

2018 Catalog



RM6

Gas Insulated Ring Main Unit - Up to 24 kV

Medium Voltage Distribution

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RM6 up to 24 kV

Gas Insulated Ring Main Unit

Your needs

Safety & Reliability



Efficiency



Connected



RM6 solution

The RM6 is a compact hi-reliable Gas Insulated ring main unit combining all MV functional Units to enable the connection, supply and protection of transformers or feeders on an open ring or radial network. Together with Easergy T300 RTUs it is smarter and meets the needs of utilities, infrastructure, buildings & industries.

- **Operator safety:**

With RM6, we are committed to operator safety..

- Designed for internal arc
- Stainless steel tanks & cable boxes are fully internal arc rated
- Visible earthing contacts contribute to operator safety while performing earthing operations
- Voltage indicators (VPIS or VDS) are located on front fascia of the equipment
- The presence of natural interlocks, as recommended in IEC 62271-200 through simple & easy understandable mimic, contributes to safe switchgear operation

- **Transformer protection with a circuit breaker:**

Provides adjustable tripping curve, overload protection, continuous earth fault protection, while avoiding fuse replacement. In addition it provides the possibility of reclosing even remotely.

- **Simplified maintenance:**

Intervals of 5 to 10 years

- **Easy to install:** Due to its compact & simple design it's easy to install, maintain & has the capacity for product evolution, e.g.: extensibility, on-site motorisation etc.

- **Guaranteed interoperability**, already connected to 1 product

- **Reduce downtime** with condition-based maintenance enabled by sensors and automation

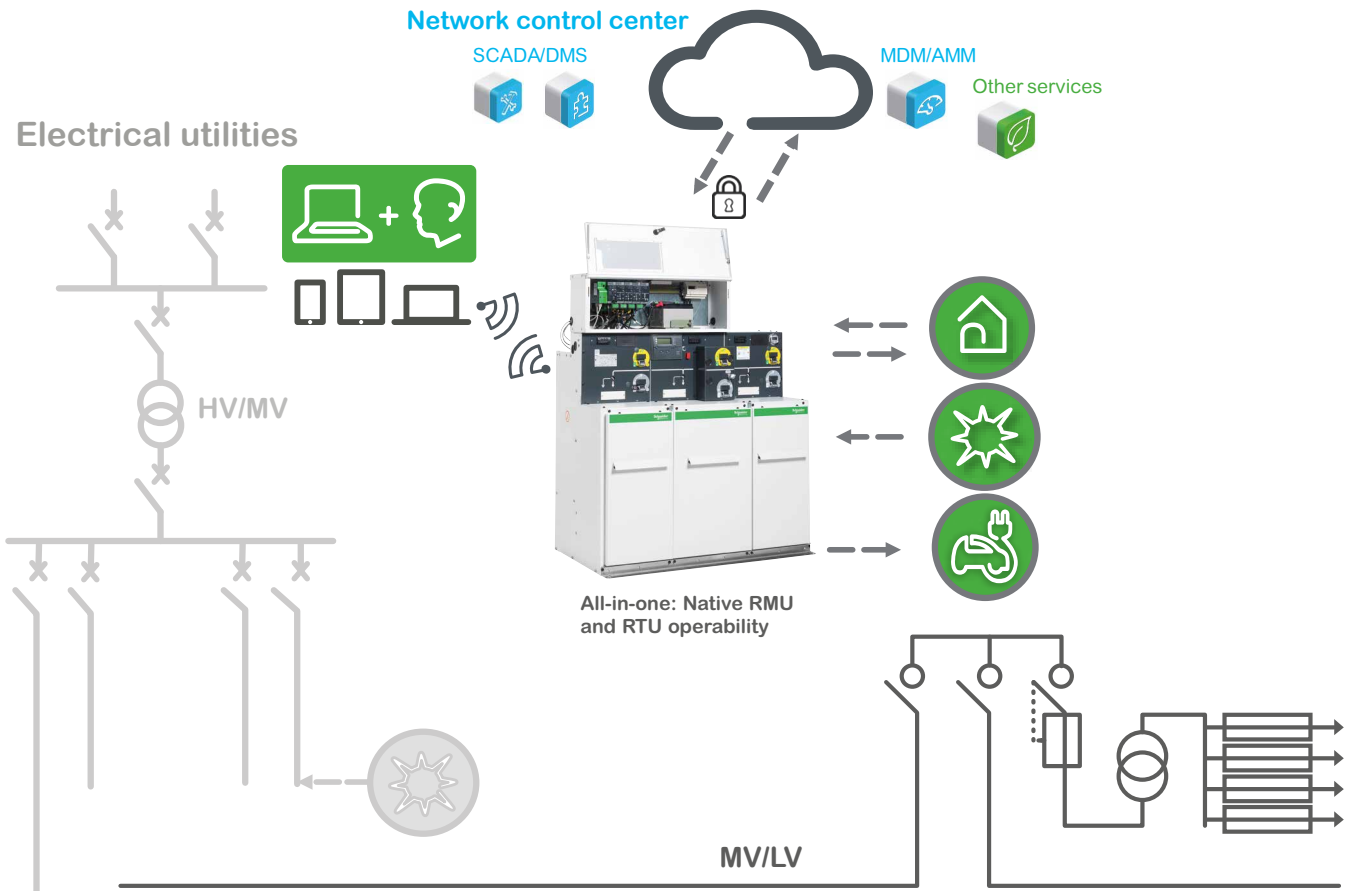
- Compliant with the **latest cyber security standards** and regulations



RM6: a truly professional solution!
More than 1 800 000 cubicles installed worldwide

RM6 connected, for efficient grid operations

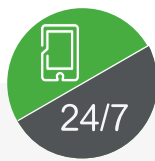
DM100956



Efficient asset management

Condition monitoring

- Thermal monitoring of cable connection
- Measurement of humidity & condensation cycles



24/7 connectivity

Remote network management

Power management



Increased Safety & Reliability

Advanced relaying & protection options

Vibration & seismic compliant

Wide range of options are available, please contact us for more details

Smart ready cubicle

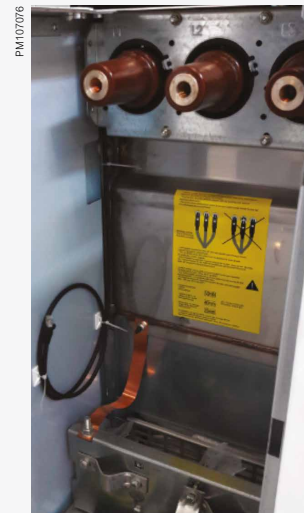
Prewired cubicle for fast&easy connection with Easergy T300

New!



Prewired Cubicle

- Factory fitted measurement class bushing CTs (accuracy class 0.5), wired to the RM6 terminal block
- Prewired RJ45 Cable for easy connection with LPVT Hub
- Saves time: No need to open the front fascia



Convenient solution for all possible RTU integrations

- Top mounted
- Side mounted
- Wall mounted

Improved Terminal block with clip on connectors for reduced wiring time



Notes

Overview

Overview

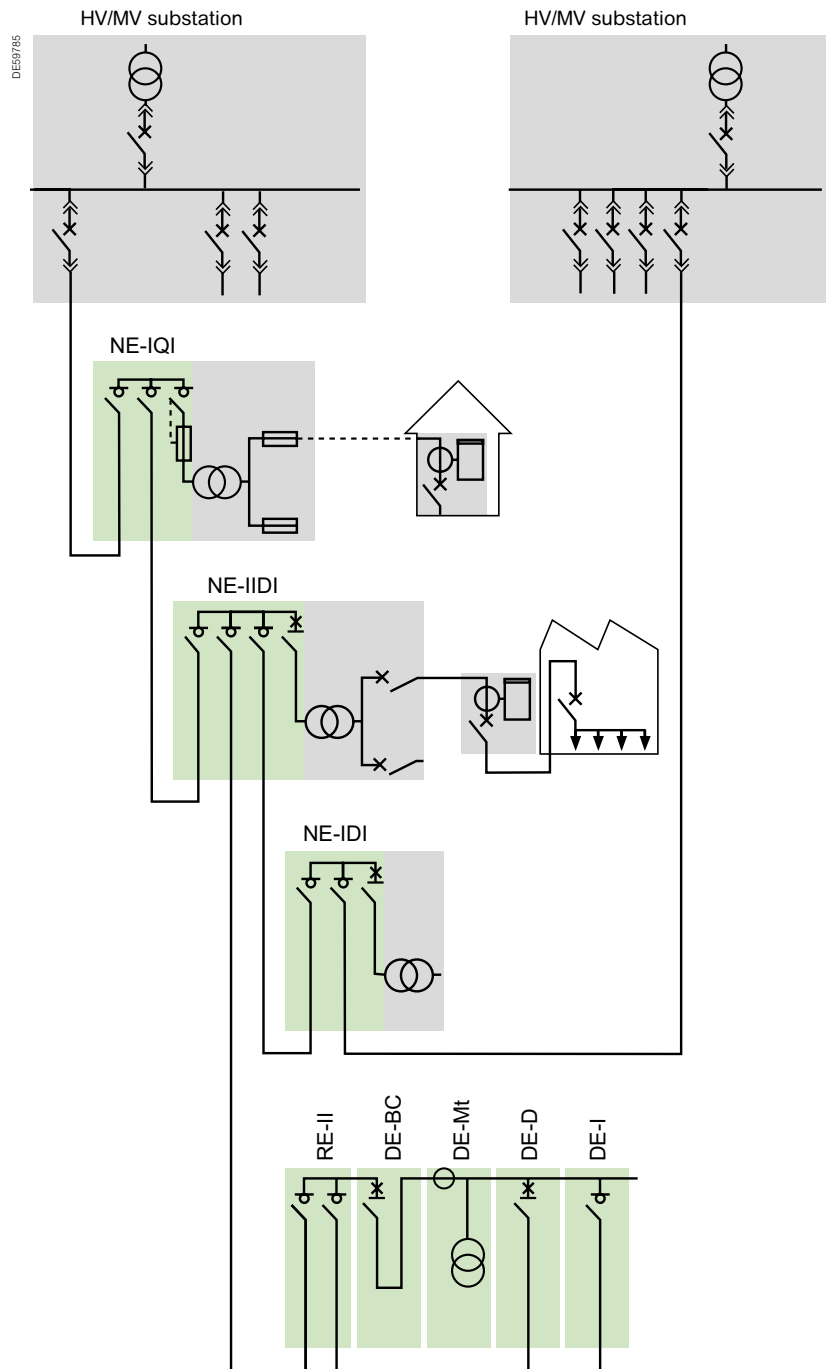
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RM6 meets all medium voltage secondary distribution needs up to 24kV.

RM6 is a gas-insulated switchboard combining all medium voltage functions to enable the connection, supply and protection of transformers for open ring or radial networks.

Transformer protection can be achieved either:

- by a fuse-switch combination for transformers up to 2 000 kVA
- by a circuit breaker with a protection relay for transformers up to 8 000 kVA



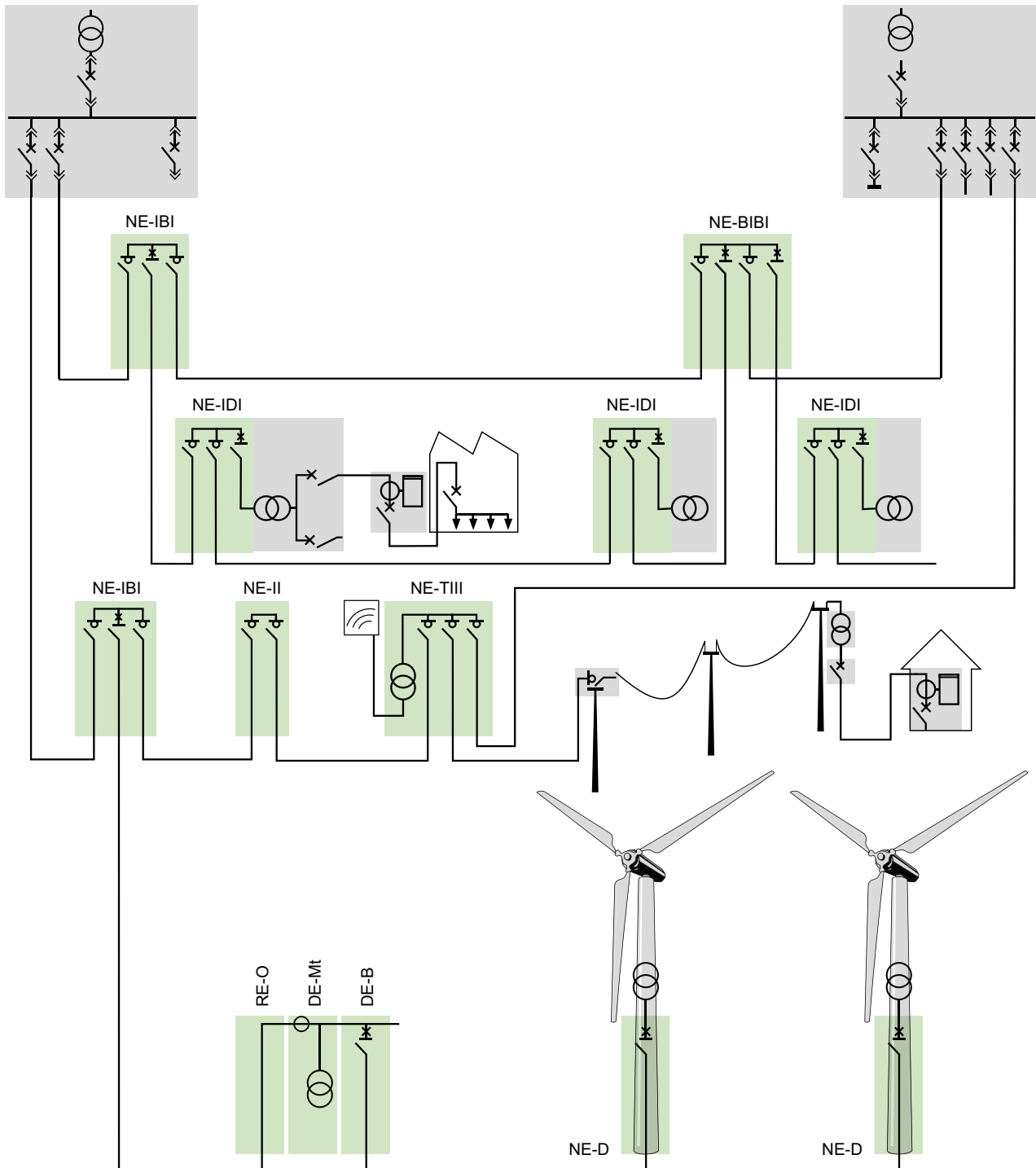
Field of application

RM6 meets all medium voltage secondary distribution needs in more complex network configurations where renewable energy supply sources are involved.

In addition to HV/MV substations, which are used to limit the effects of a fault on the network, operating a distribution network sometimes requires several switching points. RM6 offers solutions for up to five network connections thanks to:

- line protection with 630A circuit breakers
- network switching by switch-disconnectors
- integrated power supply remote control devices.

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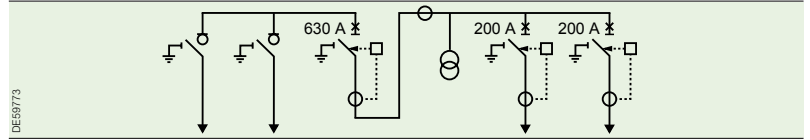
Field of application

Examples of typical applications
(free combination tank)



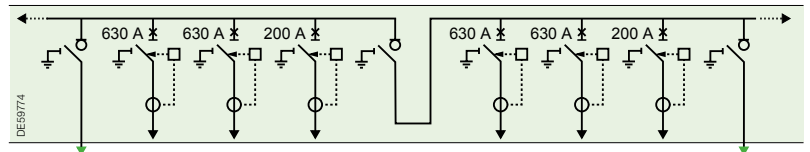
Private metering

Possible configuration with Free Combination: RE-IIBc; DE-Mt; LE-DD



Switching large sites

Possible configuration with Free Combination: RE-QIQI; DE-QQ



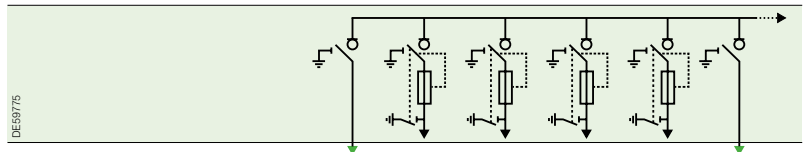
Connection to MV network

Connection to MV network



Large transformer substation

Possible configuration with Free Combination: RE-QIQI; DE-QQ



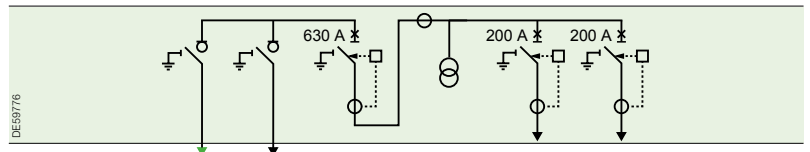
Connection to MV network

Connection to MV network



Separate MV consumer substation

Possible configuration with Free Combination: RE-IIBc; DE-Mt; LE-DD

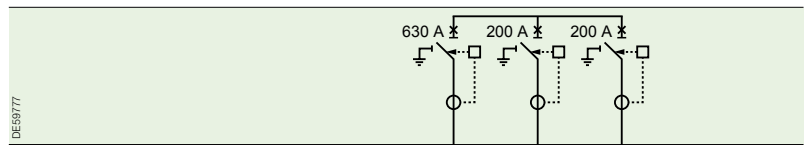


Connection to the open ring



Satellite MV consumer substation

Possible configuration with Free Combination: NE-BDD



Cable connection to utility network

Field of application

RM6 for marine applications

RM6 is compliant with IACS standards and DNV and is approved for Marine applications.



Thanks to RM6 a loop network configuration can be used onboard ships with significant advantages:

- Main medium voltage switchboard is smaller (only two functions to feed a MV loop)
- Length of medium voltage cables is reduced (> 30% typically)
- The maintainability and availability of the network are improved as:
 - a failed cable section on the MV loop can be disconnected
 - an automatic reconfiguration of the MV loop after a fault detection can be achieved

Onboard safety

If RM6 is equipped with a special LRU (internal arc Reduction Unit) "filter", internal arc classification is AFLR 20 kA 1 s as per IEC 62271-200.

Resistance to vibrations

- Complies with IACS marine standards
- RM6 has a very low centre of gravity
- New vibration withstand performance

Resistance to severe environment

Live parts are contained in a sealed-for-life tank.

Some Marine references

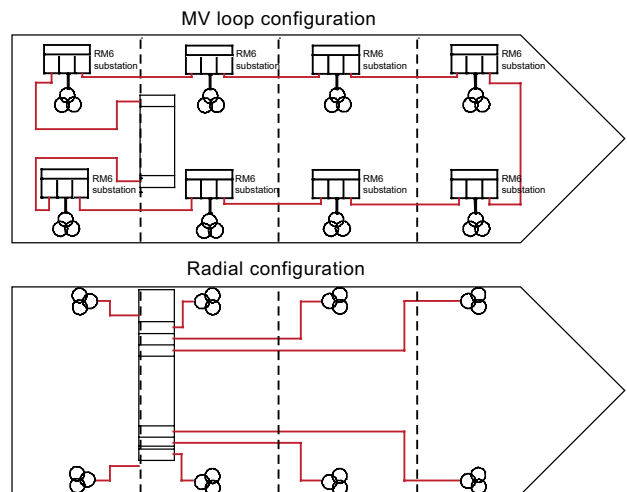
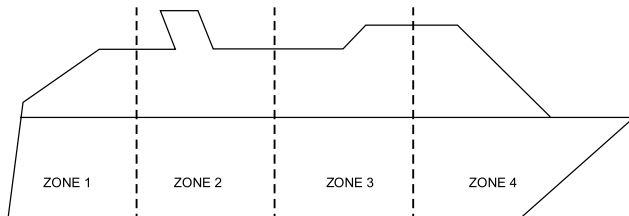
Aker Yards:

- NCL Cruise Liner
- Genesis 1 & 2.

Meyer Werft:

- Aida ships
- Norwegian Gem
- Norwegian Pearl
- Pride of Hawaiï,
- Norwegian Jewel
- Jewel of the seas...

Example of a cruise liner architecture





Robust switchgear design

Switch-disconnectors and circuit breakers have similar architecture:

- A moving contact assembly with 3 stable positions (closed, open and earthed) moves vertically (see diagram). Its design makes simultaneous closing of the switch or circuit breaker and the earthing switch impossible
- The earthing switch has a short-circuit making capacity, as required by the respective standards
- The RM6 combines both an isolating and interrupting function
- The earth collector has the appropriate dimensions for the network
- Access to the cable compartment can be interlocked with the earthing switch and/or the switch or circuit breaker

For the switch-disconnector, the electric arc extinction is obtained thanks to the SF6 puffer design, whilst for the circuit breaker the electric arc extinction is achieved thanks to a rotating arc technique combined with SF6 auto-expansion, allowing the breaking of all currents up to the short-circuit current.

Easy cable insulation test

In order to test cable insulation or look for faults, RM6 offers a unique way to inject a direct voltage of up to 42 kVdc for 15 minutes through the cables via the RM6, without disconnecting the connected devices.

The operator does not need to access the cable compartment.

The earthing switch is closed and the moving earthing connection is opened in order to inject the voltage via the "earthing covers". This system, a built-in feature of the RM6, requires the use of injection fingers (supplied as an option).

Thanks to transparent covers, the earthing switch moving contacts can be viewed in the closed position.

Internal Arc Ratings	Type of exhaust
20 kA A-FLR (1sec)	Bottom Exhaust
20 kA A-FL (1sec)	Bottom Exhaust
16 kA A-FLR (1sec)	Rear Exhaust



Please note: Bottom & rear exhaust kits to be ordered along with cubicle to achieve the IAC performance level declared above

Internal arc withstand

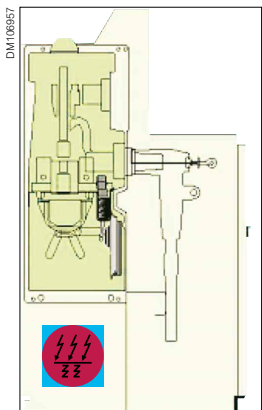
Personal safety is one of the top concerns for Schneider Electric and therefore, RM6 has been designed to withstand the impact of an internal arc supplied by different levels of short-circuit currents (as indicated below) for 1sec in order to provide the maximum protection to operator during the event of Internal Arc.

Accidental overpressure due to an internal arc is limited by opening the safety valve, at the bottom of the metal enclosure.

Arc short-circuiting

An arc short-circuiting device is available as an option on the RM6. This "arc killer" device automatically earths the feeders in case of an internal arc and prevents the tank overpressure. Consequently, the release of polluted gases outside the tank is avoided.

This option is only available on switch function (I) and in non-extensible RM6 or not on a side of extension.

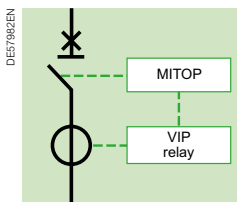




Reliable operating mechanisms

The electrical and mechanical operating mechanisms are located behind a front panel displaying the mimic diagram of the switchgear status (closed, open, earthed):

- **Closing:** the moving contact assembly is manipulated by means of a fast-acting operating mechanism. Outside these operations, no energy is stored. For the circuit breaker and the fuse-switch combination, the opening mechanism is charged in the same movement as the closing of the contacts.
- **Opening:** opening of the switch is carried out using the same fast-acting mechanism, operated in the opposite direction. For the circuit breaker and fuse-switch combination, opening is actuated:
 - by a pushbutton
 - automatically due to abnormal currents
- **Earthing:** a specific operating shaft closes and opens the earthing contacts. The hole providing access to the shaft is blocked by a cover which can be opened if the switch or circuit breaker is open, and remains locked when it is closed.
- **Switchgear status indicators:** are placed directly on the moving contact assembly operating shafts. They give a definite indication of the position of the switchgear (attachment A of IEC standard 62271-102).
- **Operating lever:** this is designed with an antireflex device which prevents any attempt to immediately reopen the switch-disconnector or the earthing switch after closing.
- **Padlocking facilities:** 1 to 3 padlocks can be used to prevent:
 - access to the switch or circuit breaker operating shaft
 - access to the earthing switch operating shaft



RM6 circuit breaker offers enhanced power availability and lower operating costs

The RM6 range offers 200 A and 630 A circuit breakers to protect both transformers and lines. They are associated with autonomous protection relays (VIP4x series) that are self-powered via current sensors or with auxiliary supply protection relays (VIP410 relays).

