

High and Medium Voltage Switchgear





PD
SD
CS
SG

Primary Distribution
Secondary Distribution
Compact Substations
Switchgear



Efacec Switchgear

Efacec is a leading company in Portugal and a worldwide reference in the development of solutions for Power Generation, Transmission, Distribution and use of electrical energy in the field of High and Medium Voltage.

With a wide and complete portfolio of High and Medium Voltage products, Efacec Switchgear is recognized for its expertise in terms of flexible and custom-made solutions and products, and the ability to understand the customer's needs and offer appropriate solutions for each project. These unique skills translate into value-added services provided by product engineering and operations teams, as well as close business relations established between Efacec Switchgear and the customer.

Through its worldwide operations and the synergies reached within the Efacec Group, the company is able to face all challenges placed by our customers and partners in any given location, constantly maintaining the levels of quality and reliability of its solutions and always complying with the requirements set by our customers regarding delivery times and conditions.

Flexibility, customization, service and innovation are the key competences of Efacec.

Efacec Switchgear offers a comprehensive and turnkey service, from manufacturing the proposed solution to its on-site assembly. This service is carried out by skilled technicians and in accordance with the specifications given by Efacec Switchgear's engineering team. Our services provide, among other things, the following:

- More benefits for the customer
- Fast commissioning
- Integration of specific engineering work
- Full customization
- Comprehensive Efacec Switchgear guarantee



Argentina



Spain



India



Portugal

Engineering - Quality - Safety

Efacec Switchgear has teams experienced in the development of medium and high voltage equipment with the use of advanced 3D software modeling and simulation of equipment operating under extreme conditions.

It has implemented a strict quality system with emphasis on continuous improvement of equipment and manufacturing processes. To meet the highest standards of industrial production, Efacec Switchgear presents:

- Flexible manufacturing lines with integration of advanced technologies to increase efficiency and ensure high standards of quality
- Laboratory testing of internal development and type test
- Processes for planning, production and logistics to increase the stringent response capability
- Flexibility to adapt our product ranges to the most demanding and diverse needs of our customers
- Equipment certified by independent international laboratories

We dedicate financial resources to programs of continuous empowerment and technological development to improve our human resources capabilities as well as our solutions portfolio, suiting it to the demands of today and tomorrow. We are constantly providing training plans to our human resources so we can always keep ourselves in the forefront of technology and know-how.

Efacec Switchgear is certified according to the following references of Quality, Environment, Health and Safety. These certifications are part of a policy of continuous improvement that extends to all areas of this Business Unit. This contributes decisively to the satisfaction of our customers, along with the recognition of the markets where we operate.

We are audited and certified by the most exacting quality standards and management: ISO 9001, ISO 14001, OHSAS 18001 and also certified according to the benchmark for Research, Development and Innovation NP 4457: 2007.



Primary Distribution

Primary Distribution

Efacec Switchgear provides its Customers with a wide portfolio of Medium Voltage solutions. For critical applications, we have a range of Primary Distribution suitable for the customer's most demanding needs. These solutions include air-insulated switchgear equipped with withdrawable circuit breakers and also outdoor solutions.

We focus on value creation by combining our engineering and production skills in the entire project phase and delivery to the end customer. All solutions are tailored towards efficiency and to provide cost saving for our customer.

Efacec Switchgear has a range of solutions for Primary Distribution with the following characteristics:

- Short circuit capacity of up to 50 kA, rated currents up to 4000 A
- Modular and metal-clad construction
- Withdrawable vacuum circuit breaker with low maintenance
- Internal arc testing ensures the safety of both operator and facility, with A FLR accessibility class
- Service continuity is ensured during equipment design with several possibilities of status monitoring
- NORMACEL and QBN7 ranges use vacuum circuit breakers and busbar connection with an air-insulation system
- Solutions can be customized according to the particular standards and regulations of each customer, as well as the specifications of each market



■ **QBN⁷**

■ **NORMACEL**

■ **DIVAC**

■ **OCB**

■ **NORMACEL^{OUT}**

■ **QBN⁷OUT**

Withdrawable Metal-clad Switchgear

Primary Distribution

Overview

The QBN7 is a Medium Voltage Air Insulated Switchgear, constructed on a modular design with metallic partitions, making it easy to extend with more feeders.

The installation area required is quite small, but without compromising the operational safety or easy access for maintenance.

The standard operation of the equipment is exclusively carried-out from the front and the need to access it from the rear is limited to the connection of the MV cables.

The construction of QBN7 switchgear is internal arc resistant in accordance with IEC 62271-200, PM type, A FLR accessibility, for the protection of personnel and other equipment.

The cubicles are fitted with DIVAC withdrawable vacuum circuit breakers, with high electrical and mechanical performance in accordance with IEC 62271-100, E3 and M2 classes.

Always in the forefront of the most demanding performances, the QBN7 range has already reached 31.5 kA.

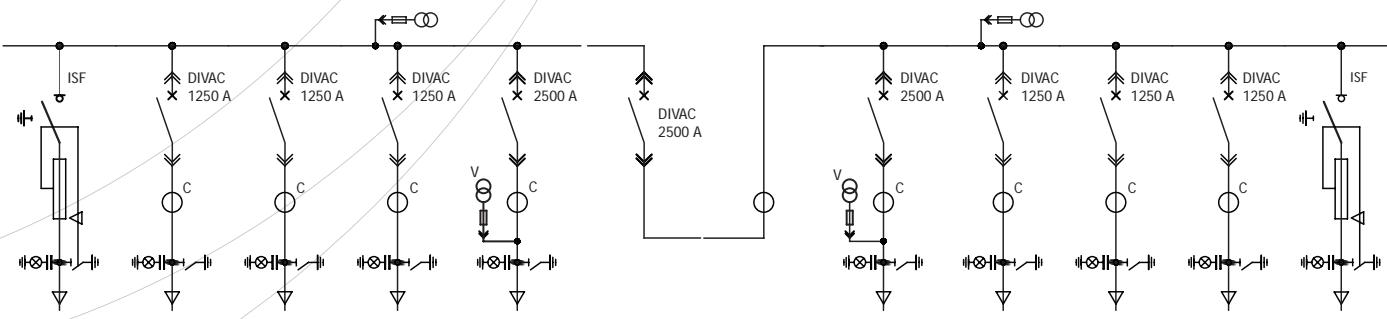


Characteristics

- Modular construction
- Expandable
- Small installation area
- Operational simplicity
- Exclusively operated from the front
- Internal arc resistant
- Equipped with a vacuum circuit breaker (E3 and M2 classes), with high electric and mechanical life
- Possibility of wall-mount installation (Special Request)
- Reliable and requires little maintenance
- Insertion/extraction of the circuit breaker with the compartment door closed for full operator safety
- Several optional equipment as specified by the customer

Electrical characteristics			
Rated voltage	36 kV		
Insulation level	Basic 170 kV	Option 200 kV	
Lightning impulse	70 kV/1 min	80 kV/1 min	
Power frequency			
Frequency	50 Hz/60 Hz		
Rated busbar current	630 up to 3150 A		
Rated tee-off current	630 up to 3150 A		
Making capacity	40 kAp	63 kAp	
Rated short-time current	16 kA/3 s	25 kA/3 s	
	31.5 kA/3 s		
Mechanical characteristics			
Protection degree (IEC 60529)	IP3X (IP41 upon request)		
Standard color	RAL 7035		
Normal service conditions			
Ambient temperature	Basic: -5 °C/+40 °C Option: -10 °C/+55 °C		
Dimensions mm			
Height	2250		
Depth	2570		
Width		1000/1200 1300	
Tee-off current up to 1250 A			
Tee-off current up to 2500 A			

Standard Features



Withdrawable Metal-clad Switchgear (Simple Busbar)

Primary Distribution

Overview

The NORMACEL range includes Medium Voltage Switchgear with air-insulation and modular construction that is metal-clad and easily extendable.

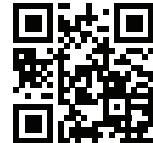
The installation area required is quite small, without compromising operational simplicity and accessibility for maintenance.

Equipment is operated exclusively from the front, which allows NORMACEL switchgear units to be wall-mounted, reducing even further the area required.

The construction of NORMACEL switchgear is internal arc resistant in accordance with IEC 62271-200, PM type, AFLR accessibility, for the protection of personnel and other equipment.

Cubicles are equipped with DIVAC-type withdrawable vacuum circuit breakers, with high electrical and mechanical performance in accordance with IEC 62271-200, E3 and M2 classes. Withdrawable contactors can be used for switching motors.

The continuous development of this product range allows us to achieve high performance levels, with rated currents of up to 4000 A and short-circuit currents up to 50 kA.



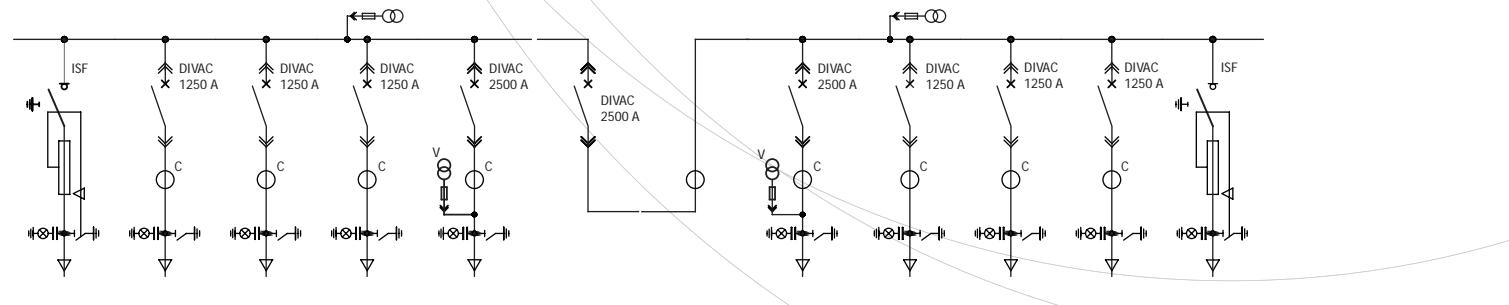
Check the product in our page:

