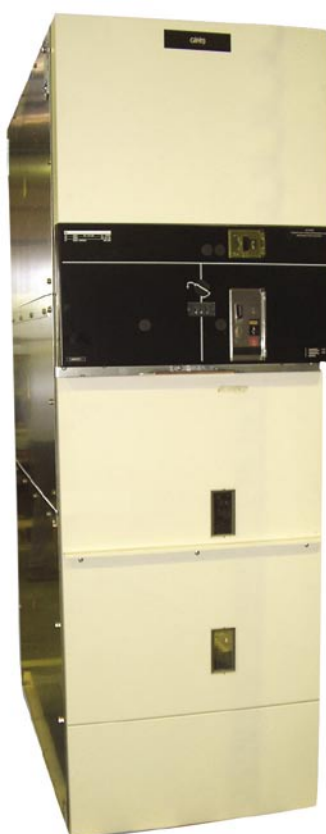


Modular units

SM6-36

Catalogue
2008



A new path for achieving your electrical installations

A comprehensive offer

The SM6-36 range is part of a comprehensive offer of products that are perfectly coordinated to meet all medium and low voltage electrical distribution requirements. All of these products have been designed to work together: electrical, mechanical and communication compatibility.

The electrical installation is thus both optimised and has improved performance:

- better service continuity,
- increased personnel and equipment safety,
- guaranteed upgradeability,
- efficient monitoring and control.

You therefore have all the advantages at hand in terms of know-how and creativity for achieving optimised, safe, upgradeable and compliant installations.

Tools for facilitating the design and installation

With Schneider Electric, you have a complete range of tools to help you get to know and install the products whilst complying with current standards and good working practices. These tools, technical sheets and guides, design software, training courses, etc. are regularly updated.

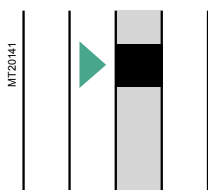
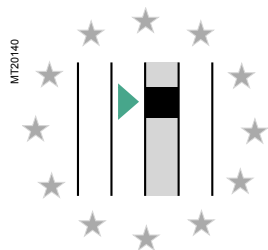
**Schneider Electric is associating itself
with your know-how and your creativity
to produce optimised, safe, upgradeable
and compliant installations**

For a real partnership with you

A universal solution doesn't exist because each electrical installation is specific. The variety of combinations on offer allows you to truly customise the technical solutions.

You are able to express your creativity and put your know-how to best advantage when designing, manufacturing and exploiting an electrical installation.

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The Schneider Electric group's experience extends over forty years in factory-built cubicles and over twenty five years in SF6 technology for Medium Voltage switchgear.

This experience means that today Schneider Electric can propose internal arc cubicles 16 kA 1 s to reinforced the safety of people.

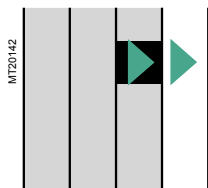
This gives you the advantage of unique experience, that of a world leader, with over half a million SF6 Medium Voltage units installed throughout the world.

Putting this experience at your service and remaining attentive to your requirements is the spirit of active partnership that we want to develop in offering you the SM6-36 range.

The modular SM6-36 range is a range of harmonised cubicles equipped with SF6 technology switchgear.

These cubicles allow you to produce all your Medium Voltage substation requirements from 25 kV to 36 kV by superposing their various functions.

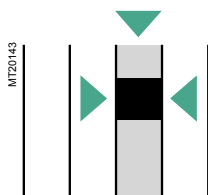
The result of in-depth analysis of your requirements, both now and in the future, SM6-36 cubicles mean that you can take advantage of all the features of both a modern and proven technology.



Upgradability

SM6-36, a comprehensive range

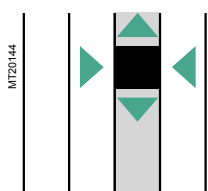
- a comprehensive offer covering your current and future requirements
- a design adapted to the extension of your installations
- a catalogue of functions for all your applications
- a product designed to be in compliance with standards constraints
- options to anticipate the telecontrol of your installations.



Compactness

SM6-36, an optimised range

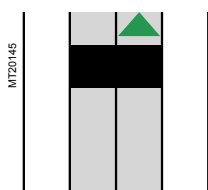
- compact units, with low increment cubicles
- rationalised space requirement for switchboard installation
- reduction of civil works costs
- easy integration in factory-built outdoor substations for which the SM6-36 is particularly well designed.



Maintenance

SM6-36, a range with reduced maintenance

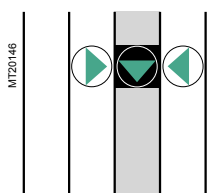
- the active parts (breaking and earthing) are integrated in an SF6-filled, "sealed for life" unit
- the control mechanisms, are intended to function with reduced maintenance under normal operating conditions
- enhanced electrical endurance when breaking.



Ease of installation

SM6-36, a simple range to incorporate

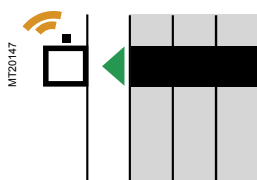
- reduced dimensions and weights
- only one civil works layout
- a solution adapted to cable connection
- simplified switchboard busbar design.



Ease and safe to operate

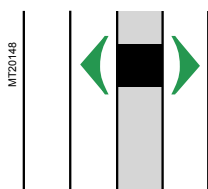
SM6-36, a proven range

- a three position switch to block incorrect switching
- the earthing disconnector has full closing capacity
- positive breaking of position indicators
- internal arcing withstand in the cable and switchgear compartments
- clear and animated display diagrams
- switching lever with an "anti-reflex" function
- compartmented cubicles.



SM6-36: a range designed with telecontrol in mind

SM6-36 switchgear is perfectly adapted to telecontrol applications. Motorised, either when installed or at a later date on-site without any interruption in service, SM6-36 combines with the remote control interface. You, therefore, benefit from a ready-to connect unit that is easy to incorporate providing guaranteed switchgear operation.



SM6-36: a range with adapted protection devices

With the SM6-36, Schneider Electric proposes solutions for protection and energy management; the Sepam and VIP or relay ranges protect installations, providing continuity of electrical supply and reducing downtime.

Quality certified to ISO 9001



A major advantage

Schneider Electric has integrated a functional organisation into each of its units. The main mission of this organisation is to check the quality and the compliance with standards.

This procedure is:

- uniform throughout all departments
- recognised by many customers and approved organisations.

But it is above all its strict application that has enabled recognition to be obtained by an independent organisation: The French Quality Assurance Association (FQAA).

The quality system for the design and manufacture of SM6-36 units has been certified in conformity with the requirements of the ISO 9001-2000 quality assurance system.



Meticulous and systematic controls

During manufacture, each SM6-36 is subject to systematic routine testing which aims to check the quality and conformity:

- sealing testing
- filling pressure testing
- opening and closing rate testing
- switching torque measurement
- dielectric testing
- conformity with drawings and plans.

The results obtained are written and reported on the test certificate for each device by the quality control department.



The environmental management system adopted by Schneider Electric production sites that produce the SM6-36 have been assessed and judged to be in conformity with requirements in the ISO 14001 standard.

Field of application

The SM6-36 is made up of modular units containing fixed metal - enclosed SF6 switchgear, using sulphur hexafluoride (SF6).

- switch - disconnecter
- SF1 circuit breaker
- disconnector.

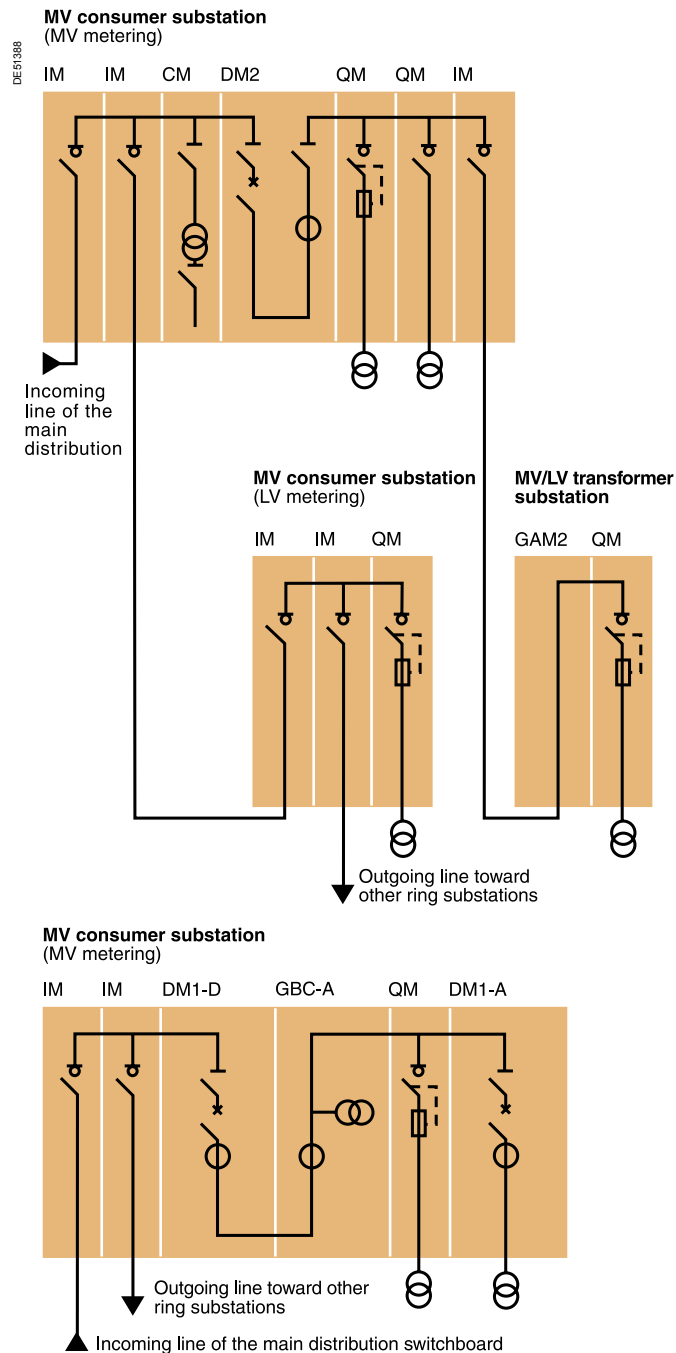
SM6-36 units are used for the MV section in MV/LV transformer substations in public distribution systems and MV consumer or distribution substations from 25 kV to 36 kV.

Unit definitions

Below is the list of SM6-36 range units used in MV/LV transformer substations and industrial distribution substations:

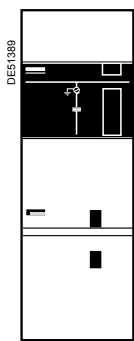
- **IM, IMC, IMB** switch
- **PM** fused switch
- **QM** fuse-switch combination
- **DM1-A, DM1-D**, single-isolation SF6 type circuit breaker
- **DM2** double-isolation SF6 type circuit breaker
- **CM, CM2** voltage transformers
- **GBC-A, GBC-B** current and/or voltage measurements
- **GIM** intermediate bus unit
- **GBM** connection unit
- **GAM2, GAM** incoming cable connection unit
- **SM** disconnector
- other units, consult us.

MV / LV transformer substations

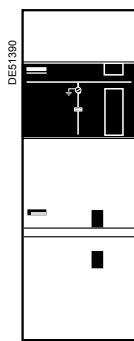


Connection to the networks

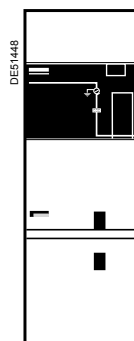
page



Incoming or outgoing unit
IM (750 mm)



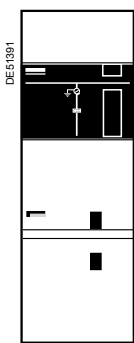
Incoming or outgoing unit
IMC (750 mm)



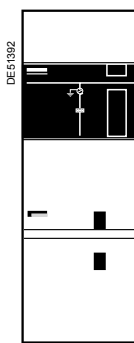
Switch unit with earthing
right outgoing line
IMB (750 mm)

24, 25

Fuse-switch protection



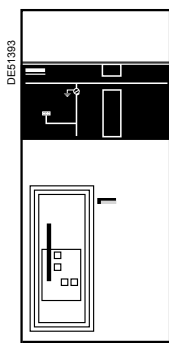
Fuse-switch combination unit
QM (750 mm)



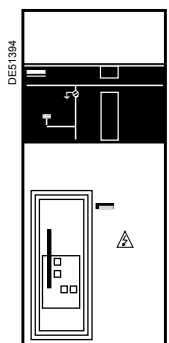
Fuse-switch unit
PM (750 mm)

26

SF6 circuit-breaker protection



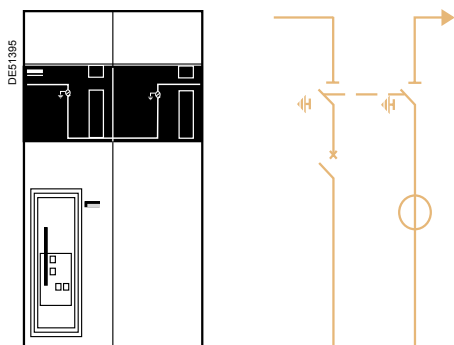
Single-isolation circuit breaker unit
DM1-A (1000 mm)



Single-isolation circuit breaker unit
right outgoing line
DM1-D (1000 mm)

