



Medium voltage products

UniSec DY800

New 24 kV air-insulated
medium voltage switchgear
to e-Distribuzione specifications

UniSec DY800

Cubicles available

Unit	e-Distribuzione specifications (Ed. 4)
UniSec ICS/1	DY 800/116
UniSec ICS/2	DY 800/216
UniSec ICS/3	DY 800/316



UniSec DY800

Characteristics

Characteristics of UniSec DY800 switchgear

UniSec DY800 switchgear is arc-proof and suitable for secondary distribution requirements.

UniSec DY800 switchgear uses a multifunction apparatus with vacuum circuit-breaker and SF₆ insulated 3-position disconnecter (line, isolated and earth).

The new integrated apparatus is made of two materials: the top part, where the vacuum interrupters are housed, is made of epoxy resin so as to guarantee the required degree of insulation while the bottom part is in steel, thereby providing metallic segregation and earthing between the busbar compartment and cable compartment.

This guarantees maximum safety for the operators when work is performed in the line compartment, even when the main busbars are energized.

Thanks to this technical solution, panel classification is LSC2A-PM, in accordance with IEC 62271-200.

All the live parts of the integrated apparatus are SF₆ insulated

and this guarantees a higher level of protection over time against strongly aggressive outdoor environments.

The new technology featured by the integrated apparatus possesses the following advantages:

- the only disconnecter apparatus with 3 positions and circuit-breaker;
- small size;
- low amount of SF₆ used for insulation;
- ease of use.

All the compartments are arc-proof in accordance with the provisions established by standard IEC 62271-200.

The IAC classification of the various types, restricted to authorized persons alone (class A), complies with the 5 criteria established by the standard.

The 3 types of UniSec DY800 compartments are classified in the following way:

- AFL on the front side and on the two sides.

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Rated electrical specifications

Cubicle	
Maximum insulation voltage	24 kV
Rated insulation level, withstand voltage:	
with lightning impulse to earth and and line-to-line	125 kV
with power-frequency to earth and and line-to-line	50 kV
with power-frequency between the open contacts of the disconnecter	60 kV
Rated frequency	50 Hz
Continuous duty rated current for the busbars	630 A
Admissible short-time withstand current for the busbars and branch lines	16 kA
Admissible short-time peak current value for the busbars and branch lines	40 kA
Rated short-circuit time	1 s
External protection class	IP3X
Internal arc withstand value:	
IAC classification	AFL
test voltage	24 kV
test current	16 kA
test duration	0.5 s
Multifunction apparatus type HySec – Integrated circuit-breaker	
Rated voltage	24 kV
Rated insulation level, withstand voltage	
Rated lightning impulse withstand voltage	125 kV
Rated frequency	50 Hz
Rated thermal current	630 A
Admissible rated short-time withstand current	16 kA
Electrical life class (ref. IEC 62271-100)	E2
Admissible short-time peak current value	40 kA
Rated short-circuit time	1 s
Rated short-circuit breaking capacity	16 kA
Rated operating sequence	O - 0.3 sec - CO - 30 sec - CO
Mechanical life	10000 operations Class M2
Rated breaking current values:	
circuit mainly active	630 A
vacuum transformer	6.3 A
no-load line	10 A
no-load cable	16 A
capacitor bank	400 A class 2
Integrated three-position disconnecter – Line Side	
Rated insulation level, withstand voltage	
Rated lightning impulse withstand voltage	125 kV
with impulse between the open contacts of the disconnecter	145 kV
Rated current	630 A
Admissible rated short-time withstand current	16 kA
Rated short-time peak current	16 kA
Admissible rated short-circuit time	1 s
Mechanical life	1000 operations Class M0
Electrical life class (ref. IEC 62271-102)	E0
Integrated three-position disconnecter – Earth Side	
Admissible rated short-time withstand current	16 kA
Rated short-time peak current	40 kA
Rated short-circuit making capacity	40 kA
Admissible rated short-circuit time	1 s
Mechanical life	1000 operations Class M0
Electrical life class (ref. IEC 62271-102)	E1

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Reference Standards

	Technical Specification e-Distribuzione and indicated references
CEI EN 60447	Human-Machine Interface. Operating principles
CEI EN 60529	Protection class of enclosures. Classification
CEI EN 62271-200	Metal-enclosed factory-built assembly for voltage values ranging from 1 kV to 52 kV
CEI EN 62271-100	Alternating current circuit-breakers with voltage values from 1 kV to 52 kV
CEI EN 62271-102	Disconnectors and earthing switches for voltage values exceeding 1000 V
CEI EN 62271-1	Common specifications for high voltage switchgear and controlgear

Normal installation conditions

Maximum ambient air temperature:	+40 °C
Minimum ambient air temperature:	-15 °C
Relative humidity:	< 95% without condensation
Altitude:	< 1000

Comply with the indications in the product standards if other installation conditions are involved. Please contact us for special installation requirements.