Characteristics

- Modular construction
- Expandable
- Small installation area
- Operational simplicity
- Exclusively operated from the front
- Internal arc resistant
- Equipped with a vacuum circuit breaker with high electric and mechanical life (E3 and M2 classes) or contactor
- Possibility of wall-mount installation
- Reliable and requires little maintenance
- Insertion/extraction of the circuit breaker with the compartment door closed
- Several optional equipment as specified by the customer

Electrical characteristics			
	12 kV	17.5 kV	24 kV
Rated voltage			
Insulation level Impulse (1.2 / 50 ms)	75 kVp (95 kVp)	95 kVp	125 kV
Power frequency (50 Hz / 1 min)	28 kV	38 kV	50 kV
Frequency		50 Hz/60 Hz	
Rated current		630 up to 4000 A	
Making capacity	up to 63 kAp	up to 100 kAp or 125 kAp	up to 63 kAp
Rated short-time current	up to 25 kA/3 s	up to 40 kA/3 s or 50 kA/3 s	up to 25 kA/3 s
Mechanical characteristics			
Protection degree		IP3X or IP41	
Standard color		RAL 7035	
Normal service conditions			
Ambient temperature	Basic: -5 °C/+40 °C Option: -10 °C/+55 °C		
Dimensions mm			
Height > 1250 A	2120	2120	2350
> 1600 A	2250	2250	2350
Depth	1560	1560	1650
Width < 1250 A; < 25 kA	600	700	800
< 1250 A; < 50 kA	N/A	750	N/A
2500 A	750	850	900
3150 A / 4000 A	N/A	1000	1200

Standard Features



Withdrawable Metal-clad Switchgear (Double Busbar)

Primary Distribution

Overview

The NORMACEL range includes Medium Voltage Switchgear with air-insulation and modular construction that is metal-clad and easily extendable.

For applications that require high reliability and service continuity, Efacec has developed double bus or transfer bus solutions.

The installation area required is quite small, without compromising operational simplicity and accessibility for maintenance.

The construction of NORMACEL switchgear is internal arc resistant in accordance with IEC 62271-200, PM type, A FLR accessibility, for the protection of personnel and other equipment.

Cubicles are equipped with DIVAC-type withdrawable vacuum circuit breakers, with high electrical and mechanical performance in accordance with IEC 62271-200, E3 and M2 classes.

With this product range, development is carried out in keeping with the customer's specific needs for each application.



Characteristics

- Modular construction
- Extendable
- Small installation area
- Operational simplicity
- Exclusively operated from the front
- Internal arc resistant
- Equipped with a vacuum circuit breaker with high electric and mechanical life (E3 and M2 classes)
- Reliable and requires little maintenance
- Insertion/extraction of the circuit breaker with the compartment door closed
- Several optional equipment as specified by the customer

Electrical characteristics

Rated voltage	17.5 kV	24 kV
Insulation level	38/95 kVp	50/125 kVp
Frequency	50 Hz/60 Hz	
Rated busbar current	up to 3150 A	
Rated tee-off current	up to 3150 A	
Crest value of the short-time withstand current	79 kA	63 kA
Rated short-time current	31.5 kA	25 kA

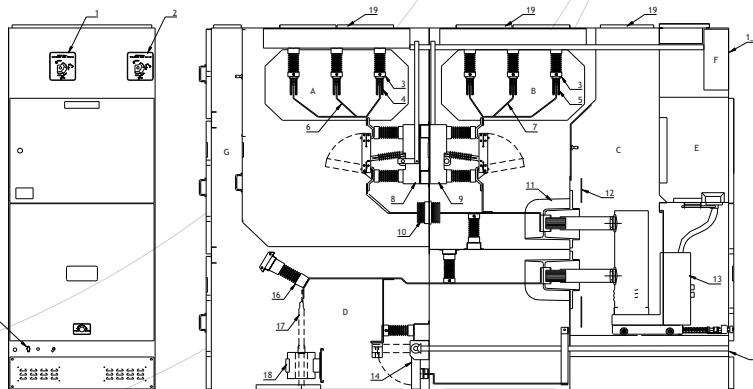
Mechanical characteristics

Protection degree	IP30 or IP41
Compartment material	Galvanized steel sheet
Standard color	RAL 7032

Dimensions mm

Height	2220	3015
Depth		
NORMACEL	2820	3000
NORMACEL AR	3000	3200
Width		
Tee-off current up to 1250 A	850	900
Tee-off current up to 2500 A	1000	1200

Composition



Description:

- A. Main busbar compartment
- B. Auxiliary busbar compartment
- C. Circuit breaker compartment
- D. Cable compartment
- E. Low-voltage compartment
- F. Disconnector compartment
- G. Internal arc (IA) gas exhaust compartment
- 1. Main busbar disconnector control
- 2. Auxiliary busbar disconnector control
- 3. Busbar support insulator
- 4. General main busbar
- 5. General auxiliary busbar
- 6. Main busbar tee-off
- 7. Auxiliary busbar tee-off
- 8. Main busbar disconnector
- 9. Auxiliary busbar disconnector
- 10. Support insulator
- 11. Support insulator
- 12. Grid
- 13. Circuit breaker
- 14. Earthing switch
- 15. Earthing switch control
- 16. Capacitive insulator
- 17. Cables
- 18. Current Transformer
- 19. Internal arc system

Outdoor Withdrawable Metal-clad Switchgear

Primary Distribution

Overview

The range Outdoor/Storm is used in outdoor applications, with an IP54 degree of protection, ventilation systems, adequate anti-condensation and enhanced sealing.

The safety of the operator of the facility and equipment is ensured through the use of doors, dual panel, complete partitioning between cells and optional internal arc detection.

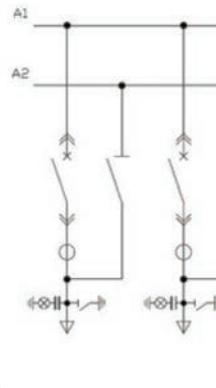
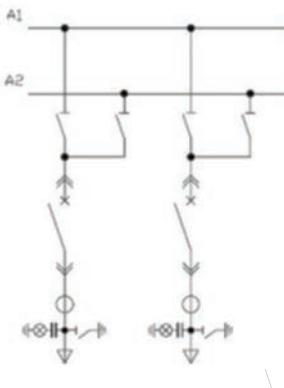
With minimal site construction, requiring only a cable trench for simplified installation of MV/LV and a building for the Automation command.

Solutions are available from 17.5 kV 40 kA to 36 kV 25 kA, single bus bar, with bus to transfer or double-bus, according to the customer's specifications.

These solutions were developed in order to ensure the safe and reliable use of equipment outdoors, even under the most adverse weather conditions.



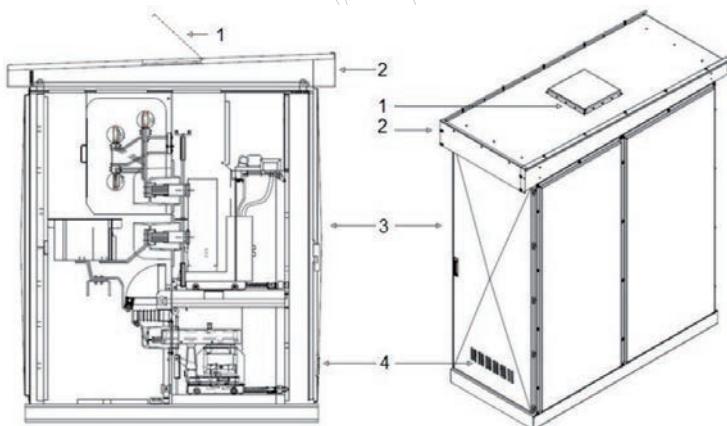
Outdoor functions range



Electrical characteristics

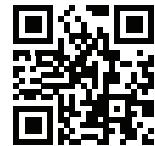
	17.5 kV	36 kV
Rated voltage		
Insulation level		
Impulse (1.2 / 50 ms)	95 kV	170 kV
Power frequency (50 Hz / 1 min)	38 kV	70 kV
Frequency	50 Hz/60 Hz	
Rated current	630/3150 A	
Making capacity	80/100 kAp	63/80 kAp
Rated short-time current	31.5/40 kA	25/31.5 kA
Dimensions mm		
Height	<2500	
Depth		
Simple Busbar	2200	3000
Transfer Busbar/Double Busbar	2900	4000
Width		
Tee-off current up to 1250 A	900	1300
Tee-off current up to 2500 A	1000	1500

Composition



Description:

1. Exhaust System
2. Roof
3. Outer Door
4. Ventilation



Mobile and Outdoor Withdrawable Metal-clad Switchgear

Primary Distribution

Overview

For scheduled maintenance or unscheduled outages, Efacec developed ready-to-use solutions, requiring minimal work to be done on site. The range of Int.M solutions is available with single bus bar, with very compact dimensions that allow transport on standard trucks. These Medium Voltage Cubicles are weatherproof and can accommodate a digital control system.

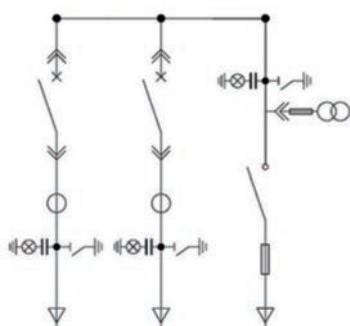
Solutions are available ranging from 17.5 kV 40 kA up to 36 kV 31.5 kA. This range of outdoor solutions is completely factory-assembled and equipped. As such, it can become quickly operational on site, with safety and efficiency.