27

SF6 circuit-breaker protection

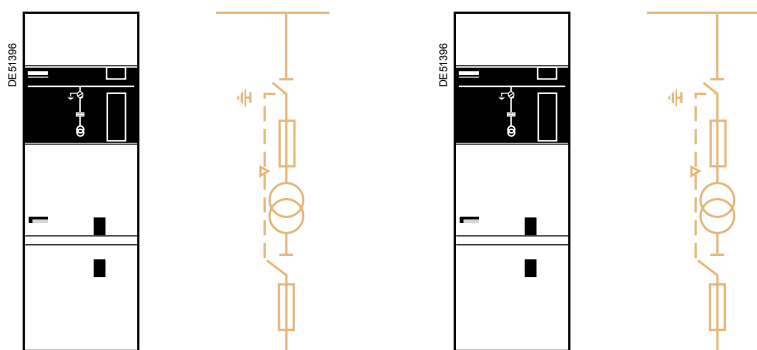


**Double-isolation circuit breaker unit
right outgoing line
DM2 (1500 mm)**

page

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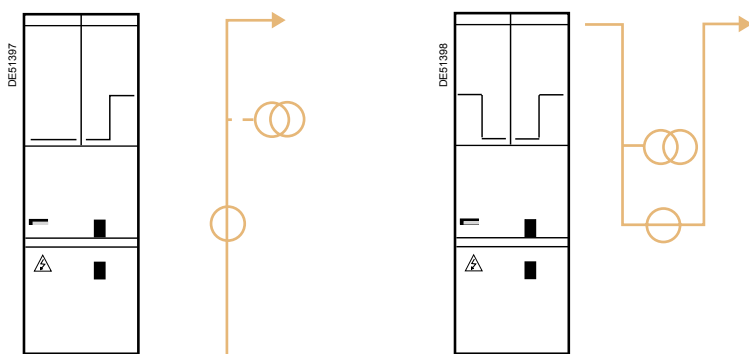
MV metering



**Voltage transformers for mains
with earthed neutral system
CM (750 mm)**

**Voltage transformers for mains with
insulated neutral system
CM2 (750 mm)**

29



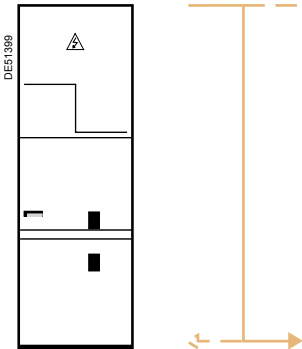
**Current and / or voltage measurement
unit right outgoing line
GBC-A (750 mm)**

**Current and / or voltage
measurement unit
GBC-B (750 mm)**

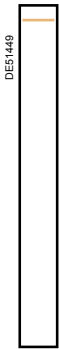
30

Casings

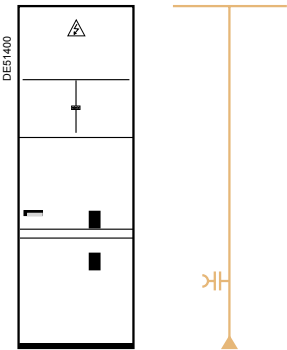
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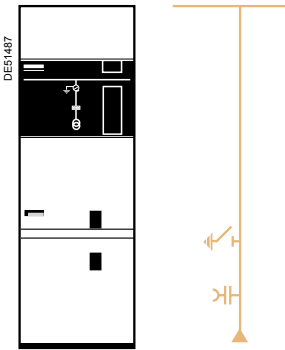
Connection unit right or left
outgoing line
GBM (750 mm)



Intermediate bus unit
GIM (250 mm)

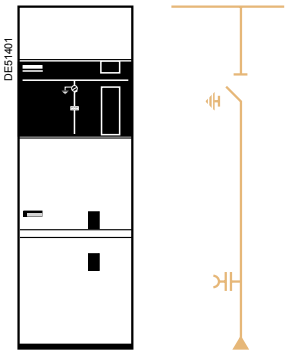


Incoming cable - connection unit
GAM2 (750 mm)



Incoming cable - connection unit
GAM (750 mm)

Other function



Disconnecter unit
SM (750 mm)

31, 32

31

In addition to its technical characteristics, SM6-36 meets requirements concerning protection of life and property as well as ease of installation, operation and protecting the environment.



SM6-36 units are designed for indoor installations (IP2XC).

Their compact dimensions are:

- 750 mm to 1500 mm wide
- 2250 mm high
- 1400 mm deep...

... this makes for easy installation in small rooms or prefabricated substations.

Cables are connected via the front.

All control functions are centralised on a front plate, thus simplifying operation.

The units may be equipped with a number of accessories (relays, toroids, instrument transformers, surge arrestor, telecontrol, etc.).

Standards

SM6-36 units meet all the following recommendations, standards and specifications.

Recommendations IEC:

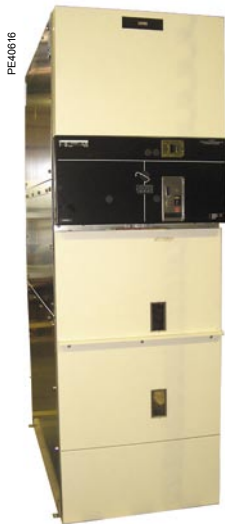
- 60694: Common specifications for high-voltage switchgear and controlgear standard
- 62271-200: A.C. metal-enclosed switchgear and controlgear for rated voltage above 1 kV and up to including 52 kV
- 60265-1: Switches for rated voltages above 1 kV and less than 52 kV
- 62271-105: Alternating current switch-fuse combinations
- 62271-100: High-voltage alternating current circuit breakers
- 62271-102: High-voltage alternating current disconnectors and earthing switches.

Designation

SM6-36 units are identified by a code including:

- an indication of the function, i.e. the electrical diagram code: IM, QM, DM1-A, CM, DM2, etc
 - the rated current: 400 - 630 - 1250 A
 - the rated voltage: 36 kV
 - the maximum short-time withstand current values: 12.5 - 16 - 20 - 25 kA 1 s
 - the colour is of RAL 9002 type (frosted satin white).
- Example for a unit designated: IM 400 - 36 - 12.5
- IM indicates an "incoming" or "outgoing" unit
 - 400 indicates the rated current is 400 A
 - 36 indicates the rated voltage is 36 kV
 - 12.5 indicates the short-time withstand current is 12.5 kA 1 s.

The hereunder values are for working temperatures from -5 °C up to +40 °C and for a setting up at an altitude below 1000 m.



Maximum breaking capacity

Rated voltage (kV)	36
--------------------	----

Insulation level

50 Hz, 1 mn	insulation	70
(kV rms)	isolation	80
1.2/50 μs	insulation	170
(kV peak)	isolation	195

Breaking capacity

Transformer off load (A)	16	
Cables off load (A)	50	
Short-time withstand current (kA/1s)	16	630 - 1250 A
	20	630 - 1250 A
	25	1250 A

The making capacity is equal to 2.5 times the short-time withstand current.

General characteristics

Maximum breaking capacity

Rated voltage (kV)	36
--------------------	----

Units

IM, IMC, IMB	630 A
QM, PM	20 kA
DM1-A, DM1-D, DM2	20 - 25 kA

- loss of service continuity category: LSC2A
- partition class: PI.

Temperatures:

The cubicles must be stored in a dry area free from dust and with limited temperature variations.

- for stocking: from -40 °C to +70 °C
- for working: from -5 °C to +40 °C
- other temperatures, consult us.

Endurance

Internal arc withstand:

- standard: 16 kA. 1s.

Protection index:

- units: IP2XC
- between compartments: IP2x.

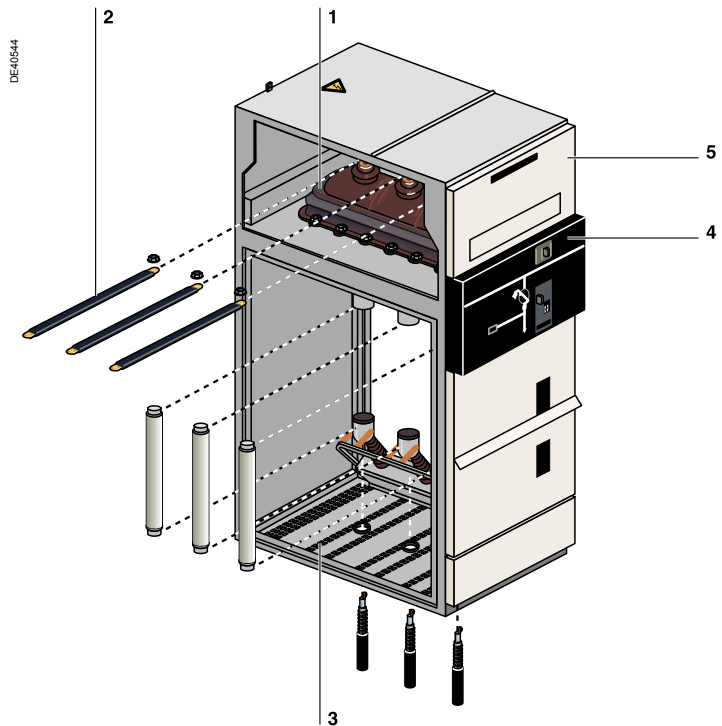
Units	Mechanical endurance	Electrical endurance
IM, IMC, IMB PM QM ⁽¹⁾	IEC 60265 1000 operations class M1	IEC 60265 100 breaks at I _n , p.f. = 0.7 class E3
SF6 circuit breaker range		
DM1-A, DM1-D, DM2	IEC 62271-100 10000 operations	IEC 62271-100 40 breaks at 20 kA 10000 breaks at I _n , p.f. = 0.7

(1) as per recommendation IEC 60420, three breakings at p.f. = 0.2

- 800 A at 36 kV

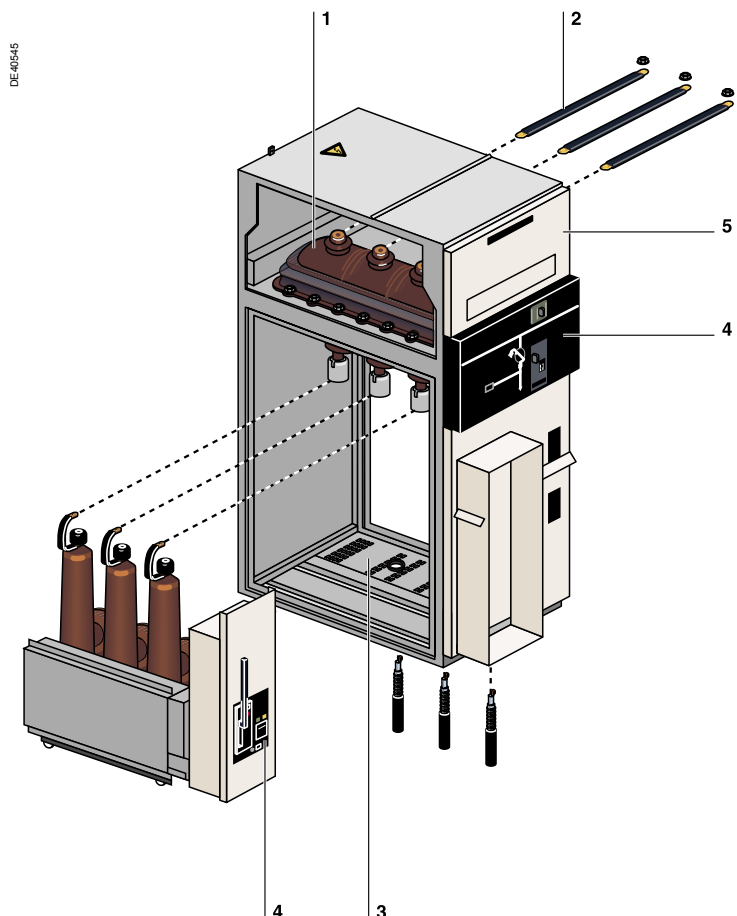
Switch cubicles

- 1 **Switchgear:** switch-disconnector and earthing switch in an enclosure filled with SF6 and satisfying “sealed pressure system” requirements.
- 2 **Busbars:** all in the same horizontal plane, thus enabling later switchboard extensions.
- 3 **Connection:** accessible through front, connection to the lower switch-disconnector and earthing switch terminals (IM cubicle) or the lower fuse-holders (QM cubicle).
This compartment is also equipped with an earthing switch downstream from the MV fuses for the transformer protection units (QM cubicle).
- 4 **Operating mechanism:** contains the elements used to operate the switch-disconnector and earthing switch and actuate the corresponding indications (positive break). The operating functions may be motorized (optional).
- 5 **Low voltage:** installation of a terminal block (if motor option installed), LV fuses and compact relay devices.



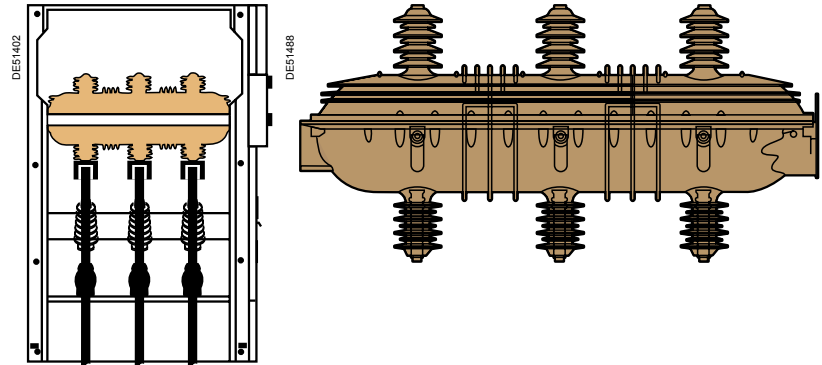
Circuit breaker cubicle

- 1 **Switchgear:** disconnecter(s) and earth switch(es) in an enclosure filled with SF6 and satisfying “sealed pressure system” requirements.
- 2 **Busbars:** all in the same horizontal plane, thus enabling later switchboard extensions.
- 3 **Connection and switchgear:** accessible through front, connection to the downstream terminals of the SF1 circuit breaker.
- 4 **Operating mechanism:** contains the elements used to operate the disconnecter(s), the circuit breaker and the earthing switch and actuate the corresponding indications. The circuit breaker operating functions may be motorized (optional).
- 5 **Low voltage:** installation of compact relays devices and test terminal boxes. If more space is required, an additional enclosure may be added on top of the cubicle.



