in table 1.

Truck locking magnet (RL2)

Compulsory accessory for withdrawable versions, which prevents the circuit-breaker from being racked into the switchgear when the auxiliary circuit plug is disconnected, and avoids incorrect operation by the operator.

Motor operator for spring loading (MAS)

This device automatically loads the springs of the operating mechanism after the closing operation. Its electrical characteristics and operation are given in table 2.

EARTHING SWITCHES

UniSec Air includes typical units in which a separate earthing switch is needed, to ensure earthing to the cable connection side. Depending on the application, different models are used on order to provide the correct functioning and earthing capabilities.

	ES – 230N	EF 230	ESWB- 150	ESWB-210
SDC				
SFC		•		
SFV		•		
SBC	•			
SBS	•			
SBR	•			
WB			• (12-17.5kV)	• (24 kV)
C			• (12-17.5kV)	• (24 kV)
WB			•	
S	•			
BME				
DRC				
DRS				



	ES – 230N	EF 230	ESWB- 150	ESWB-210
Rated Voltage	24kV	24kV	12-17,5kV	24kV
Short circuit current	20kA x 3s - 25kA x 2s	2kA x 1s	25 x 3s	20 x 3s
Making capacity	50kAp - 62.5kAp	5kAp	62.5kAp	50kAp
Number of mechanical operations	M0 – 1000 operations	M0 – 1000 operations	M0 – 1000 operations	M0 – 1000 operations

TYPICAL UNITS

Overview

SDC	Feeder with switch-disconnector
SDS	Coupler with switch-disconnector
SFC	Feeder with fused switch- disconnector
SFV	Measurement with fused switch-disconnector
SBC	Feeder with circuit-breaker and disconnector
SBS	Coupler with circuit-breaker and disconnector
SBR	Reversed feeder with circuit-breaker and disconnector
WBC	Feeder with withdrawable frontal circuit-breaker
WBS	Coupler with withdrawable frontal circuit-breaker
BME	Direct feeder with measurement and busbar earthing
DRC	Direct feeder with measurement
DRS	Riser with measurement
DLR	Cable riser with frontal access

OVERVIEW

UniSec Air offers an extensive range of standard units designed to meet the diverse functionality requirements of switchgear applications.

Additionally, LSC2B units, featuring a front-withdrawable circuit breaker, can be seamlessly integrated with LSC2A/LSC2 units within the same switchgear, providing enhanced flexibility and performance.

LIST OF AVAILABLE UNITS

Application	Acronym
Feeder with switch-disconnector	SDC
Coupler with switch disconnector	SDS
Feeder with fused switch-disconnector	SFC
Measurement with fused switch-disconnector	SFV
Feeder with circuit-breaker and disconnector	SBC
Coupler with circuit-breaker and disconnector	SBS
Reversed feeder with circuit-breaker and disconnector	SBR
Feeder with withdrawable frontal circuit-breaker	WBC
Coupler with withdrawable frontal circuit-breaker	WBS
Direct feeder with measurement and busbar earthing	BME
Direct feeder with measurement	DRC
Riser with measurement	DRS
Cable riser with frontal access	DLR

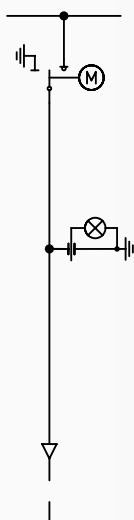
UNITS AVAILABLE WITH CURRENT DESIGN

Application	Acronym
Universal metering panel	UMP



SDC

Feeder with switch-disconnector



The feeder with switch-disconnector is mainly used as an incoming, ring or branch unit. The unit is equipped with a 3-position switch-disconnector that can be in one of three positions: “closed”, “open” or “earthed”, therefore preventing incorrect operations. The cable compartment can be accessed in the “earthed” position. Cable connections are easily inspected through the front-door window.

Panel widthWeight (kg)		
mm	H = 1700mm	H = 2000mm
500	170	180

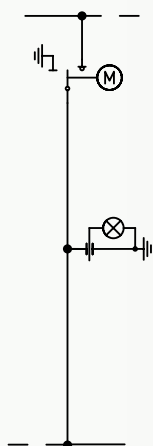
Un	Ir A	Ik
kV	630	kA
12	630	16 (3s)/20
17.5	630	(3s) 16
24		(3s)/20 (3s)
		16 (3s)/20
		(3s)

Reference	Standard equipment	Main accessories
GSec Air	3-position switch-disconnector	4 contacts for signalling closed - earthed
Switch-disconnector	Mechanical operating mechanism with position indicators	Analog pressure gauge with optional alarm contacts
	Pressure switch	Motor operator mechanism
		Shunt opening release
		Shunt closing release
		Line /earth locking magnet
		Key interlocks
		Padlocks

Reference	Standard equipment	Main accessories
Panel	Integrated standard auxiliary circuit compartment	DIN current transformers or combined sensors or ring core current transformer
	Mechanical interlocks	Current sensors
	Busbars	Wiring duct for routing auxiliary cables
	Cable compartment bottom plate	Anti-condensation heater
	Earthing connection	Internal lighting
	Voltage indicator cable clamps	Short-circuit indicator
	Cable clamps	Surge arresters
		Terminals for parallel cables
		Wide low voltage compartment

SDS

Coupler with switch-disconnector



SDS unit with switch disconnector for coupling is used together with the riser unit.

The unit is equipped with a 3-position switch-disconnector that can be in one of three positions: “closed”, “open” or “earthed”, therefore preventing incorrect operations.

The earthing system is always provided as standard equipment. Units 500 mm wide can be equipped with current and voltage transformers.

Panel widthWeight (kg)		
mm	H = 1700mm	H = 2000mm
500	175	185
750	200	215

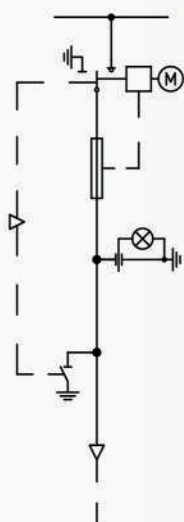
Un	Ir A	Ik
kV	63	kA
12	0	16 (3s)/20
17.5	63	(3s) 16
24	0	(3s)/20 (3s)
	63	16 (3s)/20
	0	(3s)

Reference	Standard equipment	Main accessories
GSec Air	3-position switch-disconnector	4 contacts for signalling closed - earthed
Switch-disconnector	Mechanical operating mechanism with position indicators	Analog pressure gauge with optional alarm contacts
	Pressure switch	Motor operator mechanism
		Shunt opening release
		Shunt closing release
		Line /earth locking magnet
		Key interlocks
		Padlocks

Reference	Standard equipment	Main accessories
Panel	Integrated standard auxiliary circuit compartment	DIN current and voltage transformers or combined sensors
	Mechanical interlocks	Current sensors
	Busbars	Wiring duct for routing auxiliary cables
	Earthing connection	Internal lighting
	Voltage indicator	Surge arresters
		Wide low voltage compartment

SFC

Feeder with fused switch-disconnector



SFC unit with fused switch-disconnector is mainly used for transformer protection.

The unit is equipped with a 3-position switch-disconnector and an earthing switch. To earth the fuses, the integrated earthing switch acts on the supply side, whereas a separate earthing switch acts on the load side of the fuses.

A double-spring operating mechanism is used with automatic fuse tripping.

The cable compartment can only be accessed in the “earthed” position.

Cable connections are easily inspected through the front-door window.