Characteristics



Check the product in our page



NORMACEL Simple Busbar

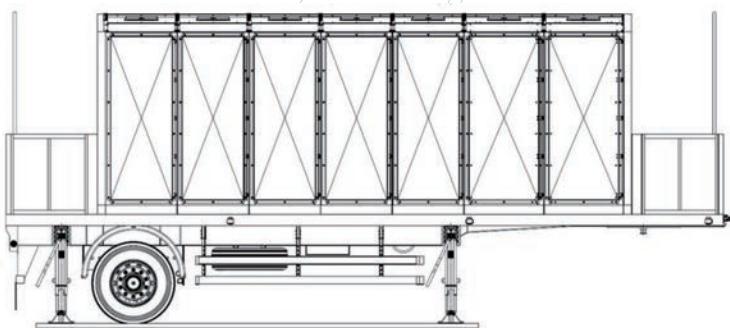
Electrical characteristics

Rated voltage	17.5 kV	36 kV
Insulation level Impulse (1.2 / 50 ms)	95 kV	170 kV
Power frequency (50 Hz / 1 min)	38 kV	70 kV
Frequency	50 Hz/60 Hz	
Rated current	630 up to 3150 A	
Making capacity	up to 100 kAp or 125 kAp	40/80 kAp
Rated short-time current	40 up to 50 kA	16 kA or 25 kA or 31.5 kA

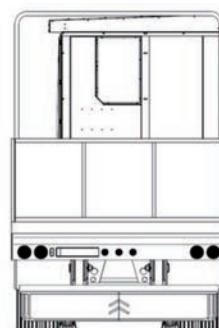
Dimensions m (mobile platform)

Height	<3.6
Depth	9 (up to 6 Cells) 9 (up to 8 Cells)
Width	<4

Composition



Example: NORMACEL OUT 24 kV



Medium Voltage Circuit breakers

Primary Distribution

Overview

Fifty years of technological development have allowed Efacec Switchgear to present this equipment. DIVAC is a three-pole indoor circuit breaker with vacuum technology. This solution, among many other applications, is used by our Primary Distribution product ranges, such as the NORMACEL and QBN7 solutions.

With reduced dimensions, the DIVAC achieves excellent electrical and mechanical performances, requiring low energy to perform closing and opening operations.



Check the product in our page:

Characteristics

- Safe and reliable
- Compact design
- Ideal for all Medium Voltage applications
- Excellent dielectric properties
- Excellent arc extinguishing properties
- Easy to install
- Easy switching operation
- High electric and mechanical life
- Maintenance free
- Several options available

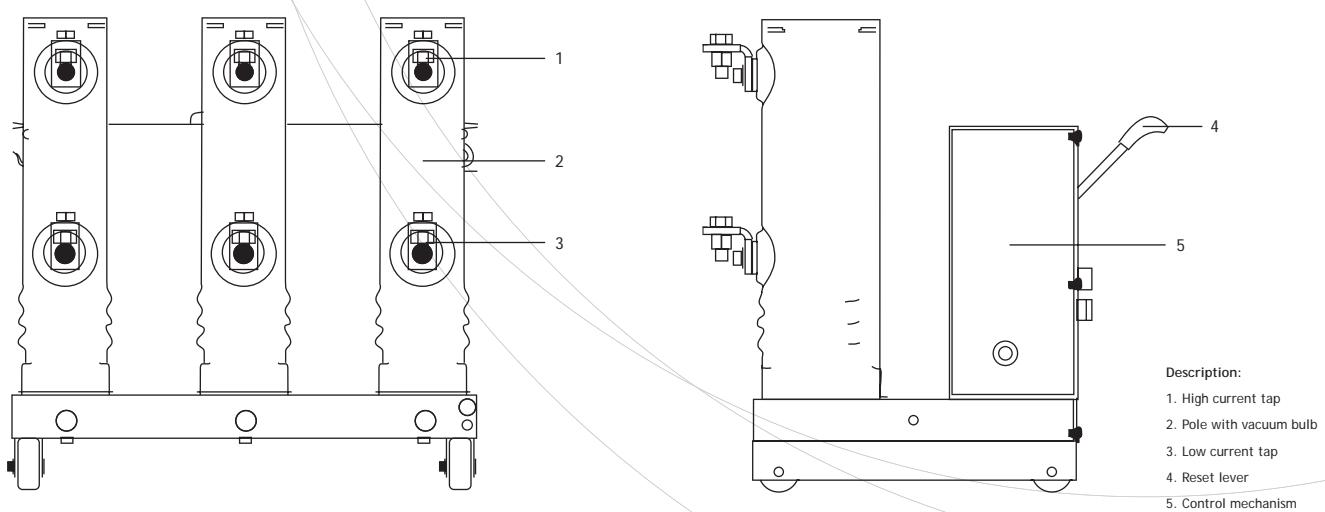
Electrical characteristics

	24 kV	36 kV
Rated voltage	24 kV	36 kV
Making capacity	25 kA	50 kA
Rated current	4000 A	3150 A
Switching cycles	A-3 min FA-3 min FA/A-0.3 s FA-15 s (15 s-FA) 0-3 min CO-3 min CO/O-0.3 s CO-15 s (15 s-CO)	
Spring reset time	<15 s	

Mechanical characteristics

Standard color	RAL 7035
Applicable standards	IEC 62271-100 IEC 62271-1 IEC 60056 ANSI IEEE C37.09 GOST

Composition



Outdoor Medium Voltage Circuit Breakers

Primary Distribution

Overview

This is an outdoor solution composed of medium voltage circuit breakers enclosed in custom-made casings. This solution is developed in keeping with the most demanding international standards and is able to withstand the most adverse extreme conditions.

Besides the circuit breaker, current transformers are also included, as well as control, measurement, protection and signaling elements.

OCBs are entirely manufactured in welded/bolted steel sheets and finished with highly resistant paint. Optionally, this equipment can be manufactured in stainless steel sheet and finished with polyurethane paint.



Characteristics

- Safe and reliable
- Placed outdoors under extreme conditions
- Compact design
- Ideal for all Medium Voltage applications
- Excellent dielectric properties
- Excellent arc extinguishing properties
- Easy to install
- Easy switching operation
- High electric and mechanical life
- Maintenance free
- Several options available
- Composed of 2 different compartments:
 - MV compartment with bushings, current and voltage (optional) transformers and a vacuum circuit breaker
 - LV compartment with protective relaying and measuring, control and signaling elements

Electrical characteristics

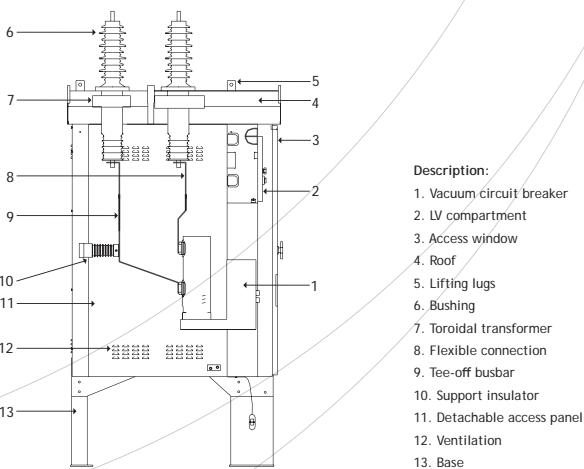
Rated voltage	15/27 kV	
Level of insulation (indoor)	90 kV	150 kV
Lightning impulse Industrial frequency	38 kV/1 min	50 kV/1 min
Frequency	50 Hz/60 Hz	
Rated current	630/1250/2000/3150 A	
Crest Value of the short-time withstand current	63/79 kAp	
Short-time rated current	25 to 31.5 kA/1 s	

Mechanical characteristics

Protection degree	IP54
Standard color	RAL 7038
Housing	Welded and/or bolted steel sheet structure protected by anti-corrosion paint
Applicable standards	IEC 62271-200 IEC 62271-1 IEC 62271-100 ANSI IEEE C37.9
Dimensions mm	

Height	2920
Depth	1300
Width	1360

Composition



Check the product in our page:



Secondary Distribution

Secondary Distribution

Keeping in mind future trends as well as the demand for efficient and modular solutions, Efacec Switchgear has been providing solutions adequate for the customer's needs in any location and under environmental conditions that require Secondary Distribution solutions.

As such, we are able to present indoor and outdoor solutions to the customer, such as gas-insulated (RMU) or air-insulated cubicles with several available features. Environmental guidelines are fully implemented in these solutions to cover the entire operating life of the equipment, covering design, production and commissioning.

Efacec Switchgear's range of solutions for Secondary Distribution has the following characteristics:

- Short circuit capacity up to 20 kA, rated currents up to 1250 A
- Modular and compartmentalized construction
- Withdrawable vacuum circuit breaker with low maintenance and replaceable components
- Internal arc testing ensures the safety of both operator and facility, with AFL and/or AFLR accessibility class lasting up to 1s
- Service continuity is ensured during equipment design with several tools for status monitoring;
- The NORMAFIX range uses vacuum circuit breakers
- The FLUOFIX range uses vacuum circuit breakers
- Solutions can be customized according to the particular standards and regulations of each customer, as well as the specifications for each geographical market



NORMAFIX

FLUOFIX

FLUOFIX^{GCT}

REVAC

IATS

Modular Switchgear

Secondary Distribution

Overview

Air-insulated modular switchgear suitable for medium voltage networks as well as industries and other applications, allowing for high adaptability and customizable configuration based on project requirements. Cubicles are entirely manufactured in steel sheet, comprising modular units equipped with several features such as the inclusion of switches, circuit breakers and several other options.

This product is available up to 36 kV covering a wide range of solutions to suit various world markets in the field of distribution of electrical energy. As well as providing multiple solutions, it has features that allow for an easy expansion of previously installed MV Switchgear.