RM6 circuit breakers provide:

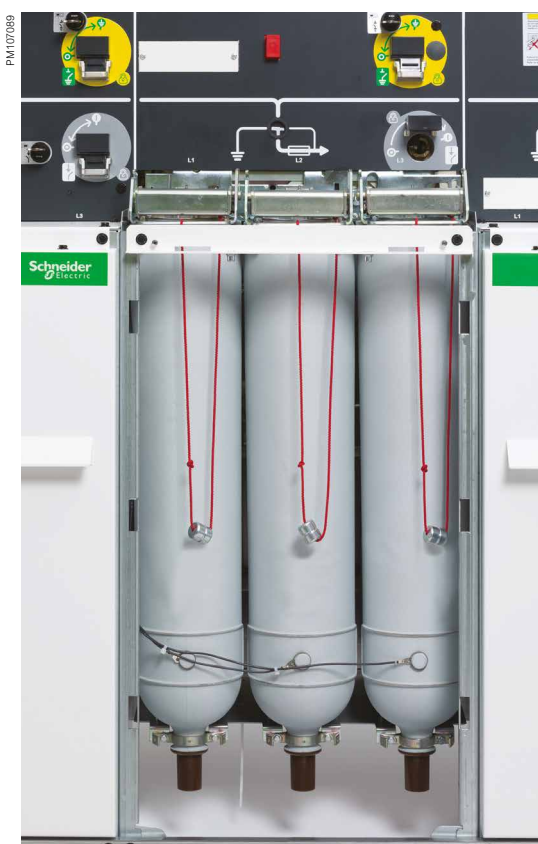
- Enhanced protection of operating staff, and improved continuity of service
 - Improved co-ordination of device protection between the source substation, circuit breaker and LV fuses
 - Rated current is normally high, allowing use of a circuit breaker to provide disconnection
 - The isolating system is fully protected in severe environment
- Simplified switching operations and remote control
 - Reduction of losses thanks to the low value of RI2 (the fuse-switches of a 1000 kVA transformer feeder can dissipate 100 W)
- Reduced maintenance costs with no need for fuse replacement



Sealed Pressure system

RM6 benefits from complete insulation:

- Stainless steel enclosure with IP67 ingress protection containing the live parts of switchgear and busbars



For switch fuse units, the fuse chambers are:

- Sealed to insulate the fuses from dust & humidity
- Metallized to protect the electrical field in solid insulation

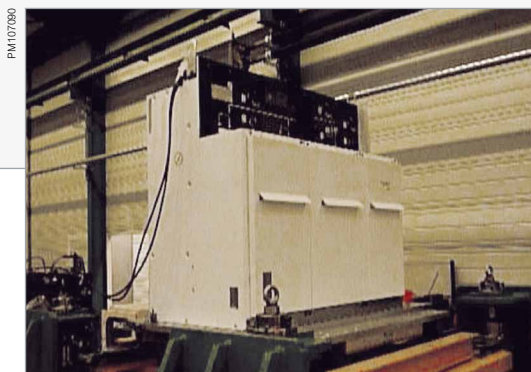
New!

Seismic & Vibration Withstand

In order to overcome the hazards originating from earth quakes and the impact of vibrations in typical applications like wind turbines, Mining and Marine, RM6 has been tested to withstand:

- Seismic: Severity class 2, acceptance class 2 as per IEC62271-210 (2013)
- Vibrations: In compliance with NF EN60068.2.6.2 (2008) *

* Please contact us for more details



PM107091



Extensibility on site

RM6 can easily be extended on site.

The extension of your RM6 with one or more functional units can be carried out by simply adding modules that are connected to each other at busbar level by directed field bushings. This very simple operation can be carried out on site:

- Without handling any gas
- Without any special tooling
- Without any particular preparation of the floor

The only technical limitation to evolving an extensible RM6 switchboard is the rated current that the busbar can support: 630 A at 40° C.

PM107092



RM6 visible earthing contacts for enhanced peace of mind

Operators can visually check that the earthing switch is in the closed position thanks to the transparent earthing covers located at the top of the RM6 that display the position of the earthing contacts.

Connected - EcoStruxure™ ready solutions

What is EcoStruxure™?

450 000

EcoStruxure™ systems deployed since 2007 with the support of our 9 000 system integrators.

EcoStruxure™ ready



Efficient asset management
Greater efficiency with **predictive** maintenance helping to reduce downtime.



24/7 connectivity
Real-time data **everywhere anytime** to make better informed decisions.



Increased protection
Proven design and experience combined with **internal arc designs** to enhance people and equipment protection.

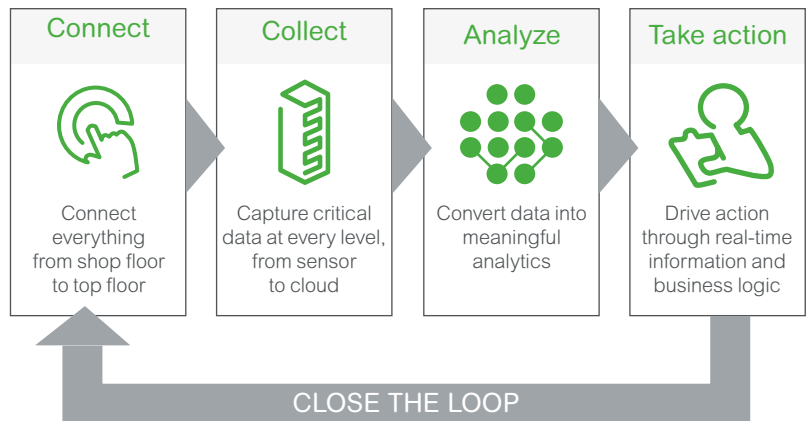
The EcoStruxure™ architecture and interoperable technology platform bring together energy, automation, and software. It provides enhanced value around safety, reliability, efficiency, sustainability, and connectivity.

Turn data into action

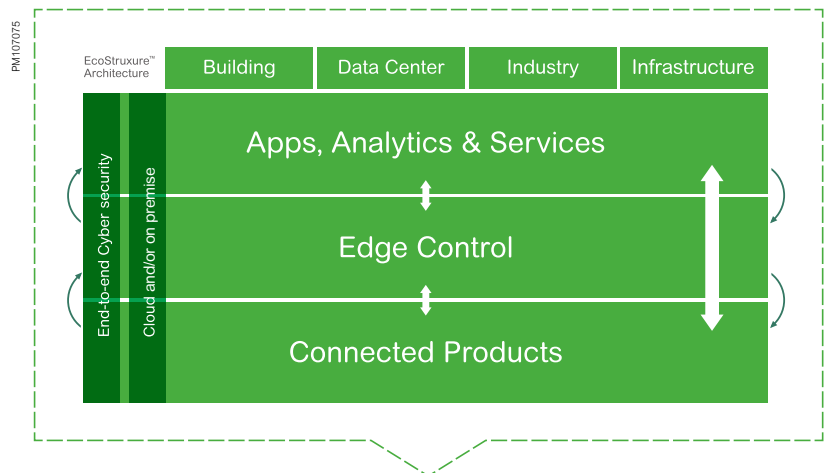
EcoStruxure™ architecture lets customers maximize the value of data.

Specifically, it helps them:

- Translate data into actionable intelligence and better business decisions
- Take informed decisions to secure uptime & operational efficiency thanks to real-time control platforms
- Get visibility of their electrical distribution by measuring, collecting, aggregating and communicating data



EcoStruxure™
Innovation At Every Level

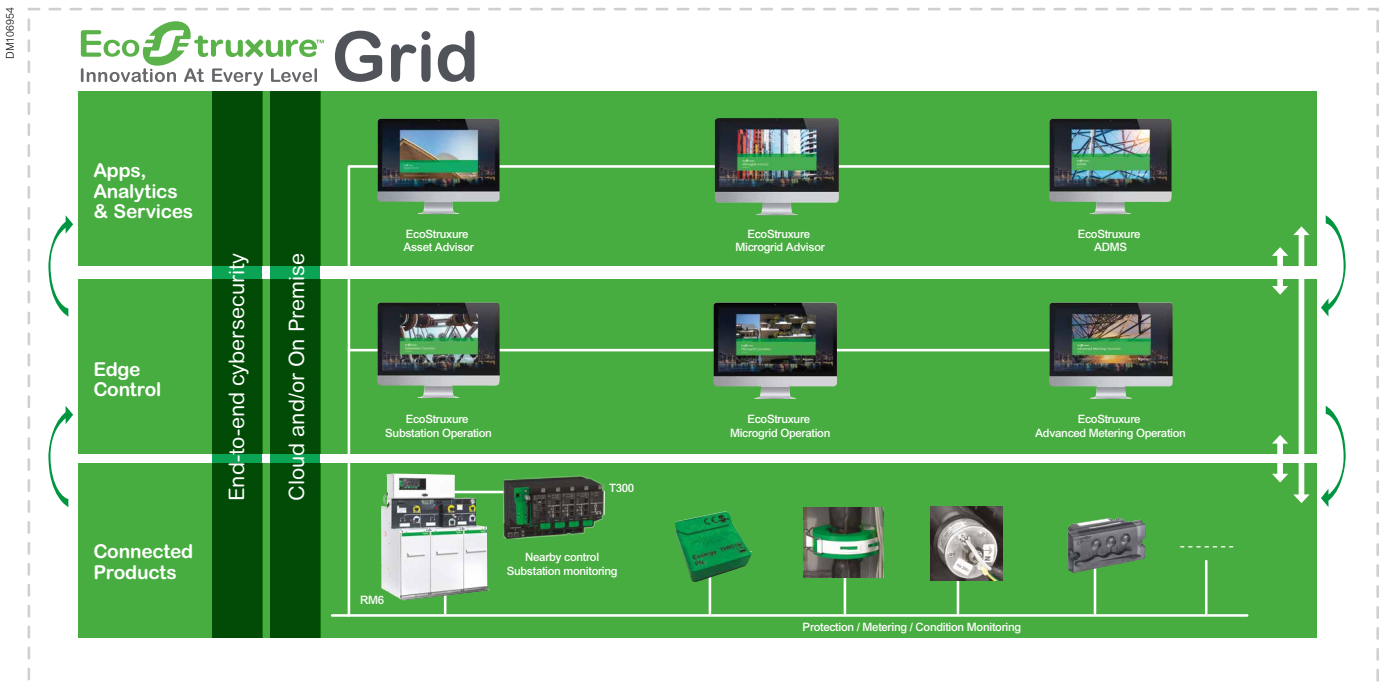
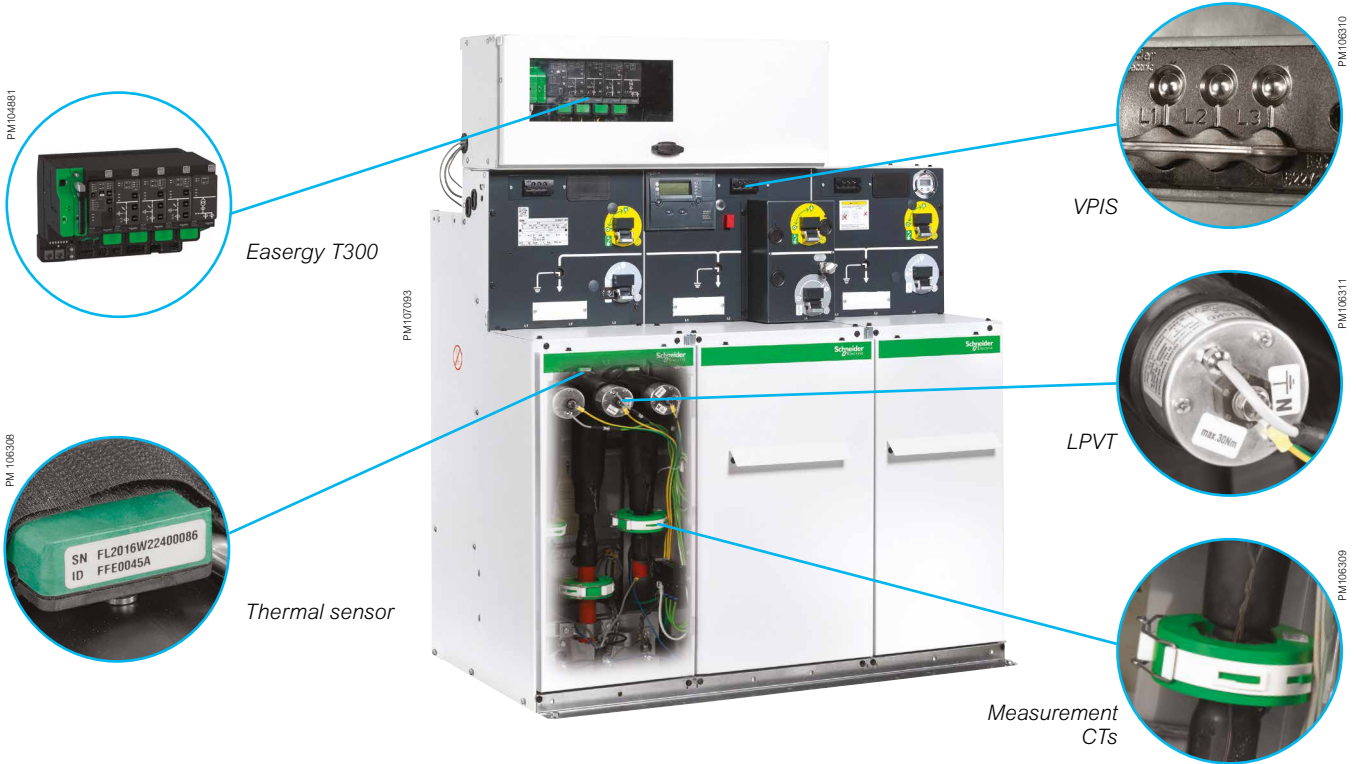


EcoStruxure™ Building | EcoStruxure™ Power | EcoStruxure™ IT | EcoStruxure™ Machine | EcoStruxure™ Plant | EcoStruxure™ Grid

Connected - EcoStruxure™ ready solutions - Core technologies for embedded connectivity and intelligence

Enable nearby control, ensure uptime

All the protection, measurement devices and special sensors can be connected through our connected RM6 solution.



Connected - EcoStructure™ ready solutions

Smart RMU: RM6+T300 “Smarter Together”

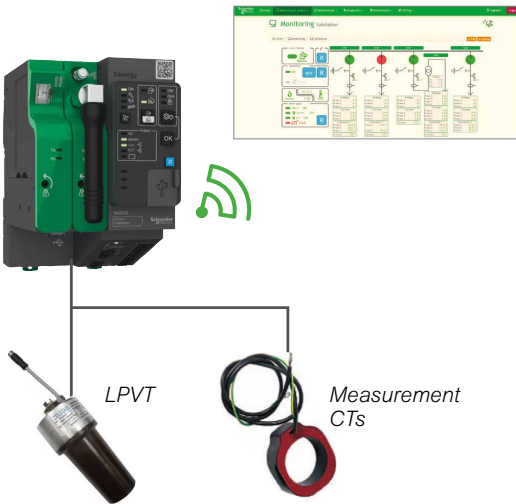
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Network management

- Status Indication switches/breaker and earth switch
- Remote operation of switch & breaker
- MV broken conductor detection

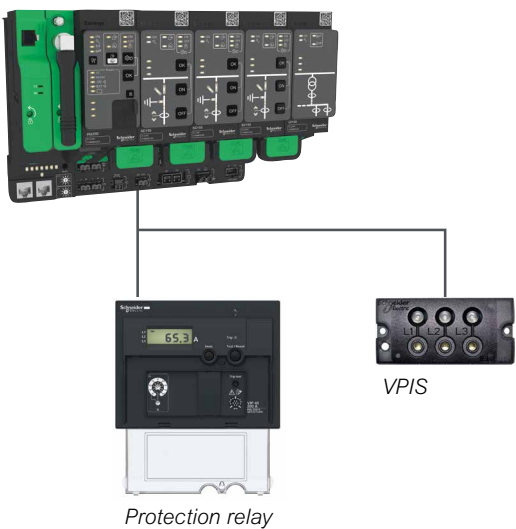
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Power management

- MV & LV power measurement (61557-12)
- Power quality measurement (61000-4-30)
- MV voltage monitoring (VPIS, VDS, LPVT)
- MV current measurement up to 0.5 accuracy class

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Protection

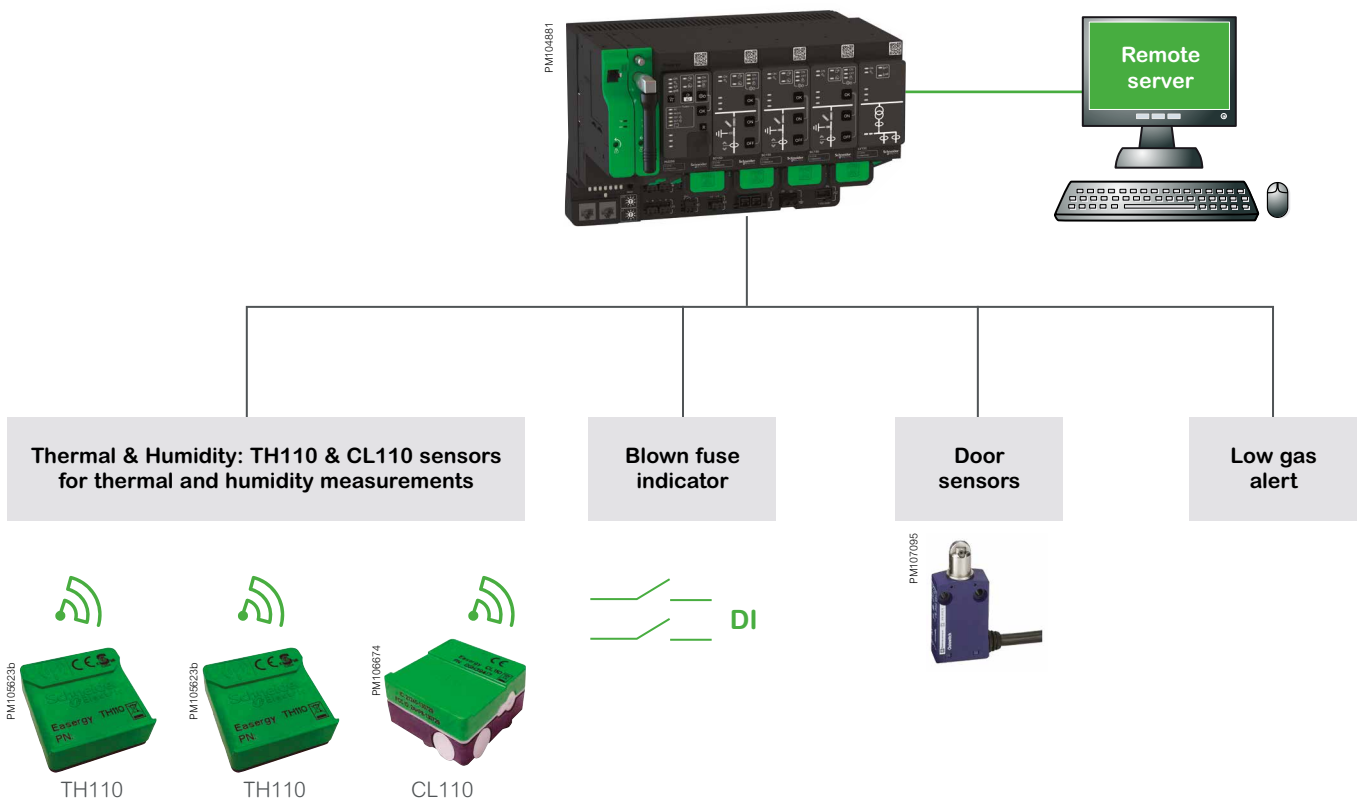
- For overcurrents & Earth faults through integrated protection relays
- Direction fault detection for network with distributed generation
- Undervoltage & overvoltage detection

Connected - EcoStructure™ ready solutions

Smart RMU: RM6+T300 “Smarter Together”

Condition monitoring

- Thermal Monitoring of cable connection for conventional & RMUs equipped with RTU T300
- Measurement of humidity & condensation cycles inside equipment & substation
- Monitoring of status of gas inside tank
- Door interlock alert for anti intrusion inside substation /kiosk
- PT100 transformer temperature monitoring
- Blown fuse indicator for fuse switch units (please contact us for details)



Cyber security



Cyber Security inside

- Compliant with the latest cyber security standards and regulations (IEEE P1686, IEC62351)
- Secure communication protocol
- Secure Wi-Fi access, Port hardening

Contact Schneider Electric for more details

Connected - EcoStructure™ ready solutions

Smart RMU: RM6+T300 “Smarter Together”

Thermal Monitoring with TH110 thermal sensors

- For cable connections of MV installations to avoid the potential risk of over heating at cable terminations happening due to poor cable connections or prolonged phase imbalances
- Suitable for screened cable connections (up to 24kV) & unscreened cable connections up to 12kV
- **Instantaneous measurement** of temperatures at cable connections for conventional RMUs through dedicated APPs
- **Continuous measurement & monitoring** through Easergy T300

Easergy TH110 thermal monitoring

Easergy TH110 is part of the new generation of wireless smart sensors ensuring the continuous thermal monitoring of all the critical connections made on-site to:

- Prevent unscheduled downtimes
- Increase operator and equipment protection
- Optimize predictive maintenance

Thanks to its small footprint and its wireless communication, Easergy TH110 allows an easy and widespread installation in every possible critical points without impacting on the performance of the MV switchgear.

By using the Zigbee Green Power communication protocol, Easergy TH110 ensures a reliable and robust communication that can be used to create interoperable solutions evolving in the Industrial Internet of Things (IIoT) age.

Easergy TH110 is self-powered by the network current and it can ensure high performances to provide accurate thermal monitoring.

CL110 characteristics

Power supply	Self-powered. Energy harvested from power circuit.
Accuracy	+/- 1°C
Range	-25 °C/+115°C
Wireless communication	ZigBee Green Power 2,4 GHz
Dimensions - Weight	31 x 31 x 13 mm - 15 g

Ambient monitoring

Schneider Electric ambient monitoring system will continuously:

- Help the maintenance manager to avoid deterioration of the MV switchgear due to moisture and pollution
- By automatically calculating the condensation cycle, and combining it with the declared mission profile conditions, the system will recommend a maintenance and cleaning frequency adjustment in order to maintain the switchgear in its nominal status

Connected - EcoStructure™ ready solutions

Smart RMU: RM6+T300 “Smarter Together”

Thermal monitoring for conventional RMUs

Supported by App to view & communicate temperature information



Network control center



SCADA / DMS

Temperature info acquired through Zigbee protocol into Zigbee concentrator



TH110



TH110



TH110



DM106960

RM6



TH110 mounted on cable termination

Thermal monitoring for smart RMUs

Temperature info acquired through Zigbee protocol into Data Concentrator



PM10498E



PM106287



PM10769E



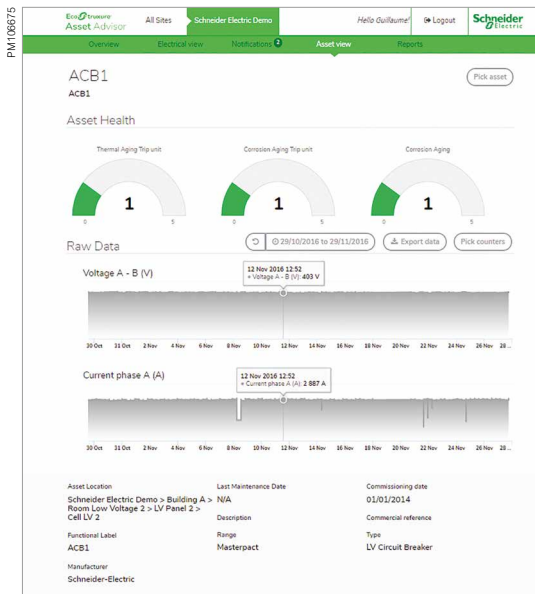
TH110

PM106279

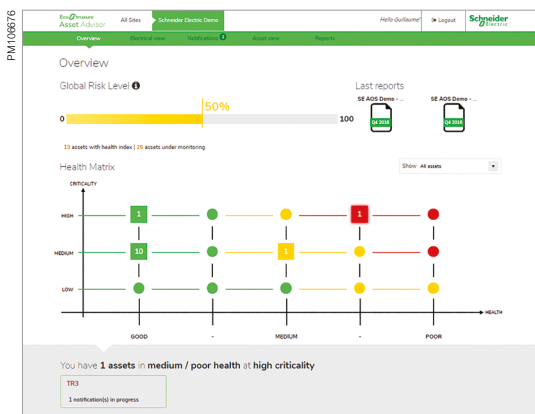
Contact Schneider Electric for more details

Connected - EcoStruxure™ ready solutions

EcoStruxure™ Asset Advisor



Asset Advisor Dashboard



Asset Health Matrix

Schneider Electric approach cybersecurity as a group...