The areas through which power conductors or auxiliary circuit conductors are routed must be protected against the access of animals, as this could lead to damage or disservice.

Protection class

The protection classes of the switchgear conform to IEC 60529 standards.

UniSec ICS switchgear is normally supplied with the following protection classes:

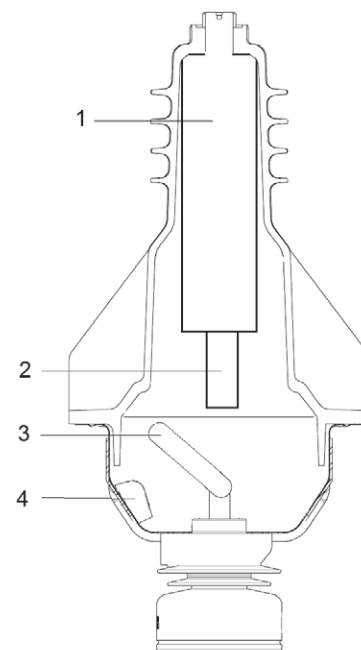
- IP 3X for the enclosure
- IP 2X for the segregation between compartments
- IP 3X for the mechanical operating mechanism.

Characteristics of the integrated apparatus

Main components

All three UniSec DY800 compartments use the same, previously described, multifunction equipment comprising the following functional components:

- **3-position disconnector (line, isolated, earth)**



- 1 Vacuum interrupter
- 2 Fixed contact of line disconnector SL
- 3 Moving contact of disconnector
- 4 Fixed contact of earthing switch ST

It is an SF₆ insulated disconnector; in the open position, the moving contacts guarantee that the isolated position is maintained.

In the line closed position, the moving contacts fit into the fixed upper contacts installed in the lower part of the circuit-breaker's vacuum interrupter.

In the closed earthed position, the moving contacts fit into the fixed lower contacts in the metal structure.

- **Characteristic of the 3-position disconnector operating mechanism**

The disconnector is equipped with a three-position stored energy operating mechanism operated by a dedicated lever.

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- **Characteristics of the circuit-breaker operating mechanism**

The circuit-breaker is equipped with a three-pole operating mechanism with the following circuits and devices:

- a three-pole voltage start-up closing circuit;
- a three-pole voltage start-up opening circuit;
- an anti-pumping device to prevent further closings other than the first when opening occurs during the initial closing request. This device must not be deactivated by functional inhibitions.

Operating energy storage occurs in two ways:

- 1) by means of a DC-powered electric motor with the following characteristics:
 - Rated auxiliary power supply voltage: 24 V DC
 - Maximum power input (excluding inrush) 300 W
 - Spring reloading time max 30 s
- 2) by means of a mechanical device operated in the manual mode by the operator.

The multifunction apparatus has a mechanical lock that prevents the three-position disconnecter from moving when the circuit-breaker is closed.

With the circuit-breaker closed and with the electric circuit of the operating power restoration motor disconnected, the energy stored by the system described above must be able to allow the circuit-breaker to accomplish the operating sequence: O - 0.3 sec - CO.

The connections to the remote control extension unit, the type of connector and the pinout conform to DY1050 specifications. The closing and opening remote controls and the remote state signals refer to the circuit-breaker.

The opening (green) and closing (red) push-buttons are installed on the front of the cubicle, where the state indicators of the circuit-breaker are also displayed.

The opening and closing push-buttons are protected against being accidentally pressed and are equipped with labels indicating their relative function.