Panel width	Weight (kg)
mm	H = 2000 mm
500175	185

Un	Ik	IkAp ⁽¹⁾	Fuses
kV	kA	kAp	A
12	16 (3s)/20	5	up to 100
17.5	(3s) 16	5	up to 100
24	(3s)/20 (3s)	5	up to 100

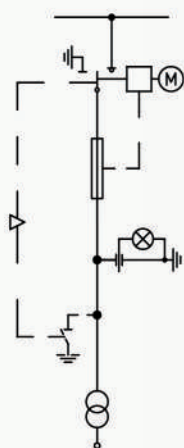
1) Making capacity of the load side earthing switch EF 230 (Ik = 2 kA) (3s)

Reference	Standard equipment	Main accessories
GSec Air	3-position switch-disconnector	4 contacts for signalling closed - earthed
Switch-disconnector	Mechanical operating mechanism with position indicators	Analog pressure gauge with optional alarm contacts
	Pressure switch	Motor operator mechanism
		1 contact for indicating fuse blown
		Shunt opening release
		Shunt closing release
		Earth locking magnet
		Key interlocks
		Padlocks

Reference	Standard equipment	Main accessories
Panel	Integrated standard auxiliary circuit compartment	Ring current sensors
	Mechanical interlocks	Wiring duct for routing auxiliary cables
	Fuse blown indicator	Anti-condensation heater
	Busbars	Internal lighting
	Lower earthing switch on load side of fuses (EF 230)	DIN Standard fuses
	Fuse supports	Wide low voltage compartment
	Cable termination and bottom plate	
	Earthing connection	
	Voltage indicator	
	Cable clamps	

SFV

Measurement with fused switch-disconnector



The SFV unit with fused switch-disconnector is primarily used for voltage measurement.

The unit is equipped with a 3-position switch-disconnector. For fuse earthing, the integrated earthing switch acts on the supply side, while a separate earthing switch available on request acts downstream of the fuses.

A double-spring operating mechanism with automatic tripping is available as an alternative to the tripping operating mechanism.

The voltage transformers are located in the bottom part of the unit to provide the measurement function.

Panel widthWeight (kg)		
mm	H = 1700 mm	H = 2000 mm
500	175	185
750	200	215

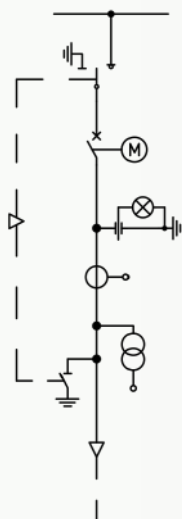
Un	Ik	Fuses
kV	kA	A
12	16 (3s)/20	2 to 6,3
17.5	(3s) 16	2 to 6,3
24	(3s)/20 (3s)	2 to 6,3
	16 (3s)/20 (3s)	

Reference	Standard equipment	Main accessories
GSec Air	3-position switch-disconnector	4 contacts for signalling closed - earthed
Switch-disconnector	Mechanical operating mechanism with position indicators	Analog pressure gauge with optional alarm contacts
	Pressure switch	Motor-operator mechanism
		1 contact for indicating fuse blown
		Shunt opening release
		Shunt closing release
		Earth locking magnet
		Key interlock
		Padlocks
		Lower earthing switch on on VT side
		Fuse tripping

Reference	Standard equipment	Main accessories
Panel	Integrated standard auxiliary circuit compartment	Wiring duct for routing auxiliary cables
	Mechanical interlocks	Anti-condensation heater
	Busbars fuse blown indicator	Internal lighting
	Fuse supports	DIN Standard fuses
	Voltage transformer to DIN Standards (phase-earth or phase-phase)	Power transformers
	Bottom plate	Wide low voltage compartment
	Earthing connection	Indicator for blown fuse
	Voltage indicator	

SBC

Feeder with circuit-breaker and disconnecter



SBC unit is are designed to control and protect distribution lines, networks, motors, transformers, capacitor banks, etc. The unit is equipped with a vacuum circuit-breaker. The circuit-breaker is installed on a rail and fixed to the busbars. A 3-position disconnecter fitted with an earthing switch is provided for the isolating operations and is positioned between the circuit-breaker and busbars. A key mechanical interlock is installed between disconnecter and circuit breaker. The door is mechanically interlocked with the earthing position of the disconnecter to ensure personnel safety. The units can be equipped with current and voltage transformers or combined sensors.

Panel width	Weight (kg)
mm H = 1700 mm	H = 2000 mm
750335	355

Un	Ir A	Ik
kV	630	kA
12	630	16 (3s)/20 (3s)/25
17.5	630	(2s) 16 (3s)/20
24		(3s)/25 (2s) 16
		(3s)/20 (3s)/25 (2s)

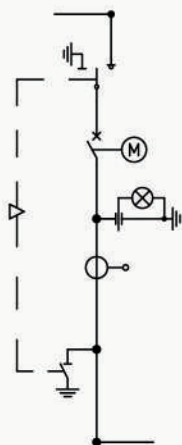
Reference	Standard equipment	Main accessories
GSec Air	3-position disconnecter	4 contacts for signalling closed – earthed
disconnector	Mechanical operating mechanism with position indicator	Analog pressure gauge with optional alarm contacts
	key interlock with circuit breaker	Key interlocks
	Pressure switch	Padlocks

Referenc	Standard equipment	Main accessories
e VD4/R	Opening device with mechanical signalling and opening and closing pushbuttons	Motor-operator mechanism
circuit breaker	Removable vacuum circuit-breaker	

Reference	Standard equipment	Main accessories
Panel	Integrated standard auxiliary circuit compartment	DIN current transformers and combined sensors or ring core current transformer and sensor
	Mechanical interlocks	DIN Voltage transformer (phase-earth or phase-phase without fuses) upstream or downstream DIN CTs
	Busbars	Current and voltage sensors
	Cable termination and bottom plate	Wiring duct for routing auxiliary cables
	Earthing switch on the cables (ES 230)	Anti-condensation heater
	Earthing connection	Internal lighting
	Voltage indicator	Wide range of protection relays
	Cable clamps	Surge arresters
		Terminals for parallel cables
		Wide low voltage compartment

SBS

Coupler with circuit-breaker and disconnecter

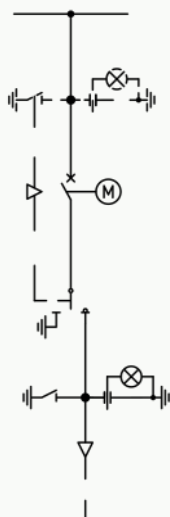


The SBS unit with disconnecter and circuit-breaker for coupling is used together with the riser unit. The standard units are equipped with a 3-position disconnecter in series with a circuit-breaker for isolating the busbar. The unit is equipped with a vacuum circuit-breaker. The circuit-breaker is installed on a rail and fixed to the busbars. A key mechanical interlock is installed between disconnecter and circuit breaker. The units can also be equipped with DIN current transformers or combined sensors.

Panel widthWeight (kg)		Un	Ir A	Ik
mmH = 1700 mm H = 2000 mm		kV	63	kA
750355	375	12	0	16 (3s)/20
		17.5	63	(3s) 16
		24	0	(3s)/20 (3s)
			63	16 (3s)/20
				0 (3s)
Reference	Standard equipment	Main accessories		
GSec Air	3-position disconnector	4 contacts for signalling closed – earthed		
disconnector	Mechanical operating mechanism with position indicator	Analog pressure gauge with optional alarm contacts		
	Key interlock with circuit breaker	Key interlocks		
	Pressure switch	Padlocks		
Referenc	Standard equipment	Main accessories		
e VD4/R	Opening device with mechanical signalling and opening and closing pushbuttons	Motor operator mechanism		
circuit breaker				
Reference	Standard equipment	Main accessories		
Panel	Integrated standard auxiliary circuit compartment	DIN current transformers or combined sensors		
	Mechanical interlocks	Wiring duct for routing auxiliary cables		
	Busbars	Anti-condensation heater		
	Earthing switch on the cables (ES 230) in lower right busbar connection panel variant	Internal lighting		
	Bottom plate	Wide range of protection relays		
	Earthing connection	Wide low voltage compartment		
	Voltage indicator			

SBR

Reversed feeder with circuit-breaker and disconnector



The SBR unit allows the disconnector to be opened and earthed while leaving the cable compartment in service.