- Data collected through secured gateways
- Secured data transport to prevent data access or manipulation
- Your data are hosted in Schneider Electric Data Center
- Results displayed on secured dashboard (reports, diagnostics, notifications...)
- You remain the owner of your data.

Click [here](#) to download the free version of **EcoStruxure Asset Advisor**

Apps, analytics & services to improve operational efficiency

Imagine having access to key data about your electrical distribution equipment whenever you need it. And experienced professionals who can help you make better informed decisions.

That's what you get with EcoStruxure Asset Advisor from the Schneider Electric connected service.

You know exactly which assets need to be serviced or replaced. So you can better plan your expenses.

Are you...

- Planning to introduce Condition Base Maintenance (beyond corrective and regular maintenance) with benefits associated with reduced time to address an issue?
- Looking for innovative solutions to scale their corporate reliability programs? Mostly started on rotary machines before.
- Striving to dive into IoT complexity with actionable deliverables (not operational alarming)? Or get them defined by the manufacturer.

Our EcoStruxure Asset Advisor solution

- Support your journey into predictive maintenance
- Designed for risk of failure mitigation and maintenance optimization
- Turning your data into short term actions and long-term decisions
- Our platform is ready-to-use by plug-in connectable electrical assets under our flexible model.
- EcoStruxure Asset Advisor brings tangible benefits on failure risk mitigation and maintenance optimization.

Operational Performance

- Lower unscheduled downtimes
- Increased asset useful life
- Reduce time to fix
- Better compliance with regulations

Financial Efficiency

- Lower Total cost of Ownership (TCO)
- Decreased failure cost
- Decreased average maintenance cost/fix

Safety

- Reduced personal risk through:
 - Maintenance expertise and continuity in high turnover environment
 - Early warning of impending equipment failures

Peace of Mind

- New asset ecosystem insights
- Consistent on-site experience
- Right people at the right time

Schneider Electric services

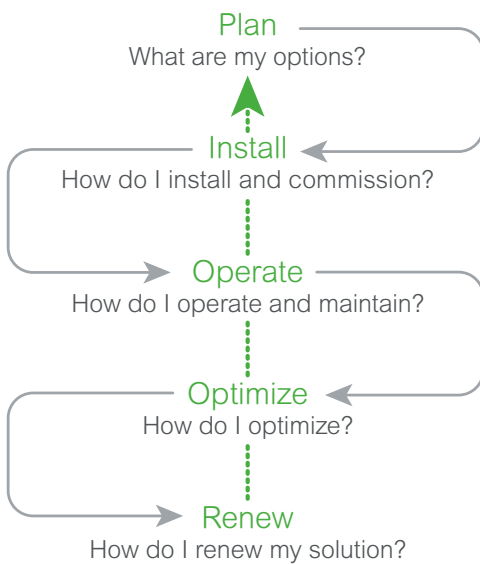
Peace of mind throughout your installation life cycle

How can you cut costs and improve performance at the same time?

When it comes to your electrical distribution infrastructure, the answer is straightforward: get professional expertise.

Life Cycle Services

DBP03843



When it comes to your electrical distribution installation, we can help you:

- Increase productivity and reliability
- Mitigate risk and limit downtime
- Keep equipment up to date and extend lifespan
- Cut costs and increase savings
- Improve your return on investment

CONTACT US!

www.schneider-electric.com/b2b/en/services/

Plan

Schneider Electric helps you plan the full design and execution of your solution, looking at how to secure your process and optimize your time:

- **Technical feasibility studies:** Design a solution in your environment
- **Preliminary design:** Accelerate turnaround time to reach a final solution design

Install

Schneider Electric will help you to install efficient, reliable and secured solutions based on your plans.

- **Project management:** Complete your projects on time and within budget
- **Commissioning:** Ensure your actual performance matches the design, through on-site testing and commissioning, and tools and procedures

Operate

Schneider Electric helps you maximize your installation uptime and control your capital expenditure through its service offer.

- **Asset operation solutions:** Provide the information you need to enhance installation performance, and optimize asset maintenance and investment
- **Advantage service plans:** Customize service plans that cover preventive, predictive and corrective maintenance
- **On-site maintenance services:** Deliver extensive knowledge and experience in electrical distribution maintenance
- **Spare parts management:** Ensure spare parts availability and optimized maintenance budget of your spare parts
- **Technical training:** Build the necessary skills and competencies to properly and efficiently operate your installations

Optimize

Schneider Electric can make recommendations for improved availability, reliability and quality.

- **MP4 electrical assessment of customer installation:** Define an improvement and risk management program

Renew

Schneider Electric extends the life of your system while providing upgrades.

We offer to take full responsibility for the end-of-life processing of old electrical equipment.

- **ECOFIT™:** Keep up to date and improve the performance of your electrical installations (LV, MV, protection relays, etc.)
- **MV product end of life:** Recycle and recover outdated equipment with end-of-life services



Quality management, a major benefit

Schneider Electric has systematically integrated a functional Quality organization into each of its departments, the main purpose of which being to ensure quality and adherence to standards.

Our Quality management procedures are the same throughout different departments and recognized by numerous customers and organizations.

The strict application of this functional organization and procedures has been recognized by an independent organization, the French Association for Quality Assurance (Association Française pour l'Assurance Qualité, or (AFNQ)).

The RM6 design and production quality systems have been certified as being in conformity with the requirements of the ISO 9001: 2008 quality assurance model.



RM6 test platform

Rigorous and systematic industrial checks

During its manufacturing, RM6 undergoes systematic routine tests, the aim of which is to check quality and conformity:

- Tightness check
- Filling pressure check
- Opening and closing speed measurement
- Operating torque measurement
- Dielectric check
- Conformity with drawings and diagrams.

For each device, the quality control department records and signs the results obtained on the test certificate.

There is a "zero" SF6 emission during the gas filling and tightness control process.



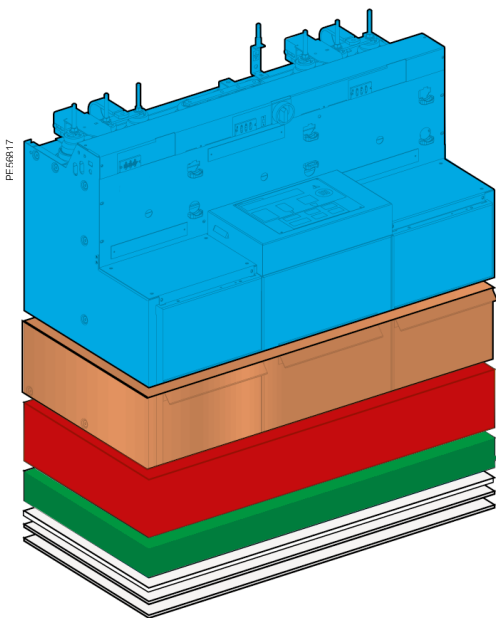
RM6 production sites follow the environmental management system of Schneider Electric and are in conformity with the ISO 14001 standard.

Schneider Electric is committed to a long term environmental approach. Schneider Electric's recycling procedure for SF6 based products is subject to rigorous management to allow each device to be traced through to end-of-life.

As part of this, the RM6 range has been designed to be environmentally friendly, notably in terms of the product's recyclability.

The materials used, both conductors and insulators, are identified and easily separable.

At the end of its life, RM6 can be processed, recycled and its materials recovered in conformity with the draft European regulations on the end-of-life of electronic and electrical products, and in particular without any gas being released into the atmosphere nor any polluting fluids being discharged.



	IDI	IQI
Ferrous metal	78.5%	72.5%
Non-ferrous metal	13.3%	11.3%
Thermohardening	4.7%	11.3%
Thermoplastics	2%	4.1%
Fluids	0.5%	0.4%
Electronic	0.7%	0%
Other	0.4%	0.4%

RM6 range

RM6 range

General characteristics	32
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RM6 is an indoor gas-insulated switchgear up to 24kV for secondary distribution networks.



Electrical characteristics

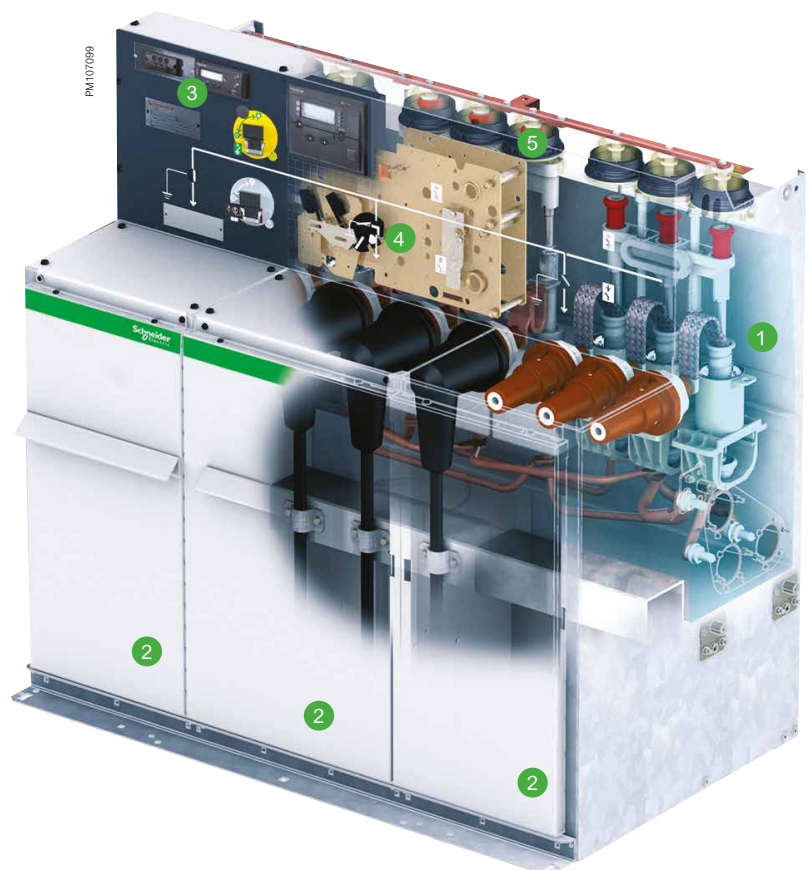
Rated voltage	Ur (kV)	12	17.5	24
Frequency	f (Hz)	50 or 60		
Insulation level				
Industrial frequency	Insulation (1) Ud (kV rms)	28	38	50
50 Hz 1 mn	Isolation (2) Ud (kV rms)	32	45	60
Impulse 1.2/50 μs	Insulation (1) Up (kV peak)	75	95	125
	Isolation (2) Up (kV peak)	85	110	145
Tank internal arc withstand		20kA 1s		
Seismic Withstand	Severity class 2, acceptance class 2 as per IEC62271-210 (2013)			
Vibration Withstand	NF EN60068.2.6.2 (2008) ⁽³⁾			

- (1) Phase-to-phase, phase-to-earth
 (2) Across the isolating distance
 (3) Please contact Schneider Electric for details

RM6 meets the definition of a "sealed pressure system" as laid out by the IEC standard.

RM6 is made up of the following elements:

1. A stainless steel tank filled with SF₆ gas (at 0.23 bar relative pressure), sealed for life and containing the busbar and all live switching components such as the switch-disconnector, the earthing switch, the fuse switch combination or the circuit breaker
2. One to four (five optional) cable compartments with interfaces to connect to the network or the transformer
3. User interface with single line diagram, actuators and LV components
4. Manual or motorized operating mechanism compartments
5. Earthing circuit with visible earthing contacts



Complete board configuration table

Cubicle	Width (mm)	Depth (mm)	Height (mm)	Weight (kg)
NE-I	472	670	1142	135
NE-B	572	670	1142	135
NE-D	572	670	1142	135
DE-I	532	670	1142	135
DE-B	632	670	1142	135
DE-D	632	670	1142	135
DE-Q	632	670	1142	185
DE-Ic	632	670	1142	145
DE-Bc	632	670	1142	145
DE-Mt	1106	840	1142	420
DE-O	532	670	1142	135
LE-O	502	670	1142	135
RE-O	502	670	1142	135
NE-II	829	670	1142	155
NE-BI	829	670	1142	180
NE-DI	829	670	1142	180
NE-QI	829	670	1142	180
RE-II	859	670	1142	155
NE-III	1186	670	1142	240
NE-IBI	1186	670	1142	250
NE-IDI	1186	670	1142	240
NE-IQI	1186	670	1142	275
RE-III	1216	670	1142	240
RE-IBI	1216	670	1142	250
RE-IDI	1216	670	1142	240
RE-IQI	1216	670	1142	275
DE-III	1246	670	1142	240
DE-IBI	1246	670	1142	250
DE-IDI	1246	670	1142	240
DE-IQI	1246	670	1142	275
NE-III	1619	670	1142	320
NE-IIBI	1619	670	1142	330
NE-BIBI	1619	670	1142	340
NE-IIDI	1619	670	1142	330
NE-DIDI	1619	670	1142	340
NE-IIQI	1619	670	1142	355
NE-QIQI	1619	670	1142	390
RE-III	1649	670	1142	320
RE-IIBI	1649	670	1142	330
RE-IIDI	1649	670	1142	330
RE-BIBI	1649	670	1142	340
RE-DIDI	1649	670	1142	340
RE-IIQI	1649	670	1142	355
RE-QIQI	1649	670	1142	390
DE-III	1679	670	1142	320
DE-IIBI	1679	670	1142	330
DE-IIDI	1679	670	1142	330
DE-IIQI	1679	670	1142	355
NE-I_I_I(1)	2000	670	1142	450 to 530(2)
RE-/LE-I_I_I(1)	2030	670	1142	455 to 535(2)
DE-I_I_I(1)	2060	670	1142	460 to 540(2)

(1) 5 function tanks

(2) Weight depends on the choice of function

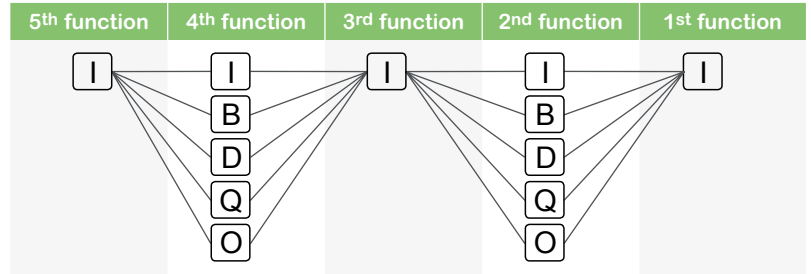
RM6 Flexibility

To further meet your installation requirements, RM6 also provides you with a higher configuration flexibility thanks to its 5 Functions range and its Free Combination range:

- Free choice of functions and options
- Compatible with standard RM6 offer in all extensibility types
- More economical than multiple single extension functions in line

5 Functions range

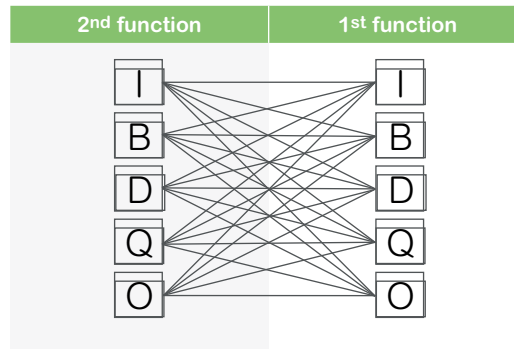
Possible combinations for RM6 five function tanks:



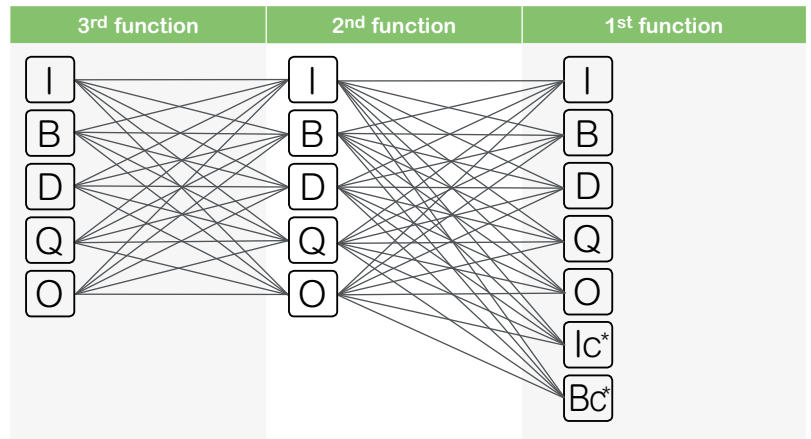
Free Combination range

700 possible combinations for RM6 2 or 3 function tanks.

Possible combinations of RM6 2 functions



Possible combinations of RM6 3 functions

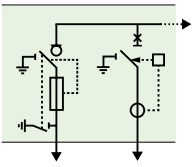


* Possible only when RM6 is RE or DE.

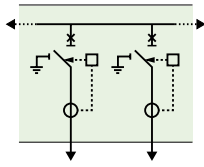
Examples

RM6 2 function combinations

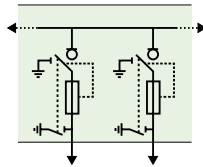
RE-QD



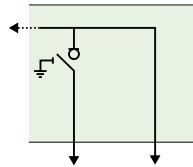
DE-DD



DE-QQ

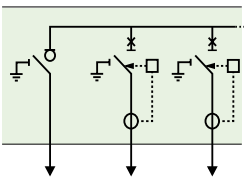


LE-IO

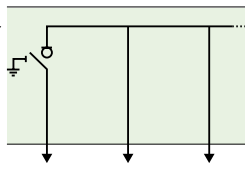


RM6 3 function combinations

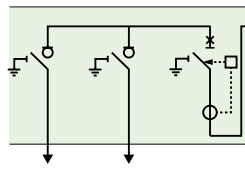
RE-IDD



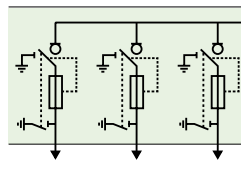
RE-IOO



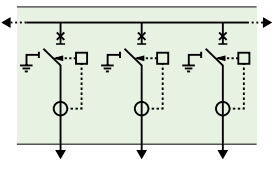
RE-IIBc



RE-QQQ



DE-BBD



Operating conditions and standards



RM6 performances meet the definition of a “sealed pressure system” as laid down in the IEC recommendations.

The RM6 tank is filled with SF6 at 0.23bar relative pressure and sealed for life after filling. Its tightness, which is systematically checked at the factory, gives the switchgear a high life expectancy.

RM6 is designed in accordance with the following IEC standards used for general operation conditions for indoor switchgear:

IEC 62271-1 (common specifications for high voltage switchgear and controlgear)

Ambient temperature: class -25°C indoor

- Lower than or equal to 40°C without derating
- Lower than or equal to 35°C over 24 hours average without derating
- Greater than or equal to -25°: please contact us for details

Altitude:

- Lower than or equal to 1000 m
- Above 1 000 m, and up to 2 000 m with direct field connectors
- Greater than 2 000 m: please contact us for further details

DE-Mt needs voltage derating after 1 000 m.

Please consider altitude and temperature when selecting Q function fuses.

Current derating according to ambient temperature

	(°C)	40	45	50	55	60
Busbars 630 A	Ir (A)	630	575	515	460	425
Busbars 400 A	Ir (A)	400	400	400	355	
Functions: I, O, B (with bushing type C)	(A)	630	575	515	460	425
Function D (with bushing type B or C)	(A)	200	200	200	200	200
Function Q	(A)	(3)	(4)	(4)	(4)	(4)

(3) Depends on fuse selection

(4) Please contact us

Operating conditions and standards



IEC 62271-200

(AC metal enclosed switchgear and controlgear for rated voltage above 1 kV and up to and including 52 kV)

- Switchgear classification: PM class (metallic partitioning)
- Loss of service continuity: LSC2 class
- Internal arc classification up to A-FLR 20kA 1 sec. (Please refer to section referring to internal arc performance for precise values)

Switch-disconnectors

IEC 62271-103 (high voltage switches for rated voltage above 1 kV and less than 52 kV)

- Class M1/E3
- 100 CO cycles at rated current and 0.7 p.f.
- 1000 mechanical opening operations.

Circuit breakers: 200 A feeder or 630 A line protection

IEC 62271-100 (high voltage alternating current circuit breakers)

- Class M1/E2
 - 2000 mechanical opening operations,
 - O-3 min.-CO-3 min.-CO cycle at rated short circuit current

Other applicable standards

IEC 62271-100 (high voltage alternating current circuit breakers)

- Switch-fuse combinations: IEC 62271-105: alternating current switch-fuse combination.
- Earthing switch: IEC 62271-102: alternating current disconnectors and earthing switches.
- Electrical relays: IEC 60255.

RM6 Protection Index

- Tank with HV parts: IP67
- Front face + mechanism: IP3X
- Protection against mechanical impact: IK07

Functions and characteristics

Functions and characteristics

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I, Ic functions	41
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Functional overview

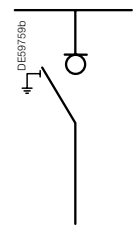
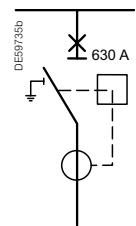
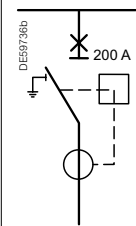
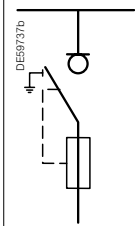
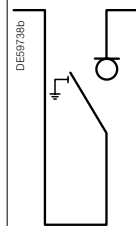
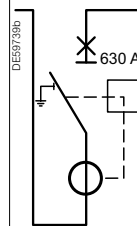

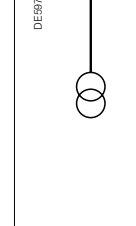
Choice of functional units

A wide choice of RM6 functions

RM6 benefits from a wide choice of MV functions enabling:

- The connection, power supply and protection of transformers on a radial or open-ring network via 200 A circuit breakers with an independent protection chain, or via combined fuse-switches
- The protection of lines by a 630 A circuit breaker
- MV Metering of private MV/LV substations.

The RM6 functions are described in the table below.

Function	Network switch	Line feeder	Transformer feeder		Network coupling		Cable connection	MV metering
Functional unit	I	B	D	Q	IC	BC	O	Mt
Device	630 A switch	630 A circuit breaker	200 A circuit breaker	Combined fuse-switch	Switch	630 A circuit breaker		
Single line diagrams								

PM107081



Scalability of RM6

To support the evolution of your distribution network, RM6 can be extended with a range of functions making it a truly scalable system.

The addition of one or more functional units can be carried out by simply adding modules that are connected to each other at busbar level by directed field bushings.