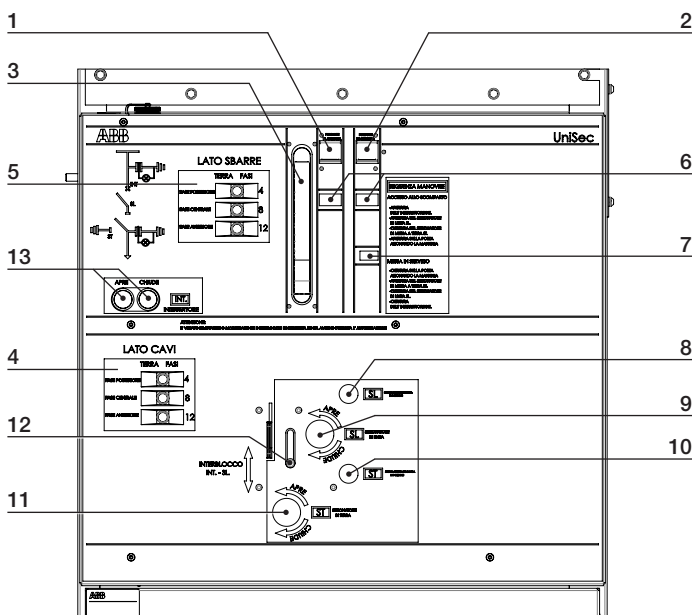
The rapid auto-reclosing cycle O - 0.3 - CO is not required in the absence of voltage.

Voltage signalling device

DY800 panels are equipped with a voltage signalling device conforming to the indications in the e-Distribuzione DY 811 and DY 1811 specifications. They are installed on the front of UniSec DY800 cubicles and signal the presence-absence of voltage in the MV lines of secondary substations.

Power is supplied to the voltage signalling device by a capacitive coupling situated in the lower insulator of the cable compartment and in the capacitive insulator of the busbar compartment.

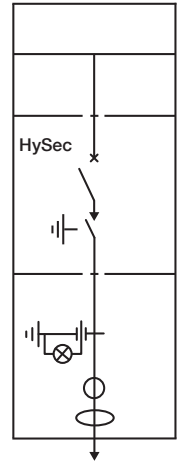
The device is indicated on the mimic plate as “CABLE SIDE” and as “BUSBAR SIDE”.



- 1 Mechanical opening push-button
- 2 Mechanical closing push-button
- 3 Circuit-breaker spring loading lever
- 4 Voltage indicator lamps - cable side
- 5 Voltage indicator lamps - busbar side
- 6 Circuit-breaker state
- 7 Circuit-breaker operation counter
- 8 SL position state
- 9 SL switching lock
- 10 ST position state
- 11 ST switching lock
- 12 Circuit-breaker - Disconnecter interlock
- 13 Electrical push-buttons of circuit-breaker

Interlocks

UniSec switchgear is equipped with all the interlocks and accessories able to ensure top-level safety and reliability for both the installation and operators. This equipment guarantees the very highest level of reliability even when accidental errors occur and allows what ABB calls an “error-free” system of interlocks to be created.



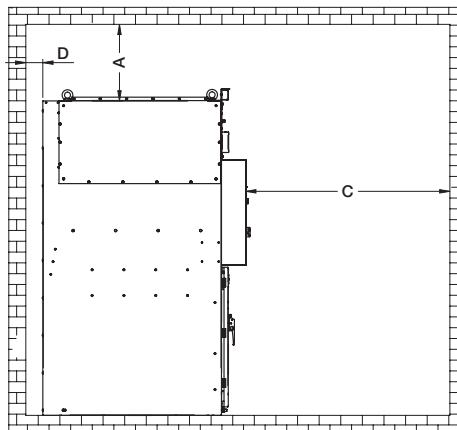
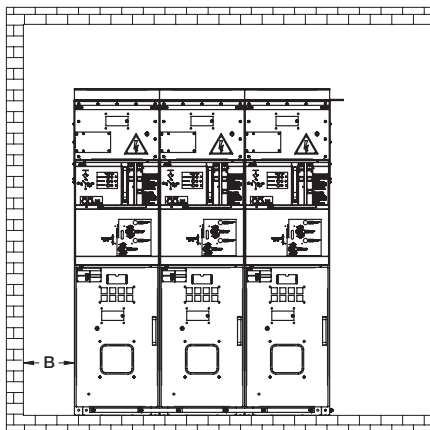
Information about installation

Installation site

The installation site must be prepared to suit the dimensions and version of the switchgear. Compliance with the distances indicated will ensure that the equipment functions correctly and safely. Consult ABB if the installation conditions differ from those indicated.