The standard unit is equipped with a 3-position disconnector in series with a circuit-breaker.

The unit has a vacuum circuit-breaker. The cable compartment is mechanically key interlocked; the circuit-breaker compartment is key interlocked with the disconnector.

The circuit-breaker door is mechanically interlocked with the earthed position of the disconnector to ensure personnel safety.

The unit can be equipped with current transformers, combined sensors and toroidal sensors. A circuit-breaker with integrated current sensors and relay is also available.

The panel is according to CEI 0-16 standard for network connection.

Panel width	Weight (kg)
mmH = 1700 mm	H = 2000 mm
750355	375

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

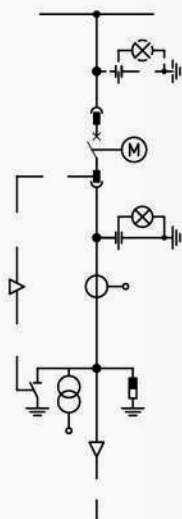
Reference	Standard equipment	Main accessories
GSec Air	3-position disconnector	4 contacts for signalling closed – earthed
disconnector	Mechanical operating mechanism with position indicator	Analog pressure gauge with optional alarm contacts
	Key interlock with circuit breaker	Key interlocks
	Pressure switch	Padlocks

Referenc	Standard equipment	Main accessories
e VD4/R	Opening device with mechanical signalling and opening and closing pushbuttons	Motor operator mechanism
circuit breaker		

Reference	Standard equipment	Main accessories
Panel	Integrated standard auxiliary circuit compartment	DIN current transformers or combined sensors
	Mechanical interlocks	Wiring duct for routing auxiliary cables
	Busbars	Anti-condensation heater
	Earthing switch on the cables (ES 230) in lower right busbar connection panel variant	Internal lighting
	Bottom plate	Wide range of protection relays
	Earthing connection	Wide low voltage compartment
	Voltage indicator	

WBC

Feeder with withdrawable frontal circuit-breaker



Unit available in the 600 mm (12-17.5 kV) and 750 mm (24 kV) widths. The WBC feeder with withdrawable circuit-breaker or contactor, is used for controlling and protecting installations where service continuity, high safety levels and high electrical characteristics are major requirements.

Busbars, isolating busbars and apparatus are segregated from each other by means of metal shutters up to 17.5 kV, or by means of insulated shutters (at 24 kV). This category ensures maximum service continuity since the apparatus compartment can be accessed while the other compartments and/or functional units remain energized. The unit can be fitted with a withdrawable VD4/P or VD4/ Sec series vacuum circuit-breaker installed on a wheeled truck that allows the it to be handled inside the compartment. The operations for racking-out, racking-in the apparatus, putting it into service, maintenance and servicing are performed directly from the front.

Panel width	Weight
mm	kg
600 (12-17.5 kV PM)	600
750 (24 kV PI)	750

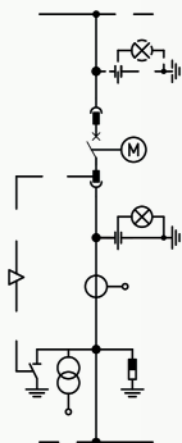
Un	Ir	Ik
kV	A	kA
12	630/1250	16 (3s)/20 (3s)/25 (3s)
17.5	630/1250	16 (3s)/20 (3s)/25 (3s)
24	630/1250	16 (3s)/20 (3s)

Reference	Standard equipment	Main accessories
Apparatus	Opening device with mechanical signalling and opening and closing pushbuttons Withdrawable vacuum circuit-breaker (VD4/P up to 17.5 kV and VD4/Sec at 24 kV) or vacuum contactor (VSC/P up to 12 kV) Truck locking magnet	Motor-operator mechanism

Reference	Standard equipment	Main accessories
Panel	Integrated standard auxiliary circuit compartment	DIN current transformers and combined sensors or ring core current transformer and sensor
	Mechanical safety interlocks	Voltage transformer to DIN standards with or without fuses
	Busbars and insulators	Accessories for internal arc classification
	Earthing busbar	Wiring duct for routing auxiliary cables
	Metal or insulated shutters	Cable compartment anti-condensation heater
	Cable termination and bottom plate	Apparatus and/or cable compartment internal lighting
	Cable clamps	Wide range of protection relays
		Manual or motor-operated earthing switch on cable side
		Mechanical interlocks
		Voltage indicator lamp on cable and/or busbar side lamps
		Key interlocks
		Locking magnets on circuit-breaker door and/or on earthing switch
		Surge arresters
		Cable connection up to 630 mm ² for 12-17.5 kV and 400 mm ² for 24 kV
		Mechanical "on-off" pushbuttons on the circuit-breaker door
		5NO + 5NC auxiliary contacts on the earthing switch
		Wide low voltage compartment

WBS

Coupler with withdrawable frontal circuit-breaker



Unit available in the 600 mm (12-17.5 kV) and 750 mm (24 kV) widths. Busbars, isolating busbars and apparatus are segregated from each other by means of metal shutters up to 17.5 kV, or by means of insulated shutters (at 24 kV). This category ensures maximum service continuity since the apparatus compartment can be accessed while the other compartments and/or functional units remain energized. The unit can be fitted with a withdrawable VD4/P or VD4/Sec series vacuum circuit-breaker installed on a wheeled truck that allows the it to be handled inside the compartment. The operations for racking-out, racking-in the apparatus, putting it into service, maintenance and servicing are performed directly from the front. The unit can be equipped with an earthing switch with full making capacity for earthing the busbars on the load side of the circuit-breaker. Current transformers can also be installed in the unit (dimensions according to DIN standards).

Panel width	Weight
mm	kg
600 (12-17.5 kV PM)	600
750 (24 kV PI)	750

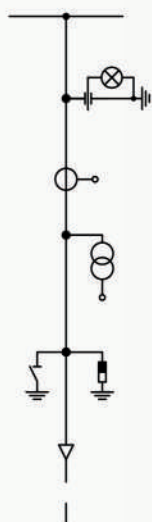
Un	Ir	Ik
kV	A	kA
12	630/1250	16 (3s)/20 (3s)/25 (3s)
17.5	630/1250	16 (3s)/20 (3s)/25 (3s)
24	630/1250	16 (3s)/20 (3s)

Reference	Standard equipment	Main accessories
Apparatus	Opening device with mechanical signalling and opening and closing pushbuttons Withdrawable vacuum circuit-breaker (VD4/P up to 17.5 kV and VD4/Sec at 24 kV) Truck locking magnet	Motor operator mechanism

Reference	Standard equipment	Main accessories
Panel	Integrated basic auxiliary circuit compartment Mechanical interlocks Busbars and insulators Earthing busbar Metallic or insulated shutters Bottom plate	DIN current transformers and combined sensors Accessories for internal arc classification Wiring duct for routing auxiliary cables Cable compartment anti-condensation heater Apparatus and/or cable compartment internal lighting Wide range of protection relays Manual or motor-operated earthing switch on cable side Mechanical interlocks Voltage indicator lamp on lower and/or upper busbar side Key interlocks Locking magnets on circuit-breaker door and/or on earthing switch Mechanical "on-off" pushbuttons on the circuit-breaker door 5NO+5NC earthing switch auxiliary contacts Wide low voltage compartment Base frame H = 300 mm

BME

Direct feeder with measurement and busbar earthing



Unit available in the 600 mm width (12-17.5 kV). It can be coupled directly to WBC and WBS units with withdrawable circuit-breakers.