There are different types of extensible RM6:

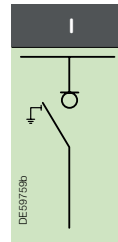
- Extensible to the right (-RE type)
- Extensible to the left (-LE type)
- Extensible on both sides (-DE type)
- Non-extensible (-NE type)

Functional overview

I, Ic functions

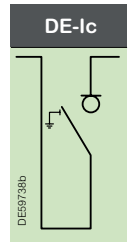
I function

- Network points with switch-disconnector



DE-Ic function

- Bus coupler by switch-disconnector



Rated voltage	Ur	kV	12	17,5	24				
Rated frequency	Fr	Hz	50 or 60	50 or 60	50 or 60				
Insulation level									
Industrial frequency 50Hz/1min	Phase-to-phase, phase-to-earth	Ud	kV rms	28	38	50			
	Across isolating distance	Ud	kV rms	32	45	60			
Lightning impulse withstand	Phase-to-phase, phase-to-earth	Up	kV peak	75	95	125			
	Across isolating distance	Up	kV peak	85	110	145			
Rated current	Ir	A	630	630	400	400	630	630	
Rated current busbars	Ir	A	630	630	400	400	630	630	
Rated peak current	Ip	kA	62.5	52.5	31.25	40	40	50	
Short-time withstand current	It	kA rms	25	21	12.5	16	16	20	
	tk	s	1	1 or 3	1	1	1	1 or 3	
Breaking capacity	Active load	Iload	A	630	630	400	400	630	630
	Earth fault	Ief1	A	320	320	320	320	320	320
	Cable charging	Icc	A	110	110	110	110	110	110
Making capacity of switch and earthing switches	Ima	kA peak	62.5	52.5	31.25	40	40	50	
Bushing (1)		Type	C	C	B or C	B or C	C	C	
Mechanical endurance	Switch-disconnector	M1	Number of openings	1000	1000	1000			
	Earthing switch	M0	Number of openings	1000	1000	1000			
Electrical endurance	Switch-disconnector	E3	Number of CO at rated current	100	100	100			
			Number of short-circuit making operations	5	5	5	5	5	2
	Earthing switch	E2	Number of CO at rated current	100	100	100			
			Number of short-circuit making operations	5	5	5	5	5	2

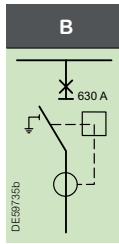
(1) No bushing for IC function

Functional overview

B, D, BC functions

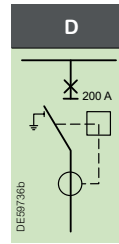
B function

- Network points with 630 A disconnecting circuit breaker (line protection feeder)



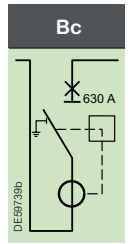
D function

- Transformer feeder 200 A with disconnecting circuit breaker



DE-Bc function

- Bus coupler by 630 A circuit breaker



Rated voltage	Ur	kV	12	17,5	24						
Rated frequency	Fr	Hz	50 or 60	50 or 60	50 or 60						
Insulation level											
Industrial frequency 50Hz/1min	Phase-to-phase, phase-to-earth	Ud	kV rms	28	38	50					
	Across isolating distance Ud		kV rms	32	45	60					
Lightning impulse withstand	Phase-to-phase, phase-to-earth	Up	kV peak	75	95	125					
	Across isolating distance Up		kV peak	85	110	145					
Rated current	Ir	A	200	630	200	630	200	630	200	200	200
Rated current busbars	Ir	A	630	630	630	630	630	400	400	630	
Short-time withstand current	It	kA rms	25	21(1)	16	20	12.5	16	12.5		
	tk	s	1	1 or 3	1	1 or 3	1	1	1		
No-load transformer breaking capacity	I3	A	-	16	-	16	-	16	16	16	
Short-circuit breaking capacity	Isc	kA	25	21	16	20	12.5	16	12.5		
Making capacity	I _{ma}	kA peak	62.5	52.5	40	50	31.25	40	31.25		
Operating sequence	O – 3min- CO – 3min - O										
Bushing(2)	Type	C	C	C	C	A	BorC	A			
Mechanical endurance	Circuit breaker	M1	Number of openings	2000	2000	2000					
	Earthing switch	M0	Number of openings	1000	1000	1000					
Electrical endurance	Circuit breaker	E2	Number of short-circuit breaking operations	3	3	3					
			Number of short-circuit making operations	2	2	2					
	Earthing switch	E2	Number of CO at rated current	100	100	100					
			Number of short-circuit making operations	5	5	5	2	5	5	5	

(1) 17.5 kA for DE-Bc

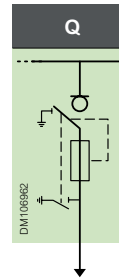
(2) No bushing for DE-Bc function

Functional overview

Q function

Q function

- Transformer feeder with fuse-switch protection



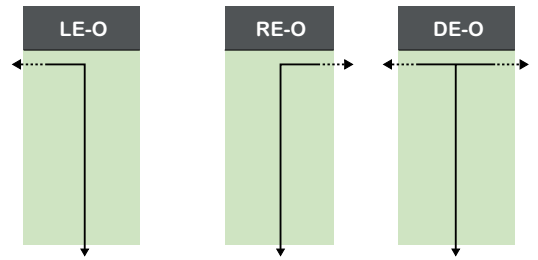
Rated voltage	Ur	kV	12	17,5	24					
Rated frequency	Fr	Hz	50 or 60	50 or 60	50 or 60					
Insulation level										
Industrial frequency 50Hz/1min	Phase-to-phase, phase-to-earth	Ud	kV rms	28	38	50				
		Across isolating distance	Ud	kV rms	32	45	60			
Lightning impulse withstand	Phase-to-phase, phase-to-earth	Up	kV peak	75	95	125				
		Across isolating distance	Up	kV peak	85	110	145			
Rated current	Ir	A	200	200	200	200	200	200	200	200
Rated current busbars	Ir	A	630	630	630	400	400	630	630	630
Short-time withstand current	It	kA rms	21	25	21	12.5	16	16	20	20
			tk	s	1	1	1 or 3	1	1	1
No-load transformer breaking capacity	I3	A	16	16	16	16	16	16	16	16
Short-circuit breaking capacity	Isc	kA	21	25	21	12.5	16	16	20	20
Making capacity	I _{ma}	kA peak	52.5	62.5	52.5	31.25	40	40	50	50
Bushing	Type		A	A	A	A	A	A	A	A
Mechanical endurance	Switch-disconnector	M1	Number of openings	1000	1000	1000				
	Earthing switch	M0	Number of openings	1000	1000	1000				
Electrical endurance	Switch-disconnector	E2	Number of CO at rated current	100	100	100				
			Number of short-circuit making operations	5	5	5			2	
	Earthing switch	E2	Number of CO at rated current	100	100	100				
			Number of short-circuit making operations	5	5	5			2	

Functional overview

O function

O function

- Cable connection



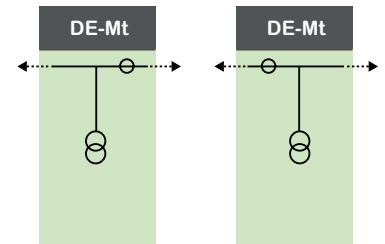
Rated voltage	Ur	kV	12	12	17.5	17.5	24	24	24
Rated current busbars	Ir	A	630	630	630	630	630	630	630
Rated current	Ir	A	200	630	200	630	200	630	630
Short-time withstand current	Ik	kA rms	25	25	21	21	16	16	20
	tk	Duration (s)	1	1	3	3	1	1	1 or 3
Bushing			C	C	C	C	C	C	C

Functional overview

DE-Mt function

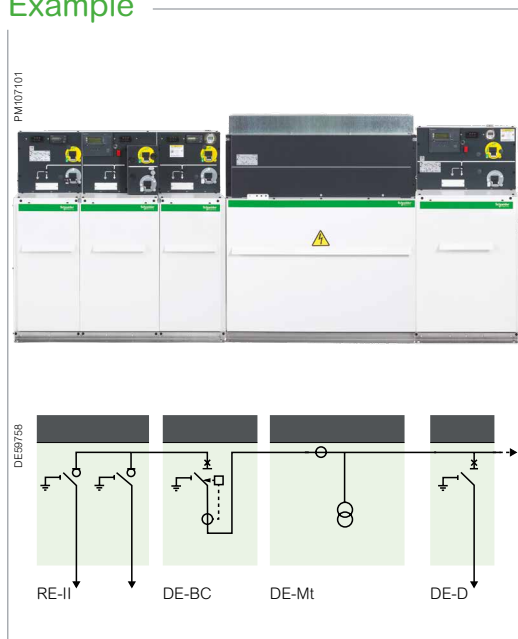
DE-Mt function

- Air-insulating metering panel for MV power billing
- Internal Arc withstand
- Connected by busbar to RM6 functions



Rated voltage	Ur	kV	12	17.5	24
Rated current busbars	Ir	A	630	630	630
Rated current	Ir	A	630	630	630
Short-time withstand current	Ik	kA rms	25	21	16 or 20
	tk	Duration (s)	1	1 or 3	1 or 3
Cubicle internal arc withstand			16kA 1s	16kA 1s	16kA 1s

Example



Voltage transformers

Schneider Electric models or DIN 42600 type section 9.
2 phase-phase VT, 2 phase-earth VT, 3 phase-earth VT.
Optional fuse protection.

Current transformers

Schneider Electric models or DIN 42600 type section 8.
2 CT or 3 CT. CTs can be right or left-fitted.

A clear separation between MV and LV

Everything is done to avoid operating on the MV compartment.

The secondary CT and VT's are cabled to the customer terminal in an LV compartment to enable:

- Connection to a remote power meter (in another room)
- Or connection to the LV cabinet mounted on the LV compartment (option).

Option: an LV cabinet

- Placed on top of the LV compartment
- Allows installation of active or reactive power meters, of all auxiliaries to monitor current, voltage and consumed power
- Cabinet door key locks available (Type R7)

Components

Components

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Automatic transfer system	72

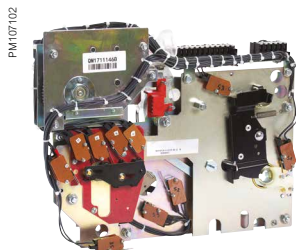
Function type		I	B	D	Q	O	Ic	Bc	DE-Mt
Motorization for remote operation	Motorization including auxiliary contacts (LSBw 2 NO-2 NC and ESw 1 O/C)	•					•		(2)
	Motorization including shunt trip coil and auxiliary contacts circuit breaker (CB 2 NO – 2 NC and ESw 1 O/C)		•	•				•	(2)
	Motorization including auxiliary contact fuse-switch combinations (LBSw 2 NO – 2 NC)				•				(1)
Auxiliary contacts alone (this option is included in remote operation option)	For main switch position indication, LSBw 2 NO – 2 NC and ESw 1 O/C	•					•		(1)
	For circuit breaker position indication, CB 2 NO – 2 NC and ESw 1 O/C		•	•				•	(1)
	For fuse-switch combinations position indication, LBSw 2 NO – 2 NC				•				(1)
Front door of cable connection compartment	Bolted - Removable with ESw interlocking - Removable with ESw interlocking and LSBw interlocking	•	•	•			•	•	(1)
Self-powered fault passage and load current indicators	Flair 21D - Flair 22D - Flair 23D - Flair 23DM - Amp 21D	•							(1)
Key locking devices	Type R1 - Type R2	•	•				•		(1)
	Type R6 - Type R7 - Type R8			•	•			•	(1)
Shunt trip coil for external tripping	24 VDC - 48/60 VDC - 120 VAC - 110/125 VDC – 220 VAC - 220 VDC/380 VAC		•	•	•			•	(1)
Undervoltage coil	24 VDC - 48 VDC - 125 VDC - 110-230 VAC		•	•	•			•	(1)
Protection relay for CB transformer protection	VIP 40			•					(1)
	VIP 45			•					(1)
	VIP 400		•	•				•	(1)
	VIP 410		•	•				•	(1)
Voltage detection	VPIS	•	•	•	•	•	•	•	(1)
	VDS	•	•	•	•	•	•	•	(1)
Forbidden closing under fault 1NC			•	•				•	(1)
Auxiliary contact D or B tripping			•	•				•	(1)
Auxiliary contact for fuse blown					•				(1)
With or without earthing switch							•	•	(1)
Arc Killer: RM6 arc short-circuiting device ⁽²⁾		•							(1)
Screened Voltage Transformers (phase-to-phase or phase-to-earth)		•							(1)

(1) See specific page for DE-Mt

(2) Available for no extensible cubicle

Motorization

Switch, circuit breaker and fuse-switch combination



Motor mechanism

Switch operating mechanism

- The switch operating mechanism includes a space that is reserved for the installation of a geared motor. This can be installed at the factory, but it can also be installed on site, by the customer, without de-energizing the unit, and without dismantling the operating mechanism.
- An electrical interlocking assembly prohibits any false operations.

Once motorized, the RM6 integrates perfectly into a telecontrol system

Circuit breaker and fuse-switch combination operating mechanism

- The circuit breaker or fuse protection functions can be motorized. The motorization can be installed at the factory, but it can also be installed on site, by the customer, without de-energizing the unit, and without dismantling the operating mechanism.
- Electrical locking prohibits any false operations. This functionality is an option for circuit breakers and is default for fuse-switch function. Once motorized, the RM6 integrates perfectly into a telecontrol system. This option becomes particularly useful for protecting a secondary ring, with supervision from a telecontrol system.

Unit applications

Operating mechanism types	CIT		C1		C1	
	Switch		Circuit breaker		Fuse switch combination	
Main circuit switch	Closing	Opening	Closing	Opening	Closing	Opening
Manual operating mode	Hand lever	Hand lever	Hand lever	Push button	Hand lever	Push button
Remote control option	Motor	Motor	Motor	Coil	Motor	Coil
Operating time	1 to 2 s	1 to 2 s	max. 13 s	45 to 75 ms	11 to 13 s	60 to 85 ms
Earthing switch	Closing	Opening	Closing	Opening	Closing	Opening
Manual operating mode	Hand lever	Hand lever	Hand lever	Hand lever	Hand lever	Hand lever

Motor option for switch-units and circuit breakers

The operating mechanism I, D, B and Q functions may be motorized

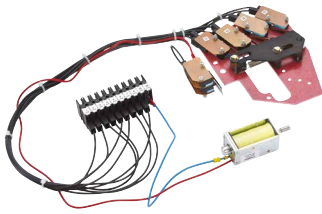
		DCw					AC (50 Hz) *		
Un power supply	(V)**	24	48	60	110	125	220	120	230
Power	(W)	240							
	(VA)						280		

(*) Please contact us for other frequencies.

(**) A minimum 20 A power supply is required when starting the motor.

Tripping and position indication

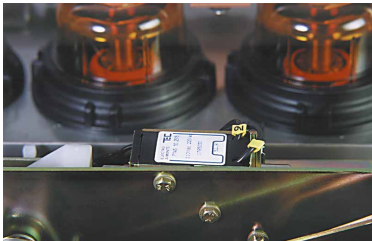
PM107104



Auxiliary contacts

- Each switch or circuit breaker can be fitted with 4 auxiliary contacts with the following positions: 2 NO and 2 NC
- The earthing switch (except fuse-switch combination) can be fitted with 1 auxiliary contact with the following position: (opening/closing)
- Each circuit breaker can receive 1 auxiliary contact for tripping indication (protection by VIP)
- Each fuse-switch combination can be fitted with 1 blown fuse indication auxiliary contact

PM107105



Opening release

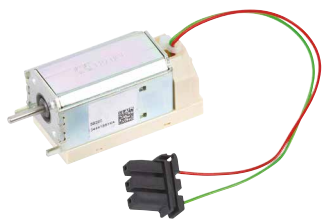
Each circuit breaker or fuse-switch combination can be fitted a switch-on opening release (shunt trip).

Opening release option for each circuit breaker or fuse-switch combination

	DC						AC (50 Hz)*	
Un power supply (V)	24	48	60	110	125	220	120	230
Power (W)	200	250	250	300	300	300		
							400	750
Response time (ms)	35						35	

(*) Please contact us for other frequencies

PM107106



Undervoltage coil

Available for the circuit breaker function and the combined fuse-switch, this trip unit causes opening when its supply voltage drops below a value below 35% of its rated voltage.

The time delay can be equipped with an undervoltage coil with a 0.5 to 3 s setting.

	DC						AC (50 Hz)*		
Un power supply (V)	24	48	60	110	125	220	120	230	
Power									
	Excitation (W or VA)	200 (during 200 ms)						200	
	Latched (W or VA)	4.5						4.5	
Threshold									
	Opening	0.35 to 0.7 Un						0.35 to 0.7	
	Closing	0.85 Un						0.85	

(*) Please contact us for other frequencies

Operating handles

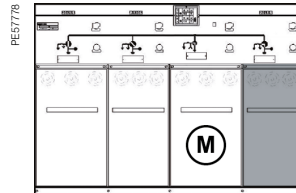
There are 3 types of operating handle for each RM6 cubicle combination:

- Standard
- Long
- Super long



The long operating handle is required:

- For RM6 2, 3, 4 or 5 functions, when the circuit breaker is motorized and is on the left side of a switch function



(M): The circuit breaker function is motorized

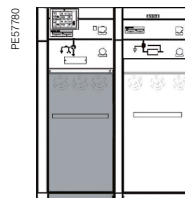
- For extensible RM6 1 function, when the circuit breaker is motorized and is on the left side of a fuse-switch function



(M): The circuit breaker function is motorized

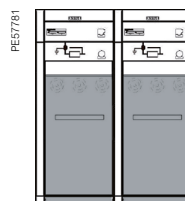
The super long operating handle is required:

- For extensible RM6 1 function, when the circuit breaker is manual and is on the left side of a fuse-switch function



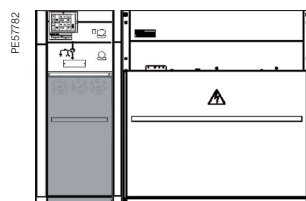
Functional unit marked in orange needs long or super long handle to be operated.

- For extensible RM6 1 function, when two fuse-switch functions are connected



Functional unit marked in orange needs long or super long handle to be operated.

- For DE-Q, DE-D, DE-B, DE-Bc, when the metering cubicle DE-Mt is on its right side



Functional unit marked in orange needs long or super long handle to be operated.

For all other possible cubicle combinations, the standard operating handle is enough to operate the RM6 switchgears.

Key locking

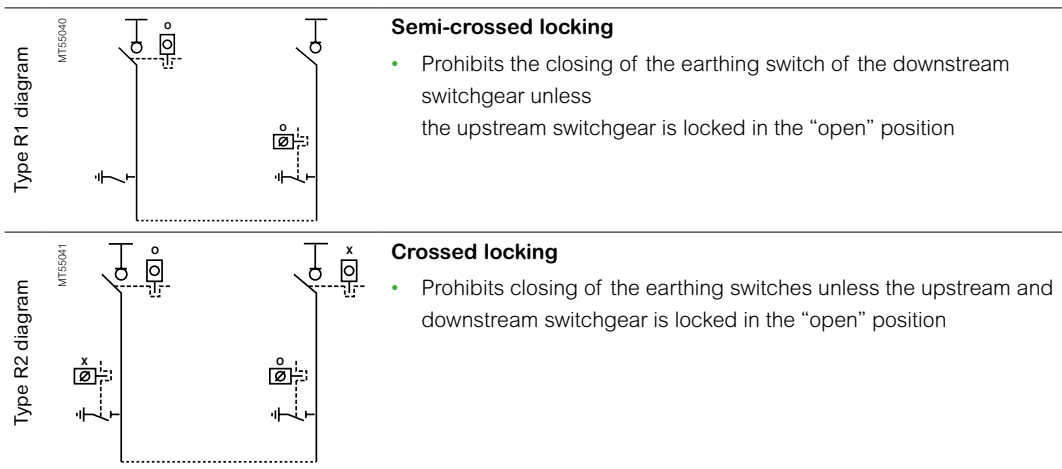
RM107108



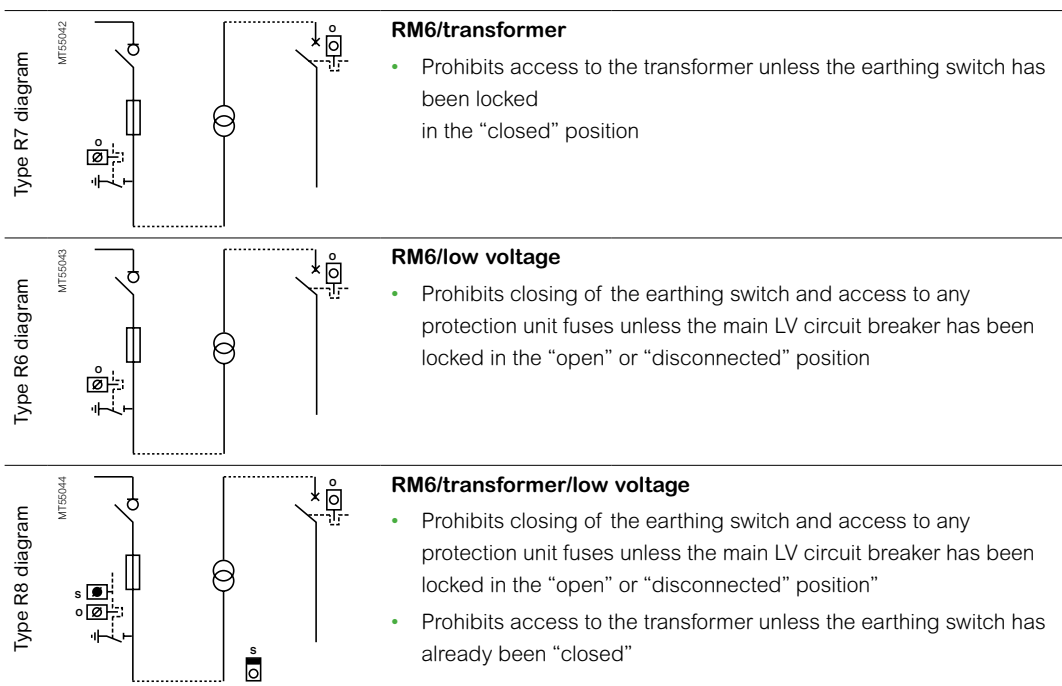
As an additional safety feature, RM6 can be fitted with keys to lock operations. For instance the RM6 remote control can be disabled when the switchgear is locked in the "open" position.

Keys and locks are engraved with specific markings (O, S and X) to help understand the diagrams.

On network switches or 630 A circuit breaker feeder



On transformer feeders



: no key

 : free key

 : captive key



Options for cable compartment

Standard equipment:

- A closing panel
- Cable binding
- Earthing cable connection

Optional equipment:

- Internal arc rated cable compartment (20 kA AFLR)
- ESw interlocking to prohibit access to the connection compartment when the earthing switch is open
- LBSw or CB interlocking to prohibit closing the switch or circuit breaker when the connection compartment panel is open
- Deeper cable compartments to accommodate a lightning arrester *
- Cable compartment doors with window *

** Deeper cable compartments & cable compartments with windows are not rated for Internal arc*

Protection relays

VIP 40, 45, 400, 410 selection guide



VIP series

Integrated self-powered protection optimized for RM6.

Transformer protection:

- VIP 40
- VIP 45

General protection:

- VIP 400
- VIP 410

		VIP				
		ANSI code	40	45	400	410
Protection functions						
Phase overcurrent		50-51	●	●	●	●
Earth fault phase	Standard (sum of current method)	51N		●	●	●
	High sensitivity (earth fault CTs)					●
Thermal overload		49			●	●
Cold load pick-up						●
Control and monitoring functions						
CB tripping			Mitop	Mitop	Mitop	Mitop
Trip circuit supervision		74TC	●	●	●	●
Time-tagged events	Local on display (5 last trips)				●	●
External tripping input						●
Cumulative breaking current, number of trip orders						●
Overcurrent and breaking profile	Number of phase and earth trips (2)				●	●
Serial communication port	Modbus RS485					●
Logic relay inputs (except TCS) used for:						1
	External tripping					1
Logic relay outputs used for:						3
	Watchdog					By modbus
	Customized output via setting					3
Measurement functions						
Phase current			●	●	●	●
Earth current				●	●	●
Phase peak demand current			●	●	●	●
Phase peak demand current						●
Power supply						
Type of supply	Self-powered or auxiliary		Self	Self	Self	DUAL Power (1)
	Minimum 3 phase load currents to activate the VIP		4 A	4 A	7 A (3)	

(1) The protection is self-powered. Auxiliary power is used only for communication and very sensitive earth fault protection.

(2) The number of trips is displayed in 4 levels:
 For D01 and D02: < 200 A, < 2 kA, < 8 kA, > 8 kA
 For D06 and D06H: < 630 A, < 10 kA, < 20 kA, > 20 kA.