Characteristics

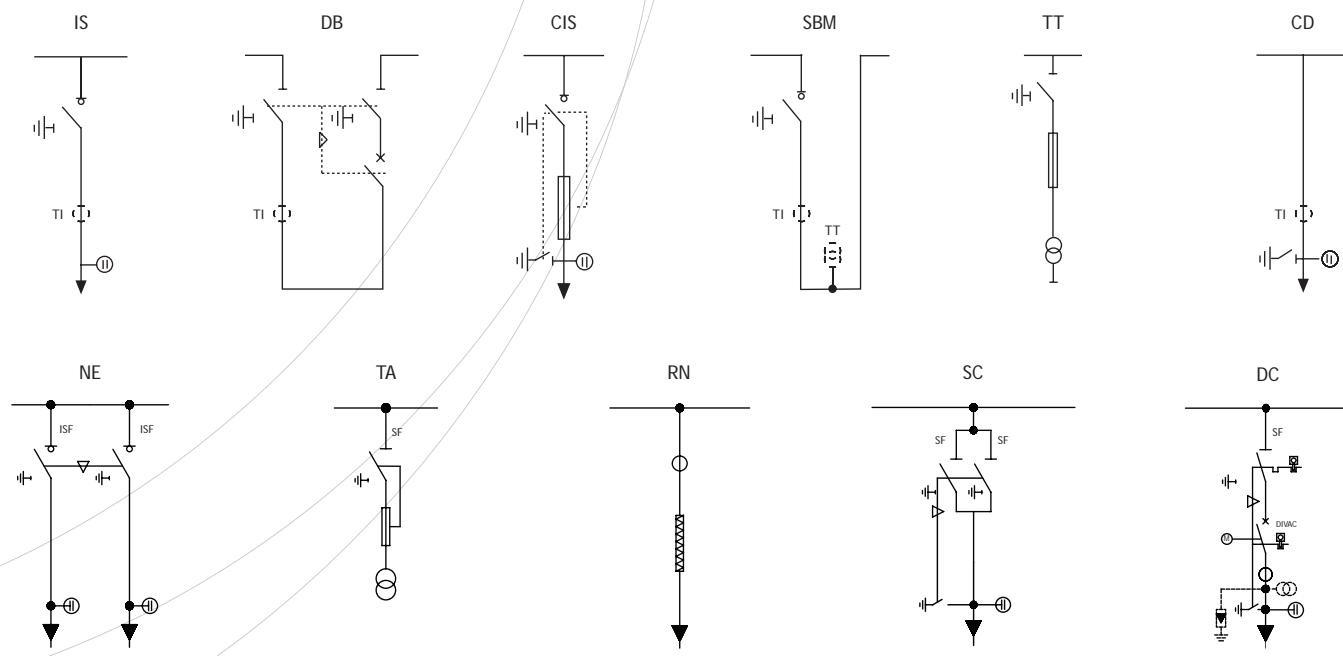
- Air-insulated modular switchgear
- Equipped with an SF₆ load break switch
- Equipped with a vacuum circuit breaker
- Modular construction
- Easy to install and expand
- Developed in accordance with International Standard IEC 62271-200
- Internal arc resistant
- High electric and mechanical life (E3 and M2 classes)
- Thermal imaging is available (optional)

Electrical characteristics

	12 kV	17.5 kV	24 kV	36 kV
Rated voltage				
Insulation level	28/75 kV	38/95 kV	50/125 kV	70/170 kV
Rated current			630/1250 A	
Short-time withstand current			16 kA/3s; 20 kA/1s	
Dimensions mm				
Height	1575		2010	
Depth	860		1155	
Width	375/500/750/1000		600/1200	

Note: Dimensions are for reference purposes only.

Standard Features



Compact Switchgear

Secondary Distribution

Overview

This solution has modular and compact cubicles with full SF₆ insulation for medium voltage networks up to 36 kV. It is a modular solution for easy installation due to its dimensions and weight.

Operational safety is ensured by tests carried out in conformity with the most demanding standards, including the construction and weather resistance of the solutions. This solution allows for numerous configurations as well as the incorporation of several options in keeping with the demands of the customer.

The reduced dimensions allow for installation in compact substations. Available with up to 5 functions in a single stainless steel hermetically isolated tank, which ensures the protection of its active components against harsh environments.

It is available in a compact version that minimizes on-site work and a modular version that maximizes different function settings.



Check the product in our page:

Characteristics

- Compact switchgear with SF₆ insulation
- Equipped with an SF₆ load break switch
- Equipped with a vacuum circuit breaker
- Developed in accordance with International Standard IEC 62271-200
- Unaffected by weather conditions
- Compact or modular version
- Internal arc resistant
- High electric and mechanical life (E3 and M2 classes)
- Stainless steel tank

Electrical characteristics

	12 kV	17.5 kV	24 kV	36 kV
Rated voltage				
Insulation level				
Impulse (1.2 / 50 ms)	28 kVp 75 kV	38 kVp 95 kV	50 kVp 125 kV	70 kVp 170 kV
Rated current			up to 630 A	
Short-time rated current			16 kA/3s; 20 kA/3s	
Temperature			-25 °C/+40 °C (others, upon request)	

Dimensions mm

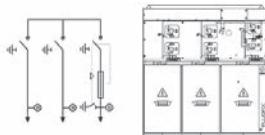
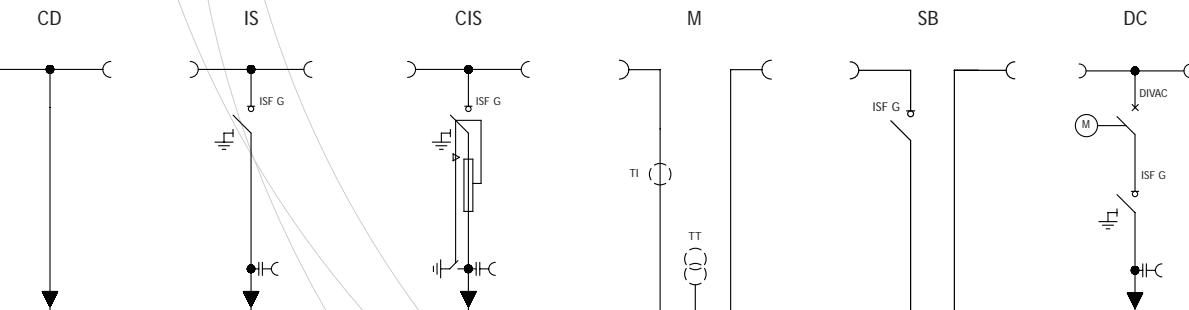
Height	1275	1728
Depth	727	900
Width	375/450/750	450/1000

Mechanical characteristics

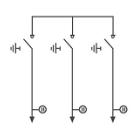
Protection degrees	IP67 (for the medium voltage compartment)
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Note: Dimensions are for reference purposes only.

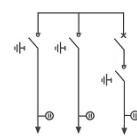
Standard Features



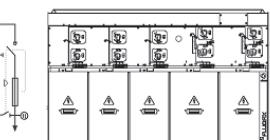
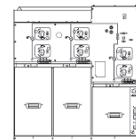
2IS + CIS



3IS



2IS + DC



3IS + 2CIS

Outdoor Compact Switchgear

Secondary Distribution

Overview

SF6-insulated compact RMU for outdoor installation. Solutions are available, with various cable box arrangements, auxiliary accessories & remote control options. All live parts are protected in an SF6-insulated tank. This solution comes equipped with an SF6 load break switch and a vacuum circuit breaker.

This equipment is designed for distribution networks up to 12 kV and can operate under the most extreme conditions, often being used in tropical, arid or saline outdoor areas. It can also be used in altitudes up to 1000m above sea level as standard.

FLUOFIX GCT is fully assembled at the plant and tested according to standards IEC 62271-200 and ENA TS 41-36. It incorporates SF6-insulated state-of-the-art technology and was developed in keeping with the NORMAFIX and FLUOFIX lines, with the following main features:

- Small dimensions and weight
- High electric and mechanical life
- Sealed and weathertight equipment
- Safety features for both operator and equipment
- Maintenance-free



Characteristics

- Outdoor compact switchgear with SF6 insulation
- Equipped with an SF6 load break switch
- Equipped with a vacuum circuit breaker
- Unaffected by weather conditions
- Internal arc resistant
- High electric and mechanical life (E3 and M2 classes)
- Stainless steel tank
- Possibility of remote control and connection to SCADA systems
- Corrosion resistant

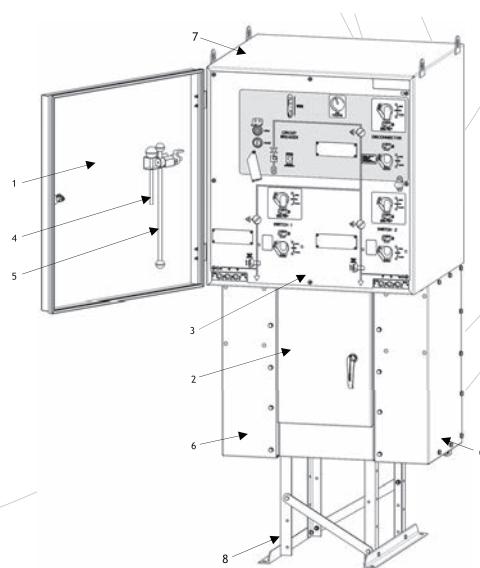
Electrical characteristics

Rated voltage	12 kV
Level of insulation	
Power frequency (50 Hz / 1 min)	38 kV
Lightning impulse (wave 1.2 / 50 ms)	95 kV _{máx}
Short-time rated current	21 kA / 3 s
Rated current	
Ring switching function	630 A
Tee-off protection function	200 A
Temperature	-25 / +40 °C
Rated pressure	0.3 Bar (rel)

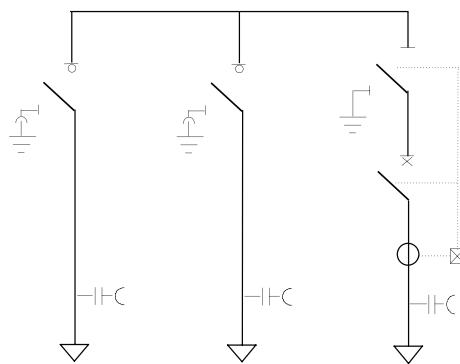
Mechanical characteristics

Protection degrees	IPX7 (for the medium voltage compartment) IP3XW (remaining equipment with closed door) IP2XC (fascia, with closed door) IK08
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Composition



- Description:
1. Main door
 2. Low voltage compartment and cable testing
 3. Synoptic
 4. Circuit breaker lever
 5. Switch lever
 6. Cable box
 7. Stainless steel tank
 8. Adjustable feet



Vacuum Circuit Breakers

Secondary Distribution

Overview

REVAC was designed to integrate an automated power distribution system. Reliability on distribution network is enhanced when integrating this equipment. Failures can be detected and isolated by the device and the network can be reconfigured from the control centre or based on distributed intelligence. This type of technology enables to increase the service quality and to reduce the cost associated to outages and line-crew dispatch.

REVAC has three poles, each one with the corresponding vacuum interrupter in an epoxy casing. Each pole has its own actuator mechanically connected by an axis that assures the synchronisation between them. A lever outside the equipment enables to trip manually.

REVAC circuit breakers, developed to operate outdoors (pole mounted), were designed to face all environment conditions, easily assembled and easy to use.



