

EcoStruxure™
Innovation At Every Level

Green
Premium™

Sustainable
performance,
by design

Set series

RM6

Catalog 2020

Gas Insulated Ring Main Unit
Up to 24 kV



se.com/rm6

Life Is On

Schneider
Electric

Same technology, same offer, simpler names

We're making it easier for you to navigate across the wide range of our world-class digital products and select the offers that are right for you and your needs with confidence.

EcoStruxure Architecture

To enable brand consistency, relevance and impact, we are reinforcing our EcoStruxure™ architecture and digital customer lifecycle tools to help ensure a seamless experience from the CAPEX to OPEX phases of each project, bridging our entire ecosystem of partners, services providers and end users.

EcoStruxure is our IoT-enabled open and interoperable system architecture and platform. EcoStruxure delivers enhanced values around safety, reliability, efficiency, sustainability and connectivity for our customers. EcoStruxure leverages advancements in IoT, mobility, sensing, cloud, analytics, and cybersecurity technologies to deliver Innovation At Every Level from Connected Products, Edge Control, Apps, and Analytics & Services: our IoT technology Levels.

Old names	New names
Ecodial	EcoStruxure Power Design
Ecoreal	EcoStruxure Power Build
Ecoreach	EcoStruxure Power Commission
MasterPact MTZ mobile App/Easergy mobile App	EcoStruxure Power Device App

Set Series

Featuring outstanding medium-voltage (MV) and low-voltage (LV) switchboards, motor control centers and power distribution solutions for high-performance power applications, Schneider Electric's Set Series is best-in-class solutions based on high levels of safety and an optimized footprint. Built on a modular architecture and incorporating smart connected devices for maximum safety, reliability, performance and energy efficiency, the Set Series is delivered to customers directly from our Schneider Electric plants or via a global network of licensed partner panel builders, who are trained and audited to provide quality equipment and support.

Old names	New names
Premset	PremSet
Compact	ComPact
Masterpact	MasterPact
Transferpact	TransferPact
Fupact	FuPact

General contents

RM6



PM108339

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Safety & Reliability



- **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 the front fascia of the equipment
- The presence of natural interlocks, as recommended in IEC 62271-200 through simple & easy to understand mimics, 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.

Efficiency



- **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 motorization etc.

Connected



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

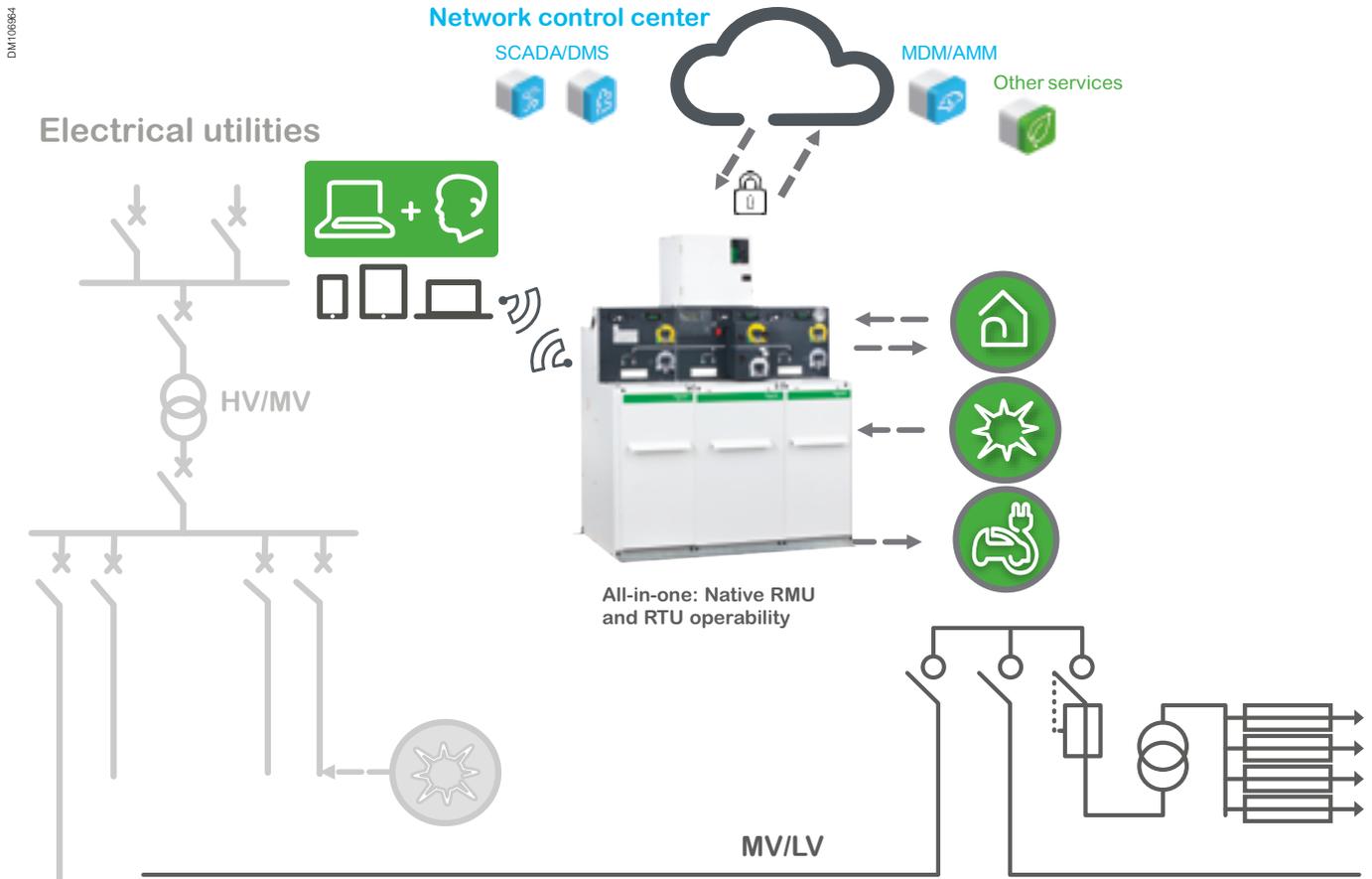
- **Reduce downtime** with condition-based maintenance enabled by sensors and automation