(3) 14 A with 630 A CBs

● Function available

Protection relays

VIP 40, VIP 45

Schneider Electric recommends circuit breakers for transformer protection instead of fuses. They offer the following advantages:

- Easy to set
- Better discrimination with other MV and LV protection devices
- Improved protection performance for inrush currents, overloads, low magnitude phase faults and earth faults
- Greater harsh climate withstand
- Reduced maintenance and spare parts
- Availability of additional functions such as measurement, diagnostics and remote monitoring
- And with the recent development of low cost circuit breakers and self-powered relays, life time costs are now equivalent to those of traditional MV switch fuse solutions

Applications

- Entry level MV/LV transformer protection
- Dependent-time phase overcurrent tripping curve dedicated to MV/LV transformer protection
- Definite-time earth fault protection
- Phase current and peak demand current measurement

Main features

Self-powered operation

- Energized by the CTs: no auxiliary power needed

Complete pre-tested protection system

- Functional block ready to be integrated

Phase overcurrent protection

- Tripping curve optimized for MV/LV transformer protection
- Protection against overloads and secondary and primary short-circuits
- Second harmonic restraint filtering
- Only one setting ($I >$)
- Discrimination with LV circuit breakers or LV fuses
- Compliant with TFL (Time Fuse Link) operating criteria

Earth fault protection

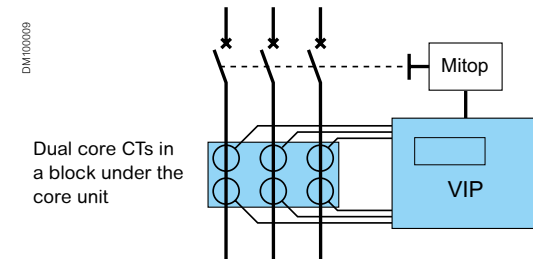
- Definite-time tripping curve
- Settings: $I_0 >$ (phase current sum method) and $I_0 >$
- Second harmonic restraint element

Measurement

- Load current on each phase
- Peak demand current

Front panel and settings

- Current measurements displayed on a 3-digit LCD
- Settings with 3 dials ($I >$, $I_0 >$, $I_0 >$) protected by a lead-sealable cover
- Trip indication powered by dedicated integrated battery with pushbutton or automatic reset



Dual core CTs: for power and for measurement

Protection relays

VIP 40, VIP 45

Other features

- Complete pre-tested solution that eliminates complicated CT selection
- Complies with MV protection relay standard IEC 60255
- No PC or specific tool required for setting or commissioning
- Maximum setting possibilities consistent with circuit breaker features
- Self-powered by dual core CTs: CUa
- Environment: -40°C/+70°C

Rated protection current setting selection by VIP 40 and VIP 45

Operating voltage (kV)	Transformer rating (kVA)																				
	50	75	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300
3	10	15	20	25	36	45	55	68	80	115	140	170	200								
3.3	10	15	18	22	28	36	45	56	70	90	115	140	200								
4.2	8	12	15	18	22	28	36	45	55	70	90	115	140	200							
5.5	6	8	12	15	18	22	28	36	45	55	68	90	115	140	170						
6	5	8	10	12	18	20	25	36	45	55	68	80	115	140	170	200					
6.6	5	8	10	12	15	18	22	28	36	45	56	70	90	115	140	200					
10	5*	5	8	8	10	12	15	20	25	30	37	55	68	80	115	140	170	200			
11	5*	5*	6	8	10	12	15	18	22	28	36	45	55	68	90	115	140	170			
13.8	5*	5*	5	6	8	10	12	15	18	22	28	36	45	55	68	90	115	140	170		
15	5*	5*	5	6	8	8	10	15	18	20	25	36	45	55	68	80	115	140	170	200	
20	5*	5*	5*	5*	6	6	8	10	12	15	20	25	30	37	55	68	80	115	140	170	200
22	5*	5*	5*	5*	5	6	8	10	12	15	18	22	28	36	45	55	68	90	115	140	170

* Short-circuit protection, no over-load protection

Please contact us for protection required for low earth faults

Protection relays

VIP 400, VIP410

VIP 400 is a self-powered relay energized by the CTs; it does not require an auxiliary power supply to operate.

VIP 410 is a dual powered relay offering self-powered functions and additional functions powered by an AC or DC auxiliary supply.

Applications

- MV distribution substation incomer or feeder protection relay
- MV/LV transformer protection.

Main features

VIP 400: Self-powered protection relay

This version is energized by the current transformers (CTs). It does not require an auxiliary power supply to operate.

- Overcurrent and earth fault protection
- Thermal overload protection
- Current measurement functions

Other features

- Designed for RM6 circuit breakers
- Complete pre-tested solution that eliminates complicated CT selection
- Complies with MV protection relay standard IEC 60255
- No PC or specific tool required for setting or commissioning
- Self-powered by dual core CTs
- Environment: -40°C/+70°C

VIP 410: Dual powered protection relay

- Offers the same self-powered functions as the VIP 400
- In addition, the VIP 410 has an AC or DC auxiliary supply to power certain additional functions that cannot be self-powered:
 - sensitive earth fault protection
 - external tripping input
 - cold load pick-up
 - communication (Modbus RS485 port)
 - signaling
- If the auxiliary power falls during an MV short-circuit, the protection functions are maintained.

Ready for smart grids

Dual supply for communication with:

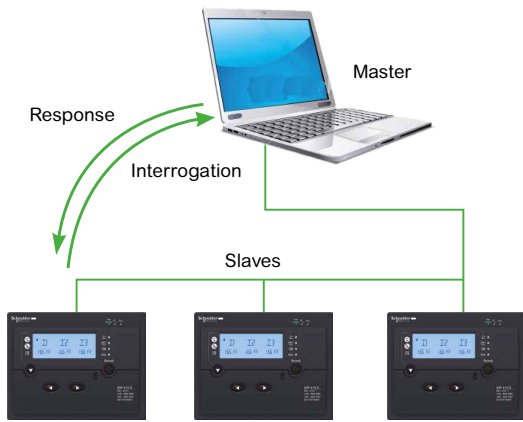
- DMS and RTUs
- Remote alarms
- Time stamped events
- Measurements of current, load history, overcurrent and breaking profile



Protection relays

VIP 400, VIP410

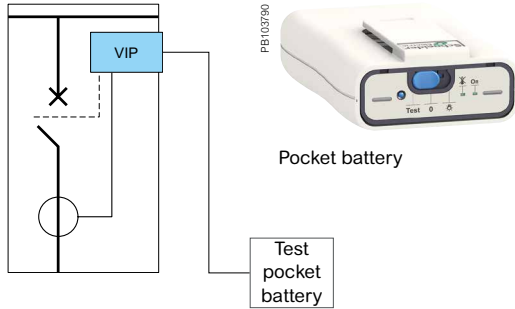
DM106855



Dedicated to intelligent MV loops with automation

- Remote configuration
- Setting selectable groups according to the configuration of the MV loop
- Remote asset management
- Plug and play system with Easergy RTUs (R200) to integrate all protocols IEC 60870-104, DNP3, IEC 61850) and remote web pages.

DM100040EN



Pocket battery for VIP4x range

This unit is used to power the VIP 40, VIP 45, VIP 400 and VIP 410 units, making it possible to operate and test the protection system. It can also be used to power Schneider Electric LV circuit breakers.

Protection relays

Transformer protection by circuit breaker VIP integrated system

The VIP series is an integrated protection system:

- Dedicated sensors located under the core unit provide protection and measurement outputs
- Optional additional earth fault sensors are available
- Actuators are low power tripping coils (Mitop)

High sensitivity sensors

VIP integrated protection system

The VIP integrated protection system is composed of sensors, a processing unit and an actuator, designed together to provide the highest level of reliability and sensitivity from 0.2 A to 20 In for VIP 400, VIP 410 and 5 A to 20 In for VIP 40 and VIP 45.

DM100035



VIP4x Current Transformer

Sensors

The sensors are made up of one block of three CTs with rated and insulation voltages of 0.72 kV/3 kV - 1 min, providing both measurement and power outputs.

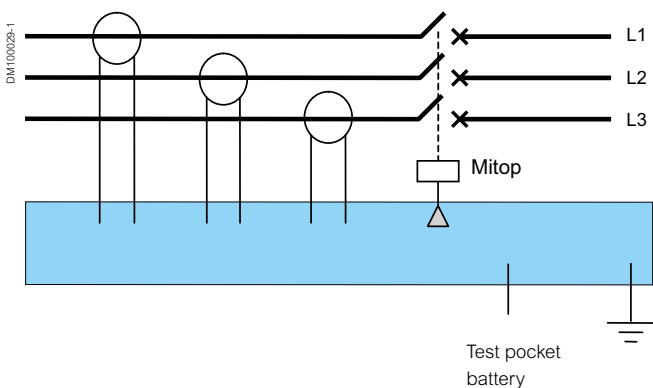
- The measurement sensor is based on Low Power Current Transformer (LPCT) technology as defined by standard IEC 60044-8, ensuring excellent accuracy:
 - 5P30 for protection
 - class 1 for measurement.
- The power supply winding ensures calibrated self-powering of the relay even for currents of just a few Amperes
 - e.g. 7 A is sufficient for operation of the VIP 400 with a 200 A circuit breaker, up to its saturation level
 - e.g. 4 A is for operation of the VIP 40 up to its saturation level.
- Optionally, the VIP 410 can be associated with an earth fault current transformer (a single zero-sequence CT) dedicated to sensitive earth fault protection with a low threshold down to 0.2A.

Actuators

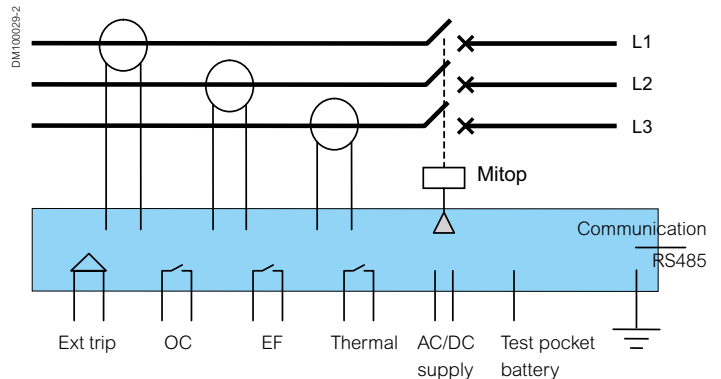
- The actuator is a dedicated low power tripping coil (Mitop) specifically designed to operate with the sensors and the processing unit with minimum energy.
- The integrity of the Mitop circuit is continuously supervised (Trip Circuit Supervision function).

Connection diagrams

VIP 40, VIP 45, VIP 400

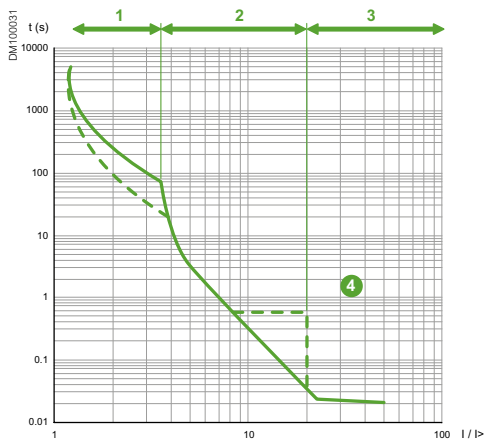


VIP 410



Protection relays

VIP40, VIP45, VIP400 and VIP410 tripping curves

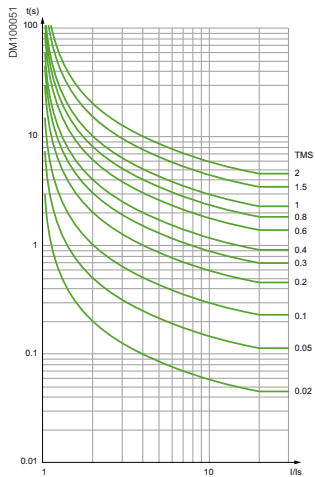


VIP40, VIP45

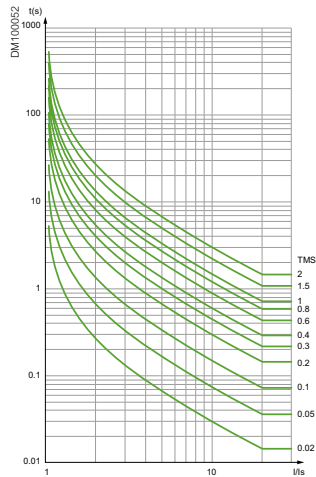
Phase overcurrent protection (ANSI 50-51).

1. Overload
2. Secondary short-circuit
3. Primary short-circuit
4. Activation of discrimination with a Low Voltage circuit breaker

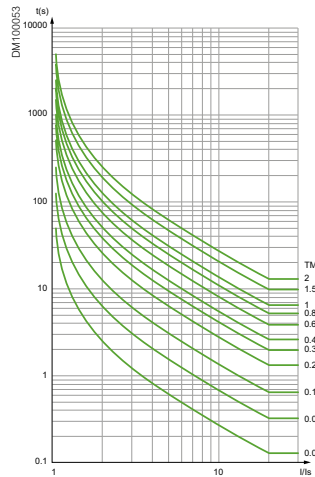
VIP400, VIP410



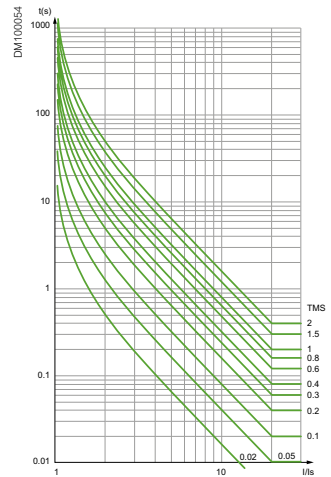
IEC Standard Inverse Time Curve (IEC/SIT or IEC/A)



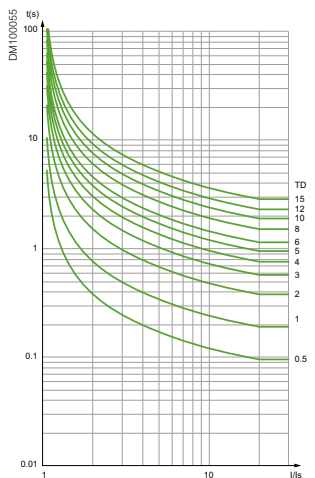
IEC Very Inverse Time Curve (IEC/VIT or IEC/B)



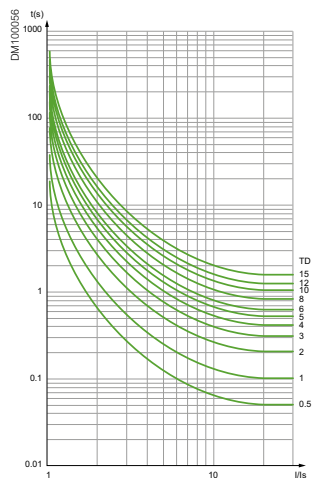
IEC Long Time Inverse Curve (IEC/LTI)



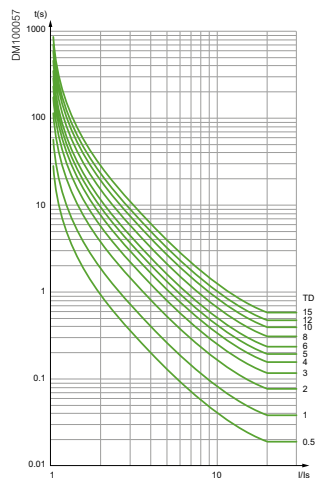
IEC Extremely Inverse Time Curve (IEC/EIT or IEC/C)



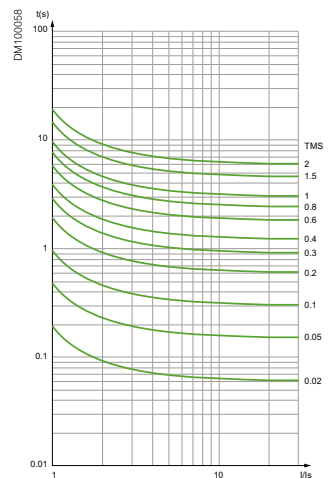
IEEE Moderately Inverse Curve (IEEE/MI or IEC/D)



IEEE Very Inverse Curve (IEEE/VI or IEC/E)



IEEE Extremely Inverse Curve (IEEE/EI or IEC/F)



RI Curve

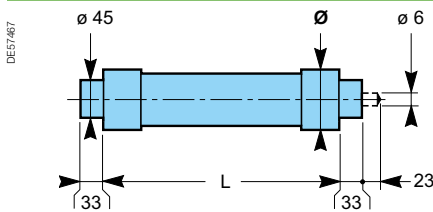
Note: Please contact us for protection required low earth faults

Fuse replacement

IEC recommendations stipulate that when a fuse has blown, all three fuses must be replaced.

Fuses dimensions

Fusarc CF



Ur (kV)	Ir (A)	L (mm)	Ø (mm)	Mass (kg)
12	10 to 25	292	50.5	1.2
	31.5 to 40	292	55	1.8
	50 to 100	292	76	3.2
	125	442	86	5
24	10 to 25	442	50.5	1.7
	31.5 to 40	442	55	2.6
	50 to 80	442	76	4.5
	100	442	86	5.7

Characteristics

Ratings for fuses for transformer protection depend, among other things, on the following criteria:

- service voltage
- transformer rating
- thermal dissipation of the fuses
- fuse technology (manufacturer).

Type of fuse that may be installed:

- Fusarc CF type: in accordance with the IEC 60282-1 dimensional standard, with or without striker.

For example, using the selection table below, for the protection of a 400 kVA transformer at 10 kV, Fusarc CF fuses with a rating of 50 A are used.

Correct operation of the RM6 is not guaranteed when using fuses from other manufacturers.

Selection table

(Rating in A, no overload, – 25°C < q < 40°C)

Fuse type Fusarc CF and SIBA (1)

(Typical example, IEC 60282-1 standard, IEC 62271-105 (to replace IEC 60420) and DIN 43625 standard)

Operating voltage (kV)	Transformer rating (kVA)																Rated voltage (kV)
	50	75	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	
3	20	31.5	40	50	50	63	80	100	125 ⁽²⁾	160 ⁽¹⁾ (2)							12
3.3	20	25	40	40	40	63	80	80	125 ⁽²⁾	125 ⁽²⁾	160 ⁽¹⁾ (2)						
4.2	20	25	25	40	50	50	63.5	80	80	100	125 ⁽²⁾	160 ⁽¹⁾ (2)					
5.5	16	20	25	25	40	40	50	63	80	80	100	125 ⁽²⁾	160 ⁽¹⁾ (2)				
6	16	20	25	25	31.5	40	50	50	63	80	100	125 ⁽²⁾	160 ⁽¹⁾ (2)				
6.6	10	20	25	25	31.5	40	50	50	63	63	80	100	125 ⁽²⁾	160 ⁽¹⁾ (2)			
10	10	10	16	20	25	25	31.5	40	50	50	63	80	100	125 ⁽²⁾			
11	10	10	16	20	20	25	25	40	40	50	50	63	80	100	125 ⁽²⁾		
13.8	10	10	10	16	16	20	25	31.5	40	40	50	50	63	100 ⁽²⁾			
15	10	10	10	10	16	20	25	31.5	31.5	40	50	50	63	80	100 ⁽²⁾		
20	10	10	10	10	16	16	20	25	25	31.5	40	40	63	63	80	100 ⁽²⁾	24
22	10	10	10	10	10	16	16	20	25	31.5	40	40	50	63	80	100 ⁽²⁾	

(1) SIBA type fuses at 160 A/12 kV reference 30-020-13.

(2) In the case of an external trip system (e.g. an overcurrent relay)

A calculation must be carried out to guarantee coordination of fuse-switches – please contact us.

For any values not included in the table, please contact us.

In the case of an overload beyond 40°C, please contact us.

Fault passage indicators

Fault and load current with voltage detection combination

Enhance the power availability of your network thanks to the Easergy Flair range of advanced Fault Passage Indicators.



Flair 21D



Flair 22D



Flair 23D



Flair 23DM



Amp21D

Fault current indicators

The Easergy Flair (21D - 22D - 23D - 23DM) range of fault passage indicators has been improved to provide indicators in DIN format that are efficient, self-powered and self-adapting to the network to provide hassle-free installation. Flair indicators work with all types of neutral networks and benefit from LCDs that act as an information display. Optional outdoor light indicator.

Functions

- Indication of phase-phase and phase-earth faults
- Display of parameters & settings
- Display of the faulty phase
- Display of load current, maximum current for each phase, frequency and direction of energy flow
- Fault passage indication with voltage detection & Modbus communication (Flair 23DM)

Easy to use and reliable

- Installs automatically on site
- Fault indication by LED, LCD and outdoor light indicator (optional)
- 15 year battery life (Flair 22D)
- Accurate Fault detection by validation of fault with voltage loss using VPIS-VO (except Flair 21D)
- FPreassembled in the factory or to be installed on site
- Using split-type current sensors helps on-site adjustment as this avoids disconnecting the MV cables.



RM6 can also be supplied with Alpha M or Alpha E (Horstmann) type short-circuit indicators.

Fault passage indicators

Fault and load current with voltage detection combination

Voltage detection relay

Smart grid ready

Flair 23DM is a fault passage indicator with modbus communication and integrated voltage detection relay for all types of neutral networks.

- Combination fault passage indicator and voltage detector
- Ideal for use with an Automatic Transfer of Source System
- Needs a stabilized external DC power supply
- Requires the VPIS-VO option to acquire the information of the mains voltage

Load current indicator

The Easergy range ammeter Amp21D of is dedicated to Medium Voltage network load monitoring.

Functions

- 3 phase current display: I1, I2, I3
- Maximum current display: I1, I2, I3

Easy to use and reliable

- Installs automatically on site
- Installed onto the RM6 in the factory or on site
- Using split-type current sensors helps on-site adjustment as this avoids disconnecting the MV cables

Fault passage indicators

Fault and load current with voltage detection combination

Characteristics

		Flair 21D	Flair 22D & 23D	Flair 23DM
Frequency (auto-detection)		50 Hz and 60 Hz	50 Hz and 60 Hz	50 Hz and 60 Hz
Operating voltage		Un: 3 to 36 kV - Vn: 1.7 to 24 kV	Un: 3 to 36 kV - Vn: 1.7 to 24 kV	Un: 3 to 36 kV - Vn: 1.7 to 24 kV
Neutral	Phase-to-phase fault	All systems	All systems	All systems
	Phase-to-earth fault	Impedance-earthed, directly earthed	Impedance-earthed, directly compensated, isolated Flair 22D: (type B), Flair 23D, type (B,C) ⁽³⁾	
Measurements				
Load	Minimum current	> 2 A	> 2 A	> 2 A
Current (A) (resolution 1 A)	For each phase Accuracy: ± (2% + 2 digits)	Ammeter Maximeter	Ammeter Maximeter	OFF or AUTO or 100 to 800 A (50A increments)
Voltage (% of rated voltage)	With VPIS-VO option Accuracy: ±1%			Phase-to-neutral or phase-to-phase voltage
Fault detection				
Threshold configuration		Via microswitches	Via front panel buttons	Via front panel buttons
Overcurrent fault Accuracy ±10%	Auto-calibration	Yes	Yes	Yes
	Thresholds	AUTO or 200, 400, 600, 800 A	OFF or AUTO or 100 to 800 A (50 A increments)	OFF or AUTO or 100 to 800 A (50 A increments)
Earth fault With 3 phase CTs Accuracy ±10%	Auto-calibration	Yes	Yes	Yes
	Algorithm Thresholds	$\Sigma 3I + di/dt$ OFF or AUTO or 40, 60, 80, 100, 120, 160 A	$\Sigma 3I + di/dt$ OFF or 5 ⁽²⁾ to 30 A (5 A increments) and 30 to 200 A (10 A increments)	$\Sigma 3I + di/dt$
Earth fault With zero sequence CT Accuracy ±10% or ±1 A	Auto-calibration	-	No	No
	Thresholds	-	OFF or AUTO ⁽⁴⁾ or 5 to 30 A (5 A increments) and from 30 to 200 A (10 A increments) ⁽¹⁾	
Fault acknowledge time delay		60 ms		
Fault confirmation time delay		70 s	3 s, 70 s or OFF	
Inrush	Time delay		3 s, 70 s or OFF	
Reset	Automatic	Upon current return 2 A (70 s or OFF)	Upon current return 2 A (3 s, 70 s or OFF)	
	Manual via front panel	Yes	Yes	Yes
	External contact	Yes	Yes	Yes
	Deferred	4 h	1, 2, 3, 4, 8, 12, 16, 20, 24 h. Factory setting = 4 h	
Indications	LED	Yes	Yes	Yes
	External contact	Yes	Yes	Yes
	External indicator lamp	Yes (with battery)	Yes (without battery)	Yes (without battery)
	Phase indication	Yes	Yes	Yes
Communication				
RS485 2-wire, connector with LEDs		No	No	Yes

Speed: auto-detection 9600, 19200, 38400 bits/s - Class A05

- Accessible data: phase and earth faults; fault passage counters including transient faults
- Current measurements (I1, I2, I3, I0), max. current, voltage (U, V, residual)
- Fault indication, counters and max. values reset
- Fault and voltage presence/absence detection parameters
- Communication parameters
- Time synchronisation and time-tagged events

Fault passage indicators

Fault and load current with voltage detection combination

	Flair 21D	Flair 22D & 23D	Flair 23DM
Power supply			
Self-powering On measuring CTs	Yes (I load > 3 A)	Yes	Yes
Battery (Service life: 15 years)	No	Lithium (Flair 22D), No (Flair 23D)	No
External power supply	No	No (Flair22D), 24 to 48 Vcc (Conso mac: 50 mA) (Flair 23D)	24 to 48 Vdc (conso mac: 50 mA)
Display			
Display	4-digits LCD	4-digits LCD	4-digits LCD
Fault	Red LED	Red LED	Red LED
Phase at fault	Yes	Yes	Yes
Setting	Yes (CT type)	Yes	Yes
Sensors			
Phase CT	3 phase CTs	2 or 3 phase CTs	2 or 3 phase CTs
Zero sequence CT	No	Diameter: 170 mm	Diameter: 170 mm
Test mode			
By button on front panel	Product name - Software version - Network frequency - Residual current - Digits test	Product name - Software version - Network frequency - Residual current - VPIS presence - Direction of energy - Digits test	

(1) The minimum threshold 5 A can only be reached with earth CT ref CTRH2200.