Benefits

- Flexible
- Reliable
- Remotely controlled
- Long service life (10 000 mechanical manoeuvres)
- Ideal for adverse environmental conditions
- Compact equipment design
- Simple and flexible installation
- Adapted to any type of pole assemblies
- Few mechanical parts, minimal maintenance
- Prepared for smart automation of distribution networks



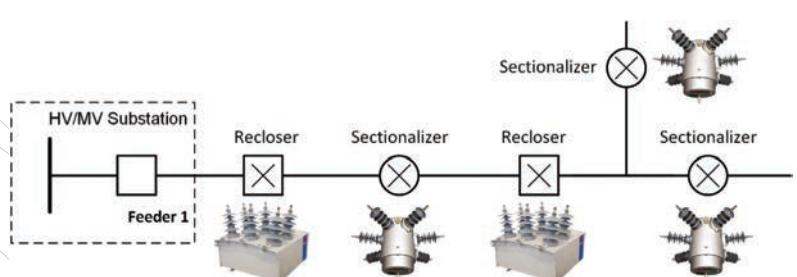
Technical Data

	12 kV	17.5 kV	27 kV	36 kV
Rated Voltage			630 A	
Rated Current				
Frequency		50 / 60 Hz		
Short-time Short-circuit Current			12.5 kA (3s)	
Impulse Insulation Level (1.2 / 50 µs)	75 kV	95 kV	125 kV	150 kV
Short-circuit Making Current			31.5 kA _p	
Breaking Capacity			12.5 kA	
Auxiliary Voltage Supply		48 Vcc / 110 Vca / 220 Vca		
Applicable Standards		IEC 62271-111 / IEEE C37.60 / IEC 62271-1		
Weight (kg)	145		160	
Dimensions (mm)				
Width	735		750	
Height	784		850	
Depth	885		885	



Controller

The REVAC is equipped with a RCU 220E controller that targets protection and control of distribution assets together with conventional RTU-functionality. The RCU 220 provides not only reclosing function but also feeder isolation and restoration algorithms for loop/ring configurations. The automatic loop restoration control function has the advantage of not requiring communication capabilities to isolate faulty sections and restore power to unaffected segments.



Switches**Secondary Distribution****Overview**

IATS is an SF₆ load break switch for pole-mounting. All live parts are protected against environmental hazards inside an SF₆-filled compartment. The switch is sealed for life in a stainless steel tank.

IATS was designed to be used outdoors, in power distribution facilities, under the most extreme conditions. This equipment is particularly suitable for industrial (dust, sand), tropical, arid and saline environments. It can be used at altitudes above 1000 m of altitude.

IATS is assembled and tested according to standard IEC 60265. The increasing demands regarding people and equipment protection are taken into consideration by Efacc Switchgear during the development and design of this equipment.

**Characteristics**

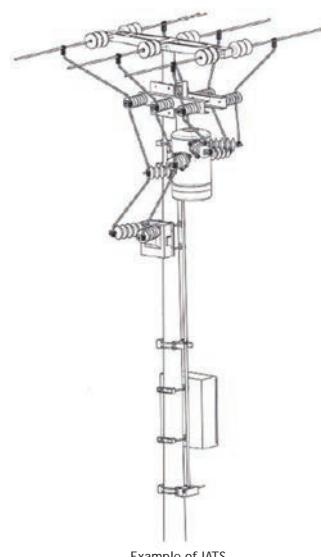
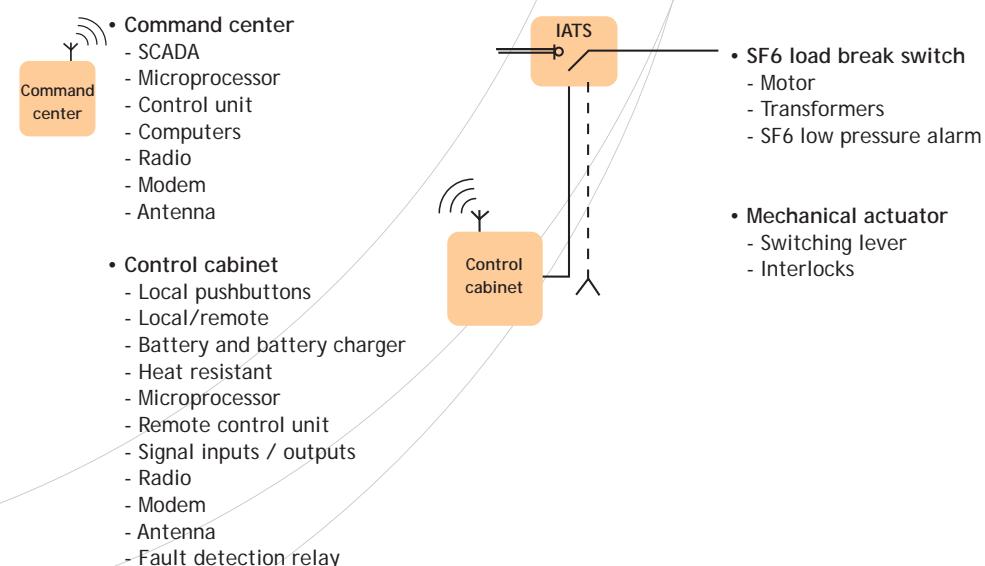
- Reliable
- Compact and light
- Suitable for all kinds of poles
- Ideal for extreme weather conditions
- Not hazardous to the environment
- Easy to install
- Easy to operate
- Remote control and monitoring via radio
- Simple and safe (mechanical and electric) interlocks
- High electric and mechanical life
- Maintenance free
- Several options available

Electrical characteristics

	12 kV	17.5 kV	24 kV	36 kV
Rated voltage				
Level of insulation				
Power frequency (50 Hz / 1 min)	75 kVp	95 kVp	125 kVp	170 kVp
Lightning impulse (wave 1,2 / 50 ms)	28 Kv	38 Kv	50 Kv	70 Kv
Rated current			400 A or 630 A	
Short-time short-circuit current		12.5 kA/3s; 16 kA/3s		
Short circuit making current			31.5/40 kA	
Breaking current: mainly active load			630 A	
Breaking current: closed loop			630 A	
Breaking current: cable charging			25 A	
Ambient temperature		-25 °C/+40 °C (others, upon request)		
Mechanical endurance			2.000 operations	

Mechanical characteristics

Protection degrees (IEC 60529 y EN 50102)	IP54 (mechanism compartments) IP67 (MV compartments)
Standards	IEC60265 HN 64 S46

Standard Features

Example of IATS

Switchgear

High and Medium Voltage Switchgear

For high and medium voltage power distribution, Efacec Switchgear provides a set of solutions up to 550 kV. The range of solutions for High and Medium Voltage Switchgear includes disconnectors, circuit breakers, withdrawable circuit breakers and switches.

Efacec Switchgear has been developing solutions by using the most advanced IT resources with the purpose of increasing the performance of said equipment.

The guarantee of an excellent mechanical and electrical performance of the High and Medium Voltage Switchgear solutions is evidenced by the documentation concerning all type and routine tests that were carried out, taking into account all kinds of equipment installation, even those under the most adverse conditions (seismic areas or extreme temperatures).

Efacec Switchgear's range of solutions for High and Medium Voltage Switchgear has the following characteristics:

- High voltage disconnectors include several options and can be transported while assembled at lower voltages or in modules at higher voltages
- Allow for manual, motor, local or remote operation by using a control capable of operating all poles simultaneously or individually, as per the needs of the customer
- Easy installation and maintenance with economic and financial gains
- Short breaking times
- Highly efficient and adequate materials
- Solutions with type tests in accordance with current IEC standards, guarantee to the customer that the device reaches the intended ratings



SHCR **SHD**

SVL **SVN**

SXD **SXE**

SP

Horizontal Break Disconnectors

Switchgear

Overview

These two or three-column disconnectors include center break (SHD) or double side break (SHCR), have separate poles and are for outdoor installation. They can be supplied with manual, motor, local or remote control.

Closing and opening operations are made by rotating the movable contact blade in a horizontal plane. Optionally, this equipment can also be supplied for vertical or suspended mounting.



Check the product in our page.

Characteristics

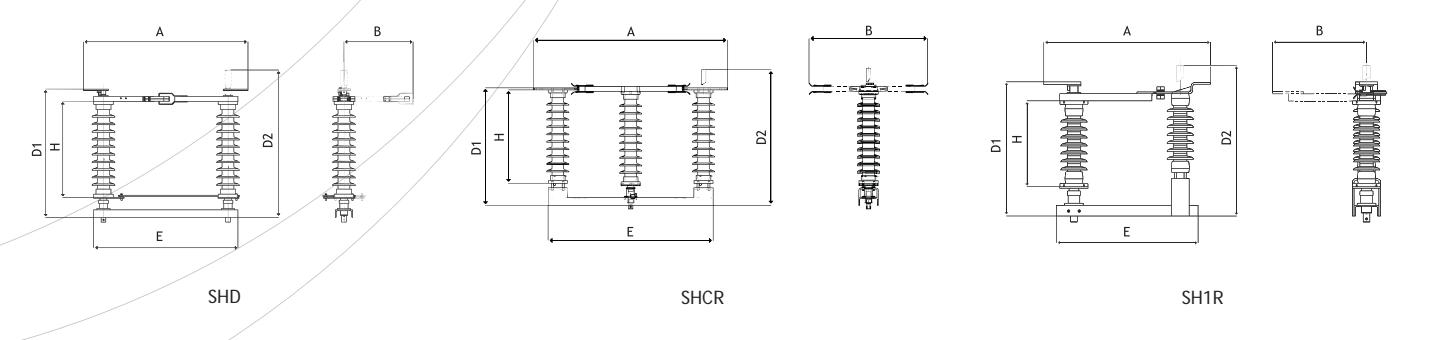
- Up to 245 kV
- Seismic-resistant
- Up to 50 kA (rms)/4000 A
- Ice-resistant
- Easy installation and maintenance
- Double side break/center break
- IEC/ANSI certification