Room layout

DY 800/116



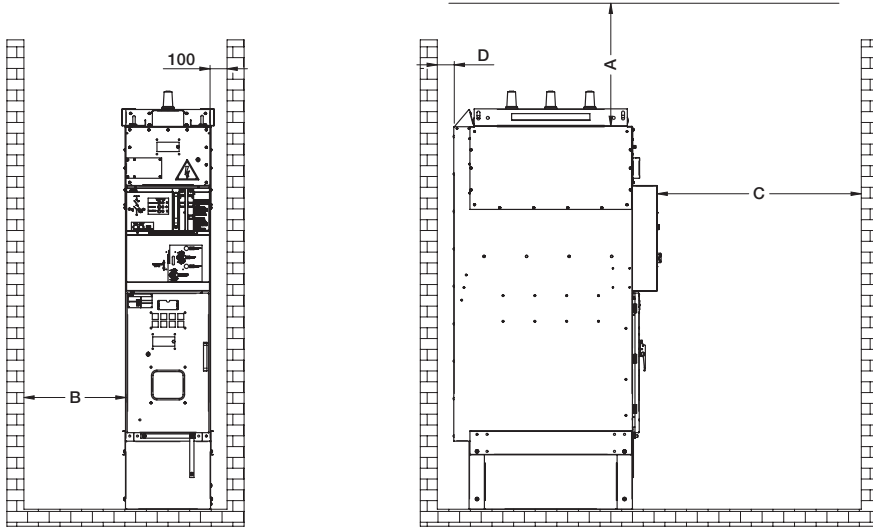
A [mm]	B [mm]	C [mm]	D [mm]
≥ 450	≥ 100	≥ 1200 ⁽¹⁾	≥ 100