(2) 20 A minimum for resistive neutral type,
5A minimum for isolated or compensated neutral type

(3) Type C mounting is not available on compensated neutral

(4) Only with isolated and compensated neutral

Voltage indicators and relay

VPIS and VDS



VPIS

Voltage presence indicators

A voltage presence indicating device can be integrated in all the functional units, either on the cable or busbar side. It can be used to check whether or not a voltage is present across the cables.

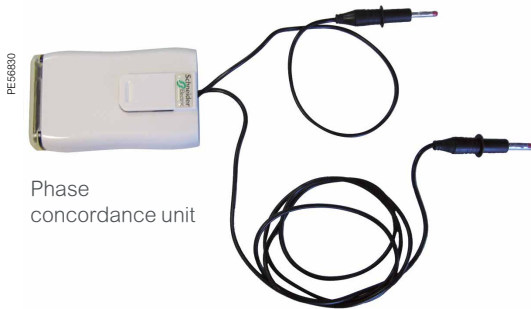
Two devices are available:

- VPIS: Voltage Presence Indicator System, as defined by standard IEC 62271-206. The VPIS can be fitted with a voltage output (VPIS-VO) dedicated to various voltage detection applications such as automatic transfer switches, voltage absence or presence contacts, live-cable earthing switch lockout, etc.
- VDS: Voltage Detecting System, as defined by standard IEC 61243-5

Voltage sensors

A voltage sensor is integrated in all the functional units. It provides a signal with an accuracy of 5% to the VPIS through a 30 pF capacitive divider.

The sensor is integrated in the tightening cap used to secure the busbar or cable connections. The voltage can be detected either on the cable side or the busbar side.



Phase concordance unit

Phase concordance unit

This unit is used to check phase concordance.



VD23

VD23 voltage detection relay

VD23 is a compact voltage detection relay for MV networks for voltages from 3kV to 36kV, 50/60 Hz, efficient and self-adapted.

- VD23 detects a presence and absence of voltage, and activates 2 relays:
 - R1 = Presence of voltage
 - R2 = Absence of voltage.
- The 2 functions operate simultaneously
 - Both relay outputs are separate and can therefore work independently (e.g. voltage absence for automatic transfer function, voltage presence indication for interlocking on earthing switch, etc).
 - Combining functions creates specific applications.

VD23 is fitted to a VPIS-VO adapted for voltage measurement. The VPIS-VO, is linked to the capacitor connected to the MV busbar, and delivers a voltage signal on a specific connector.



New LPVT options

The RM6 can be specified with compact high accuracy Low Power Voltage Transformers (LPVT). These innovative sensors are ideal for the new generation of electronic protection devices and are the only way to measure energy in secondary MV loops.

- Up to Class 0.5 accuracy levels for metering
- Linear wide spectrum voltage range with no ferroresonance characteristics.
- Low power consumption and reduced size - ideal for new or retrofit solutions
- Excellent harmonic performance for Power Quality monitoring
- Easy to install, operate and test - no need to disconnect for cable testing 42kV/15min
- Comply international standard: IEC 60044-7

Metering in harsh environments

The VRT4 is a phase-to-earth screened voltage transformer, placed behind the cables.

Fully protected in harsh environments, it does not require any fuse protection. A flexible connection to the front T-type cable plugs can be easily disconnected for commissioning tests.



VRT4 screened voltage transformer

Standard	IEC 61869-3									
Voltage (kV)	7.2 - 20 - 60		7.2 - 32 - 60		12 - 28 - 75		12 - 42 - 75		17.5 - 38 - 95	
Primary (kV)	6/√3	6.6/√3	6/√3	10/√3	11/√3	10/√3	13.8/√3	15/√3		
1st secondary (V)	100/√3	110/√3	100/√3	100/√3	110/√3	100/√3	110/√3	100/√3		
Rated output and accuracy class	10 VA cl 0.2									
2nd secondary (V)	100/3	110/3	100/3	100/3	110/3	100/3	110/3	100/3		
Rated output and accuracy class	30 VA 3P									

The ARC5 is a ring-type current transformer used in a core unit

- Compact dimensions for easy installation.
- Cost-effective compared to standard MV block CTs.

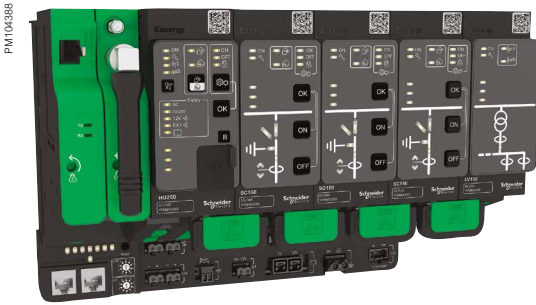


ARC5 ring current transformer

Rated & Insulation voltage (kV)	0.72/3			
Thermal withstand	25 kA x 2 s			
Transformation ratio	100/5	200/5	400/5	600/5
Rated output with class 0.2S Fs ≤ 5 (VA)	5			

Easergy Remote Terminal Units

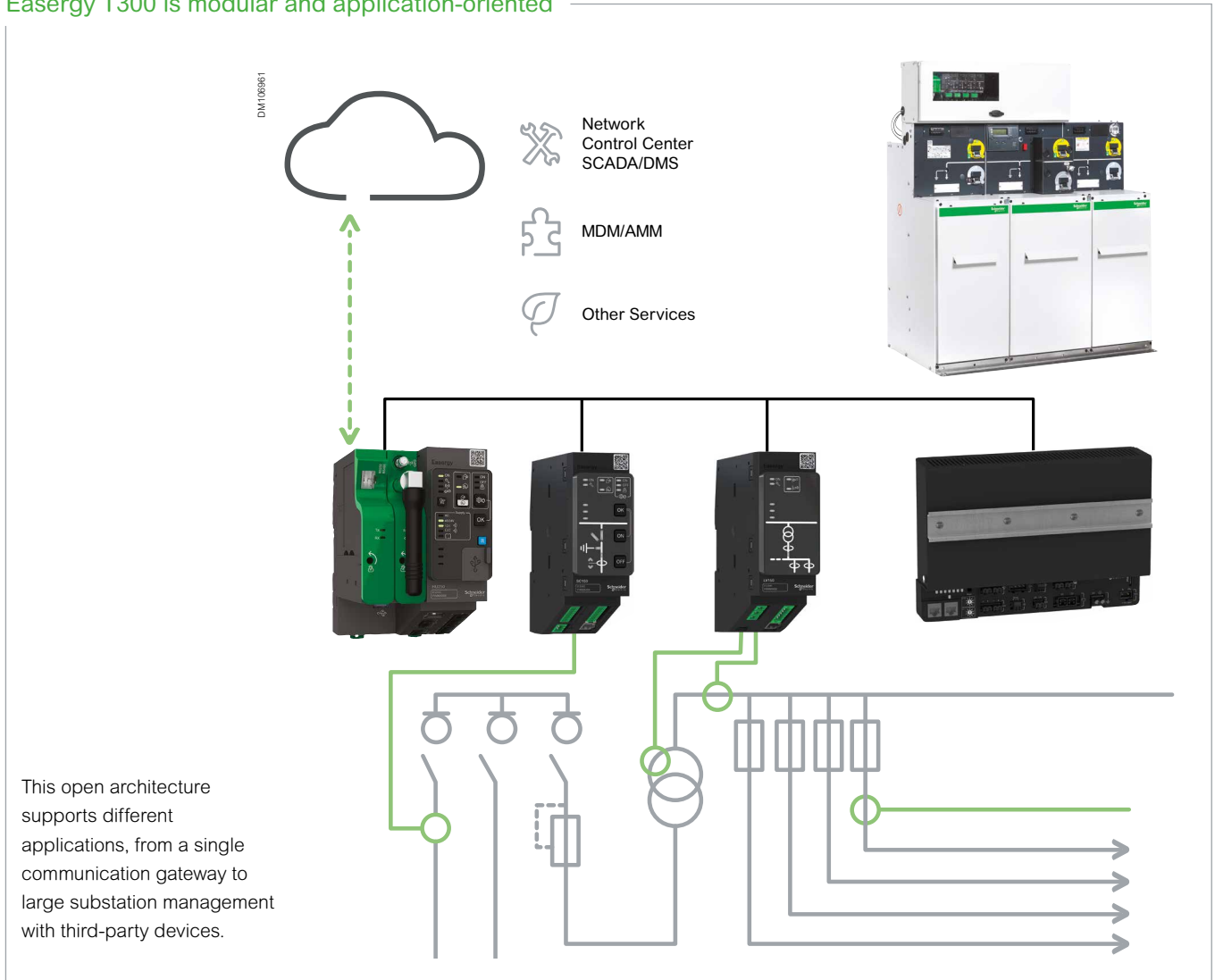
Easergy T300



Easergy T300: newest generation of remote terminal unit

- Modular architecture with a very small footprint, a power supply back-up, up to 24 RM6 functions and 3 transformer management.
- Powerful communication with standard and secure protocol, open P2P communication for decentralized automation, easy to upgrade on site.
- Advanced MV and LV network control with directional fault detection for distributed generation networks, MV & LV power measurement (IEC 61557-12), power quality measurement (IEC 61000-4-30 Class S), MV voltage monitoring (VPIS, VDS, LPVT, VT), PLC framework IEC61131-3 for automation design, MV broken conductor detection, etc.
- Cyber Security inside with compliancy with the latest cyber regulations (IEEE P1686, IEC62351), secure communication protocol and secure local WiFi access.
- Latest user interface technology with web server compatibility with PC, smartphone and digital tablet.

Easergy T300 is modular and application-oriented



Easergy Remote Terminal Units

Easergy T300

These modules, with their supported applications, are:



Easergy HU250 – Head Unit communication gateway

- Flexible communication to control center and other customer IT applications
 - Standard and security-focused protocols: IEC 101/104, DNP3, IEC 61850(*), Modbus(*)
 - Open peer-to-peer communication to self-healing application
 - Flexible communication media (Ethernet, USB, GPRS, 2G, 3G, 4G, radio)
- Cyber security management
- Open to third-party devices with many protocol capabilities
- Built-in webserver for commissioning and maintenance with local and remote access, compatible with PC, tablet and smartphone devices
- Embedded IEC 601131-3 PLC for automation design



Easergy SC150 – Switch controller

- Control and monitoring of all switchgear types
- Advanced Fault Passage Indicator (FPI) algorithms:
 - Phase-phase and phase-ground detection ANSI 50/51, 50N/51N
 - Directional phase-phase and phase-ground detection ANSI 67/67N
 - Broken conductor detection (one phase lost) ANSI 47
- Large current and voltage measurement capabilities: standard CT for current, LPVT, VT, VDS, VPIS and capacitor interface for voltage
- Current and voltage measurement in accordance with IEC 61557-12
- Power quality in accordance with IEC 61000-4-30 class S:
 - Specific application automation: sectionalizer

(*) Contact us for availability

Easergy Remote Terminal Units

Easergy T300



Easergy LV150 – Transformer and Low Voltage monitoring

- Transformer temperature measurement and monitoring
- Voltage, current and power measurement in accordance with IEC 61557-12
- Broken conductor detection (one phase lost MV or LV)
- Power quality in accordance with IEC 61000-4-30 class S



Easergy PS25 and Easergy PS50 – Power Supply for control and monitoring solutions

Two back-up power supplies are available in the catalog:

- PS25 monitoring solution with only one voltage output
 - 12 Vdc or 24 Vdc
- PS50 is a harsh environment power supply

Automatic transfer system

Because a MV power supply interruption is unacceptable especially in critical applications, an automatic system is required for MV source transfer.

For your peace of mind, RM6 provides automatic control and management of power sources in your Medium Voltage secondary distribution network with a short transfer time (less than 10 seconds), making your installation extremely reliable.

Automatic control is performed by Easergy T200 I.

This T200 I device can also be used for remote control with a wide range of modems and protocols.

By default, T200 I is provided with the RS232 modem and the Modbus/IP protocol.



An ATS solution is made of:

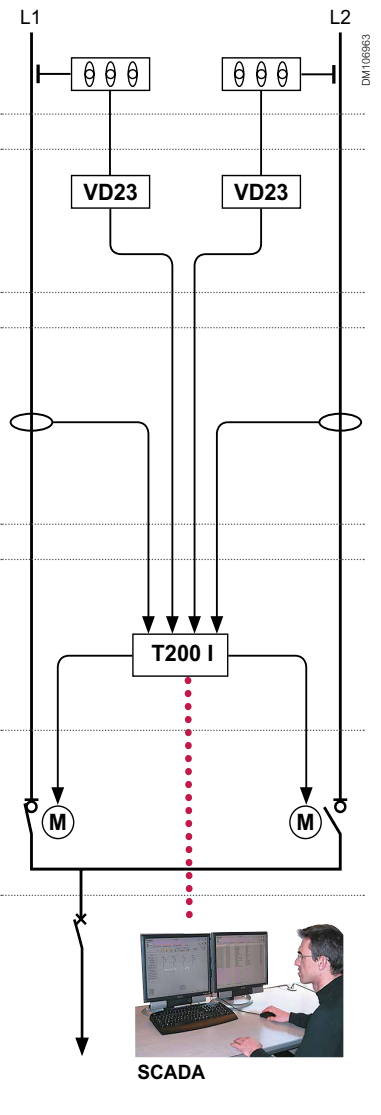
- 2 VPIS-VO

Voltage sensor: dedicated version of VPIS with voltage output signal.
- 2 VD23

Voltage detector: a relay is activated when a loss of voltage is detected from the VPIS voltage output signal.
- 2 CTs for FPI

Fault Passage Indicator (included in T200 I): if a fault current is detected, the Automatic Transfer System is locked in order to avoid closing the healthy line on the fault.
- 1 T200 I + switch function motorized

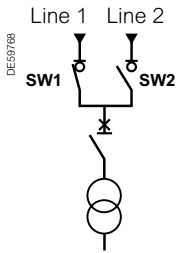
From the VD23 digital input and the FPI information, T200 I makes the decision to switch from one line to the other.



Communication to SCADA: optionally, communication facilities may be added.
 Modems: PSTN, Radio, GSM/GPRS/3G, Ethernet, ...
 Protocols: Modbus, Modbus IP, IEC 870-5-101 and 104, DNP3, DNP3 IP, ...
 Functions: dual port, remote configuration, ...

Automatic transfer system

Network ATS (1/2)



Changeover between 2 MV network sources

3 operating modes (selected from the T200 I Web server)

1. Auto SW1 or Auto SW2 mode

In the event of a voltage loss on the distribution line in service (SW1), the ATS changes over to the backup line (SW2) after a configurable time delay (T1).
[opening of SW1, closing of SW2]

As soon as voltage returns on the main line (SW1), the ATS changes back to the main line after a time delay (T2).

[opening of SW2, closing of SW1 if the paralleling option is not activated
[closing of SW1, opening of SW2 if the paralleling option is activated]

2. Semi-Auto SW1XVSW2

In the event of a voltage loss on the distribution line in service (SW1), the ATS changes over to the backup line (SW2) after a configurable time delay (T1).
[opening of SW1, closing of SW2]

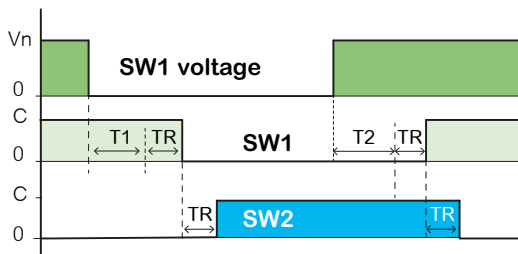
The ATS does not change back to the main line, except in the event of a voltage loss on the backup line [opening of SW2, closing of SW1]

3. Semi-Auto SW1VSW2 or Semi-Auto SW2VSW1

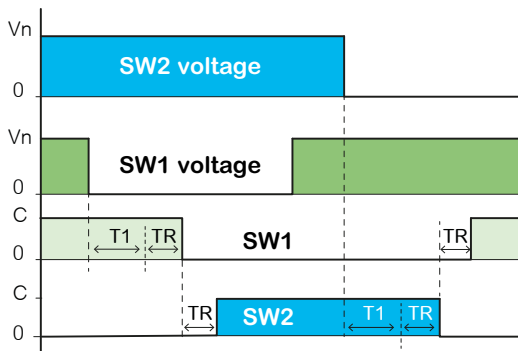
In the event of a voltage loss on the distribution line in service (SW1), the ATS changes over to the backup line (SW2) after an adjustable time delay (T1).
[opening of SW1, closing of SW2]

The ATS maintains the backup line in service (SW2) irrespective of the voltage on the two lines.

DM1108951
Network ATS: Auto mode SW1
(with paralleling upon automatic return)



Network ATS: Semi-auto mode
(without paralleling upon automatic return)



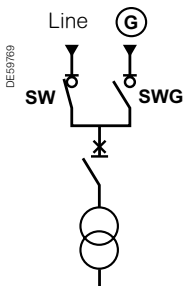
Characteristics

TR: switch response time (< 2 s)

- Time delay before changeover (T1)
Configurable from 0 s to 200 s in increments of 100 ms (factory setting = 1 s).
This time delay is also used to delay return to the initial channel in Semi-Auto mode SW1XVSW2
- Time delay before return to the initial channel (T2) (Auto mode only)
Configurable from 0 s to 30 min. in increments of 5 s (factory setting = 15 s)

Automatic transfer system

Generator ATS (1/2)



Changeover between a distribution system line and a generator

3 operating modes (selected from the T200 I Web server)

1. Auto SW mode

In the event of a voltage loss on the distribution line in service (SW), after a time delay T1, the ATS sends the opening command to SW and the Generator start-up order at the same time

- Case 1 "Generator channel closing after Generator power on": the Generator channel closing order is sent only when Generator voltage is detected.
- Case 2 "Generator channel closing after Generator start-up order": immediately after sending the Generator start-up order, the closing order is given to the Generator channel, without waiting until the Generator is actually started.

[opening of SW, closing of SWG]

The remaining operation of the changeover sequence depends on the configuration of the "Generator channel closing" option:

As soon as voltage returns on the main line (SW), after a time delay T2, the ATS changes back to the main line and the generator stoppage order is activated.

- [opening of SWG, closing of SW if the paralleling option is not activated]
- [closing of SW, opening of SWG if the paralleling option is activated]

2. Semi-Auto SWXVSWG

The ATS does not change back to the main line, except in the event of a voltage loss on the generator due to generator stoppage or the opening of a switch upstream of the SWG channel.

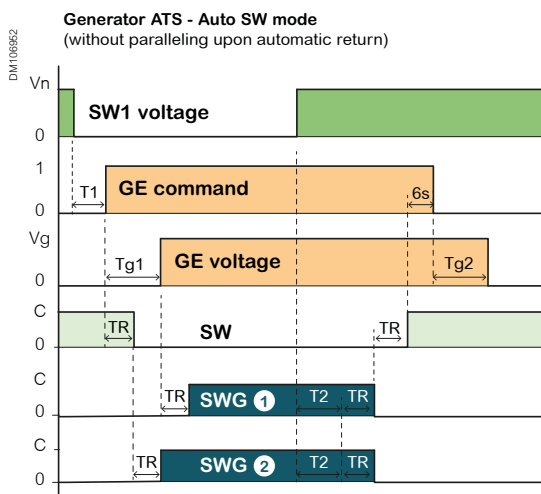
3. Semi-Auto SWVSWG

In the event of a voltage loss on the distribution line in service (SW), after a time delay T1, the ATS sends the opening command to SW and the Generator start-up order at the same time.

- Case 1 "Generator channel closing after Generator power on"
 - Case 2 "Generator channel closing after Generator start-up order"
- [opening of SW, closing of SWG]

The remaining operation of the changeover sequence depends on the configuration of the "Generator channel closing" option:

The ATS maintains the backup line in service (SWG) and there is no automatic return.



Case ①: Generator channel closing after Generator power on (configurable option)

Case ②: Generator channel closing after Generator startup command (configurable option)

Characteristics

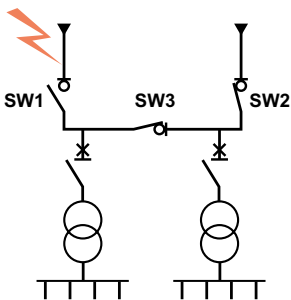
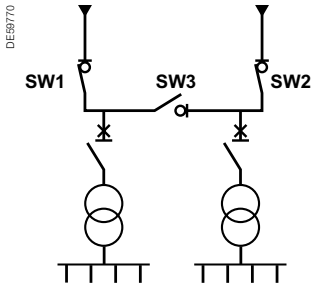
TR: switch response time

- Time delay before changeover (T1): configurable from 0 s to 200 s in increments of 100 ms (factory setting = 1 s). This time delay is also used to delay return to the initial channel in Semi-Auto mode SWXVSWG
- Time delay before return to the initial channel (T2)
- (Auto mode only). Configurable from 0 s to 30 min. in increments of 5 s (factory setting = 15 s).
- Tg1: Generator start-up, depending on the generator type, not configurable (max. waiting time: 60 s). If Tg1 is greater than 60 s, changeover is suspended.
- Tg2: Generator stoppage, depending on the generator type, not configurable (max. waiting time: 30 s).

Note: the generator stoppage command is sent 6 s after the end of changeover.

Automatic transfer system

Bus tie coupling (2/3)



Source changeover between 2 incoming lines (SW1 and SW2) and a busbar coupling switch (SW3)

2 operating modes (selected from the Easergy T200 I configurator)

1. Standard mode

In the event of a voltage loss on the distribution line in service (SW1), the ATS changes over to the backup line (SW2) after a configurable time delay (T1).
[opening of SW1, closing of SW3]

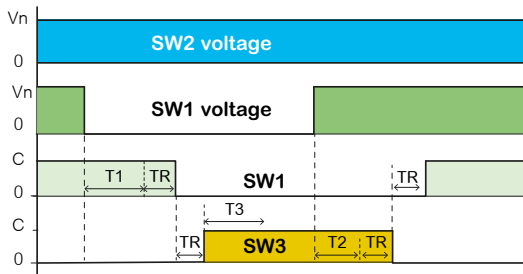
As soon as voltage returns on the main line (SW1), the ATS changes back to the main line after a time delay (T2).
[opening of SW3, closing of SW1 if the paralleling option is not activated]
[closing of SW1, opening of SW3 if the paralleling option is activated]

2. Mode with locking upon voltage loss after changeover

In the event of a voltage loss on the distribution line in service (SW1), the ATS changes over to the backup line (SW2) after an adjustable time delay (T1).
[opening of SW1, closing of SW3].