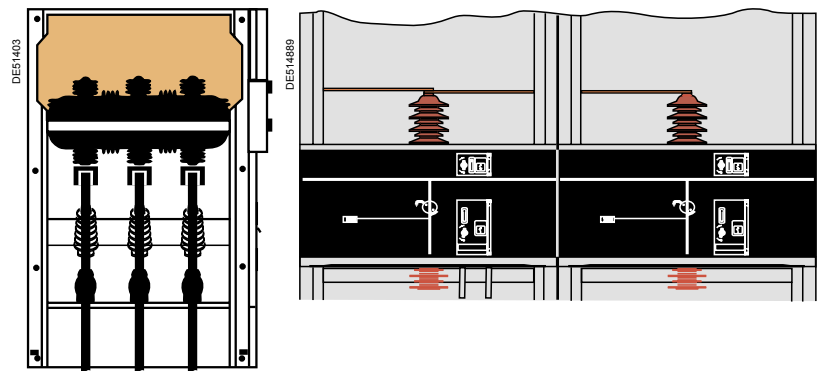
Cubicles are made up of five compartments separated by metal or insulating partitions.

Switchgear compartment



This compartment is separated from the busbar compartment and the connection compartment by the enclosure surrounding the switch, and the earthing switch.

Busbar compartment



The three insulated busbars are parallel-mounted. Connection is made to the upper pads of the enclosure. Rating 630 - 1250 A.

Connection compartment

The network cables are connected to the terminals of the switch, of the circuit breaker and the earthing switch. Transformer cables are connected to the lower fuse holder.

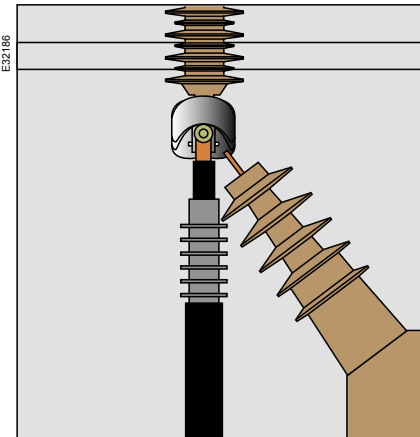
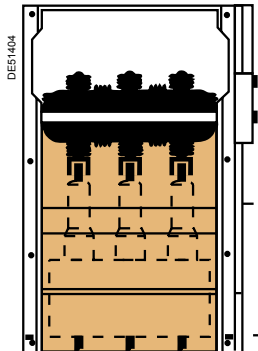
Cables may have either:

- simplified terminations for dry-type one-core cables
 - heat-shrink ends for dry-type or paper-insulated cables.
- With basic equipment, the maximum allowable cross-section for cables is:

- 240 mm² for incoming or outgoing cubicles
- 95 mm² for transformer protection cubicles incorporating fuses.

The earthing switch must be closed before the cubicle may be accessed. The reduced depth of the cubicle makes for easy connection of all phases.

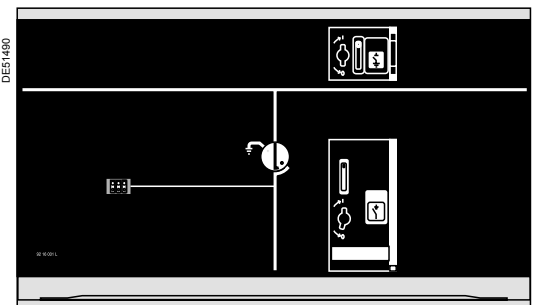
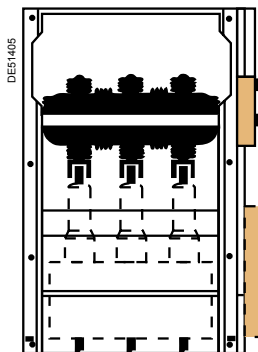
A stud incorporated in the field distributor makes it possible to position and secure the cable-end lug with a single hand.



Operating-mechanism compartment

This compartment contains the various operating functions for the switch, the circuit breaker, the earthing switch and the voltage indicators.

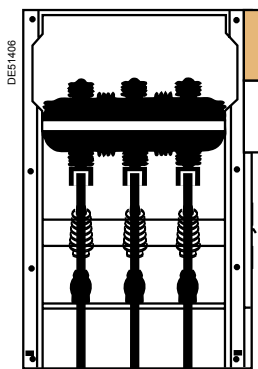
The operating-mechanism compartment for the switch, earthing switch may be accessed with the cables and busbars energised and without isolating the substation. It also enables easy installation of padlocks, locks and standard LV accessories (auxiliary contacts, trip units, motors, etc.).

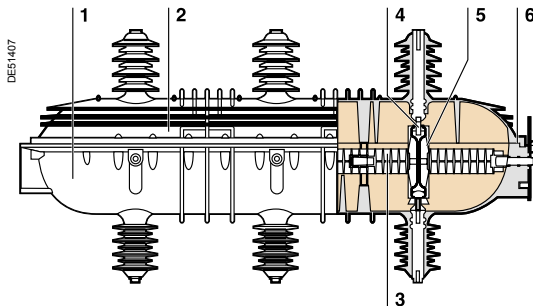


Low-voltage compartment

If the switch operating mechanism is motorised, this compartment is equipped with a terminal block and LV fuses.

This compartment may be accessed with the cables and busbars energised and without isolating the substation.





- 1 Enclosure.
- 2 Cover.
- 3 Operating shaft.
- 4 Fixed contact.
- 5 Moving contact.
- 6 Seal.

Switch and earthing switch

The three rotating contacts are placed in an enclosure filled with gas to a relative pressure of 1.5 bar (1500 hPa).

This system offers maximum operating reliability.

■ gas tightness

The enclosure filled with SF6 gas satisfies "sealed pressure system" requirements and seal tightness is always checked in the factory.

■ operating safety

- the switch may be in one of three positions: "closed", "open" or "earthed", representing a natural interlocking system that prevents incorrect operation. Moving-contact rotation is driven by a fast-acting mechanism that is independent of the action of the operator
- the device combines the breaking and disconnection functions
- the earthing switch placed in the SF6 has a short-circuit making capacity, in compliance with standards
- any accidental over-pressures are eliminated by the opening of the safety membrane, in which case the gas is directed toward the back of the unit, thus avoiding projection or other related phenomena in front.

■ breaking principle

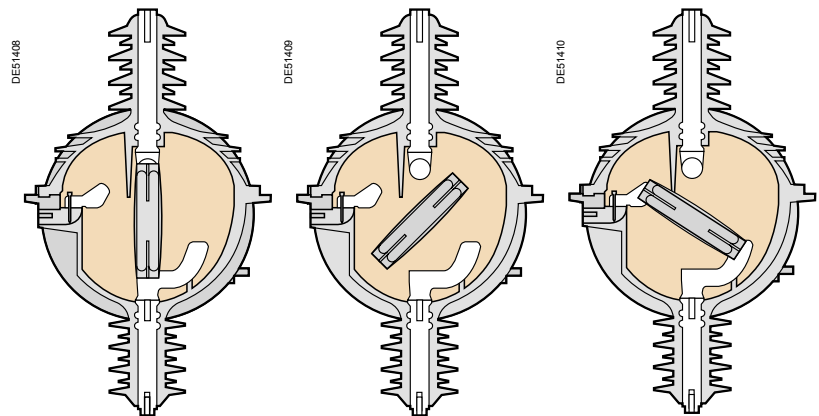
The exceptional qualities of SF6 gas are used to extinguish the electrical arc.

To increase cooling of the arc, a rotative movement is created between the arc and the gas. The arc appears when the fixed and moving contacts separate.

The combination of the current and a magnetic field created by a permanent magnet provokes arc rotation around the fixed contact, resulting in arc extension and cooling until it is extinguished at current zero.

The distance between the fixed and moving contacts is then sufficient to withstand the recovery voltage.

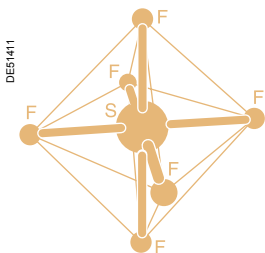
This system is both simple and sure and also provides improved electrical endurance due to very low wear on contacts.



Contacts closed.

Contacts open.

Contacts earthed.



SF6, the switchgear manufacturer's gas

SM6-36 switch-disconnectors and earthing switches use sulphur hexafluoride gas (SF6) for insulation and breaking. The active parts are placed in an insulating enclosure in accordance with the definition of IEC 56/Appendix EE (1987 edition) for sealed pressure systems.

SM6-36 devices offer remarkable characteristics:

- long service life
- maintenance-free active parts
- high electrical endurance
- very low over-voltage level
- operating safety.

PE40817



SF1 circuit breaker.

SF1 circuit breaker

The SF1 circuit breaker is made up of three separate pole mounted on a structure supporting the operating mechanism. Each pole-unit houses all the active elements in an insulating enclosure filled with gas to a relative pressure of 2 max bar. This system offers maximum operating reliability:

■ gas tightness

The enclosure filled with SF6 gas satisfies "sealed pressure system" requirements and seal tightness is always checked in the factory.

■ operating safety

As for switch-units, accidental over-pressures are eliminated by the opening of the safety membrane.

■ breaking principle

The circuit breaker is based on the SF6 gas autocompression principle.

The inherent qualities of SF6 and the soft break resulting from this technique reduce switching over-voltages.

■ precompression

When the contacts begin to open, the piston slightly compresses the SF6 gas in the pressure chamber.

■ arcing period

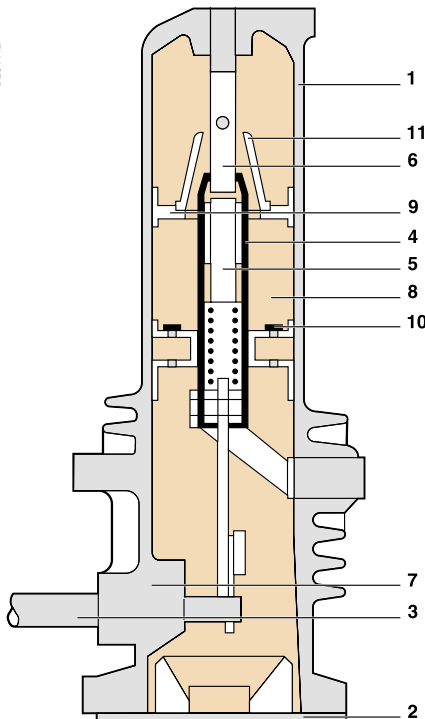
The arc then forms between the arcing contacts and the piston continues its downward movement. A small quantity of gas, directed by the insulating nozzle, is injected into the arc.

The cooling of the arc is thus achieved through forced convection for the interruption of low currents, however, during the interruption of high currents, thermal expansion is responsible for the transfer of the hot gases toward the cold parts of the pole unit. Toward current zero, the distance between the two arcing contacts is sufficient for final interruption of the current due to the dielectric properties of the SF6 gas.

■ sweeping over-stroke

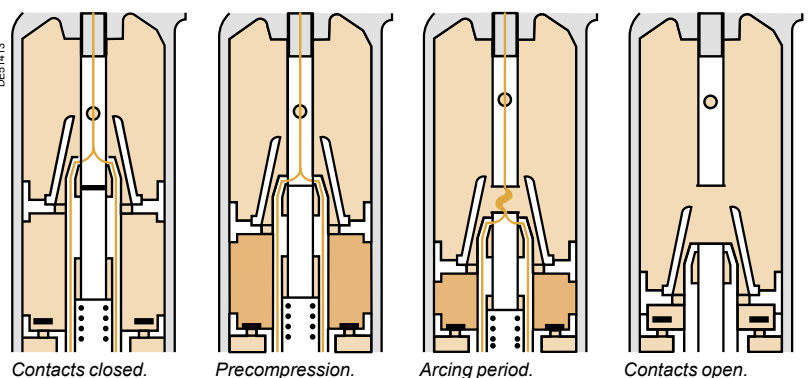
The moving parts finish their travel whereas the cold gas injection continues until the contacts are completely open.

DE51412



- 2 Bottom cover.
- 3 Operating shaft.
- 4 Main moving contact.
- 5 Moving arcing contact.
- 6 Fixed arcing contact.
- 7 Compression chamber.
- 9 Moving piston.
- 10 Valves.
- 11 Insulating nozzle.

DE51413

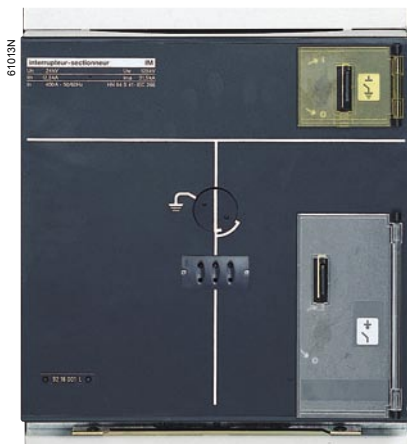


Contacts closed.

Precompression.

Arcing period.

Contacts open.



Reliable operating mechanism

Switchgear status indicator

Fitted directly to the mobile equipment's shaft, these give a definite indication of the switchgear's position (appendix A of standard IEC 60129).

Operating lever

This is designed with an anti-reflex device that stops any attempt to re-open the device immediately after closing the switch or the earthing disconnector.

Locking device

Between one and three padlocks enable the following to be locked:

- access to the switching shaft of the switch or the circuit breaker
- access to the switching shaft of the earthing disconnector
- operating of the opening release push-button.

Simple and effortless switching

Mechanical and electrical controls are side by side on the front fascia, on a panel including the schematic diagram indicating the device's status (closed, open, earthed).

Closed:

the mobile equipment is operated via a quick acting mechanism, independent of the operator. No energy is stored in the switch, apart from when switching operations are taking place.

For combined switch fuses, the opening mechanism is armed at the same time as the contacts are closed.

Opening:

the switch is opened using the same quick acting mechanism, operated in the opposite direction.