BME units have been created for earthing the switchgear busbar by means of the earthing switch with full making capacity and/or busbar measurement using voltage transformers (dimensions according to DIN standards - see Main Components section), with or without fuses at the bottom.

The transformers are installed on a metal plate that can be easily removed for maintenance work or replacements.

This unit is available with optional cable connection to be used as direct incomer. Current and Voltage transformers or combined sensors are available in this configuration.

Besides the safety interlocks prescribed by the standard, the earthing switch can be equipped with key interlocks and locking magnet.

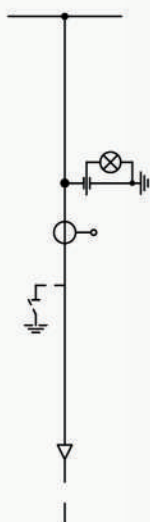
Panel width	Weight
mm	kg
600 (12-17.5 KV PM)	450

Un	Ir	Ik
kV	A	kA
12	630/1250	16 (3s)/20 (3s)/25 (3s)
17.5	630/1250	16 (3s)/20 (3s)/25 (3s)

Reference	Standard equipment	Main accessories
Panel	Integrated basic auxiliary circuit compartment	DIN current transformers and combined sensors
	Busbars and insulators	Voltage transformer to DIN standards with or without fuses
	Earthing busbar	Accessories for internal arc classification
	Bottom plate	Wiring duct for routing auxiliary cables
	Cable clamps	Anti-condensation heater
		Internal lighting
		Key interlocks on the earthing switch
		Locking magnet on the earthing switch
		Wide low voltage compartment
		Voltage indicator lamp on busbar side lamps
		Manual or motor-operated earthing switch
		Surge arresters
		Apparatus and/or cable compartment internal lighting
		5NO+5NC auxiliary contacts on the earthing switch
		Cable connection up to 630 mm ²
		Base frame H = 300 mm

DRC

Direct feeder with measurement and busbar earthing



A direct riser unit is available for connecting cables directly to the busbars. The lower front door is fixed and can only be opened with a tool. The door has a window for inspection. The earthing switch with full making capacity can be installed in the 500 mm unit. It can be used for earthing the switchgear busbars or the incoming line cable.

The panel can be fitted with current transformers, combined sensors or voltage transformers. The unit is also available in the version without cable entry for measurements (voltage) and busbar earthing.

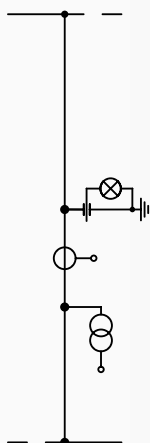
Panel widthWeight (kg)	
mmH = 1700 mm	H = 2000 mm
500135	145

Un	Ir	Ik
kV	A	kA
12	630/1250	16 (3s)/20 (3s)/25 (3s)
17.5	630/1250	16 (3s)/20 (3s)/25 (3s)
24	630/1250	16 (3s)/20 (3s)

Reference	Standard equipment	Main accessories
Panel	Integrated standard auxiliary circuit compartment	Wiring duct for routing auxiliary cables
	Bottom plate	Toroidal current transformers/sensors
	Earthing connection	Anti-condensation heater
	Earthing points	Earthing switch with full making capacity

DRS

Riser with measurement



The riser unit with measurement is connected with a coupling unit with circuit-breaker or switch-disconnector.

The version 500mm wide can be used with the installation of three current and voltage transformers.

The front door has to be opened with a tool and the door has a window for inspection. DRS unit, 500mm wide and 2000mm high only, can also be coupled to panels WBC and WBS with withdrawable circuit breakers.

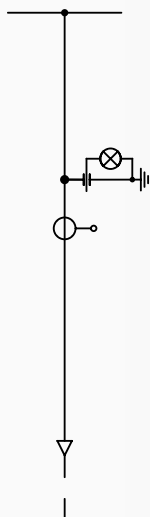
Panel widthWeight (kg)	
mm H = 1700 mm	H = 2000 mm
500135	145

Un	Ir	Ik
kV	A	kA
12	630/1250	16 (3s)/20 (3s)/25 (3s)
17.5	630/1250	16 (3s)/20 (3s)/25 (3s)
24	630/1250	16 (3s)/20 (3s)

Reference	Standard equipment	Main accessories
Panel	Integrated standard auxiliary circuit compartment	Wiring duct for routing auxiliary cables
	Bottom plate	DIN current transformer, combined sensors
	Earthing connection	DIN Voltage transformer phase-earth or phase-phase
		Anti-condensation heater
		Internal lighting
		Wide low voltage compartment

DLR

Cable riser with frontal access



Lateral cable riser, can be coupled with any LSC2A unit. Equipped with earthing points for mobile earthing devices.
The front door has to be opened with a tool and the door has a window for inspection.

Panel widthWeight (kg)
mmH = 1700 mm
375135

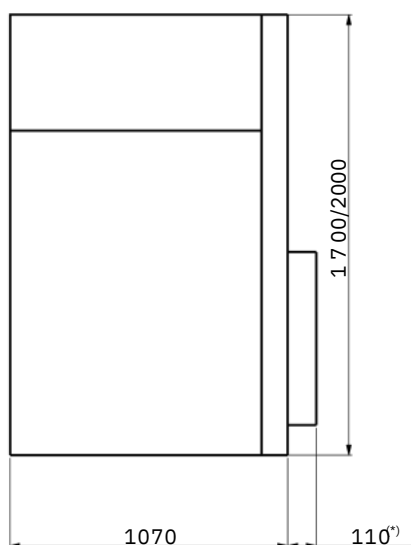
Un	Ir A	Ik
kV	630	kA
12	630	16
17.5	630	(3s)
24		16
		(3s)
		16
		(3s)

Reference	Standard equipment	Main accessories
Panel	Bottom plate	Wiring duct for routing auxiliary cables
	Earthing points	Ring current sensors
		Anti-condensation heater

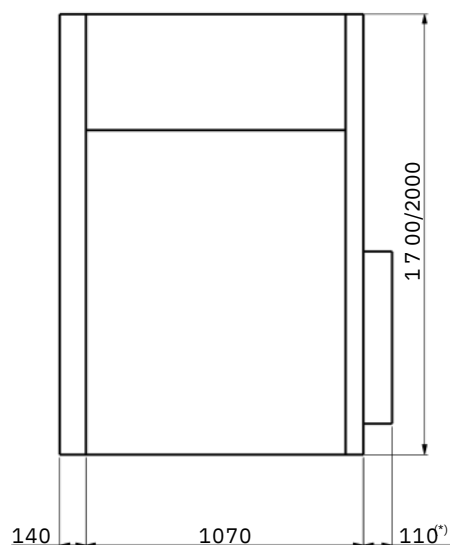
DIMENSIONAL DRAWINGS

The drawings merely give the indicative dimensions of typical units but do not refer to specific configurations.