IEC ANSI	Rated voltage	Rated permanent current	Lightning impulse withstand voltage				Power frequency withstand voltage						Rated withstand current		RIV test HV (1MHz)	
			To earth and between poles	Across the insulating distance	To earth and between poles (kVRms)			Across the insulating distance (kVRms)			Short-time	kAp kA (rms)				
Type	(kV)	(A)	(kVp)	(kVp)	Dry	Rain	Dry	Rain	Dry	Rain						
SH1R-24	24	25.8	up to 2000	up to 2000	125	150	145	165	50	70	50	60	60	77	60	31.5 25 80 65
SHD-24			up to 3150	up to 3000					50	40	125	114				
SH1R-36			up to 2000	up to 2000	170	200	195	220	70	95	70	80	80	105	80	31.5 25 80 65
SHD-36	36	38	up to 3150	up to 3000					50	44	125	114				
SHCR-36			up to 2000	up to 2000					50	44	125	114				
SH1R-72.5			up to 2000	up to 2000	325	350	375	385	140	175	140	140	160	193	160	31.5 25 80 65
SHD-72.5	72.5	72.5	up to 3150	up to 3000					50	44	125	114				
SHCR-72.5			up to 2000	up to 2000					50	44	125	114				
SHD-100	100		up to 3150		450		520		185		185		210		210	50 125 125
SHD-123	123	121	up to 3150	up to 3000	550	550	630	605	230	280	230	230	265	308	265	50 44 125 114
SHCR-123			up to 2000	up to 2000					50	44	125	114				
SHD-145	145	145	up to 3150	up to 3000	650	650	750	715	275	335	275	275	315	369	315	50 44 125 114
SHCR-145			up to 2000	up to 2000					50	44	125	114				
SHD-170	170	169	up to 3150	up to 3000	750	750	860	825	325	385	325	315	375	424	375	50 44 125 114
SHD-245	245	242	up to 3150	up to 3000	1050	900	1200	990	460	465	460	385	530	512	530	50 44 125 114
SHD-245			up to 3150	up to 3000	1050	900	1200	990	460	465	460	385	530	512	530	50 44 125 114

Dimensions mm

Model	SH1R 24	SH1R 36	SHD 36	SH1R 72	SHD 72	SHCR 72	SHD 100	SHCR 100	SHD 123	SHCR 123	SHD 145	SHCR 145	SHD 170	SHD 245
A	495	600	920	1240	1195	1700	1445	2100	1665	2200	1945	2600	2180	2820
B	390	530	420	830	569	480	569	668	796	714	898	902	1000	1360
D1	-	-	765	1086	1035	969	1285	1219	1505	1419	1797	1739	1997	2783
D2	765	905	920	-	1195	1175	1445	1425	1665	1625	1945	1945	2180	2820
E	695	800	900	1100	1370	1360	1570	1760	1790	1860	1990	2300	2290	2870
H	195	445	445	770	770	770	1020	1020	1220	1220	1500	1500	1700	2300
Mass kg														
Weight	60	80	80	100	120	120	130	180	250	250	220	280	250	410

Standard Features



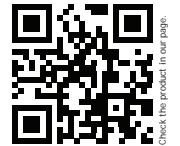
Vertical Break Disconnectors

Switchgear

Overview

This rotating vertical break disconnector is intended for outdoor installation. It is composed of three insulators, two of them fixed (support) and a switching rod. Operation is made by means of motor control and, optionally, can be supplied with manual control, motor, local or remote control.

Closing and opening operations are made by rotation (SVN) or translation (SVL) of the switching rods and mechanisms, which rotate the blade around the shaft itself during opening/closing and rotate it in a vertical plane during the transition between the opening and closing positions.



Characteristics

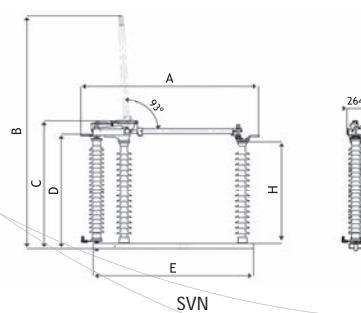
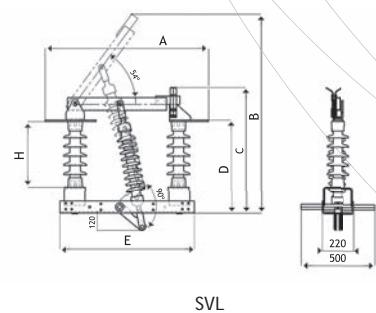
- Up to 245 kV
- Up to 50 kA (rms)/3150 A
- Easy installation and maintenance
- IEC/ANSI certification
- Seismic-resistant
- Ice-resistant
- Supply option with earth switch included

IEC ANSI	Rated voltage	Rated permanent current	Lightning impulse withstand voltage		Power frequency withstand voltage						Rated withstand current			RIV test HV (1 MHz)	
			To earth and between poles	Across the isolating distance	To earth and between poles (kVrms)		Across the isolating distance (kVrms)		Short-time	kAp		kA (rms)			
Type	(kVrms)	(AMPS)	(kVp)	(kVp)	Dry	Rain	Dry	Rain		50	38	100	61		
SVL-36	36 38	up to 1250 A	up to 1200 A	170 200	195 220	70 95	70 80	80 105	80 88						
SVL-72.5	72.5 72.5			325 350	375 385	140 175	140 145	160 176	160 154						
SVN-72.5				450	520	185	185	210	210						
SVN-100	100			550 550	630 605	230 280	230 230	265 308	265 308						
SVN-123	123 121	up to 3150 A	up to 3000 A	650 650	750 715	275 335	275 275	315 368	315 368						
SVN-145	145 145			750 750	860 825	325 385	325 325	375 423	375 423						
SVN-170	170 169			1050 1050	1200 1155	460 545	460 455	530 600	530 600						
SVN-245	245 242														

Dimensions mm

Model	SVL-36	SVL-72.5	SVN-72.5	SVN-100	SVN-123	SVN-145	SVN-170	SVN-245
A	1100	1450	1940	2140	2440	2640	2790	3490
B	1315	1915	2105	2550	3005	3535	3835	5220
C	840	1160	1180	1430	1630	1910	2110	2784
D	625	950	980	1230	1430	1710	1910	2583
E	900	1250	1675	1875	2175	2375	2525	2840
H	445	770	770	1020	1220	1500	1700	2300
Mass kg								
Weight	75	125	140	200	240	280	360	550

Standard Features



Pantograph Disconnectors**Switchgear****Overview**

These pantograph-type disconnectors have separate poles and are intended for outdoor installation. They can be supplied with manual or electric control. Closing and opening operations are made by the contact blade moving in a vertical plane. These devices have a simple design and are easy to assemble.

**Characteristics**

- Up to 420 kV
- Up to 50 kA (rms)/4000 A
- Easy installation and maintenance
- IEC/ANSI certification
- Seismic-resistant
- Ice-resistant

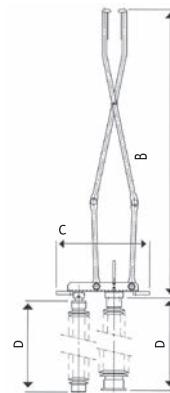
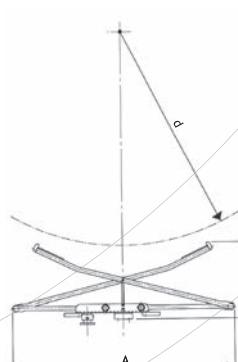
IEC ANSI	Rated voltage	Rated permanent current	Test pulse voltage				Power frequency withstand voltage						Rated withstand current					Switching impulse withstand voltage			
			To earth and between poles		Across the isolating distance		To earth and between poles (kVrms)		Across the isolating distance (kVrms)		Short-time	kAp		RIV test HV (1 MHz)	To earth and between poles (kVp)	Across the isolating distance (kVp)					
			(kVp)	(kVp)	(kVp)	(kVp)	Dry	Rain	Dry	Rain		kA (rms)	HV (1 MHz)								
SXD-72.5	72.5	72.5			325	350	375	385	140	175	140	145	160	176	160	154	40	100			
SXE-170	170	169	up to 3150 A	up to 3150 A	750	750	860	825	325	385	325	315	375	423	375	423		50	38	125	61
SXE-245	245	242			1050	1050	1200	1155	460	545	460	455	530	600	530	600	<2500 <500 μV				
SXE-420	420	400	up to 4000 A	up to 4000 A	1425	1470	1425	1617	520	680	520	680	610	748	610	748	μV	1050	900 (+345)		

Dimensions mm

Model	SXD-72.5	SXE-170	SXE-245	SXE-420
A	1230	1789	2445	3580
B	1630	2506	3353	4780
C	886	886	886	-
D	770	1700	2300	-
d	990	1900	2400	3400

Mass kg

Weight	75	140	200	240
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Standard Features

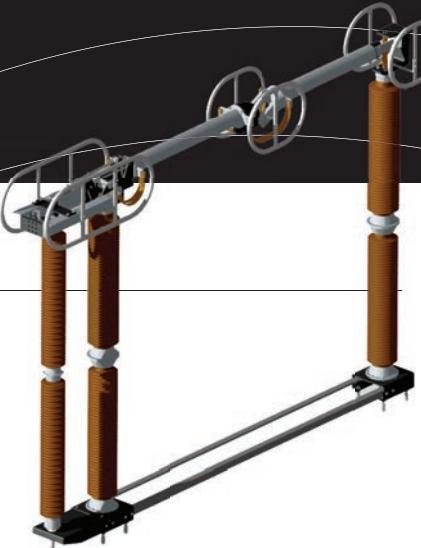
Semi-Pantograph Disconnectors

Switchgear

Overview

These semi-pantograph-type disconnectors have separate poles and are intended for outdoor installation. They can be supplied with manual or electric control. Closing and opening operations are made by moving a single articulated blade. These devices have a simple design and are easy to assemble.

Their articulated design provides these disconnectors with a high mechanical resistance to short-circuit electrodynamic stress, allowing them to achieve high performances.