For circuit breakers and the combined switch fuses, opening is controlled by:

- a push-button
- a fault.

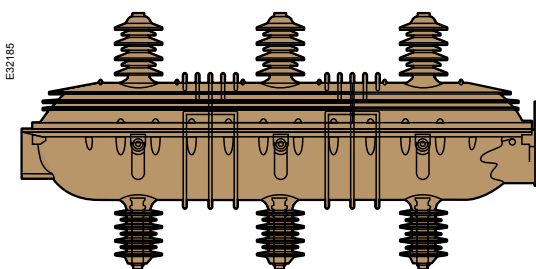
Earthing:

a specific control shaft enables the opening or closing of the earthing contacts.

Access to this shaft is blocked by a cover that can be slid back if the switch is open but which remains locked in place if it is closed.

Voltage presence indicator

This device has integrated VPIS (Voltage Presence Indicating System) type lights, in conformity with IEC standard 61958, enabling the presence (or absence) of voltage to be checked on the cables.



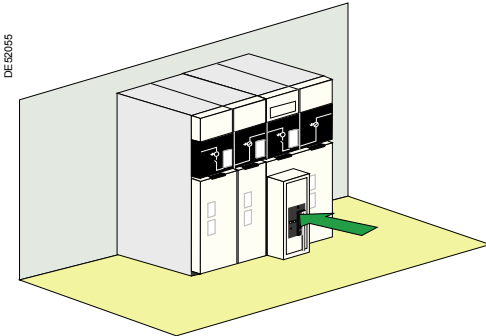
Switch-disconnector and earthing switch

Insensitivity to the environment

■ **an internal sealed enclosure**, contains the active parts of the switchgear (switch, earthing disconnector). It is filled with SF6 in accordance with the definitions in IEC recommendation 60298 for "sealed pressure systems"

- sealing is systematically checked in the factory.
- parts are designed in order to obtain optimum electrical field distribution
- the metallic structure of cubicles is designed to withstand and aggressive environment and to make it impossible to access any energised part when in operation.

Standard IEC 60298 appendix AA indicates a method for testing switchgear in metal enclosures under internal arcing conditions. The aim of this test is to show that an operator present in front of a switchboard would be protected against the effects of an internal fault.



Case of an SM6-36 switchboard installed against the wall exhaust: 1-side internal arc protection

To enhance the safety of people, it is desirable to provide as high a degree of protection as possible by evacuating the effects of internal arcing using:

- evacuation systems which direct gases towards the top or the bottom of the switchboard enabling over pressure to be limited in the case of an internal fault in the compartments
- channelling and evacuating hot gases towards an external area, which is not hazardous for the operator
- materials which are non-inflammable for the cubicle
- reinforced panels.

Consequently

The SM6-36 is designed to offer a good level of safety:

- **control of the architecture:**
 - compartment type enclosure
- **technological control:**
 - electrotechnical: modelling of electrical fields
 - mechanical: parts produced using CAD systems
- **use of reliable components:**
 - choice of materials
 - earthing switch with closing capacity
- **devices for total operating safety:**
 - voltage presence indicator on the front face
 - natural reliable interlocking
 - locking using keys or padlocks.

Internal arc withstand of the cubicles

- **1 version is available:**
 - basic version: 16 kA 1s.

SM6-36 internal arc (in conformity with IEC 60298 appendix AA)

In its internal arc version, the SM6-36 range has successfully passed all of the type testing relative to standard IEC 60298 (6 acceptance criteria).

The materials used meet the constraints for which the SM6-36 is designed.

The thermal and mechanical forces that an internal arc can produce are perfectly absorbed by the enclosure.

An operator present in the front of the SM6-36 switchboard during an internal fault will not be exposed to the effects of arcing.

SM6-36 proposes one option to install an internal arc switchboard

- **1-side internal arc protection**

Case of an SM6-36 switchboard positioned against the wall, access to the rear of the cubicles is impossible, internal arc protection on one side are sufficient.

Way of exhaust

- **sidewards exhaust**

Civil engineering with an adequate volume is necessary.

A range for the tracking of permanent faults on MV underground networks.



Easergy F250 electronic detector unit.

Split-core current transformer.

The Easergy FPI range completes the expertise and leadership of Schneider Electric in the MV field.

It is the widest range available on the market place and covers all types of MV networks with their neutral grounding arrangements. Holding several key patents in this technology, Schneider Electric's Easergy directional or ammeter FPIs are available for both overhead and underground MV lines, with various power supplies and packages. Backed by Schneider Electric international organization and experience of 40 years in Medium Voltage applications, Easergy puts its know how at the service of utilities striving for a better quality.

Usage

The Easergy range is designed for the tracking of permanent faults on MV cable networks. Thanks to an ammeter or directional fault detection scheme it covers the needs of all types of MV networks. Available in weatherproof or non-weatherproof enclosures, LV battery back, DC, or battery-only power supplies, the Easergy range is very versatile and offers more than 15 versions.

Benefits

Thanks to its programmability, the lineman is sure to be able to select the tripping parameters (current reset, timer reset, Low Voltage reset, manual reset) that match the one of the protection devices on a given feeder.

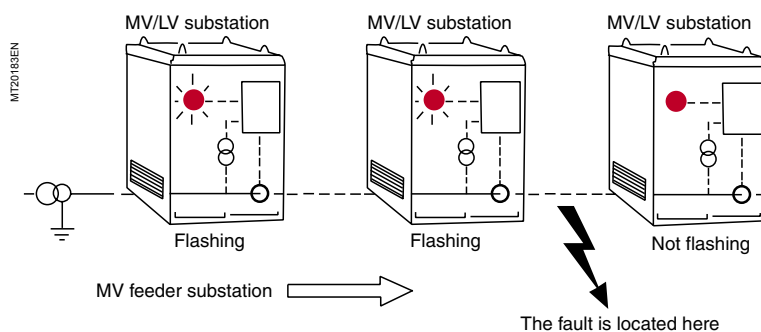
Easergy standard features

- 16 3Io, 4 Imax trip values
- 8 timer reset values, (3 reset modes).

This is of paramount importance for tripping reliability.

MV telecontrol system

All members of the Easergy family come equipped with a dry contact output for connection to a Remote Terminal Unit as Easergy T200 I Schneider Electric, capable of tele-signalling the passage of the fault current. In addition, a cost-effective tele-signalling device is available.



The Sepam range of protection and metering is designed for the operation of machines and electrical distribution networks of industrial installations and utility substations for all levels of voltage. It consists of complete, simple and reliable solutions, suited to following 3 families:

- Sepam series 20
- Sepam series 40
- Sepam series 80.



Sepam protection relay

A range adapted at your application

- protection of substation (incoming, outgoing line and busbars)
- protection of transformers
- protection of motors, and generators.

Accurate measurement and detailed diagnosis

- measuring all necessary electrical values
- monitoring switchgear status: sensors and trip circuit, mechanical switchgear status
- disturbance recording
- Sepam self-diagnosis and watchdog.

Simplicity

Easy to install

- light, compact base unit
- optional modules fitted on a DIN rail, connected using prefabricated cords
- user friendly and powerful PC parameter and protection setting software to utilize all of Sepam's possibilities.

User-friendly

- intuitive User Machine Interface, with direct data access.
- local operating data in the user's language.

Flexibility and evolutivity

- enhanced by optional modules to evolve in step with your installation
- possible to add optional modules at any time
- simple to connect and commission via a parameter setting procedure.

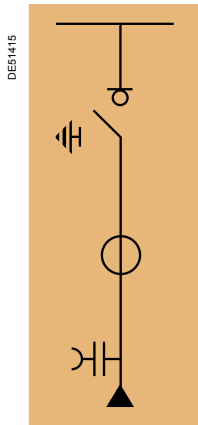
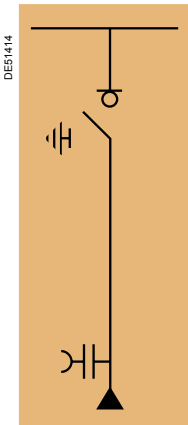
Sepam	Characteristics	Protections		Applications				
		Basic	Specific	Substation	Transformer	Rotation	Generator	Busbars
Sepam series 20 For common applications	■ 10 logic inputs and 8 relay outputs ■ 1 Modbus communication port	Current protection		S20	T20	M20		
		Voltage and frequency protection						B21
		Loss of mains (ROCOF)						B22
Sepam series 40 For demanding applications	■ 10 logic inputs ■ 8 relay outputs ■ 1 Modbus communication port ■ Logic equations editor	Current voltage and frequency protection		S40	T40		G40	
		Directional earth fault		S41		M41		
		Directional earth fault and phase overcurrent		S42	T42			
Sepam series 80 For complete applications	■ 42 logic inputs and 23 relay outputs ■ 2 Modbus communication port ■ Logic equations editor ■ Removal memory cartridge ■ Battery to save event logging data	Current voltage and frequency protection		S80				
		Directional earth fault		S81	T81	M81		
		Directional earth fault and phase overcurrent		S82	T82		G82	

For connection to the networks

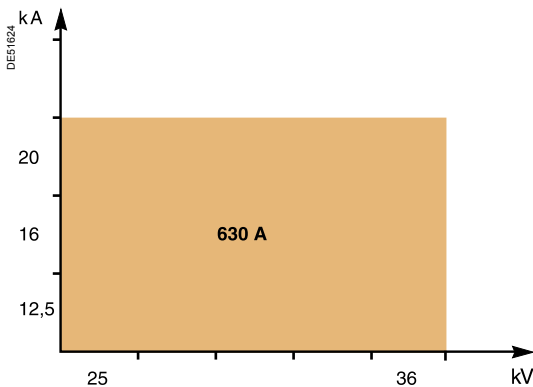
IM (750 mm)IMC (750 mm)

Incoming or outgoing unit

Incoming or outgoing unit



Electrical characteristics



Basic equipment

Switch and earthing switch
Three-phase busbars
CIT operating mechanism
Voltage indicators
Connection pads for dry-type single-core or three-core cables
Three CTs

Version

Manual or motorised operating mechanism CI1 or CI2 with opening and closing shunt trips.

Optional accessories

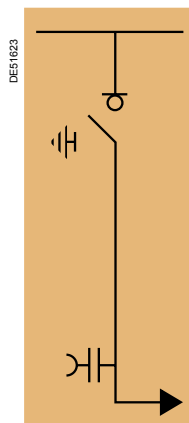
Motor for operating mechanism
Auxiliary contacts
Key-type interlocks
150 W heating element
Phase comparator
Fault indicators
Additional enclosure or connection enclosure for cabling from above with voltage indicators
Release units
Connection pads for two dry-type single-core cables
Surge arrester

For connection to the networks

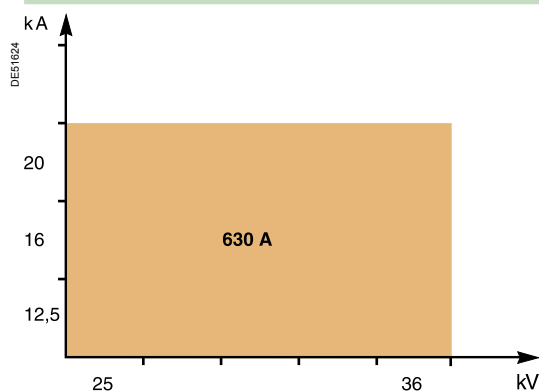
IMB (750 mm)

Switch with earthing switch

Right outgoing



Electrical characteristics



Basic equipment

Switch and earthing switch

Three-phase busbars

CIT operating mechanism

Voltage indicators

Three-phase bottom busbars for outgoing lines (right)

Version

CI1 operating mechanism

CI2 operating mechanism

Optional accessories

Motor for operating mechanism

Auxiliary contacts

Key-type interlocks

150 W heating element

Additional enclosure or connection enclosure for cabling from above with voltage indicators

Release units

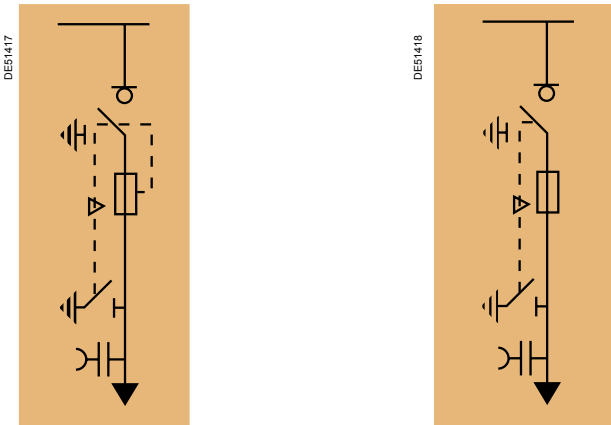
For transformer protection

QM (750 mm)

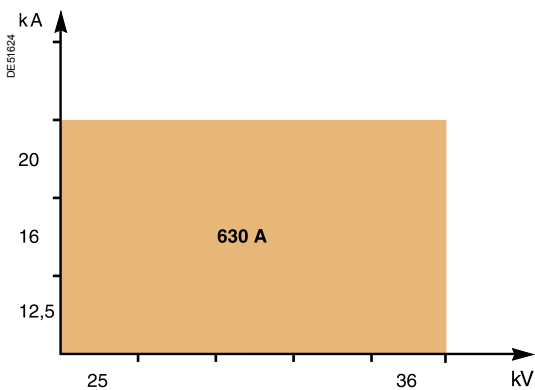
PM (750 mm)

Fuse-switch combination unit

Fused-switch unit



Electrical characteristics



Basic equipment

- Switch and earthing switch
- Three-phase busbars
- Voltage indicators
- Equipment for three DIN fuses
- Mechanical indication system for blow fuses
- Connection pads for dry-type single-core
- Cables
- Downstream earthing switch
- CI1 operating mechanism
- CIT operating mechanism