⁽¹⁾ Dimension C represents the space required to withdraw the cubicle

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Characteristics

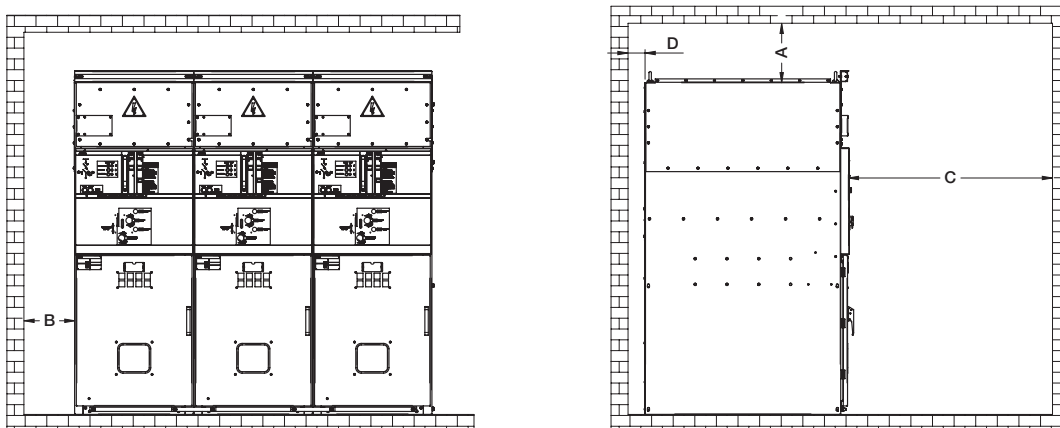
DY 800/216



A [mm]	B [mm]	C [mm]	D [mm]
-	-	≥ 1200 ^(*)	≥ 100

^(*) Dimension C represents the space required to withdraw the cubicle

DY 800/316

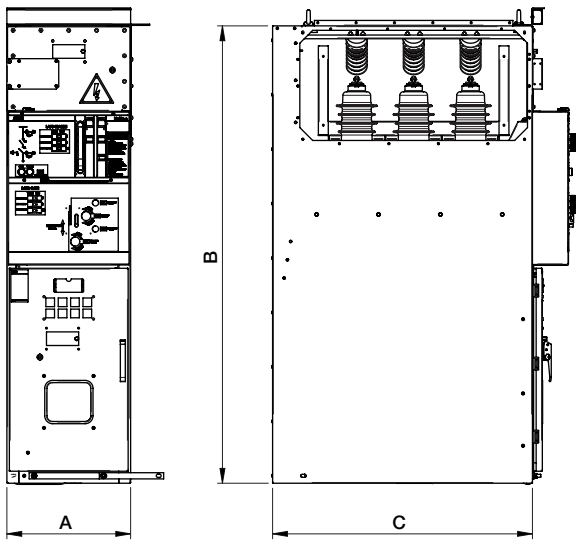


A [mm]	B [mm]	C [mm]	D [mm]
≥ 350	≥ 100	≥ 1200 ^(*)	≥ 100

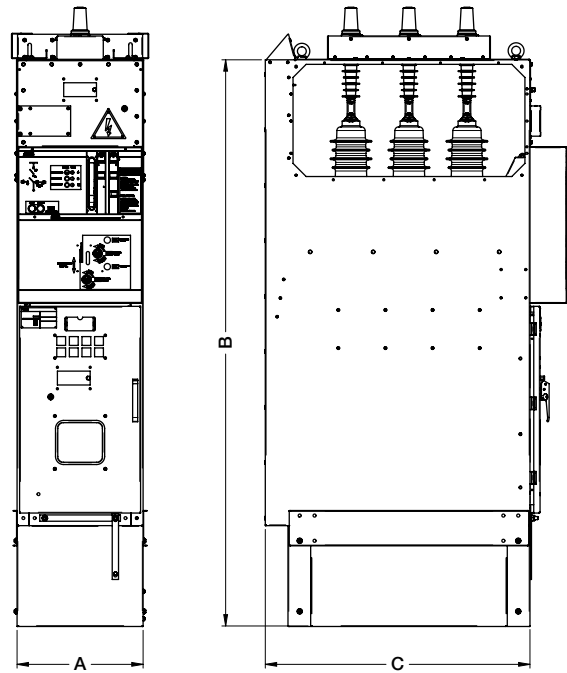
^(*) Dimension C represents the space required to withdraw the cubicle

Dimensions of the units

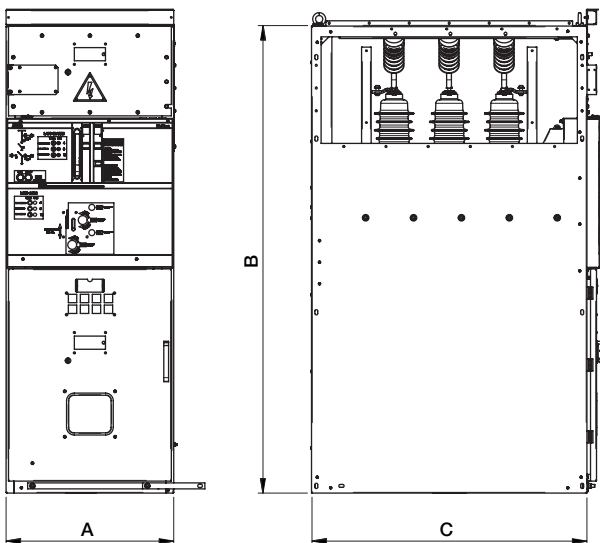
The drawings merely show indicative dimensions of typical units but do not depict the switchgear front or sections.



UniSec DY800/116



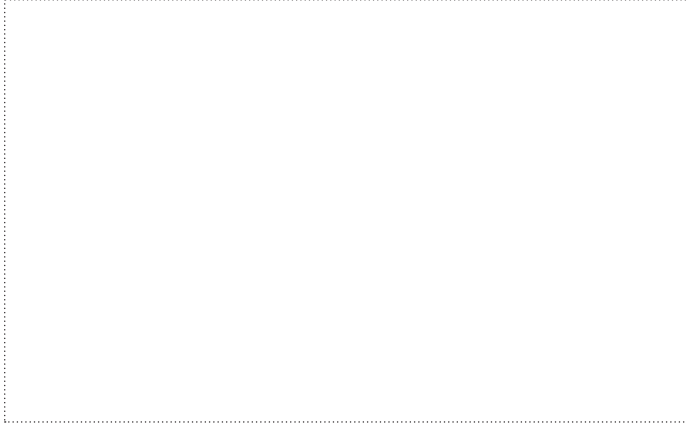
UniSec DY800/216



UniSec DY800/316

	Dimensions (mm)			Weights (kg)
	A	B	C	
UniSec DY 800/116	500	1850	1050	275
UniSec DY 800/216	500	2250	1050	302
UniSec DY 800/316	700	1950	1150	305

Contacts



Your sales contact: www.abb.com/contacts

More product information: www.abb.com/productguide

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