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

The RM6 is a **compact** and very **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.

RM6 connected

For efficient grid operations



Efficient asset management

Condition monitoring

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



24/7 connectivity

Remote network management

Power management



Increased Safety & Reliability

Advanced relaying & protection options

Vibration & seismic compliant

A 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

PM107076



Convenient solution for all possible RTU integrations

- Top mounted
- Side mounted
- Wall mounted

Improved Terminal block with clip on connectors for reduced wiring time

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Overview

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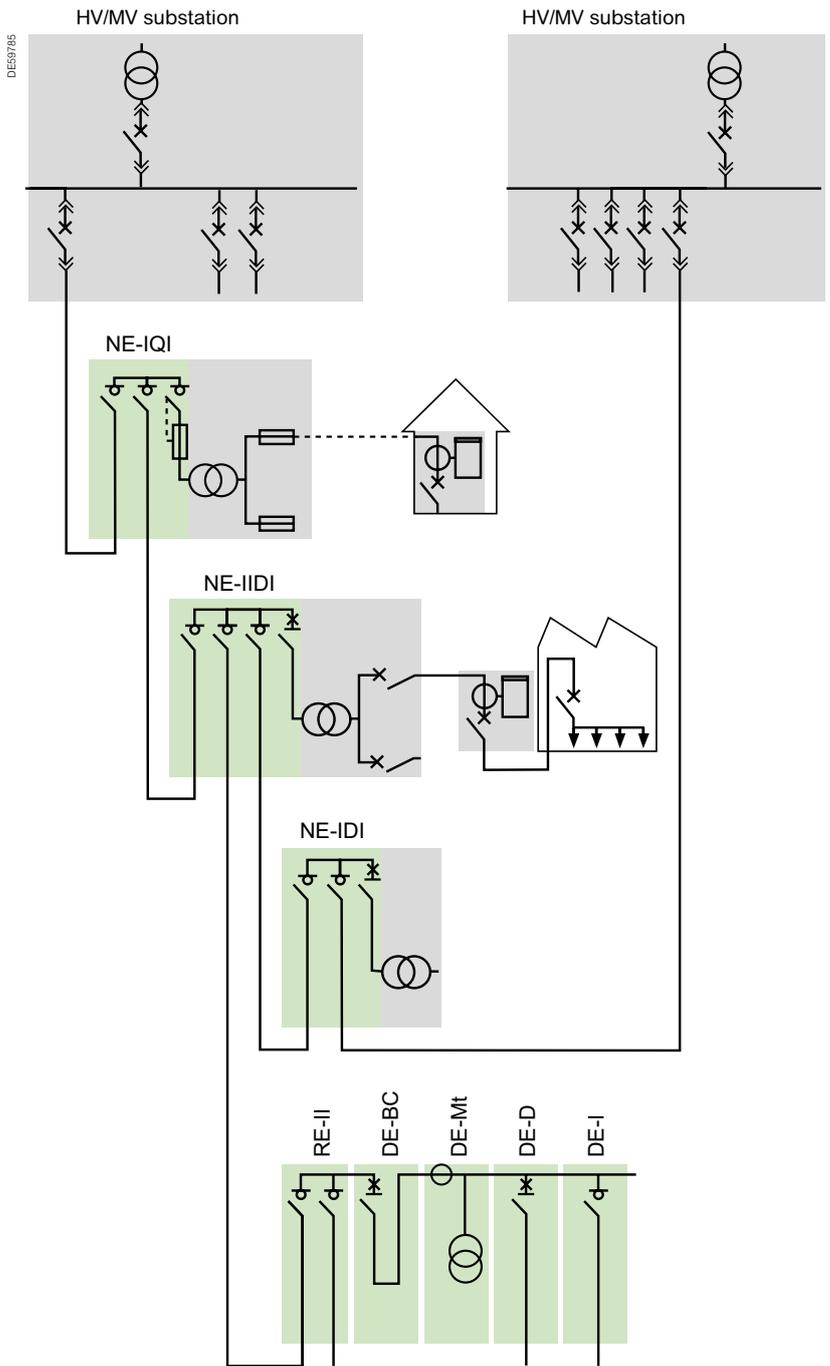
Field of application