Version

- CI2 operating mechanism
- CI1 operating mechanism

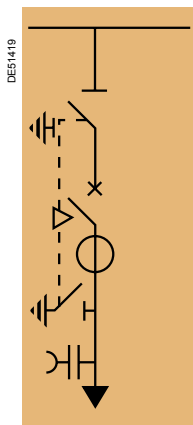
Optional accessories

- Motor for operating mechanism with opening shunt trips
- Auxiliary contacts
- Key-type interlocks
- 150 W heating element
- Auxiliary contact for blow fuses
- DIN striker fuse
- Opening shunt trip release
- Additional enclosure or connection enclosure for cabling from above with voltage indicator
- Release units

For transformer protection

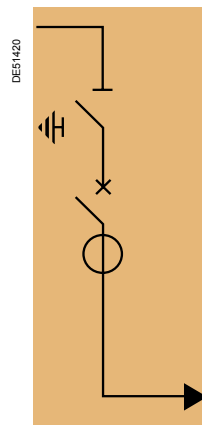
DM1-A (1000 mm)

Single-isolation circuit breaker

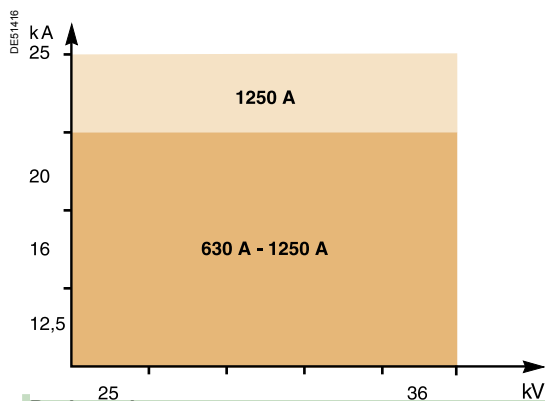


DM1-D (1000 mm)

Single-isolation circuit breaker, outgoing line on right



Electrical characteristics



Basic equipment

SF1 circuit breaker
 Disconnecter and earth switch
 Three-phase busbars
 Circuit breaker operating mechanism RI
 Disconnecter operating mechanism CS
 Three CTs
 Auxiliary contacts on circuit breaker

Version

Connection pads for dry-type cables	Three-phase bottom busbars
Downstream earthing switch	

Optional accessories

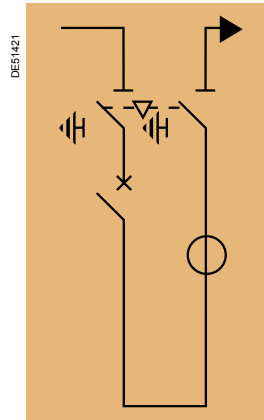
Cubicle
 Auxiliary contacts on the disconnecter
 Additional enclosure or connection enclosure for cabling from above with voltage indicators
 Protection using Sepam programmable electronic unit for SF1 circuit breaker
 Key-type interlocks
 150 W heating element
 Connection pads for two dry-type single-core cables
 Surge arrester

Circuit breaker
 Motor for operating mechanism
 Release units
 Operation counter on manual operating mechanism

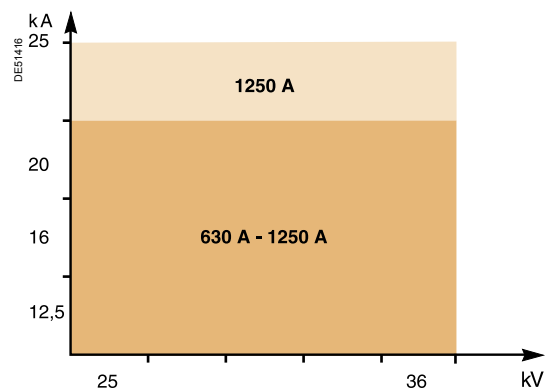
For transformer protection

DM2 (1500 mm)

Double-isolation circuit breaker outgoing line on right



Electrical characteristics



Basic equipment

SF1 circuit breaker
Three-phase busbars
Circuit breaker operating mechanism RI
Three CTs
Auxiliary contacts on circuit breaker
Disconnecter and earth switch
Disconnecter operating mechanism CS

Optional accessories

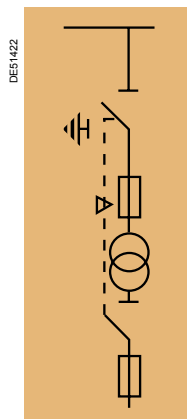
Cubicle
Auxiliary contacts on the disconnector
Additional enclosure
Protection using Statimax relays or Sepam
Programmable electronic unit
Key-type interlocks
150 W heating element
Additional enclosure or connection enclosure
For cabling from above with voltage Indicators

Circuit breaker
Motor for operating mechanism
Low-energy Mitop or undervoltage opening
Release
Opening and closing shunt trips
Operation counter on manual operating
Mechanism

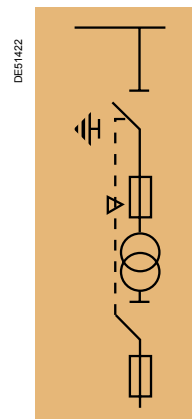
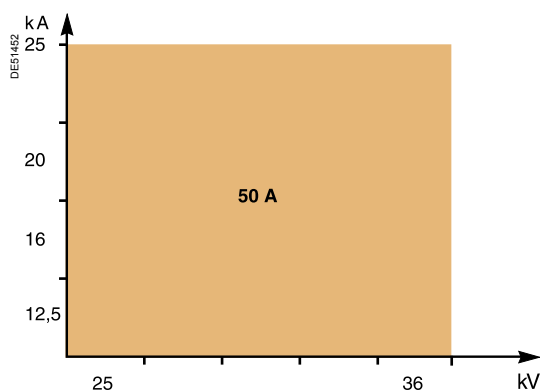
For MV metering

CM (750 mm)

Voltage transformers for mains with earthed neutral system

**CM2 (750 mm)**

Voltage transformer for mains with insulated neutral system

**Electrical characteristics****Basic equipment**

Disconnecter and earth switch

Three-phase busbars

Operating mechanism CS

LV circuit isolating switch

LV fuses

Three 6.3 A fuses

Three voltage transformers (phase-to-earth)

Two voltage transformers (phase-to-phase)

Optional accessories

Auxiliary contacts

Additional enclosure

150 W heating element

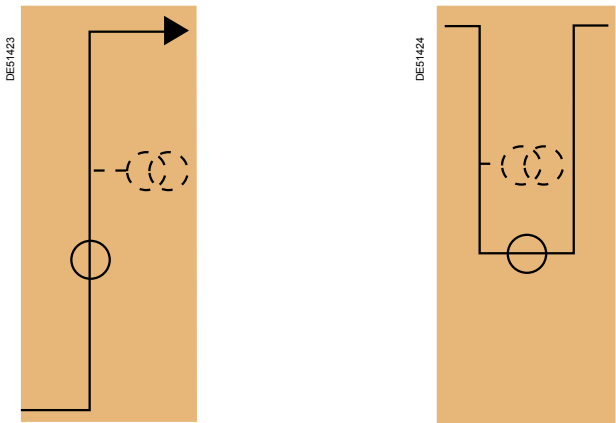
Additional enclosure or connection enclosure for cabling from above with voltage indicators

For MV metering

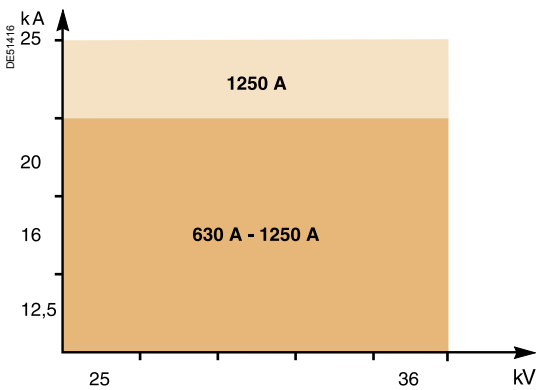
GBC-A (750 mm)GBC-B (750 mm)

Current and / or voltage measurements
outgoing line on right

Current and/or voltage measurements



Electrical characteristics



Basic equipment

- Three CTs
- Connection bars
- Three-phase busbars

Optional accessories

- Additional enclosure
- Three voltage transformers (phase-to-earth)
- 150 W heating elements
- Additional enclosure or connection enclosure for cabling from above with voltage indicators

Functions required by private networks

GIM (250 mm)

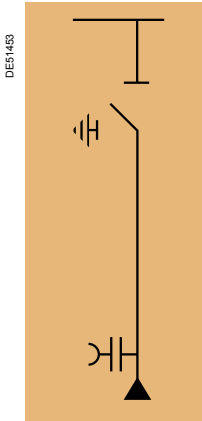
Intermediaire bus unit



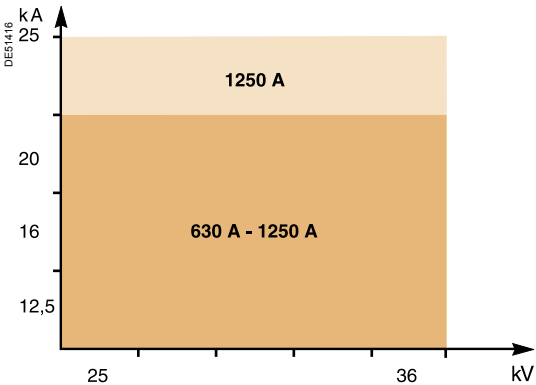
Other functions

SM (750 mm)

Disconnecter unit



Electrical characteristics



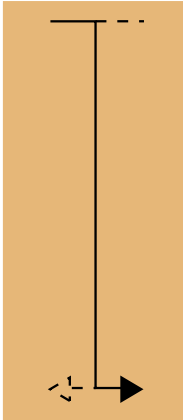
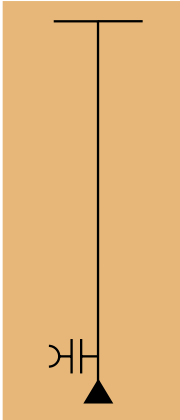
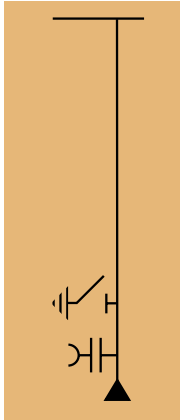
Basic equipment

- Three-phase busbars
- Disconnecter and earthing switch
- CS operating mechanism
- Voltage indicators
- Connection pads for dry-type single-core or three-core cables

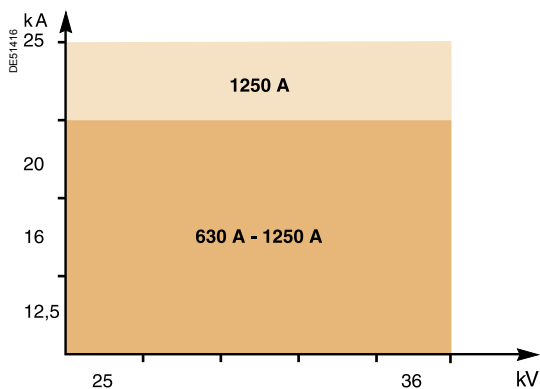
Optional accessories

- Auxiliary contacts
- Key-type interlocks
- 150 W heating element
- Phase comparator
- Fault indicators
- Additional enclosure or connection enclosure for cabling from above with voltage indicators
- Release units
- Connection pads for two dry-type single-core cables
- Surge arrester

For functions required by private networks

GBM (750 mm)	GAM2 (750 mm)	GAM (750 mm)
Connection unit outgoing line right or left	Incoming cable-connection unit	Incoming cable-connection unit
DES1426	DES1427	DES1486

Electrical characteristics



Basic equipment

Connection bars	Three-phase busbars
Three-phase busbars for outgoing lines (right or left)	Voltage indicators
	Connection pads for dry-type single core cables
	Connection bars

Optional accessories

150 W heating elements	Additional enclosure or connection enclosure for cabling from above with voltage indicators
	Surge arrester
	Operating mechanism CS1
	Earthing switch
	Auxiliary contacts
	Key-type interlocks

The control devices required for the unit operating mechanisms are centralised on the front panel. The different types of operating mechanism are presented in the table opposite.

Operating speeds do not depend on the operator, except for the CS.

For the interlocks, consult the table pages 32/33 according to concerned cubicles.

Units	Type of operating mechanism				
	Switch/disconnector				
	CIT	CI1	CI2	CS	CC
IM, IMC	■	□	□		
PM	■	□	□		
QM		■	□		
CM, CM2, GAM				■	
DM1-A, DM1-D, DM2				■	■
SM				■	

■ provided as standard
□ other possibility



Double-function operating mechanism CIT

Switch function

Independent-operation opening or closing by lever or motor.

Earthing-switch function

Independent-operation opening or closing by lever.

Operating energy is provided by a compressed spring which, when released, provokes closing or opening of the contacts.

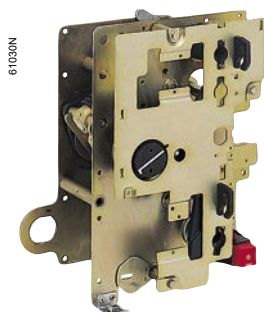
Auxiliary contacts

- switch (2 O + 2 C)
- switch (2 O + 3 C) and earthing switch (1 O + 1 C)
- switch (1 C) and earthing switch (1 O + 1 C) if motor option.

Mechanical indications

Fuses blown in unit PM.

Motor option



Double-function operating mechanism CI1

Switch function

- independent-operation closing by lever or motor.

Operating energy is provided by a compressed spring which, when released, provokes closing of the contacts

- independent-operation opening by push-button (O) or trip units.

Earthing-switch function

Independent-operation closing and opening by lever.

Operating energy is provided by a compressed spring which, when released, provokes closing or opening of the contacts.

Auxiliary contacts

- switch (2 O + 2 C)
- switch (2 O + 3 C) and earthing switch (1 O + 1 C)
- switch (1 C) and earthing switch (1 O + 1 C) if motor option
- fuses blown (1 C).