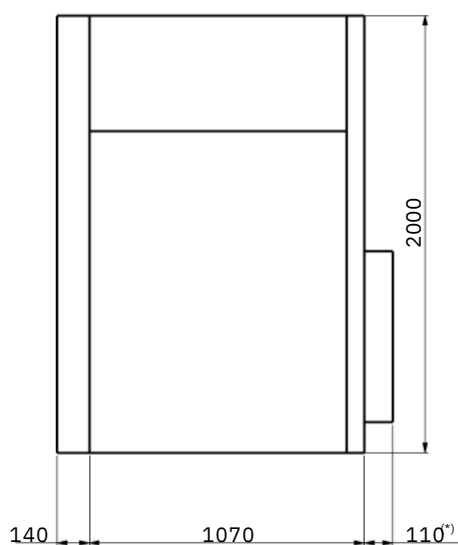
Side view IAC A-F 16 kA 1s



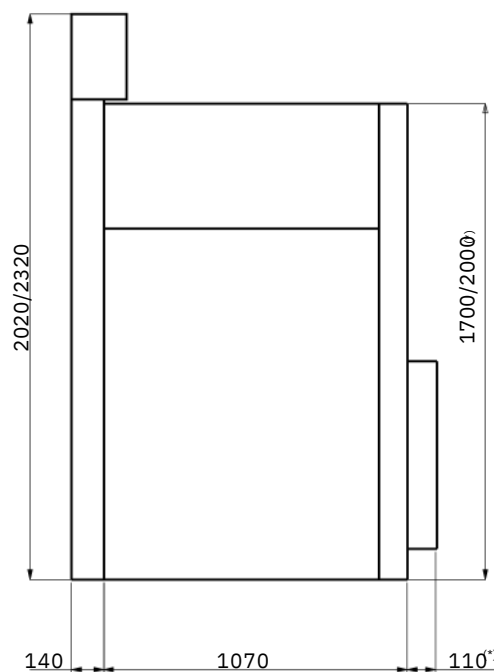
Side view IAC A-FLR 16 kA, with filters



Side view IAC A-FLR 20 kA, with filters



Side view IAC A-FLR 20 kA, with gas duct

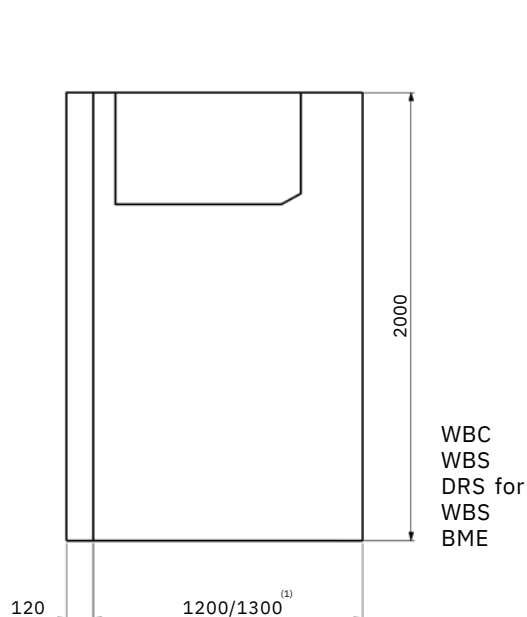


(*) For panels with lateral circuit breaker

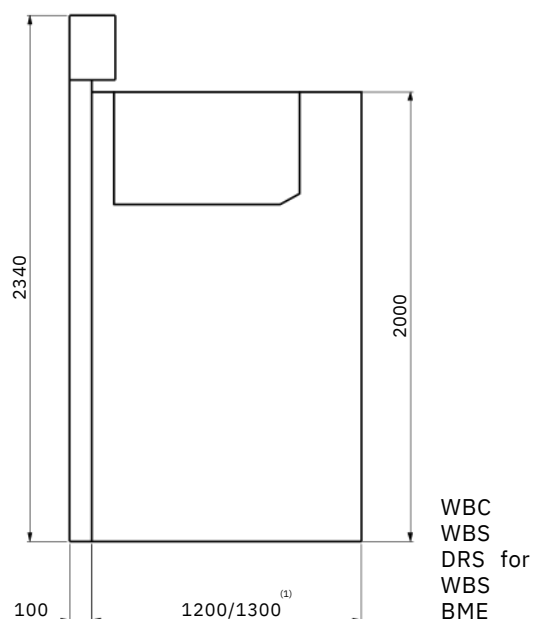
(*) For panels with lateral circuit breaker

DIMENSIONAL DRAWINGS

Side view of units 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



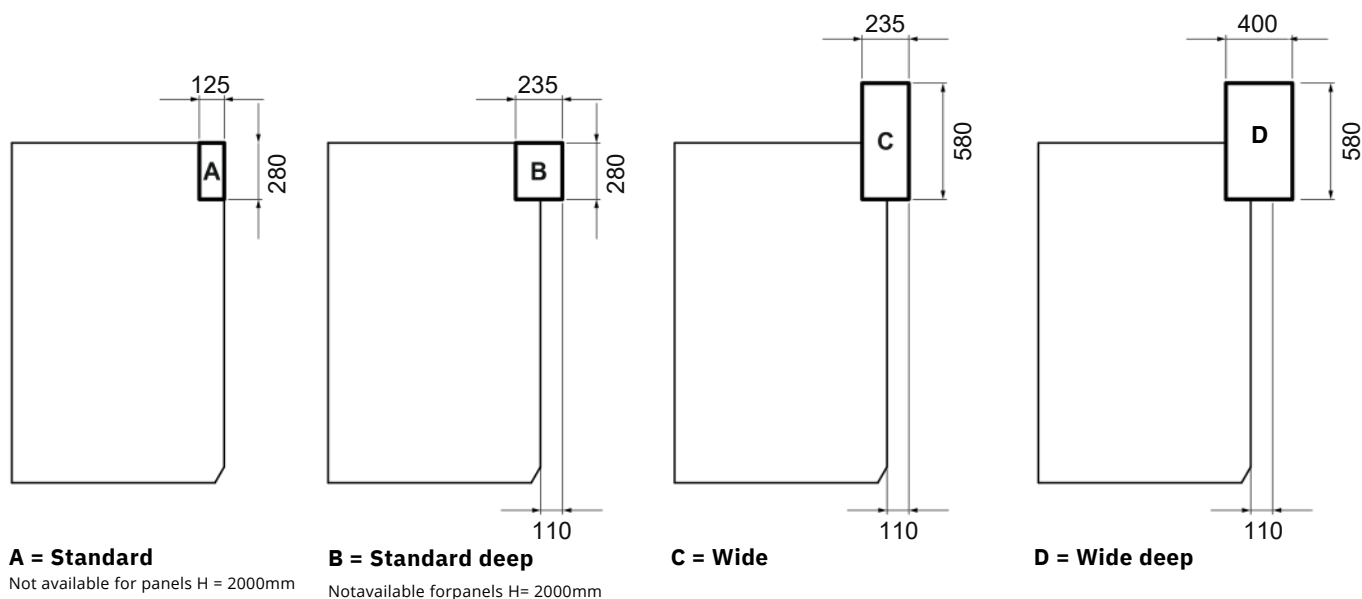
Side view of units with withdrawable circuit-breakers, IAC A-FLR 25 kA, 1 sec up to 17.5 kV and IAC A-FLR 20 kA, 1s at 24 kV with gas duct



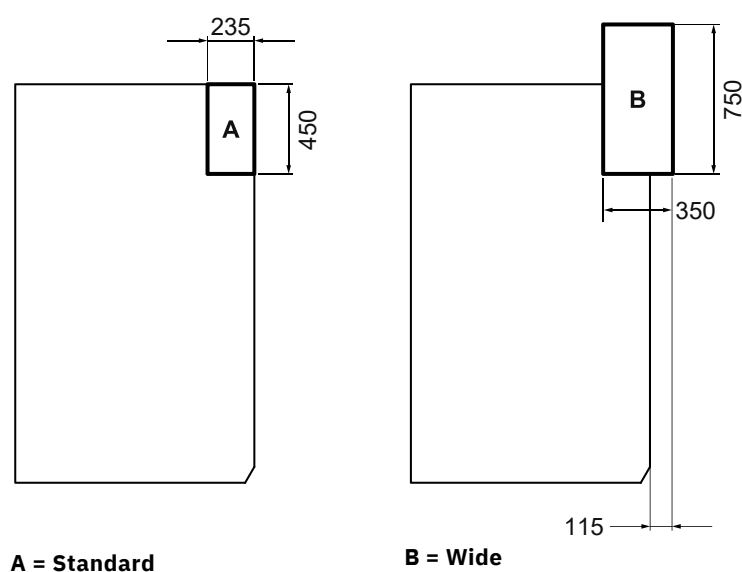
(1) 1200mm for 12-17,5 kV or 1300mm for 24 kV

DIMENSIONAL DRAWINGS

Solutions for units with switch-disconnector or disconnector



Solutions for switchgear with frontal withdrawable circuit-breakers and contactors



WEIGHTS

Estimated weights of basic units

1700 mm height and 2000 mm height for basic units with 630 A main busbars and without components (CT, VT, Surge arrester, Fuses, ect.).