Voltage presence is monitored during a configurable period T3. If the voltage disappears during this period, coupling switch SW3 is opened and the automatic transfer system is locked.

DM106953 BTA - Standard mode (without paralleling upon automatic return)



Characteristics

TR: switch response time (< 2 s).

- Time delay before changeover (T1)
Configurable from 100 ms to 60 s in increments of 100 ms (factory setting = 5 s).
- Time delay before return to the initial channel (T2)
Configurable from 5 s to 300 s in increments of 1 s (factory setting = 10 s)
- Monitoring time (T3)
Configurable from 100 ms to 3 s in increments of 100 ms (factory setting = 1 s)

Changeover conditions

- Validation of the ATS (from the configurator)
- The ATS is in operation (local control panel or remote control)
- The external closing digital input is OFF
- The switch for the main line is closed and the backup line switch is open
- No fault detected on the line in service
- The earthing switch is open on both switches

Automatic transfer system

Bus tie coupling (2/3)

Other functions

ATS in ON/OFF mode

The ATS system can be switched on or off from the local control panel (T200 I) or remotely (Scada system).

When the ATS is OFF, the RM6 switches can be electrically actuated by local or remote control (operation in parallel mode is therefore possible).

ATS in parallel mode upon Auto return

Activating this option enables paralleling of the channels by the automatic transfer system, during the phase of automatic return to the priority channel.

To be used when the ATS is in "Auto" mode.

Application: synchronization of the voltages of the main power supply line and the backup line allows return to the main line without any interruption.

Generator ON override command

Activation of the ATS and transfer on Generator can be activated upon an order: remotely or through dedicated digital input.

Applications:

- Periodic maintenance tests of the ATS/Generator system
- Switch on Generator when the Network is overloaded.

During peak hours, and if network is overloaded, Utility can send a remote order that will activate Generator. Having this facility, it will allow a private customer to negotiate a better electricity price.

Notes

Installation and connection

Installation and connection

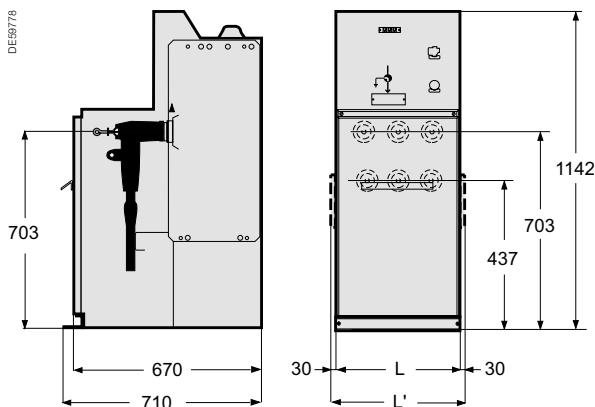
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Dimensions and installation conditions

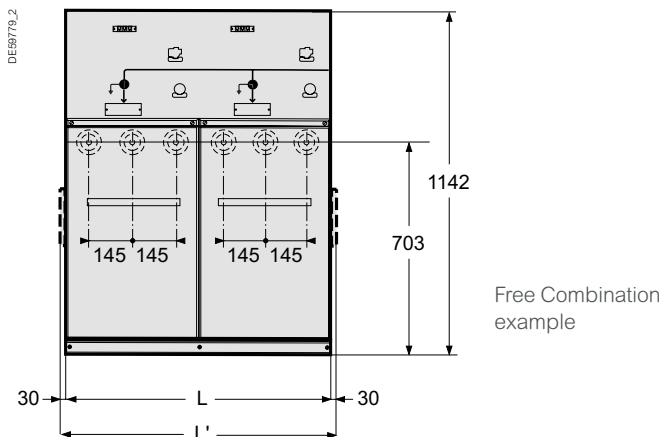
1 function module

	Function	Weight (kg)	Length (mm)
Regular RM6			
NE	I	135	L = 572
	D		L = 572
	B		L = 572
DE	I	135	L' = 472 + 30 + 30 = 532
	D		L' = 572 + 30 + 30 = 632
	B		L' = 572 + 30 + 30 = 632
	Q		L' = 472 + 30 + 30 = 532
RE		185	L' = 472 + 30 = 502
LE	O	135	L' = 472 + 30 = 502
DE			L' = 472 + 30 + 30 = 532
DE	Ic	145	L' = 572 + 30 + 30 = 632
	Bc		L' = 572 + 30 + 30 = 632



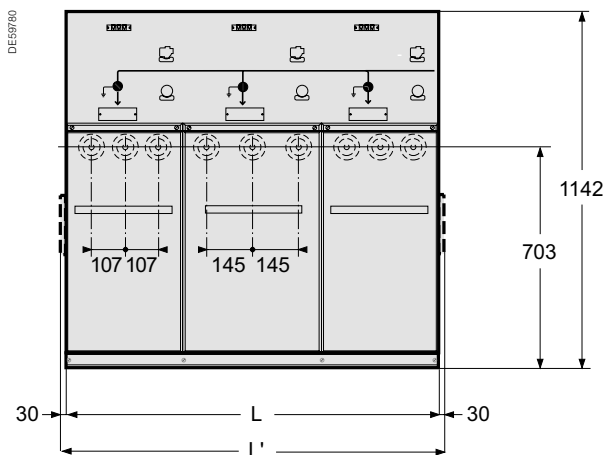
2 function modules

	Function	Weight (kg)	Length (mm)
Regular RM6			
NE	QI	180	L = 829
	DI, BI		L = 829
	II		L = 829
RE	II	155	L' = 829 + 30 = 859
RM6 Free Combination			
NE			L = 1052
LE			L' = 1052 + 30 = 1082
RE			L' = 1052 + 30 = 1082
DE			L' = 1052 + 30 + 30 = 1112



3 function modules

	Function	Weight (kg)	Length (mm)
Regular RM6			
NE	IQI	275	L = 1186
	III		L = 1186
	IDI		L = 1186
	IBI		L = 1186
RE	IQI	275	L' = 1186 + 30 = 1216
	III		L' = 1186 + 30 = 1216
	IDI		L' = 1186 + 30 = 1216
	IBI		L' = 1186 + 30 = 1216
DE	IQI	275	L' = 1186 + 30 + 30 = 1246
	III		L' = 1186 + 30 + 30 = 1246
	IDI		L' = 1186 + 30 + 30 = 1246
	IBI		L' = 1186 + 30 + 30 = 1246
RM6 Free Combination			
NE			L = 1532
LE			L' = 1532 + 30 = 1562
RE			L' = 1532 + 30 = 1562
DE			L' = 1532 + 30 + 30 = 1592
RM6 Free Combination with bus coupler			
RE			L' = 1532 + 30 = 1562
DE			L' = 1532 + 30 + 30 = 1592



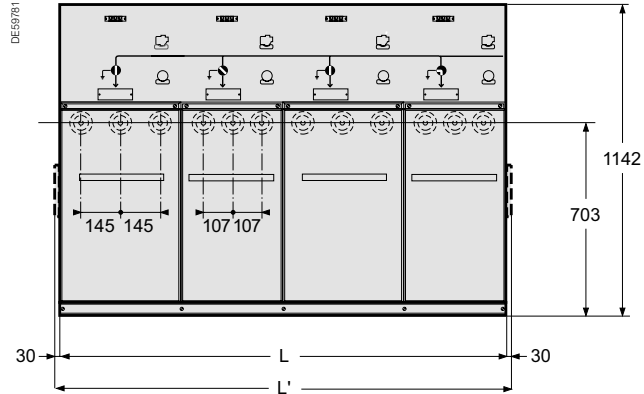
Type of tank

NE: non-extensible
RE: extensible to the right

LE: extensible to the left
DE: extensible to the left and right

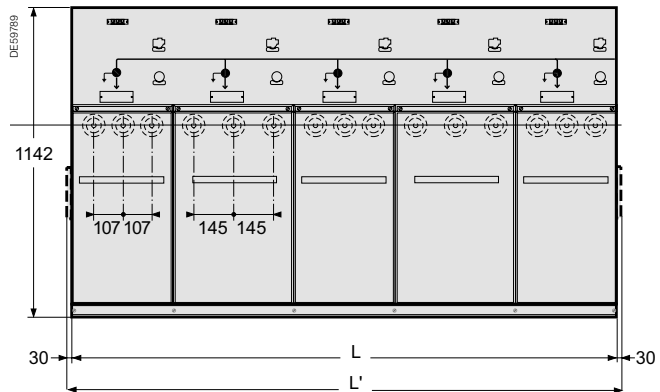
4 function modules

	Function	Weight (kg)	Length (mm)
Regular RM6			
NE	IIQI	355	L = 1619
	IIII	320	L = 1619
	IIDI	330	L = 1619
	IIBI	330	L = 1619
	QIQI	390	L = 1619
	BIBI	340	L = 1619
RE	IIQI	355	L' = 1619 + 30 = 1649
	IIII	320	L' = 1619 + 30 = 1649
	IIDI	330	L' = 1619 + 30 = 1649
	IIBI	330	L' = 1619 + 30 = 1649
	QIQI	390	L' = 1619 + 30 = 1649
	DIDI	340	L' = 1619 + 30 = 1649
DE	IIQI	355	L' = 1619 + 30 + 30 = 1679
	IIII	320	L' = 1619 + 30 + 30 = 1679
	IIDI	330	L' = 1619 + 30 + 30 = 1679
	IIBI	330	L' = 1619 + 30 + 30 = 1679



5 function modules

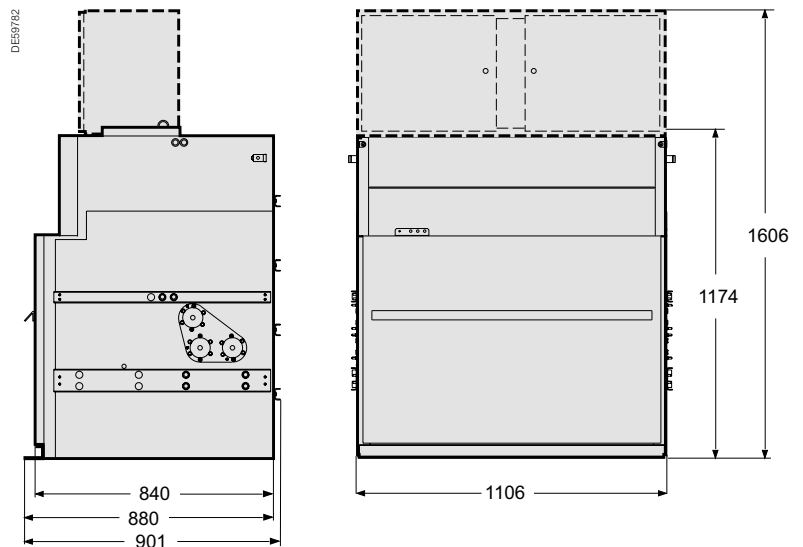
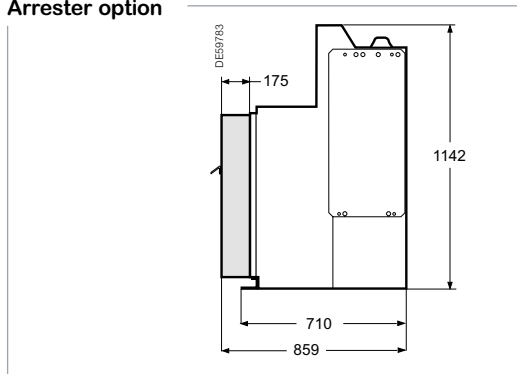
	Function	Weight (kg)	Length (mm)
Regular RM6			
NE	IDIDI	470	L = 2000
	IQIQI	520	L = 2000
	IBIQI	495	L = 2000
RE	IDIDI	475	L' = 2000 + 30 = 2030
	IIII	455	L' = 2000 + 30 = 2030
DE	IDIDI	480	L' = 2000 + 30 + 30 = 2060
	IIIQI	495	L' = 2000 + 30 + 30 = 2060



Metering cubicle

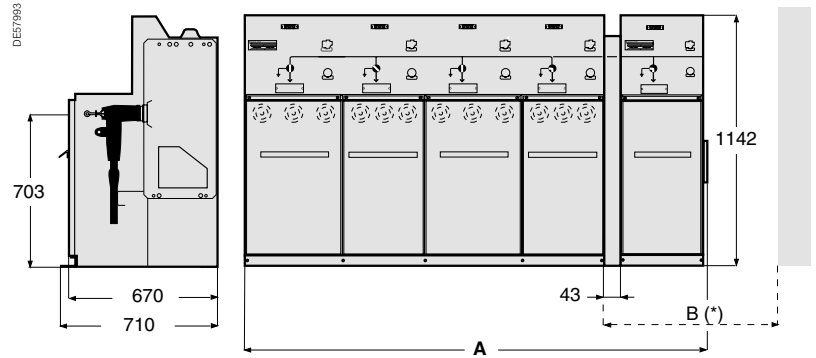
	Function	Weight (kg)	Length (mm)
RM6 metering cubicle with LV compartment			
DE	DE-Mt	420	L = 1106
RM6 metering cubicle without LV compartment			
DE	DE-Mt	400	L = 1106

Arrester option



Dimensions and installation conditions

Dimensions of RM6 REs with an extension module



(*) B = 900 for 1 DE function
 B = 1600 for 3 DE functions
 B = 2000 for 4 DE functions

These dimensions can be reduced under special conditions, contact us.

As a reminder, there is only one standard range installation restriction, for the standard range, as a rule, installation is carried out from left to right, starting with the heaviest unit.

No. of RE units	DE single unit type	A Length (mm)
RM6 standard functional units		
2 units	Type 1	1374
	Type 2	1474
3 units	Type 1	1731
	Type 2	1831
4 units	Type 1	2164
	Type 2	2264
RM6 Free Combination functional units		
2 units	Type 1	1597
	Type 2	1697
3 units	Type 1	2077
	Type 2	2177
Type 1: DE-I, DE-Q, DE-O		
Type 2: DE-B, DE-D, DE-IC, DE-BC		

Dimensions and installation conditions

Layout

Floor mounting

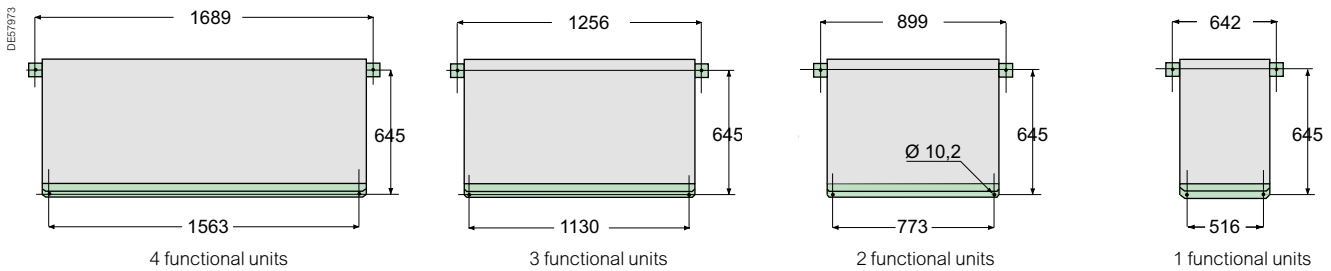
The RM6 is supported by 2 metal feet with holes for mounting:

- on a flat floor fitted with trenches, passages or ducts
- on concrete footing
- on studs

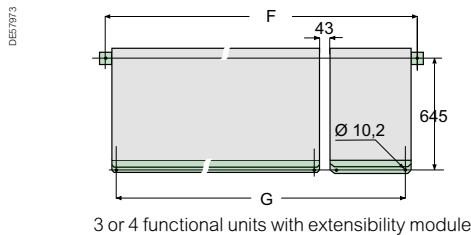
Options for adding a cubicle	1st position	2nd position	3rd position	Last position
∅	RE-x	DE-x	DE-x	LE-x
RE-x*	DE-x	DE-x	LE-x	∅

* It is not possible to add RE-x to a DE station where the switchboard is in first position

Standard non-extensible RM6 (top view)



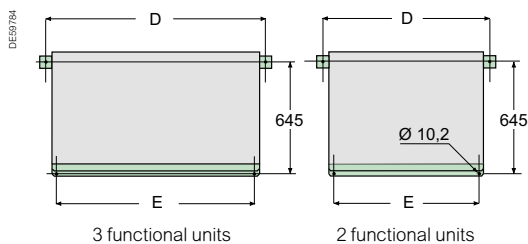
Extensible RM6 (top view)



3 or 4 functional units with extensibility module

No. of RE units	DE single unit type	Length (mm)	
		F	G
RM6 standard functional units			
2 units	Type 1	1414	1288
	Type 2	1514	1388
3 units	Type 1	1771	1645
	Type 2	1871	1745
4 units	Type 1	2204	2078
	Type 2	2304	2178
RM6 Free Combination functional units			
2 units	Type 1	1637	1511
	Type 2	1737	1611
3 units	Type 1	2117	1991
	Type 2	2217	2091

RM6 Free Combination (top view)



3 functional units

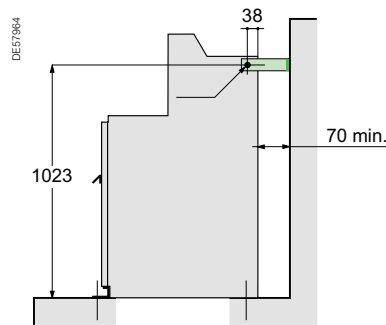
2 functional units

No. of units	Length (mm)	
	D	E
RM6 Free Combination functional units		
2 units	1122	996
3 units	1602	1476

Dimensions and installation conditions

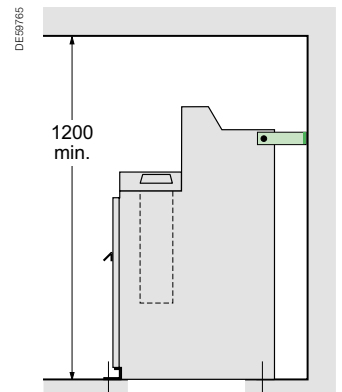
Wall mounting

There are two holes to attach the unit to a wall and on the floor.



Ceiling clearance

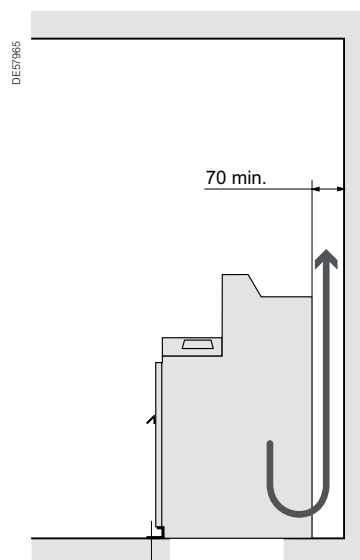
For substations with fuse-holders, provide a minimum ceiling clearance of 1200 mm.



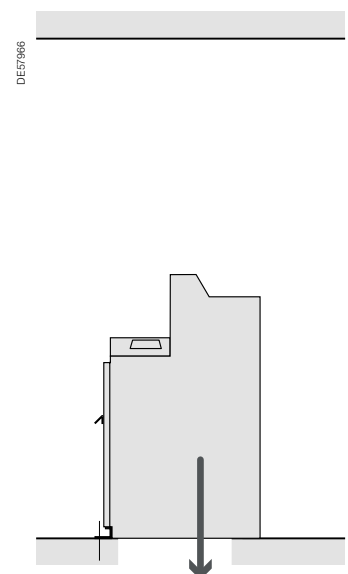
Installing of the substation for internal arc withstand

When there is a requirement for installations to have protection against internal arc faults, refer to the following diagrams.

Gas removal to the rear



Gas removal to the bottom



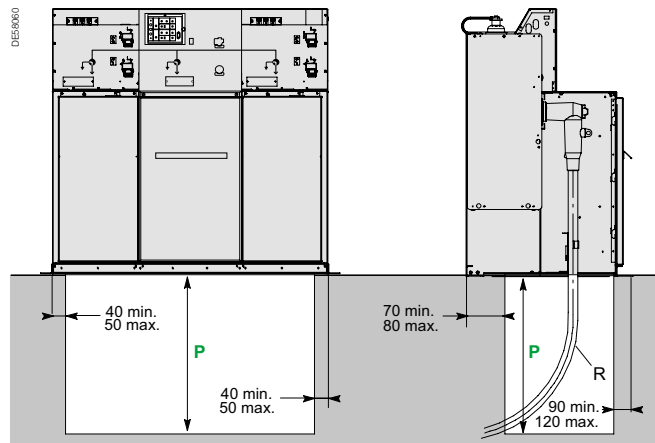
N.B.: parts for guiding the gases to vent openings and cooling walls are not part of the switchgear supply. These must be adapted to each specific case.

For connection to a “network” or “transformer” via circuit breaker

Cable insulation	Cable	Cross-section (mm ²)	Bending radius	Cable entry through a trench		Cable entry through a duct	
				P (plug-in)	P (disconnectable)	P (plug-in)	P (disconnectable)
Dry insulation	Single	≤ 150	500	400		400	
		185 to 300	600	520		520	
	Three	≤ 150	550	660		660	
		185	650	770		770	
Paper impregnated non-draining type	Single	≤ 150	500		580		580
		185 to 300	675		800		800
	Three	≤ 95	635		750		750
		150 to 300	835		970		970

The “network” cables can be run either:

- Through trenches, passages, ducts
- Through the left or right side



Trench depth P or RM6 without plinth

Note: trench depths can be reduced and sometimes eliminated by adding a plinth.

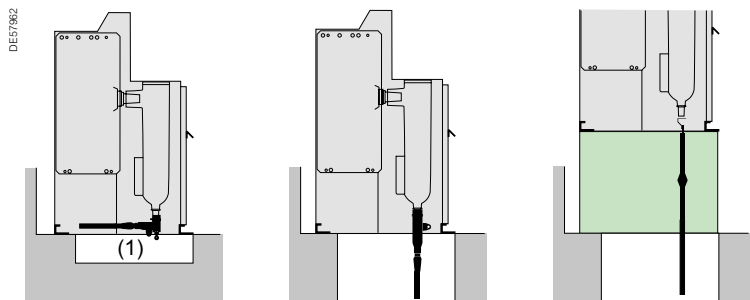
For “transformer” connection via fuse-switch

Cable insulation	Cable	Cross-section (mm ²)	Bending radius	Plug-in Elbow connector	Plug-in Straight connector	Disconnectable (2)
						P
Dry insulation	Single	16 to 35	335	100	520	335
		50 to 70	400	100	520	440
		95 to 120	440	100	550	440
	Three	35	435		520	725
		50 to 70	500		520	800
		95	545		550	860

(1) Leave a clearance of 100 mm

(2) 520 mm plinth must be used

- The cross-sections of “transformer” cables are generally smaller than those of the “network” cables. All the cables are then run through the same space
- When straight MV connectors are used, the depth P indicated below can be greater than that of the “network” cables



- The profiles, contacts and dimensions of the RM6 connection interfaces are defined by the IEC 60137 standard.
- 100% of the epoxy resin interfaces undergo dielectric testing at power frequency and partial discharge tests.
- An insulated connector must be used in order to guarantee the dielectric performance over time. Schneider Electric recommends using nkt connectors.

Appropriateness for use

The bushings carry the electrical current from the outside to the inside of the enclosure, which is filled with SF6 gas, ensuring insulation between the live conductors and the frame.