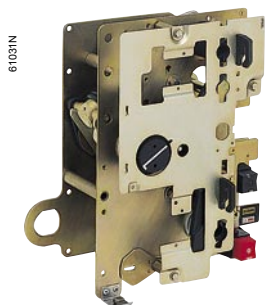
Mechanical indications

Fuses blown in units PM, QM.

Opening releases

- shunt trip
- undervoltage for unit QM.

Motor option



Double-function operating mechanism CI2

Switch function

- independent-operation closing in two steps:
 - 1 - operating mechanism recharging by lever or motor,
 - 2 - stored energy released by push-button (I) or trip unit.
- independent-operation opening by push-button (O) or trip unit.

Earthing-switch function

Independent-operation closing and opening by lever.

Operating energy is provided by a compressed spring which, when released, provokes closing or opening of the contacts.

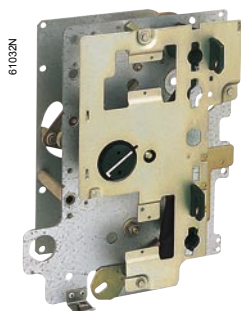
Auxiliary contacts

- switch (2 O + 2 C)
- switch (2 O + 3 C) and earthing switch (1 O + 1 C)
- switch (1 C) and earthing switch (1 O + 1 C) if motor option.

Opening release shunt trip

Closing release shunt trip

Motor option



Double-function operating mechanism CS

Switch and earth switch functions

Dependent-operation opening and closing by lever.

Auxiliary contacts

- disconnecter (2 O + 2 C) for units DM1-A, DM1-D, DM1-W, DM2 and CRM without VT
- disconnecter (2 O + 3 C) and earthing switch (1 O + 1 C) for units DM1-A, DM1-D, DM1-W, DM2 and CRM without VT
- disconnecter (1 O + 2 C) for units CM, CM2, TM, DM1-A, DM1-D, DM2 and CRM with VT.

Mechanical indications

Fuses blown in units CM and CM2.



Single-function operating mechanism RI for
the SF circuit breaker

Circuit-breaker function

- independent-operation closing in two steps.
First operating mechanism recharge by motor or lever, then release of the stored energy by push-button (I) or trip unit
- independent-operation opening by push-button (O) or trip units.

Auxiliary contacts

- circuit breaker (4 O + 4 C)
- mechanism charged (1 C).

Mechanical indications

- operation counter.

Opening releases

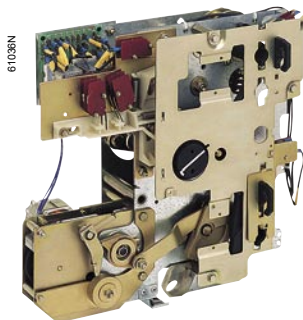
- mitop (low energy)
- shunt trip
- undervoltage.

Closing release

- shunt trip.

Motor option (option and installation at a later date possible)

Possible combinations between opening releases						
Release type	SF1					
	Combinations					
	1	2	3	4	5	6
Mitop (low energy)	■	■	■			
Shunt trip		■		■	■	
Undervoltage			■		■	■



Motor option and releases for switch-units

The operating mechanisms CIT, CI1 and CI2 may be motorised.

The motor option can be installed on the site "switch open" without replacement the operating mechanism.

Un		DC				AC	
Power supply	(V)	24	48	110	125	120	230 (50 Hz) ⁽¹⁾
Motor option							
	(W)			200			
	(VA)						200
	(s)			< 5			< 5
Opening releases							
Mitop (low energy)	(W)	3					
Shunt trip	(W)	200	250	300	300		
	(VA)					400	600
Undervoltage	pick-up	(W)		160			
		(VA)				280	550
	hold	(W)		4			
		(VA)					50
Closing release							
Shunt trip	(W)			30			
	(VA)						60

⁽¹⁾ Please consult us for other frequencies.



Motor option and releases for circuit breakers

Operating mechanism RI may be equipped with the motor option for the recharging function.

Un		DC				AC	
Power supply	(V)	24	48	110	125	120	230 (50 Hz) ⁽¹⁾
Motor option							
	(W)			390			
	(VA)						390
	(s)			< 15			< 15
Opening releases							
Mitop (low energy)	(W)			3			
Shunt trip	(W)			85			
	(VA)						180
Undervoltage	pick-up	(W)		160			
		(VA)				280	550
	hold	(W)		10			
		(VA)				50	40
Closing release							
Shunt trip	(W)			85			
	(VA)						180
Possible combinations between opening releases							
		SF1					
Mitop (low energy)		■	■	■			
Shunt trip			■		■	■	
Undervoltage				■		■	■

⁽¹⁾ Please consult us for other frequencies.

Current transformers

For units DM1-A, DM1-D, DM2, IMC, GBC-A, GBC-B

Transformer ARM6N2

- double primary
- double secondary winding for measurement and protection.

Short-time withstand current I_{th} (kA)

I_n (A)	50-100	75-150	100-200	150-300	200-400	300/600	1000/1250
I_{th} (kA)	16 - 20						25
t (s)	1						1
Meas. and protection	5 A	7.5 VA - 15 VA - class 0.5					30 VA - class 0.5
	5 A	2.5 VA - 5 VA - 5P20					10 VA - 5P20

Voltage transformers

For units CM, GBC-A, GBC-B

Transformers VRF3n/S2 (phase-to-earth)

- single primary winding
- double secondary.

Rated voltage (kV)	36	
Primary voltage (kV)	$30/\sqrt{3}$	$33/\sqrt{3}$
Secondary voltage (V)	$100/\sqrt{3}$	$100/\sqrt{3}$ or $110/\sqrt{3}$
Thermal power (VA)	450	
Accuracy class	0.5	3P
Rated output for		
Single primary winding (VA)	30-50	30

For unit CM2

Transformers VRC3/S1 (phase-to-phase)

- single primary winding
- single secondary.

Rated voltage (kV)	36	
Primary voltage (kV)	30	33
Secondary voltage (V)	100	100 or 110
Thermal power (VA)	700	
Accuracy class	0.5	
Rated output for single primary winding (VA)	50 - 100	

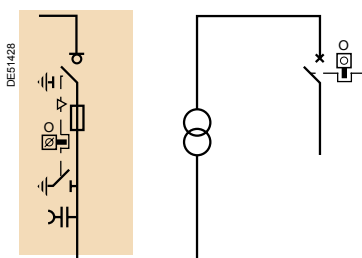
Switch units

- the switch can be closed only if the earthing switch is open and the access panel is in position
- the earthing switch can be closed only if the switch is open
- the access panel for connections can be opened only if the earthing switch is closed
- **the switch is locked** in the open position when the access panel is removed. The earthing switch may be operated for tests

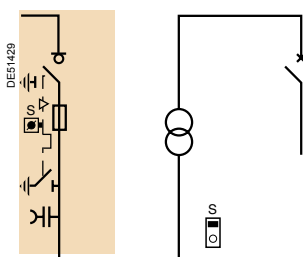
Circuit-breaker units

- the disconnector(s) can be closed only if the circuit breaker is open and the access panel is in position
- the earth switch(es) can be closed only if the disconnector(s) is/are open
- the access panel for connections can be opened only if:
 - the circuit breaker is locked open
 - the disconnector(s) is/are open
 - the earth switch(es) is/are closed.

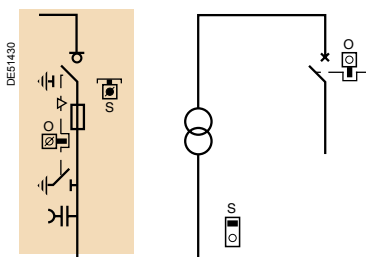
Note: it is possible to lock the disconnector(s) in the open position for no-load operations with the circuit breaker.



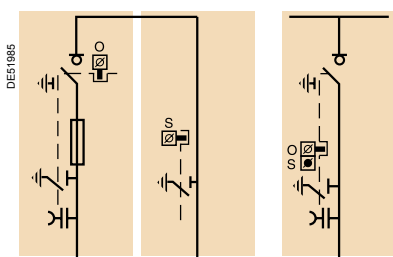
A1 type



C1 type



C4 type



A5 type

Functional interlocks

These comply with IEC recommendation 60298 and EDF specification HN 64-S-41.

In addition to the functional interlocks, each disconnector and switch include:

- **built-in padlocking** capacities (padlocks not supplied)
- **four knock-outs** that may be used for keylocks (supplied on request) for mechanism locking functions.

Unit interlock

Units	Interlock									
	A1	A3	A4	A5	C1	C4	P1	P2	P3	P5
IM, IMC		■	■				■			
PM, QM, DM1-A, DM1-D	■				■	■				
SM								■	■	
GAM				■				■	■	

Key-type interlocks

Outgoing units

Aim:

- to prevent the closing of the earthing switch on a transformer protection unit unless the LV circuit breaker is locked in "open" or "disconnected" position.

- to prevent the access to the transformer if the earthing switch for transformer protection has not first been closed.

- to prevent the closing of the earthing switch on a transformer protection unit unless the LV circuit breaker is locked in "open" or "disconnected" position
- to prevent the access to the transformer if the earthing switch for transformer protection has not first been closed.

- to prevent the closing of the earthing switch of the casing unit unless the downstream and the upstream switches are locked in the "open" position.

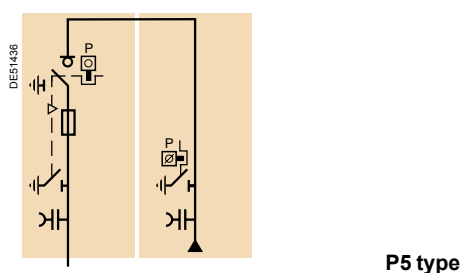
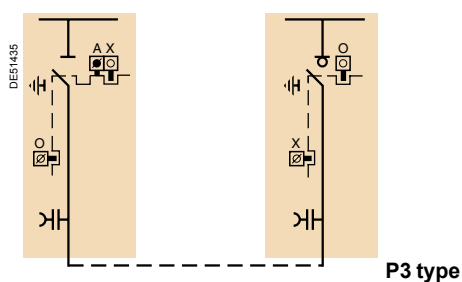
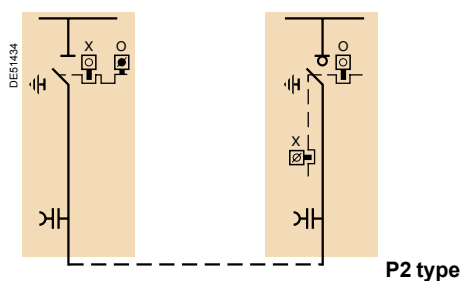
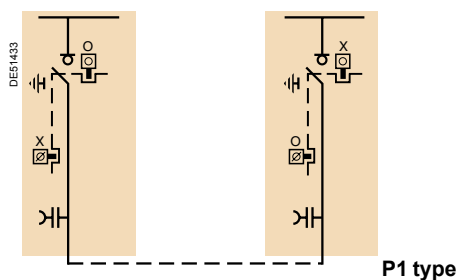
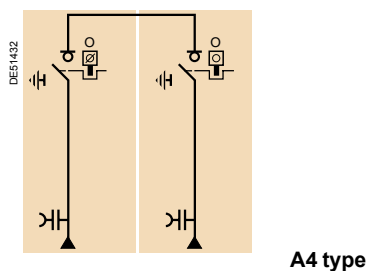
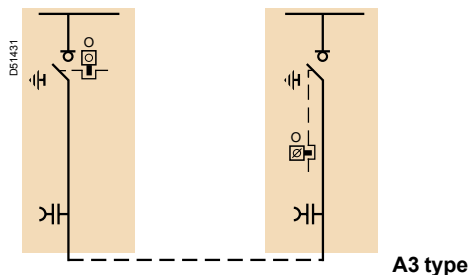
Legend for key-type interlocks:

MT20ADEN
□ □ no key

□ free key

■ captive key

□ panel or door



Ring units

Aim:

- to prevent the closing of the earthing switch of a load-side cubicle unless the line-side switch is locked "open".

- to prevent the simultaneous closing of two switches.

- to prevent the closing of an earthing switch if the switch of the other unit has not been locked in the "open" position.

- to prevent on-load operation of the disconnecter unless the switch is locked "open"
- to prevent the closing of the earthing switches unless the disconnecter and the switch are locked "open".

- to prevent on-load operation of the disconnecter unless the switch is locked "open"
- to prevent the closing of the earthing switches with the unit energised, unless the disconnecter and the switch are locked "open"
- to allow off-load operation of the switch.

- to prevent the closing of the earthing switch of the incoming unit unless the disconnecter and the switch is locked "open".

Legend for key-type interlocks:

MT20240EN no key

free key

captive key

panel or door

Transformer protection

Fuse ratings for SM6-36 protection units such as the PM, QM, depend among other things, on the following criteria:

- service voltage
- transformer rating
- fuse technology (manufacturer).

Different types of fuses with medium loaded striker may be installed.

Fusarc CF fuses as per DIN dimensions 43-625.

Example:

For the protection of a 400 kVA transformer at 33 kV, select Fusarc CF fuses rated 25 A.



Please consult us on installation of fuses from other manufacturers.

Dimensions of fuses

Fusarc CF (DIN standards)

Rated voltage (kV)	Rating (A)	L (mm)	Ø (mm)	Weight (kg)
36	10 - 16	537	50.5	1.8
	25	537	57	2.6
	31.5 - 40	537	78.5	4.7
	50 - 63	537	86	6.4

Selection table of fuses ⁽²⁾

Rating in A - no overload, -5 °C < 0 < 40 °C ⁽¹⁾

Service voltage (kV)	Transformer rating (kVA)											Rated voltage (kV)
	160	250	315	400	500	630	800	1000	1250	1600	2000	
For dry type transformers												
Fusarc CF												
30	10	10	16	20	25	31.5	31.5	50	50	63	63	36
31.5	10	10	16	20	25	25	31.5	50	50	63	63	36
33	6.3	10	16	25	25	25	31.5	40	50	50	63	36
34.5	6.3	10	16	20	25	25	31.5	40	50	50	63	36
For oil immersed type transformers												
Fusarc CF												
30	10	10	16	20	25	31.5	31.5	40	40	50	63	36
31.5	10	10	16	20	25	31.5	31.5	40	40	50	63	36
33	10	10	16	25	25	25	31.5	31.5	40	40	50	36
34.5	10	10	16	20	25	25	31.5	31.5	40	40	50	36

(1) Please consult us for overloads and operation over 40 °C.