Characteristics

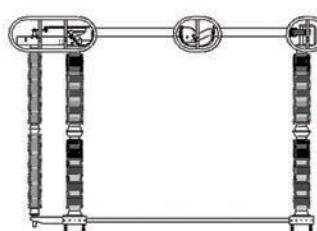
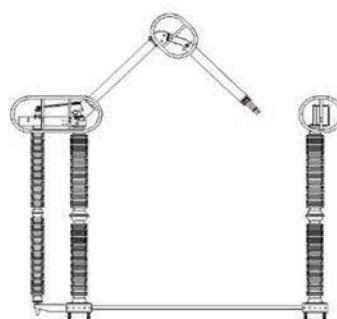
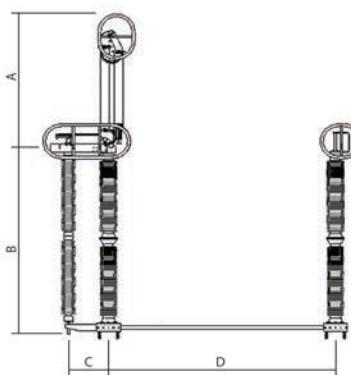
- Up to 550 kV
- Up to 63 kA (rms)/3150 A
- Easy installation and maintenance
- IEC/ANSI certification
- Seismic-resistant
- Ice-resistant

	IEC ANSI	Rated voltage	Rated permanent current	Test pulse voltage				Power frequency withstand voltage				Rated withstand current						Switching impulse withstand voltage			
				To earth and between poles		Across the isolating distance		To earth and between poles (kVrms)		Across the isolating distance (kVrms)		Short-time		kAp kA (rms)		RIV test HV (1 MHz)	To earth and between poles	Across the isolating distance			
Type		(kVrms)	(AMPS)	(kVp)	(kVp)	Dry	Rain	Dry	Rain						(kVp)	(kVp)					
SP-420	420	362	up to 3150 A	up to 3150 A	1425 (+240)	1050	1155	520	545	455	610	600	455	50	50	120	130	<2500 μV	<500 μV	1050	900 (+345)
SP-550	550	550	up to 3150 A	up to 3150 A	1550 (+315)	1550	1705	620	710	620	800	781	620					1175	900 (+450)		

Dimensions mm

Model	SP-420	SP-550
A	2547	3213
B	3310	3510
C	705	705
D	4000	5330

Standard Features



Compact Substations

Compact Substations

Due to the market evolution in the scope of turnkey solutions and their high level of customization, Efacec Switchgear has extended its portfolio of power distribution solutions to include compact substations. These solutions incorporate the majority of equipment developed by the Efacec Group. Currently often used in the field of renewable energy, these solutions allow for quick commissioning as well as easy integration in either an urban or rural environment.

These solutions have evolved in keeping with the smart concept. When developing its intelligence solutions, Efacec Switchgear takes into account the evolution of power distribution networks in the scope of urban mobility and efficient management of the electrical grid.

Efacec Switchgear's range of solutions of Compact Substations has the following characteristics:

- SF6 or air-insulated Medium Voltage Switchgear
- Protection, control and measuring units
- Up to 4 oil-filled or dry Medium/Low Voltage distribution transformers
- Low Voltage Switchgear: Low Voltage Cells
- Direct cable connections through Medium Voltage and Low Voltage
- Earth circuits
- Lighting circuit and auxiliary services
- Possibility of integrating ventilation systems
- Precast concrete or metal building, easy to install on-site
- Fully factory assembled
- Configuration and parameterization of compact substations by resorting to proprietary software



■ MSA

■ MSB

■ PUCBET

■ PUCMET

■ POWERPUC

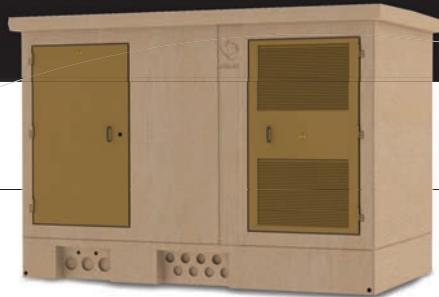
Compact Substations

Overview

PUCBET is a compact substation designed for outdoor installation. In order to meet the specific needs of each project and each customer, several configurations of PUCBET are available in several models of existing concrete buildings.

The several available concrete buildings allow for various equipment combinations. It is possible to install dry or oil-immersed power transformers/converters and also to install medium voltage equipment, either air-insulated or full SF₆-insulated equipment.

PUCBET is a precast building with dimensions that make it possible to implement any Medium Voltage electrical arrangement, perfectly adapting to the various uses and needs of the customer in scope of both public and private distribution. The high reliability and resistance of this equipment is ensured by the quality of the reinforced concrete, which provides a resistance higher than 300 kg/cm² and full impermeability. It should be stressed the importance of the concrete shell's very high mechanical resistance, since the sites where this type of equipment is installed are, most of the times, accessible to the public and not fenced.



Characteristics

- Follows all applicable standards and regulations, ensuring a full operational safety
- Manufactured in highly resistant and fully impermeable reinforced concrete
- Allows for the use of any type of cladding and outer coating
- Ventilation windows and grids in painted and galvanized steel
- Resistant to the most extreme weather conditions and tested for seismic environments
- Simple to integrate in rural and urban environments
- Great flexibility in the use of inner space
- Adapted to several kinds of equipment (public and private)
- Easy to transport and assemble
- Low construction cost
- Short delivery times
- Turnkey solution
- Power converters (Inverters) for renewable energies

Electrical characteristics

Medium Voltage	up to 36 kV - 50 Hz		
Low Voltage	up to 1000 V		
NORMAFIX	Check respective specifications		
FLUOFIX	Check respective specifications		
Transformer	Rated voltage up to 36 kV	Power up to 1600 kVA ¹	

Mechanical characteristics

Standard Colors ²	Wall frames/ironwork : RAL 1015					
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Dimensions mm

Model	PBT-3500	PBT-4500	PBT-5500	PBT-6500	PBT-7500	PBT-8500
Depth	2520	2520	2520	2520	2520	2520
Width	3500	4500	5500	6500	7500	8500
Height	2600	2600	2600	2600	2600	2600

Mass t

Weight (without transformer)	14	18	20	23	27	30
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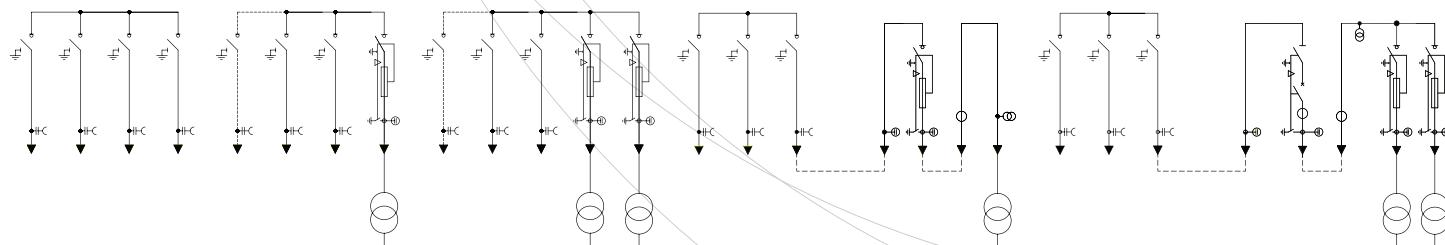
¹ Further options upon request

² Others upon request

• Buildings with different width upon request

• The presented solutions are subject to possible changes

Standard Features



Compact Substations

Overview

PUCMET is a compact substation designed for outdoor installation. Its small dimensions allow for optimal transport costs as well as the required installation space.

Made in welded construction, this building has the following compartments that are fully segregated:

- Compartment for medium voltage cubicles, prepared for Efacec Switchgear's NORMAFIX and FLUOFIX equipment
- Compartment for distribution transformers
- Compartment for the low voltage distribution board



Check the product in our page

Characteristics

- Certified by KEMA
- Fully tested in the factory
- Completely manufactured in stainless steel (optionally in zincor)
- Resistant to extreme environments - protected against corrosion
- Special anti-condensation ventilation system
- Simple to integrate in rural and urban environments
- High flexibility in the distribution of inner space
- Adapted to several types of equipment (public and private)
- Easy to transport (20 or 40-feet containers) and assemble
- Small installation area
- Low maintenance
- Anti-vandal protection
- Low construction cost
- Short delivery times
- Turnkey solution

Electrical characteristics

Medium Voltage	up to 36 kV	
Low Voltage	up to 1000 V	
NORMAFIX	Check respective specifications	
FLUOFIX	Check respective specifications	
Transformer	Rated voltage up to 36 kV	Power up to 1600 kVA
Earth circuit	Earth protection circuit - 20x1 copper tape with 20 mm ² section Earth service circuit - insulated copper tape with 35 mm ² section	

Mechanical characteristics

Protection degree (IEC 60529 & EN 50102)	All compartments (MV, LV and Transf.) possess IP 35D
Standard color *1	RAL 7032

Dimensions mm

Model	PUC 3F 630	PUC 4F 1000	PUC 5RC 630	PUC 3F 1000 (36)	PUC 4F 1000 (36)	PUC 5F 1000 (36)
Depth	1600	2250	2250	2250	2250	2250
Width	3350	3350	2850	3350	5000	5600
Height	1930	2040	1930	2335	2335	2335

Mass kg

Weight (without transformer)	1240	1710	1555	2015	2880	3305
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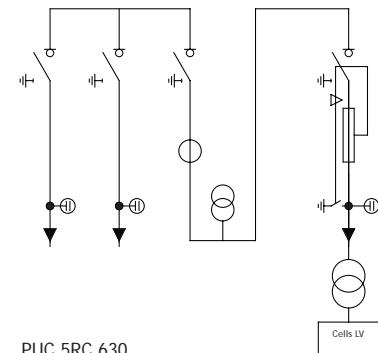
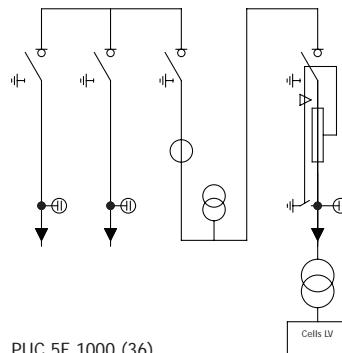
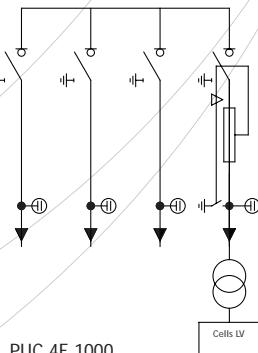
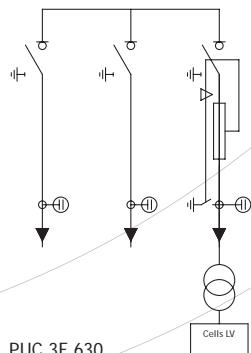
*1 Others upon request

• Buildings with different dimensions upon request

• Solution of larger power upon request

• The presented solutions are subject to possible changes

Standard Features



Compact Substations

Overview

These installation solutions are for outdoor areas in secondary power distribution networks. This solution is the most recent answer to Efacec Switchgear's technological development with the purpose of meeting the needs of the global market.