Width (mm)	Type of unit (kg)								
	SDC	SDS	SFC	SBC	SBS	SBR	SFV	DRC	DRS
500	170/180	175/185	175/185	–	–	–	175/18	135/145	14 0/15 0
600	–	–	–	–	–	–	5	–	–
750	195/210	200/215	20 0/215	335/355	355/375	355/375	–	–	–

Width (mm)							
	WBC	WBS	BME	DR	SFC	SFV	DR
500	–	–	–	S	225	225	C
600	600	600	450	160	–	–	270
750	750	750	–	–	–	–	–

(*) ABB wishes to highlight that values of dimensions and weights provided herein are preliminary and may change after final design preparation, based on final scope of supply and installation details of the switchgear. As a consequence, provided values of dimensions and weights are NOT to be considered as final but only for standard reference purposes.
Accordingly, you expressly acknowledge and agree that values of dimensions and weights provided herein are neither final nor binding and that the result of their use is neither feasible nor accurate nor error free.

ESTIMATED WEIGHT OF COMPONENTS

Current transformers

12/17.5 kV	22 kg
24 kV	33 kg

Voltage transformers

12/17.5 kV	20 kg
24 kV	35 kg

Apparatus

VD4/R-Sec	90 kg
VD4/Sec, VD4/P	125 kg
VSC/P	52 kg ⁽¹⁾
GSec Air	38 kg

1) Excluding fuses

Fuses

3 fuses	19 kg
---------	-------

Gas exhaust type Gas ducts	height 1700 mm	height 2000 mm
Width 600 mm	-	38 kg
Width 750 mm	30 kg	45 kg

Gas exhaust type Filter	height 1700 mm	height 2000 mm
Width 500 mm	34 kg	41 kg
Width 600 mm	-	66 kg
Width 750 mm	47 kg	54/72 kg ⁽¹⁾

1) Withdrawable frontal breaker unit, LSC2B

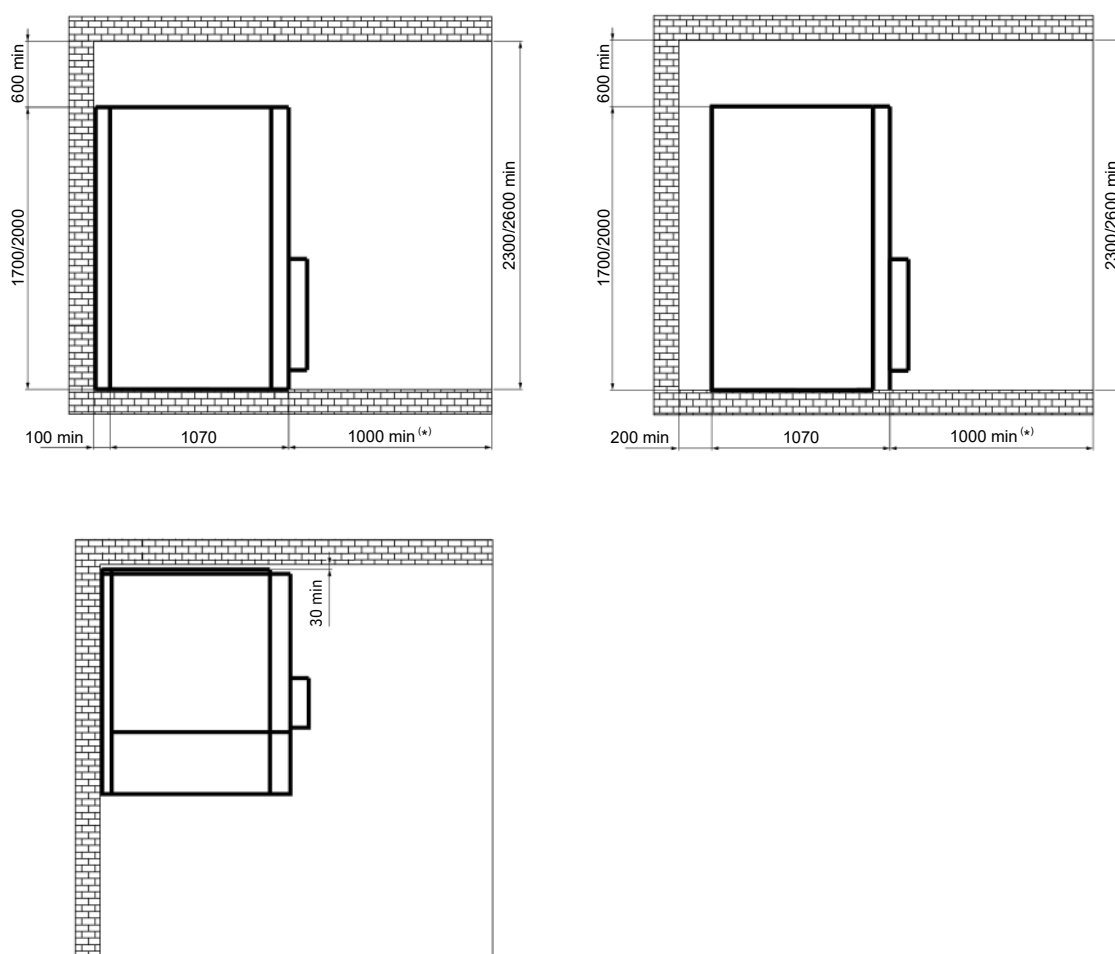
SWITCHGEAR ROOM

The installation room must be prepared to suit the switchgear dimensions and version. Compliance with the distances indicated ensures that the equipment will operate correctly and safely. Please consult ABB if the installation conditions differ from those indicated.

Room layout

IAC A-F up to 16 kA

Installation distances from the walls of the switchgear room. IAC A-F 16 kA 1s basic solution.



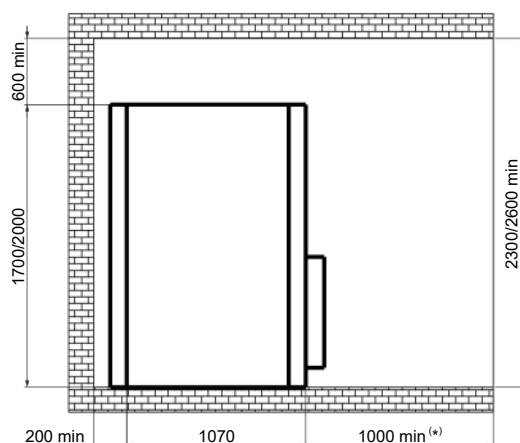
(*) 1300 mm at least for panels with circuit-breaker or 1030 mm using the special truck (only with VD4/R-Sec) on request.