(2) This selection table has been prepared according to the technical characteristics of France Transfo.

The characteristics of transformers and fuses may change according to manufactures and standards.

Access to fuses

Access via the front with the front panel removed. Fuses may be removed without tools by simply pulling them forward. The field deflector pivots and automatically returns to its position.

Replacement of fuses

When fault clearance results in one or two blown fuses, it is still common practice to replace only the blown fuses.

However, though the remaining fuse(s) may apparently be in good condition, their operating characteristics are generally reduced due to the short-circuit. If non-blown fuses remain in service, they may blow even at very low over-current values.

In systems where continuity of service is of importance, it is recommended to replace all three fuses, in compliance with IEC recommendation 282.1.

Connections with dry-type cables

Dry-type cables connect via short simplified terminations (EUIC):

- with a field deflector or a linear voltage distributor for type HN 33-S-22 single-core copper or aluminium cables
- with a linear voltage distributor for type HN 33-S-23 single-core or three-core cables.

The termination lug must be connected to the integrated stud on the field deflector, using a torque wrench set to 50 mN.

Single-core cables		Units 630 A	
Cable-section (mm ²)	Bending radius (mm)	IM, IMC, QM, CM, CM2, PM, DM1-A, GAM2, SM	
		Depth P (mm)	
		P1	P2
1 x 35	525	350	550
1 x 50	555	380	580
1 x 70	585	410	610
1 x 95	600	425	625
1 x 120	630	455	655
1 x 150	645	470	670
1 x 185	675	500	700
1 x 240	705	530	730

Note: the unit and the cables requiring the greatest depth must be taken into account when determining the depth P for single-trench installations. In double-trench installations must be taken into account to each type of unit and cable orientations.

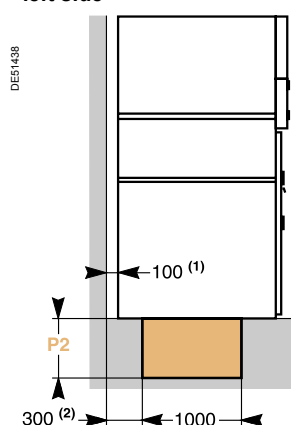
Cabling from below

All units through trenches

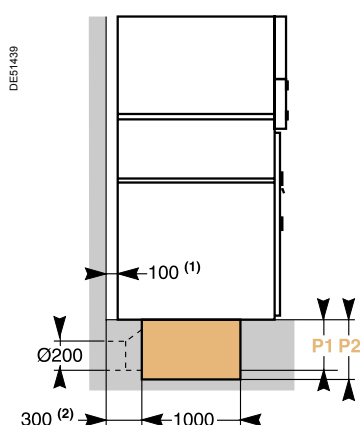
- the trench depth P is given in the table opposite for commonly used types of cables.

Trench diagrams

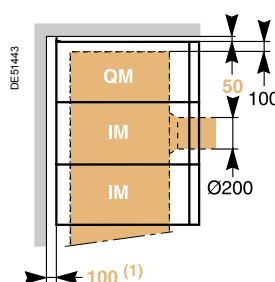
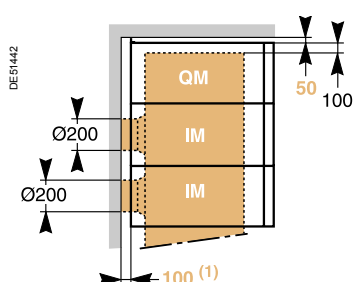
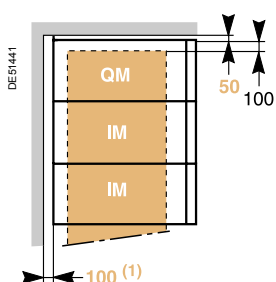
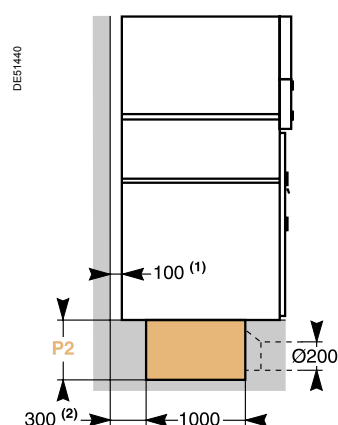
Cable entry or exit through right or left side



Rear entry or exit with conduits



Front entry or exit with conduits



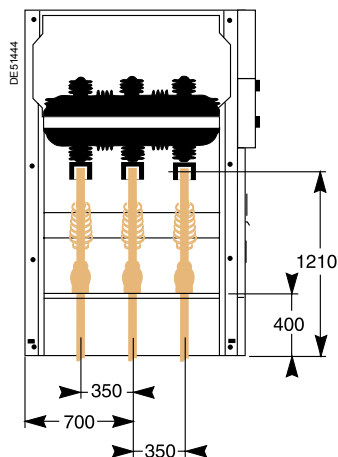
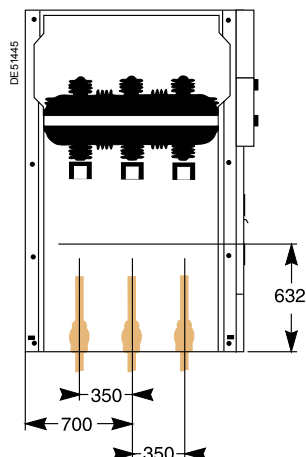
Required dimensions (mm)

(1) 200 mm for internal arc version.

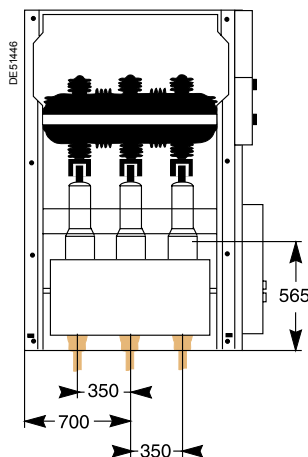
(2) 400 mm for internal arc version.

Cable-connection height

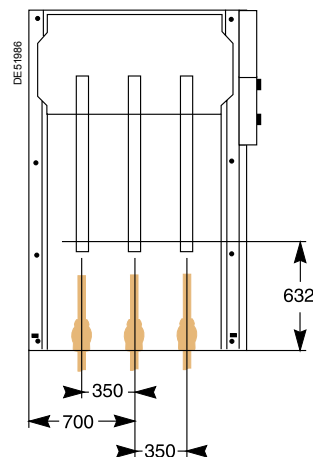
IM/SM unit

QM, PM units
*IMC 583 mm

DM1-A unit



GAM2 unit



Floor preparation

Units may be installed on ordinary concrete floors, with or without trenches depending on the type and cross-section of cables.

Required civil works are identical for all units.

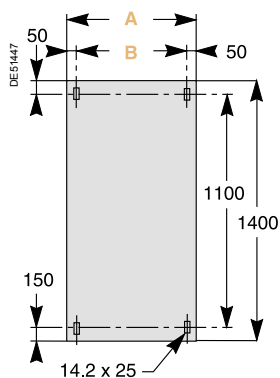
Dimensions and weights

Unit type	Height (mm)	Width (mm)	Depth ⁽¹⁾ (mm)	Weight (kg)
IM, SM	2250	750	1400 ⁽³⁾	310
IMC, IMB	2250	750	1400 ⁽²⁾	420
QM, PM	2250	750	1400 ⁽³⁾	330
DM1-A	2250	1000	1400 ⁽²⁾	600
DM1-D	2250	1000	1400 ⁽²⁾	560
GIM	2250	250	1400	90
DM2	2250	1500	1400 ⁽²⁾	900
CM, CM2	2250	750	1400 ⁽²⁾	460
GBC-A, GBC-B	2250	750	1400 ⁽³⁾	420
GBM	2250	750	1400 ⁽³⁾	260
GAM2	2250	750	1400 ⁽³⁾	250
GAM	2250	750	1400 ⁽³⁾	295

(1) The depth measures are given for the floor surface.

(2) The depth in these units are 1615 mm with the enlarged low voltage compartment.

(3) The depth in these units are 1500 mm with the standard low voltage compartment.



Fixing of units

With each other

The units are simply bolted together to form the MV switchboard (bolts supplied). Busbar connections are made using a torque wrench set to 28 mN.

On the floor

■ for switchboards comprising up to three units, the four corners of the switchboard must be secured to the floor using:

- bolts (not supplied) screwed into nuts set into the floor using a sealing pistol
- screw rods grouted into the floor

■ for switchboards comprising more than three units, the number and position of fixing points depends on local criteria (earthquake withstand capacities, etc.)

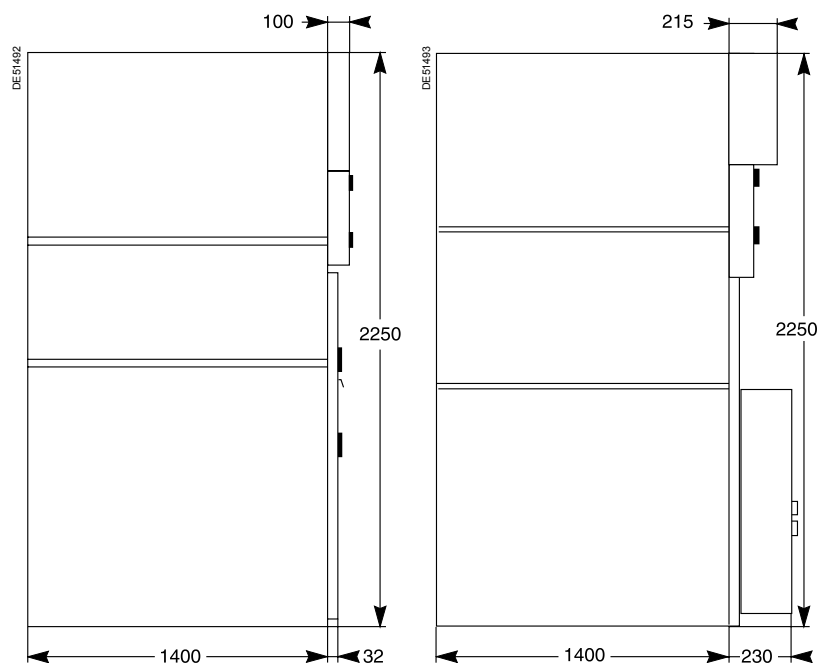
■ position of fixing holes depends on the width of units.

Cubicles	A (mm)	B (mm)
IM, IMC, IMB, QM, PM, SM, CM, CM2	750	650
GBC-A, GBC-B, GBM, GAM2, IMB, GAM		
DM1-A, DM1-D	1000	900
DM2	1500	1400
GIM	250	150

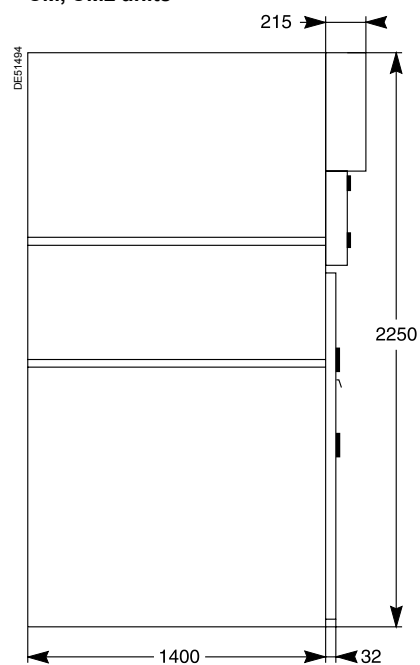
Dimensions

IM, SM, IMC, QM, PM, IMB, GBM,
GAM, GAM2, GBC-A, GBC-B units,

DM1-A, DM1-D, DM2 units

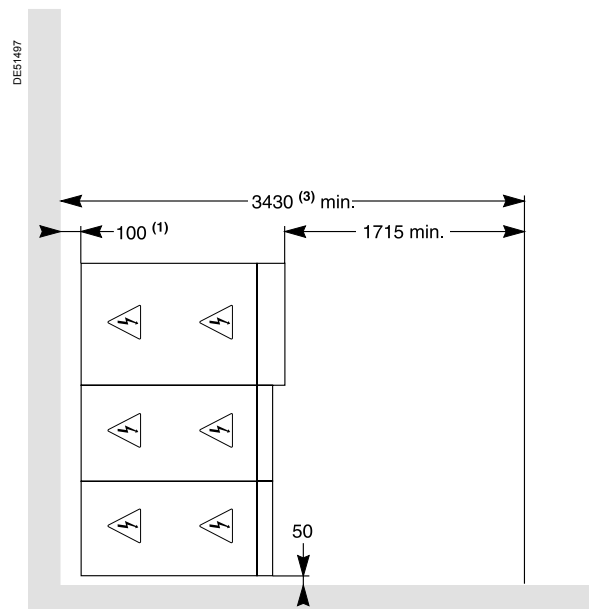
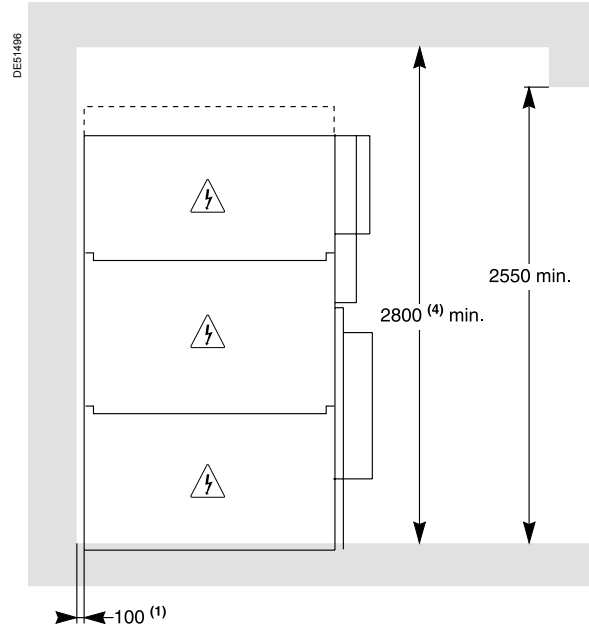
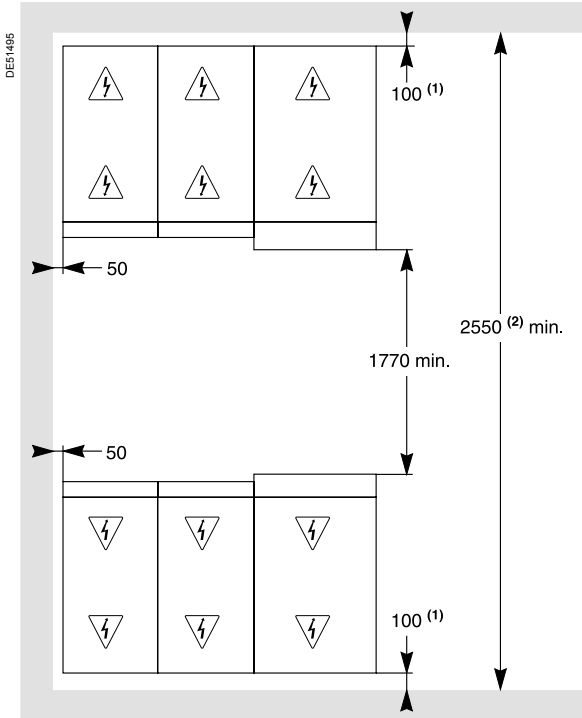