There are 3 types of bushing, which are defined by their short-time withstand current:

- Type A: 200 A: 12.5 kA 1 s and 31.5 kA peak (plug-in)
- Type B: 400 A: 16 kA 1 s and 40 kA peak (plug-in)
- Type C: 630 A: 25 kA 1 s, 21 kA 3 s and 62.5 kA peak (disconnectable M16)

How to define the connection interface

The connection interfaces depend on specific criteria, such as:

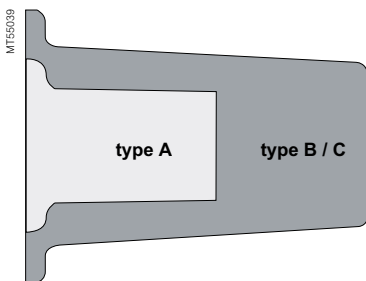
Installation

- Current rating of the connected equipment: 200, 400, 630 A
- Short-time withstand current for 12.5 kA, 16 kA, 25 kA switch and circuit breaker functions
- For the fuse-switch combination function, as the short-circuit current is limited by the fuse, the connection interface will be of type A (200 A)
- Minimum phase expansion length
- Connection type:
 - plug-in: multicontact ring
 - disconnectable: bolted
- Output position: straight, elbow.

Cable

- Specified voltage:
 - of the cable
 - of the network
- Type of conductor:
 - aluminium
 - copper
- Cross section in mm²
- Insulation diameter
- Cable composition:
 - single-core
 - 3-core
- Insulation type:
 - dry
 - paper impregnated (non-draining type)
- Type of screen
- Armature

This information must be provided to give a full explanation of the connection interfaces.



Types of connection interface

Cable connections

Compatible cable connections

- Directed field plug-in connector
- Dry single-core cable

Type A bushing

Performance	Connection	Supplier	Reference	Cross section	Remarks
7.2 to 10 kV 200 A -95 kV impulse	Plug-in	Elastimold	158LR	16 to 120	T-shaped elbow
		Elastimold	151SR	16 to 120	Straight, Q function only
		Prysmian	FMCE 250	16 to 95	
7.2 to 17.5 kV 200 A -95 kV impulse	Plug-in	nkt cables GmbH	EASW 12/250 A	25 to 95	Shaped elbow
		nkt cables GmbH	EASG 12/250 A	25 to 95	Straight
		Tycoelectronics	RSES-52xx	25 to 120	Shaped elbow
		Tycoelectronics	RSSS-52xx	25 to 95	Straight connection
7.2 to 24 kV 200 A -125 kV impulse	Plug-in	Elastimold	K158LR	16 to 95	T-shaped elbow
24 kV 200 A -125 kV impulse	Plug-in	nkt cables GmbH	EASW 20/250 A	25 to 95	Shaped elbow
		nkt cables GmbH	EASG 20/250 A	25 to 95	Straight
		Tycoelectronics	RSES-52xx	25 to 120	Shaped elbow
		Tycoelectronics	RSSS-52xx	25 to 95	Straight connection

- Non-directed field disconnectable connector (*)
- Dry single and 3-core cable

Type A/M8 bushing

Performance	Connection	Supplier	Reference	Cross section	Remarks
7.2 to 17.5 kV 200 A -95 kV impulse	Heat shrinkable	Tycoelectronics	EPKT + EAKT + RSRB	16 to 150	
	Insulating boots	Kabeldon	KAP70	70 max.	

(*) 520 mm plinth must be used

- Directed field plug-in connector
- Dry single-core cable

Type B bushing

Performance	Connection	Supplier	Reference	Cross section	Remarks
7.2 to 10 kV 400 A-95 kV impulse	Plug-in	Elastimold	400 LR	70 to 240	Limited to Us = 10 kV
7.2 to 17.5 kV 400 A-95 kV impulse	Plug-in	nkt cables GmbH	CE 12-400	25 to 300	
		Tycoelectronics	RSES-54xx	25 to 300	Shaped elbow
24 kV 400 A-125 kV impulse	Plug-in	Prysmian	FMCE 400	70 to 300	
		Elastimold	K400LR	35 to 240	
		Kabeldon	SOC 630	50 to 300	
		nkt cables GmbH	CE 24-400	25 to 300	
		Tycoelectronics	RSES-54xx	25 to 300	Shaped elbow

For cross section > 300 mm², please contact us.

Cable connections

Compatible cable connections

Type C bushing

- Directed field disconnectable connector
- Dry single-core cable

Performance	Connection	Supplier	Reference	Cross section	Remarks
7.2 to 10 kV 630 A-95 kV impulse	Disconnectable	Elastimold	440 TB	70 to 240	
7.2 to 17.5 kV 630 A-95 kV impulse	Disconnectable	nkt cables GmbH	CB 12-630	25 to 300	
		Tycoelectronics	RSTI-58xx	25 to 300	"T"-shaped connector
7.2 to 24 kV 630 A-125 kV impulse	Disconnectable	Prysmian	FMCTs 400	70 to 300	
		Elastimold	K400TB	35 to 240	
		Kabeldon	SOC 630	50 to 300	
24 kV 630 A-125 kV impulse	Disconnectable	nkt cables GmbH	CB 24-630	25 to 300	
		Tycoelectronics	RSTI-58xx	25 to 300	"T"-shaped connector

- Non-directed field disconnectable connector
- Dry single and three-core cable

Performance	Connection	Supplier	Reference	Cross section	Remarks
7.2 to 10 kV 630 A -95 kV impulse	Heat shrinkable	Tycoelectronics	EPKT + EAKT + RSRB	16 to 300	
		Sigmaform	Q-CAP	16 to 300	
	Insulating boots	Kabeldon	SOC 630	50 to 300	Completed by a kit for three core-pole cable
	Simplified disconnectable	Tycoelectronics	RICS + EPKT	25 to 300	
Euromold		15TS-NSS	50 to 300	Limited to Us = 20 kV	
24 kV 630 A -125 kV impulse	Disconnectable	nkt cables GmbH	AB 12-630	25 to 300 (+ATS)	For 3-core cable
	Simplified disconnectable	Tycoelectronics	RICS + EPKT	25 to 300	

- Non-directed field disconnectable connector
- Single-core cable, paper impregnated, non-draining type

Performance	Connection	Supplier	Reference	Cross section	Remarks
7.2 to 17.5 kV 630 A-95 kV impulse	Insulating boots	Kabeldon	SOC	25 to 300	
	Simplified disconnectable	Tycoelectronics	RICS - EPKT	25 to 300	
	Heat shrinkable	Tycoelectronics	EPKT+EAKT+RSRB	95 to 300	
24 kV 630 A-125 kV impulse	Simplified disconnectable	Tycoelectronics	RICS - EPKT	25 to 300	

- Non-directed field disconnectable connector
- Three-core cable, paper impregnated, non-draining type

Performance	Connection	Supplier	Reference	Cross section	Remarks
7.2 to 17.5 kV 630 A-95 kV impulse	Insulating boots	Kabeldon	SOC 630	25 to 300	
	Simplified disconnectable	Tycoelectronics	RICS - EPKT	25 to 300	
	Heat shrinkable	Tycoelectronics	EPKT+EAKT+RSRB	16 to 300	
24 kV 630 A-125 kV impulse	Simplified disconnectable	Tycoelectronics	RICS - EPKT	25 to 300	

For cross section > 300 mm², please contact us.

- Disconnectable connector
- Single-core dry cable and lightning arrester

Connectors with lightning arrestors

Performance	Connection	Supplier	Reference	Cross section	Remarks
7.2 to 17.5 kV 630 A-95 kV impulse	Disconnectable	nkt cables GmbH	AB 12-630 + ASA12 (5 or 10 kA)	25 to 300	Non-directed field
			CB 24-630 + CSA 24 (5 or 10 kA)	25 to 300	Directed field
24 kV 630 A-125 kV impulse	Disconnectable	nkt cables GmbH	AB 12-630 + ASA12 (5 or 10 kA)	25 to 300	Non-directed field
			CB 24-630 + CSA 24 (5 or 10 kA)	25 to 300	Directed field
7.2 to 17.5 kV 630 A-95 kV impulse	Disconnectable	Tycoelectronics	RICS+EPKT RDA 12 or 18	25 to 300	
		Elastimold	K400TB + K400RTPA + K156SA	35 to 300	Enlarged cable box
24 kV 630 A-125 kV impulse	Disconnectable	Tycoelectronics	RICS + EPKT RDA 24	25 to 300	Enlarged cable box
		Elastimold	K440TB + K400RTPA + K156SA	35 to 300	Enlarged cable box
		Tycoelectronics	RSTI-58 + RSTI-CC-58SAxx05	25 to 300	Directed field 5 kA arrester
		Tycoelectronics	RSTI-58 + RSTI-CC- 66SAxx10M16	25 to 300	Directed field 10 kA arrester

For cross section > 300 mm², please contact us.

Order form

Order form

Available functions	92
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Available functions

Basic unit characteristics																			
Rated voltage	(kV)	12	12	12	12	17.5	17.5	17.5	17.5	24	24	24	24	24	24	24	24	24	
Short-time withstand current	(kA rms)	21	21	25	25	21	21	21	21	12.5	12.5	12.5	16	16	16	20	20	20	
	Duration (s)	1	1	1	1	1	3	1	3	1	1	1	1	1	1	1	3	1	
Rated current	(A)	200	630	200	630	200	200	630	630	200	400	630	200	400	630	200	200	630	
Extensions	Functions																		
NE	I				•			•		•	•			•	•			•	
	D	•		•		•				•			•			•			
	P				•			•	•						•			•	
	QI			•		•		•		•			•			•			
	DI			•		•		•		•			•			•			
	PI				•			•	•						•			•	
	II				•			•			•			•	•			•	
	IQI		•		•			•	•		•			•	•			•	•
	IIQI		•		•			•	•		•			•	•			•	•
	QIQI		•		•			•	•		•			•	•			•	•
	IDI				•			•	•		•	•		•	•			•	•
	IIDI				•			•	•		•	•		•	•			•	•
	DIDI				•			•	•		•	•		•	•			•	•
	III				•			•	•		•			•	•			•	•
	IIII				•			•	•		•			•	•			•	•
	IPI				•			•	•						•			•	•
	IIPi				•			•	•						•			•	•
PIPI				•			•	•						•			•	•	
RE	O			•	•		•		•			•		•	•		•	•	
	IQI		•		•			•	•		•			•	•		•	•	
	IIQI		•		•			•	•		•			•	•		•	•	
	QIQI		•		•			•	•		•			•	•		•	•	
	IDI				•			•	•		•	•		•	•		•	•	
	IIDI				•			•	•		•	•		•	•		•	•	
	DIDI				•			•	•		•	•		•	•		•	•	
	II				•			•		•				•	•		•	•	
	III				•			•	•		•			•	•		•	•	
	IIII				•			•	•		•			•	•		•	•	
	IPI				•			•	•						•		•	•	
IIPi				•			•	•						•		•	•		
PIPI				•			•	•						•		•	•		
LE	O			•	•		•		•			•		•	•		•	•	
	I				•			•	•		•			•	•		•	•	
	PC				•				•					•	•		•	•	
	IC				•				•					•	•		•	•	
	O			•	•		•		•			•		•	•		•	•	
	Q	•		•		•	•		•			•		•		•	•		
	D			•		•	•		•			•		•		•	•		
	P				•			•	•					•	•		•	•	
	IQI		•		•			•	•					•	•		•	•	
	IIQI		•		•			•	•					•	•		•	•	
DE	IDI				•			•	•			•		•		•	•	•	
	IIDI				•			•	•			•		•		•	•	•	
	III				•			•	•					•	•		•	•	
	IIII				•			•	•					•	•		•	•	
	IPI				•			•	•					•	•		•	•	
	IIPi				•			•	•					•	•		•	•	
	Mt				•			•						•			•	•	

N.P.: D and Q functions limited to 200 A
 NE: non-extensible, RE: extensible to the right, LE: extensible to the left, DE: double extensible.
 All performances are available for RM6 Free Combination cubicles.

Basic unit and options

Only one of the boxes (ticked or filled with the required value) has to be taken into account between each horizontal line.
 Grey box corresponds to functions without a price.

Basic unit configuration						Quantity	<input style="width: 50px;" type="text"/>						
	5th function	4th function	3rd function	2nd function	1st function								
Configuration (one function per box, fill in from the right) 5 functions choice →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Option for I, D, B, Ic, Bc functions													
Auxiliary contacts alone For main switch position indication 2 NO - 2 NC and ESw 1 O/C (this option is included in remote operation option)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Option for I or Ic function													
Arc killer device	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Front door of cable connection compartment													
Bolted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Removable with ESw interlocking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Removable with ESw interlocking and LBSw interlocking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Fault or load current indicator and voltage detection													
Amp 21D	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Flair 21D	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Flair 22D	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Flair 23DM*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
VD23	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Alpha M	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Alpha E	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
CT on bushings													
CT for T200 I on bushings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
CT for T200 I on bushings + VD23	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Remote operation on I function													
Motor mechanism and auxiliary contacts LBSw 2 NO - 2 NC and ESw 1 O/C Add metallic VT in some RM6 cubicle (I function)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	50 Hz	<input type="checkbox"/>	60 Hz	<input type="checkbox"/>	120 Vac	<input type="checkbox"/>	220 Vac	<input type="checkbox"/>
						24 Vdc	<input type="checkbox"/>	48 Vdc	<input type="checkbox"/>	60 Vdc	<input type="checkbox"/>		
						110 Vdc	<input type="checkbox"/>	125 Vdc	<input type="checkbox"/>	220 Vdc	<input type="checkbox"/>		
Option for D, B, Bc functions													
Front door of cable connection compartment													
Bolted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Removable with ESw interlocking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Removable with ESw interlocking and C.B. interlocking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Protection relay for lines or transformer protection by circuit breaker (only one type of relay per unit)													
Relay VIP 40 (over current)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Relay VIP 45 (over current and earth fault)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Relay VIP 410	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Relay VIP 400 (over current & earth fault/multi curve in accordance with IEC 255-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Motor disabled when CB trips	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Fault tripping auxiliary contact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Shunt trip coil for external tripping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	50 Hz	<input type="checkbox"/>	60 Hz	<input type="checkbox"/>	120 Vac	<input type="checkbox"/>	220 Vac	<input type="checkbox"/>
						24 Vdc	<input type="checkbox"/>	48 Vdc	<input type="checkbox"/>	60 Vdc	<input type="checkbox"/>		
						110 Vdc	<input type="checkbox"/>	125 Vdc	<input type="checkbox"/>	220 Vdc	<input type="checkbox"/>		
Remote operation on D, B, Bc functions													
Motor mechanism and auxiliary contacts C.B. 2 NO - 2 NC and ESw 1 O/C (including shunt trip coil)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	50 Hz	<input type="checkbox"/>	60 Hz	<input type="checkbox"/>	120 Vac	<input type="checkbox"/>	220 Vac	<input type="checkbox"/>
						24 Vdc	<input type="checkbox"/>	48 Vdc	<input type="checkbox"/>	60 Vdc	<input type="checkbox"/>		
						110 Vdc	<input type="checkbox"/>	125 Vdc	<input type="checkbox"/>	220 Vdc	<input type="checkbox"/>		
DE-D et DE-B only. Option of ring type CT in some RM6 cubicles													
Option for Q function													
Auxiliary contacts alone For position indication 2 NO - 2 NC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								

Basic unit and options

Only one of the boxes (ticked or filled with the required value) has to be taken into account between each horizontal line.
 Grey box corresponds to functions without a price.

Basic unit configuration (continued)						Quantity				
Auxiliary contact for blown fuses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Shunt trip coil for external tripping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	50Hz <input type="checkbox"/>	60Hz <input type="checkbox"/>	120 Vac <input type="checkbox"/>	220 Vac <input type="checkbox"/>	
						24 Vdc <input type="checkbox"/>	48 Vdc <input type="checkbox"/>	60 Vdc <input type="checkbox"/>		
						110 Vdc <input type="checkbox"/>	125 Vdc <input type="checkbox"/>	220 Vdc <input type="checkbox"/>		
Remote operation on Q function Motor mechanism and auxiliary contacts 2 NO - 2 NC (including shunt trip coil)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	50Hz <input type="checkbox"/>	60Hz <input type="checkbox"/>	120 Vac <input type="checkbox"/>	220 Vac <input type="checkbox"/>	
						24 Vdc <input type="checkbox"/>	48 Vdc <input type="checkbox"/>	60 Vdc <input type="checkbox"/>		
						110 Vdc <input type="checkbox"/>	125 Vdc <input type="checkbox"/>	220 Vdc <input type="checkbox"/>		
Option for D, B, Q functions Undervoltage coil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			120 Vac <input type="checkbox"/>	220 Vac <input type="checkbox"/>	
						24 Vdc <input type="checkbox"/>	48 Vdc <input type="checkbox"/>	110 Vdc <input type="checkbox"/>		

* Contact us for availability

Only one of the boxes (ticked or filled with the required value) has to be taken into account between each horizontal line.
 Grey box corresponds to functions without a price.

Basic unit configuration (continued)					Quantity					
	5th function	4th function	3rd function	2nd function	1st function					
Configuration (one function per box, fill in from the right) Example →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
	I		I		I					
Option for operation										
Voltage indicator VPIS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Network service voltage (kV)	10 <input type="checkbox"/>	15 <input type="checkbox"/>		
VPIS Voltage Output (compulsory if with VD23 or Flair 22D*, 23D*, 23DM*)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6 <input type="checkbox"/>	11 <input type="checkbox"/>	20 <input type="checkbox"/>		
VDS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.6 <input type="checkbox"/>	13.8 <input type="checkbox"/>	22 <input type="checkbox"/>		
Key locking devices						Flat key type <input type="checkbox"/>	Tubular key type <input type="checkbox"/>			

Type R1 (on I and B functions)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	On switch or circuit breaker <input type="checkbox"/>	On earth switch <input type="checkbox"/>
Type R2 (on I and B functions)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Type R6 (on Q or D functions)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Type R7 (on Q or D functions)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Type R8 (on Q or D functions)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

* Contact us for availability

Options and accessories

Only one of the boxes (ticked or filled with the required value) has to be taken into account between each horizontal line.
 Grey box corresponds to functions without a price.

Specific option for one function									
Bushing for I function									
Plug-in 400 A type B									
Bolted M16 screw type C (compulsory with 17.5 or 24 kV-630 A)									
Bolted 5/8" ANSI									
Bushing for D function									
Plug-in 200 A type A (limited to 12.5 kA 1 s)									
Plug-in 400 A type B (limited to 16 kA 1 s)									
Bolted M16 screw type C (compulsory with 17.5 or 24 kV-630 A)									
Bushing well ANSI (limited to 12.5 kA 1 s)									
Bushing for B function									
Bolted M16 type C									
Bolted 5/8" ANSI									
Bushing for Q function									
Plug-in 200 A									
Heat shrinkable terminal for fuse chamber									
Cable type for I, Ic functions									
Single core <input type="checkbox"/> Three-core <input checked="" type="checkbox"/>									
Bottom plate in cable box (compulsory with three-core cable)									
Cable type for D, B, Bc functions									
Single core <input type="checkbox"/> Three-core <input checked="" type="checkbox"/>									
Bottom plate in cable box (compulsory with three-core cable)									
Cable type for O function									
Single core <input type="checkbox"/> Three-core <input checked="" type="checkbox"/>									
Bottom plate in cable box (compulsory with three-core cable)									
In and fuse type for Q function									
6 kV <input type="checkbox"/> 10 kV <input type="checkbox"/> 12/24 kV & 10/100 A <input checked="" type="checkbox"/>									
(fuses to be procured separately) 16 to 100 A <input type="checkbox"/> 125 A <input type="checkbox"/>									
Global option									
Pressure detection									
Manometer Arabic <input type="checkbox"/> Scandinavian <input type="checkbox"/> Standard <input type="checkbox"/>									
or pressure switch Scandinavian <input type="checkbox"/> Standard <input type="checkbox"/>									
Door with window (for I, D and B functions)									
Deep cable box for I and D or B functions									
(enables surge arrestors to be fitted)									
Additional earth busbar									
(compulsory if earth fault > 6 kA 1 s)									
Internal arc cable box 20 kA 1 s for I, D, B, O, Ic, Bc functions									
(unable to coexist with door with window)									
Autotransfer system for I function I (48 Vdc electrical motorization compulsory)									
Fixation support T200 I to RM6 Without <input checked="" type="checkbox"/> With <input type="checkbox"/>									
Changeover type ATS 1/2 network <input type="checkbox"/> ATS 1/2 genset <input type="checkbox"/> BTA 2/3 <input type="checkbox"/>									
Communication modem GSM/GPRS <input type="checkbox"/> FSK (radio) <input type="checkbox"/> RS485 <input type="checkbox"/>									
Protocol IEC101/104 <input type="checkbox"/> DNP3/IP <input type="checkbox"/>									
Current measurement (only cables, if CT on RM6 bushings)									
sensors + cables									
Single core AC 5 m <input type="checkbox"/> Single core AC 10 m <input type="checkbox"/> Three-core AH 5 m <input type="checkbox"/> Three-core AH 10 m <input type="checkbox"/>									
Connection cable to motorization 1 3 m <input type="checkbox"/> 5 m <input type="checkbox"/> 10 m <input type="checkbox"/>									
Connection cable to bus tie (only for BTA 2/3) 5 m <input type="checkbox"/> 10 m <input type="checkbox"/>									
Connection cable to motorization 2 3 m <input type="checkbox"/> 5 m <input type="checkbox"/> 10 m <input type="checkbox"/>									
Accessories									
Raising plinth h = 260 mm <input type="checkbox"/> h = 520 mm <input type="checkbox"/>									
Set of 3 MV fuses Fusarc CF Rating (A) <input type="checkbox"/>									
Phase comparator									
Test box for circuit breaker relay (VAP 6)									
PS100 backup power supply									
Exhaust gas To the bottom <input type="checkbox"/> To the rear <input type="checkbox"/>									
Additional operating handle Standard <input type="checkbox"/> Longer <input type="checkbox"/> Super long <input type="checkbox"/>									
Additional extension kit 1 fct <input type="checkbox"/> 2 fct <input type="checkbox"/> 3 fct <input type="checkbox"/> 4 fct <input type="checkbox"/> 5 fct <input type="checkbox"/> DE Mt <input type="checkbox"/>									
Additional instructions									
Installation and civil engineering instructions French <input type="checkbox"/> English <input type="checkbox"/>									



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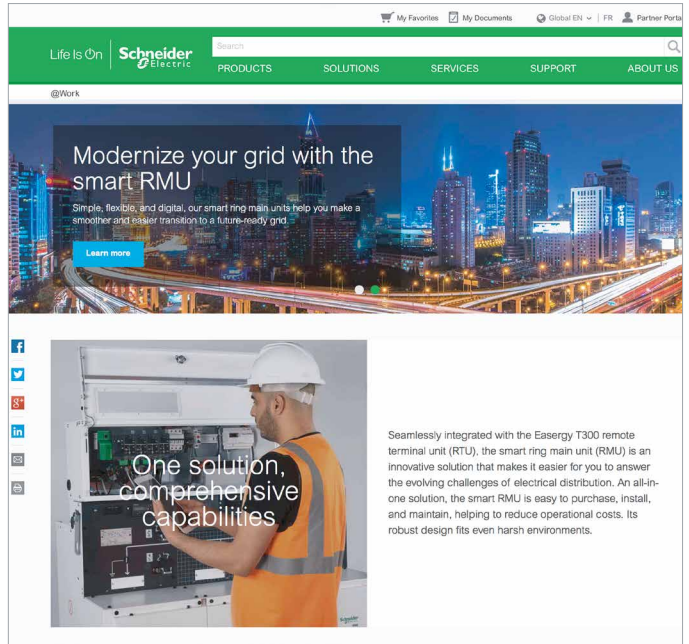
<https://www.schneider-electric.com/en/work/products/product-launch/smart-ring-main-unit/>



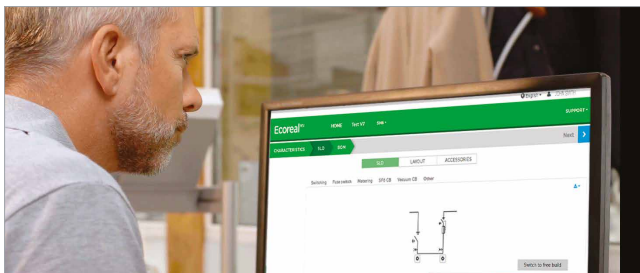
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Schneider Electric Industries SAS

35 rue Joseph Monier
92500 Rueil-Malmaison, France
Tel : +33 (0)1 41 29 70 00

www.schneider-electric.com

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