SWITCHGEAR ROOM

Room layout

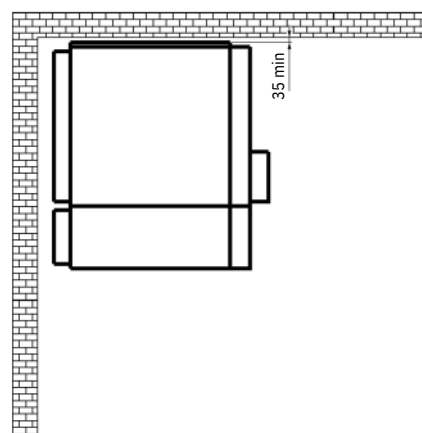
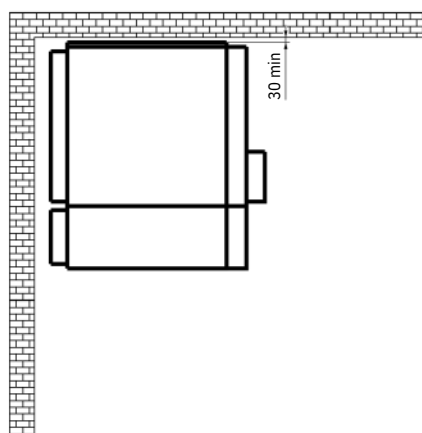
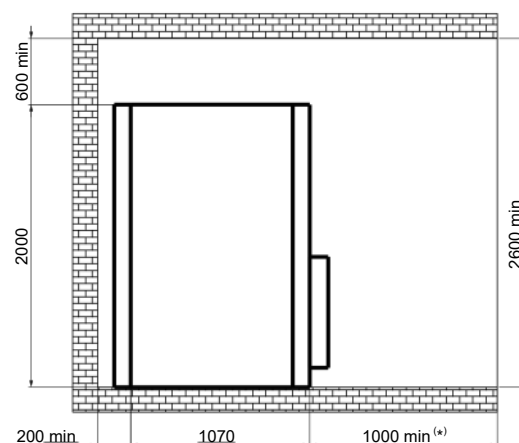
Filters IAC A-FLR up to 16 kA

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



Filters IAC A-FLR up to 20 kA

Minimum distances from the walls of the installation room. Solution IAC A-FLR 20 kA 1s with filters installed on each unit.



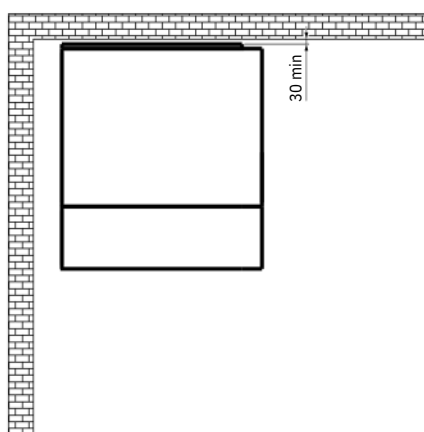
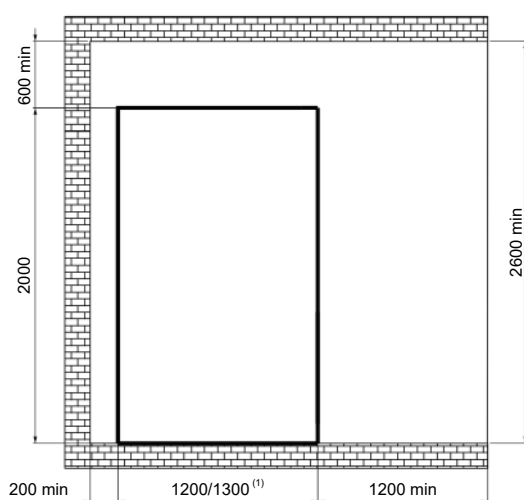
(*) 1300 mm at least for panels with circuit-breaker or 1030 mm using the special truck (only with VD4/R-Sec) on request.

SWITCHGEAR ROOM

Room layout for units with withdrawable frontal breaker unit

IAC A-F up to 16 kA

Minimum distances from the walls of the installation room. IAC A-F 16 kA 1s basic solution.



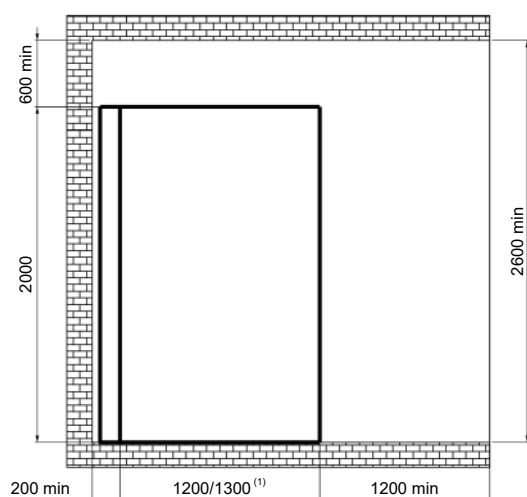
(*) 1300 mm at least for panels with circuit-breaker or 1030 mm using the special truck (only with VD4/R-Sec) on request.

SWITCHGEAR ROOM

Room layout for units with withdrawable frontal breaker unit

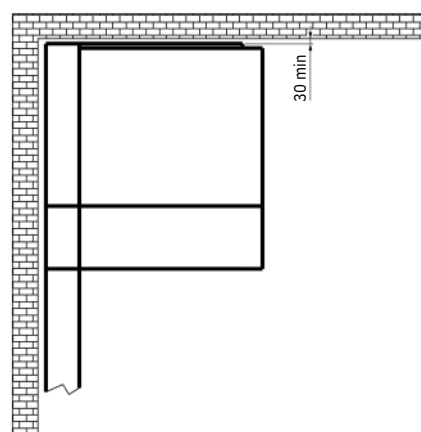
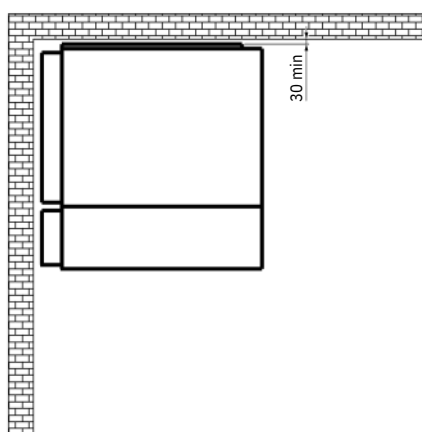
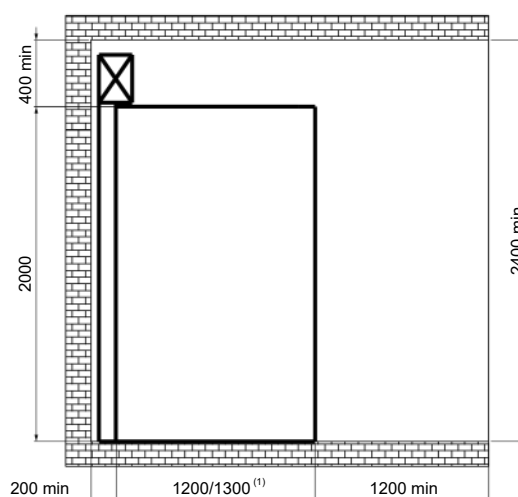
Filters IAC A-FLR up to 25 kA

Minimum distances from the walls of the installation room. Solution IAC A-FLR 25 kA, 1s at 12-17.5 kV and 16 kA, 1s at 24 kV with filters installed on each unit.



Gas exhaust ducts IAC A-FLR up to 25 kA

Minimum distances from walls of installation room. Solution IAC A-FLR 25 kA, 1s at 12-17.5 kV and 20 kA, 1s at 24 kV with gas exhaust ducts.