CM, CM2 units



Conventional masonry substation

(bottom view dimensions)



Minimum required dimensions (mm).

(1) 200 mm for internal arc version.

(2) 5400 mm for internal arc version.

(3) 3530 mm for internal arc version.

(4) 2650 mm for internal arc version.

Order form

SM6 36

Connection to the network

Calculation zone

Only one of the boxes (ticked ☐ or filled ☒) by the needed value) have to be considered between each horizontal line.
Orange box ☒ corresponds to none priced functions.

Basic cubicle		Quantity
Rated voltage Ur	(kV)	☐
Short-circuit current I _{sc}	(kA)	☐
Rated current I _r	(A)	☐
Type of cubicle	IM 750 ☐ IMC 750 ☐ SM 750 ☐ IMB 750 ☐	
Internal arc version 16 kA 1 s (not possible with "top incomer" option)		☐
Position number in the switchboard (from left to right)		☐
Options		
Replacement of CIT by	C11 ☐	C12 ☐
Electrical driving motorization	CIT ☐	
Electrical driving mechanism (with O/C coils and AC contacts)	C11 ☐	C12 ☐
O/C coils without electrical driving mechanism	C11 ☐	C12 ☐
Electrical driving mechanism and/or coils voltage (not applicable for SM)	24 V DC ☐	110 V DC ☐
	32 V DC ☐	120-125 V DC ☐
	48 V DC ☐	137 V DC ☐
	60 V DC ☐	220 V DC ☐
120/127 V AC (50 Hz)	☐	
220/230 V AC (50 Hz)	☐	
120/127 V AC (60 Hz)	☐	
220/230 V AC (60 Hz)	☐	
Signaling contact	1 C on SW and 1 O & 1 C on ES (not applicable on SM cubicle)	
	2 O & 2 C on SW ☐	2 O & 3 C on SW and 1 O & 1 C on ES ☐
Top incomer (single core, cable maxi 240 mm ² , with voltage indicator)		☐
Cable connection by the bottom		☐
(2 x single core, cable maxi 240 mm ² , not applicable for IMC)		☐
Interlocking (with key)	Ronis ☐	Profalux ☐
For all cubicle (except SM)	A4 ☐	A3 SM6-SM6 ☐
Location of 2 nd lock for A3	on switch ☐	on earthing switch ☐
Location of 2 nd lock for A4	cubicle no. ☐	
SM cubicle only	P2 SM6-SM6 ☐	P3 SM6-SM6 ☐
Heating element	☐	
Surge arrestors for IM	36 KV ☐	
Replacement of 630 A busbar by 1250 A (not for IMB)		☐

Order form

SM6 36

Fuse switch protection

Calculation zone

Only one of the boxes (ticked ☐ or filled ☒) by the needed value) have to be considered between each horizontal line.
Orange box ☒ corresponds to none priced functions.

Basic cubicle		Quantity	
Rated voltage Ur	(kV)	☐	☐
Short-circuit current Isc	(kA)	☐	☐
Rated current Ir	(A)	☐	☐
Type of cubicle	PM 750 ☐ QM 750 ☐		
Internal arc version 16 kA 1 s (not possible with "top incomer" option)			
Position number in the switchboard (from left to right)			
Fuses		See fuse price structure	
Options			
Replacement of mechanism	For PM	CIT by CI1 ☐	CIT by CI2 ☐
	For QM	CIT by CI2 ☐	
Electrical driving motorization	24 V DC ☐	110 V DC ☐	120/127 V AC (50 Hz) ☐
	32 V DC ☐	120-125 V DC ☐	220/230 V AC (50 Hz) ☐
	48 V DC ☐	137 V DC ☐	120/127 V AC (60 Hz) ☐
	60 V DC ☐	220 V DC ☐	220/230 V AC (60 Hz) ☐
Shunt trip	opening (on CI1) ☐	closing and opening (on CI2) ☐	
	24 V DC ☐	110 V DC ☐	120/127 V AC (50 Hz) ☐
	32 V DC ☐	120-125 V DC ☐	220/230 V AC (50 Hz) ☐
	48 V DC ☐	137 V DC ☐	120/127 V AC (60 Hz) ☐
	60 V DC ☐	220 V DC ☐	220/230 V AC (60 Hz) ☐
		380 V AC (50/60 Hz) ☐	
Auxiliary contact signaling	1 C on SW and 1 O & 1 C on ES ☐		
	2 O & 2 C on SW ☐	2 O & 3 C on SW and 1 O & 1 C on ES ☐	
	Blown fuse signaling contact (only for QM) ☐		
Top incomer (single core, cable maxi 240 mm², with voltage indicator) ☐			
Interlocking (with key)	Ronis ☒		Profalux ☒
	C4 ☐	A1 ☐	C1 ☐
Heating element ☐			
Replacement of 630 A busbar by 1250 A ☐			

Order form

SM6 36

Circuit breaker protection

Calculation zone

Only one of the boxes (ticked ☐ or filled ☐ by the needed value) have to be considered between each horizontal line.
Orange box ☐ corresponds to none priced functions.

Basic cubicle		Quantity
Rated voltage Ur	(kV)	
Short-circuit current I _{sc}	(kA)	
Rated current I _r	(A)	
Type of cubicle	DM1-A 1000 ☐ DM2 right 1500 ☐ DM1-D right 1000 ☐	
Internal arc version 16 kA 1 s (not possible with "top incomer" option)		☐
Position number in the switchboard (from left to right)		
Voltage of the auxiliaries	48/60 V DC ☐ 110/125 or 220/250 V DC ☐	
	110/130 or 220/240 V AC (50 Hz) ☐	
Voltage of signaling	48/60 V DC ☐ 100/125 V DC ☐ 220/250 V DC ☐	
	110/130 V AC (50 Hz) ☐ 220/240 V AC (50 Hz) ☐	
Options		
Top incomer (single core, cable maxi 240 mm ² , with voltage indicator)		☐
Cable connection by the bottom (for DM1-A 630 A only)		
3 x single core cable maxi 240 mm ² ☐ 6 x single core cable maxi 240 mm ² ☐		
Interlocking	Ronis ☐ Profalux ☐	
Not applicable on DM2 C4 ☐ A1 ☐ C1 ☐		
Current transformers and voltage transformers		See specific order form
Signaling contact	2 O & 2 C on SW (not applicable with VT's) ☐	
	2 O & 3 C on SW and 1 O & 1 C on ES (not applicable with VT's) ☐	
	1 O & 2 C on SW (available only on cubicle with VT's) ☐	
Heating element		☐
SF1 circuit breaker		See specific order form
Sepam relay protection		See specific order form
Replacement of 630 A busbar by 1250 A (only DM1-A))		☐

Order form

SF1 fixed for SM6 36 (IEC standard)

Calculation zone

Only one of the boxes (ticked ☐ or filled ☐ by the needed value) have to be considered between each horizontal line.

Orange box ☐ corresponds to none priced functions.

Basic circuit breaker		Quantity	
Rated voltage Ur	(kV)		
Impulse voltage Uw	(kVbil)		
Breaking current Isc	(kA)		
Rated current Ir	(A)		
Frequency	50 Hz ☐ 60 Hz ☐		
Installation	Fixed		B1 ☐
Colour for push buttons and indicators	IEC standard	ANSI standard	

Push buttons open/close	red/black	☐	
Indicator open/close	black/white	☐	green/red ☐
Operating mechanism charged/ discharged	white/yellow	☐	charge/discharge ☐

Circuit breaker options

1st opening release ⁽¹⁾ (see possible choice combination table)

Shunt opening release			
24 V DC ☐	60 V DC ☐	48 V AC (50 Hz) ☐	120 V AC (60 Hz) ☐
30 V DC ☐	110 V DC ☐	110 V AC (50 Hz) ☐	230 V AC (60 Hz) ☐
48 V DC ☐	220 V DC ☐	230 V AC (50 Hz) ☐	
Undervoltage release			
24 V DC ☐	60 V DC ☐	220 V DC ☐	220 V AC (50 Hz) ☐
30 V DC ☐	110 V DC ☐	48 V AC (50 Hz) ☐	120 V AC (60 Hz) ☐
48 V DC ☐	125 V DC ☐	110 V AC (50 Hz) ☐	240 V AC (60 Hz) ☐
MITOP	without contact ☐	with contact ☐	

2nd opening release ⁽¹⁾ (see possible choice combination table)

Shunt opening release			
24 V DC ☐	60 V DC ☐	48 V AC (50 Hz) ☐	120 V AC (60 Hz) ☐
30 V DC ☐	110 V DC ☐	110 V AC (50 Hz) ☐	230 V AC (60 Hz) ☐
48 V DC ☐	220 V DC ☐	230 V AC (50 Hz) ☐	
Undervoltage release			
24 V DC ☐	60 V DC ☐	220 V DC ☐	220 V AC (50 Hz) ☐
30 V DC ☐	110 V DC ☐	48 V AC (50 Hz) ☐	120 V AC (60 Hz) ☐
48 V DC ☐	125 V DC ☐	110 V AC (50 Hz) ☐	240 V AC (60 Hz) ☐
MITOP	without contact ☐	with contact ☐	

Remote control

Electric motor - MCH	24...32 V DC ☐	110...127 V DC/AC ☐
	48...60 V DC/AC ☐	220...250 V DC/AC ☐

Shunt opening release			
24 V DC ☐	60 V DC ☐	220 V DC ☐	220 V AC (50 Hz) ☐
30 V DC ☐	110 V DC ☐	48 V AC (50 Hz) ☐	120 V AC (60 Hz) ☐
48 V DC ☐	220 V DC ☐	110 V AC (50 Hz) ☐	240 V AC (60 Hz) ☐

Leaflets language	French ☐	English ☐	Spanish ☐
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(1) Different releases combinations

Shunt opening release	1		2	1	1
Undervoltage release		1		1	1
MITOP	1			1	1

Order form

SM6 36

MV metering

Calculation zone

Only one of the boxes (ticked ☐ or filled ☐ by the needed value) have to be considered between each horizontal line.
Orange box ☐ corresponds to none priced functions.

Basic cubicle		Quantity
Rated voltage Ur		(kV)
Short-circuit current I _{sc}		(kA)
Rated current I _r		(A)
Type of cubicle	CM 750 ☐	CM2 750 ☐
	GBC-A 750 ☐	GBC-B 750 ☐
Internal arc version 16 kA 1 s (not possible with "top incomer" option),		☐
Direction of lower busbars for GBC-A (assembly on the first cubicle of the switchboard impossible on GBC-A 630 A)		right ☐
Position number in the switchboard (from left to right)		☐
Voltage transformers		See specific order form
Signaling contact		1 O and 2 C on SW ☐
		blown fuse mechanical indication ☐
Fuses for CM and CM2 only		See fuse price structure
Options		
Current transformers and voltage transformers for GBC		See specific order form
Top incomer (single core, cable maxi 240 mm ² , with voltage indicator)		☐
Heating element (only CM, CM2)		☐
Replacement of 630 A busbar by 1250 A (only CM, CM2)		☐

Order form
SM6 36
Casing

Calculation zone

Only one of the boxes (ticked ☐ or filled ☐ by the needed value) have to be considered between each horizontal line.
Orange box ☐ corresponds to none priced functions.

Basic cubicle		Quantity
Rated voltage Ur	(kV)	
Short-circuit current Isc	(kA)	
Rated current Ir	(A)	
Type of cubicle	GAM2 750 ☐ GBM 750 ☐	
Internal arc version 16 kA 1 s(not possible with "top incomer" option)		☐
Position number in the switchboard (from left to right)		
Direction of lower busbars for GBM left (impossible on the first cubicle of the switchboard)		☐ right ☐
Options		
Top incomer (single core, cable maxi 240 mm², with voltage indicator)		☐
Heating element		☐
Replacement of 630 A busbar by 1250 A (only GAM2)		☐

Notes

Notes

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As standards, specifications and designs change from time to time, please ask for confirmation of the information given in this publication.



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