These solutions are designed according to the demands and local specifications, particularly regarding public safety and the operator's safety. They incorporate medium voltage equipment, low voltage equipment, distribution transformer with a steel structure resistant to the most varied conditions. Several options are available, such as gas exhaust systems or anti-theft protection systems.



Characteristics

- Compact substation, standard up to 1000 kVA and voltages up to 24 kV
- Steel, 3CR12 stainless steel or other material according to the specification of the Customer
- Small installation area
- Easy to transport and install
- Short delivery time
- Low maintenance
- Turnkey solution
- Flexibility of space distribution
- Option for installation of internal arc-proof means (chimney)
- Additional information
 - Medium voltage compartment with an SF₆-insulated unit of the FLUOFIX range
 - Low Voltage switchgear in keeping with the customer's specifications

Electrical characteristics

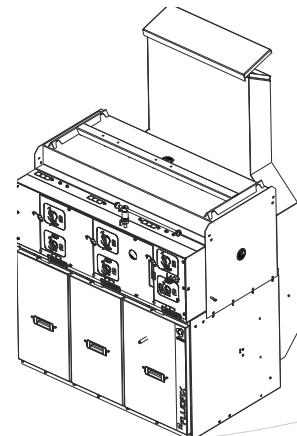
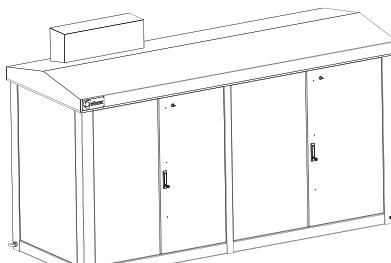
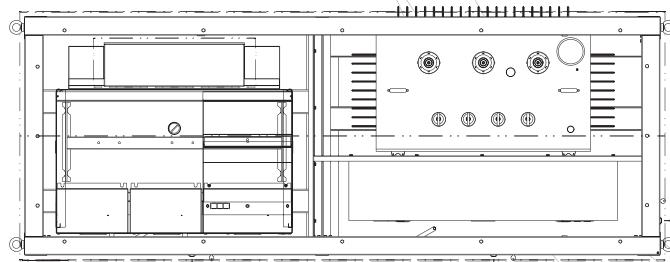
Medium Voltage	up to 24 kV
Low Voltage	up to 1000 V
FLUOFIX	Check respective specifications
Transformer	Power up to 1000 kVA
Compartments	Medium Voltage Low Voltage Transformer

Dimensions mm

Model	MSA	MSA-c	MSB	MSB-c
Depth	2800	2800	3000	3000
Width	1124	1124	1650	1650
Height	1425	1925	1465	1925

Note: Different power upon request

Composition



Certified by SABS
(South African Bureau of Standards)
- IAC-AB classification
- Internal arc: 20 kA 0,5s

Compact Mobile Substations

Compact Substations

Overview

This is the most recent High and Medium Voltage Switchgear solution, which combines current technologies and equipment with significant network experience. The main feature of this solution is mobility. It is composed of generating equipment, low and medium voltage solutions all integrated and incorporated into a container specifically prepared for this purpose. The indoor space was carefully studied in order to ensure a better performance of the equipments as well as the full safety of the complete solution. A full exterior customization is also possible in accordance with the customer's specifications and image.



Check the product in our page.

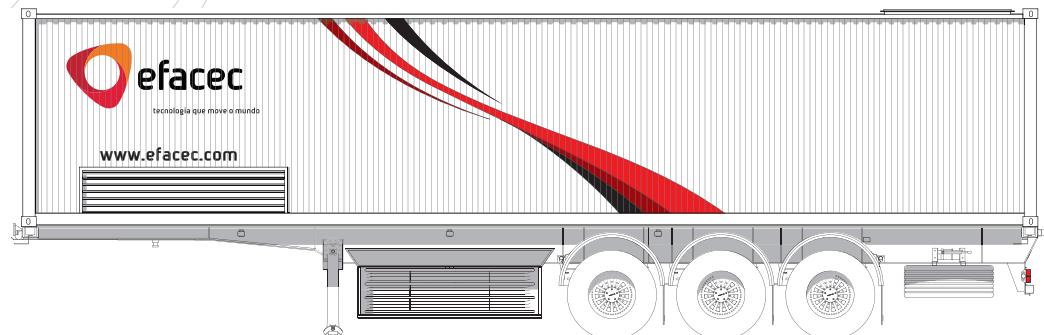
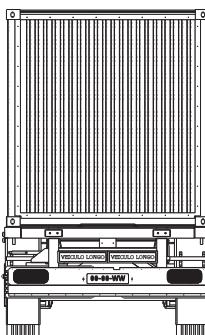
Characteristics

- Emergency medium voltage supply system equipped with:
 - Medium voltage solution up to 36 kV
 - Generator up to 1250 kVA (standard)
 - LV/MV step-up transformer, single voltage or double voltage
- Semitrailer (optional)
- Medium voltage cable winders (optional)
- MV metering equipment (optional)
- In keeping with all applicable standards and regulations, ensuring a full operational safety
- The container-type construction allows for easy transport (road, sea or railway)
- Ventilation adequate for the installed equipments
- Turnkey solution
- Possibility of customizing an exterior image according to the Customer's specifications

Electrical characteristics

Medium Voltage	up to 36 kV
Rated Current	up to 630 A
Power Unit	up to 1250 kVA
NORMAFIX	Check respective specifications
Dimensions m (mobile platform)	
Depth	up to 12
Width	up to 2.5
Height	up to 4

Composition



Solutions & Service

Overview

Efacec Switchgear has the expertise of more than 60 years developing, producing, installing, rehabilitating and maintaining Medium and High Voltage installations.

All technical means available leverage the capacity of Efacec Switchgear, associated to highly qualified and specialized teams in this type of installations. Customers are provided with highly reliable and available systems resulting on economic profits and a more competitive business.

Remodelling/ Rehabilitation

High voltage

- Reconditioning of HV circuit-breakers and sectionalizers;
- Adapting/remodelling of High Voltage installations, with the replacement of:
- Conductive parts of sectionalizers;
- Old sectionalizer commands by up-to-date electrical commands;
- Earth sectionnalizers;
- Re-electrification of the circuit-breaker commands;
- Mobile parts of extractable parts with circuit-breakers and last generation transformers.



Medium voltage

- Replacement of end-of-life circuit-breakers by today's technology circuit-breakers (air cut, DIVAC circuit-breaker) by adapting them to Efacec panels and others;
- Development of adapting cells between different cells;
- Remodelling command and protection systems;
- Deployment of safety systems using lock and/or padlock;
- Installation of internal arc detection.



Commissioning

- Assembly of circuit-breakers, sectionalizers and HV draw-out units;
- Tuning, tests and commissioning;
- Assembly of medium voltage equipment;
- Protection relays setting and testing;
- Site acceptance tests and commissioning.

Maintenance

Efacec has the proprietary know-how of multiple Efacec and third party equipment and systems, covering a high level of technical areas and is entitled to supply a complete service, including total or part of overall maintenance contracts of medium and high voltage, at the power production centres, transport, distribution and industry.

After-Sales Service

The know-how and the experience of more than 60 years of field activity enable us to play a leader role in domestic market and a reference in the international market, supplying a very qualified service to our clients. We developed systems of power management and power efficiency, focusing on how to use power by the clients, improving the quality and reducing costs.

The aim of these intervention areas is to enhance the reliability, availability, durability, efficiency and productivity of equipment and systems, assuring the protection and safety of people and reducing direct and indirect costs of maintenance and exploitation. The Efacec has the competence and experience required, running a quality service that adds value to their customers, opportunities for greater competitiveness to your business.



Main references

Our experience, flexibility and capacity to innovate allow us to present customers with solutions adapted to their needs.

Technologic and organisational innovation have allowed Efacec to create a complete portfolio of systems and products capable of meeting our client's most demanding needs and this can be seen by the vast number of companies that are hereby referenced:

- ADP Paris Airport (France)
- Bergen Metro (Norway)
- COBRA Group (Spain)
- CAMEG (Algeria)
- CEGELEC (France)
- CEM (China - Macau)
- CEZ Group (Czech Republic)
- CHILECTRA (Chile)
- CIMPOR (Portugal)
- CITY POWER (South Africa)
- CORPOELEC (Venezuela)
- Dublin Metro (Ireland)
- EDEL (Angola)
- EDENOR (Argentina)
- EDESUR (Argentina)
- EDF (France)
- EDL (Lebanon)
- EDP Bandeirantes (Brazil)
- EDP Distribuição (Portugal)
- ENA Energy Networks Association (UK)
- ENDESA (Spain)
- ENE (Angola)
- ENEL (Italy)
- E-ON (Germany; UK; Central Europe)
- ENERGOINVEST (Bosnia and Herzegovina)
- ENERGY TRANSFO (Morocco)
- FORCLUM (France)
- GALP (Portugal)
- HC Energia (Spain)
- IBERDROLA (Spain)
- ISOLUX (Spain)
- Lisbon and Oporto Metro (Portugal)
- KAHRAKIB (Algeria)
- KAHRIF (Algeria)
- LYDEC (Morocco)
- MATELEC (Lebanon)
- ONE (Morocco)
- PORTUCEL (Portugal)
- PPC (Greece)
- REE (Spain)
- RELIANCE (India)
- REN (Portugal)
- São Paulo Metro (Brazil)
- SEC (Saudi Arabia)
- SONANGOL (Angola)
- SONEGAZ (Algeria)
- SOPORCEL (Portugal)
- STEG (Tunisia)
- Sporting Club de Portugal (Portugal)
- TSE (Belgium)
- UNION FENOSA (Spain)

Headquarters

Efacec Energia, Máquinas e Equipamentos Eléctricos, S.A.

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Due to our policy of continuous development, specifications may change without notice. Not valid as a contractual item.

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