(1) 1200 mm for 12-17,5 kV or 1300 mm for 24 kV

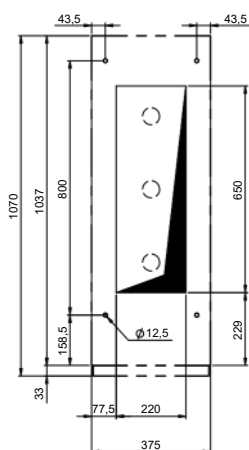
SWITCHGEAR ROOM

Cable entry and fixing points of the units

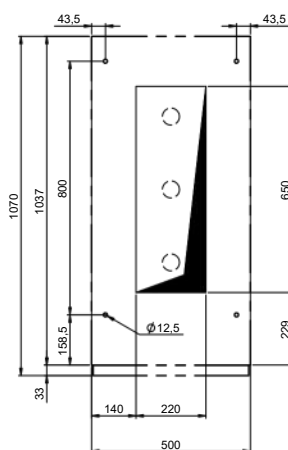
The following drawings show the positions and sizes of the cable entry underneath the different units. These holes must be made before the switchgear is installed. The switchgear fixing points are also shown in the drawings.

There is one fixing point in each corner of the unit (4 per unit). The dimensions and fixing points of units without cable entry depend on the width of the unit. 10 mm anchor bolts can be used for fixing.

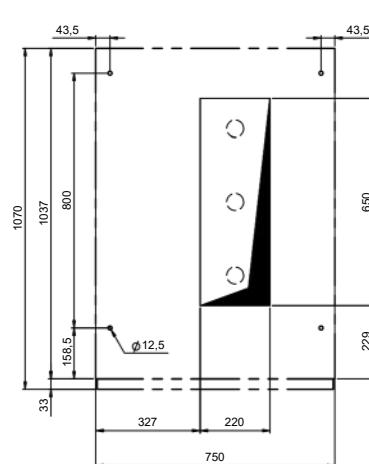
Units 375 mm wide



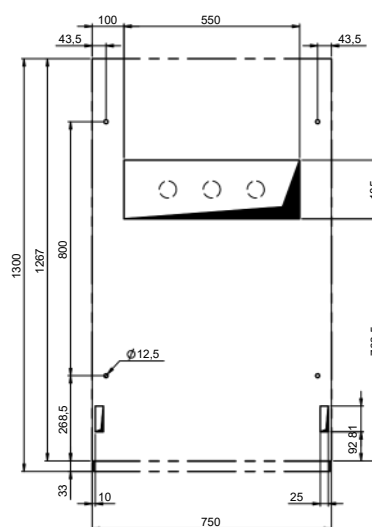
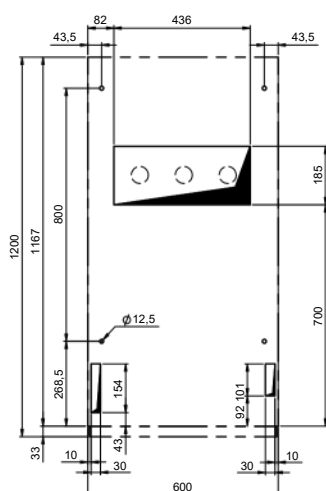
Units 500 mm wide



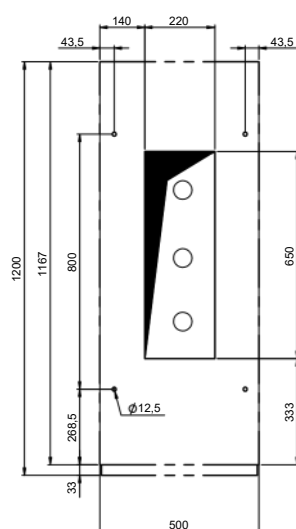
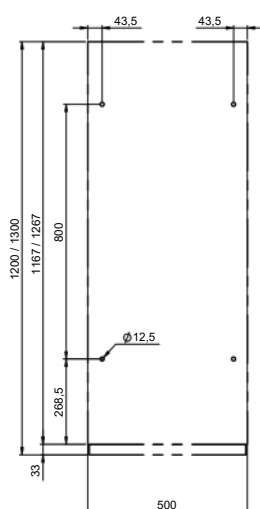
Units 750 mm wide



750 mm width for units with withdrawable circuit-breakers up to 24 kV
WBS without cable outlet



DRC for WBC/WBS/BME



SWITCHGEAR ROOM

Foundations

The switchgear must be positioned on a foundation that complies with the 2x1000 levelling requirement in relation to the length of the switchgear.

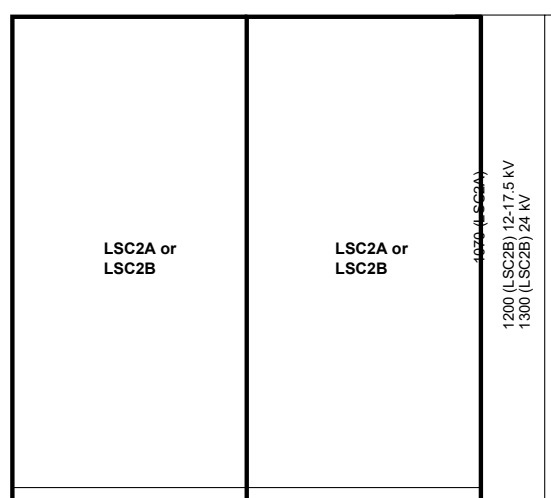
The load capacity of the floor and foundation must also be sufficient to bear the weight of the switchgear.

The switchgear can be fixed to the concrete floor by jack bolts, on a metal frame and on a raised floor.

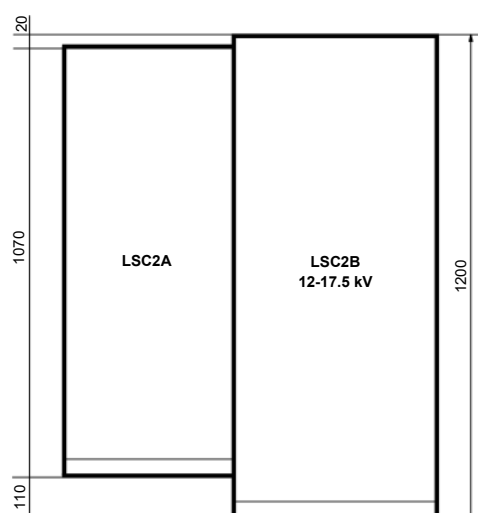
Depths of LSC2A and/or LSC2B panels

Depending on the type of unit (LSC2A/LSC2B) and different rated voltage (12-17.5 kV/24 kV) the depth and misalignment between units connected in the same line-up can change, as outlined below:

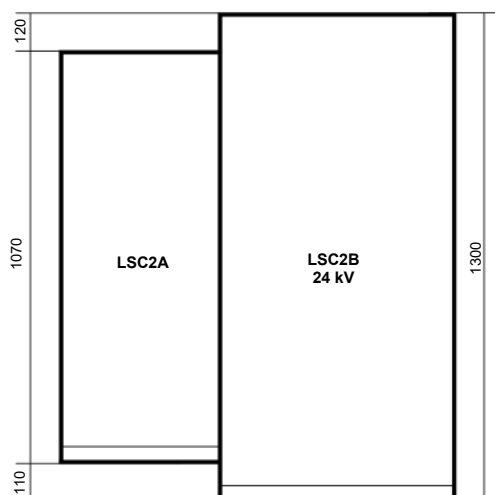
Switchgear with SAME depths



Switchgear LSC2A and LSC2B 12-17.5 kV



Switchgear LSC2A and LSC2B 24 kV





VEEI POWER SRL

Via del Progresso, 65 – 36070 Castelfranco (VI) Italy

Tel. +39 0445 488948 – Mail: info@veeipower.com

www.veeipower.com