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



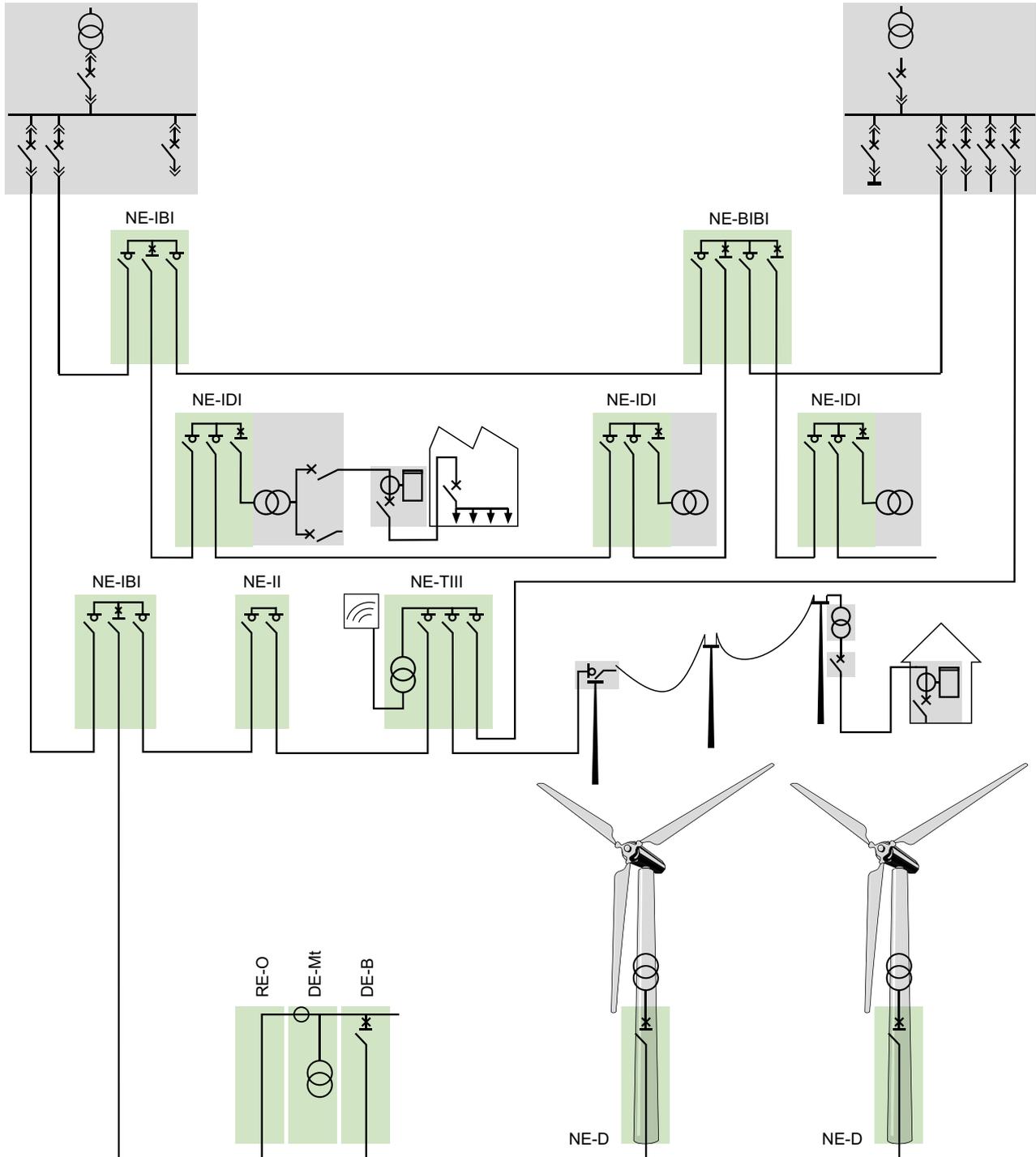
Field of application

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.

DE95761



Field of application

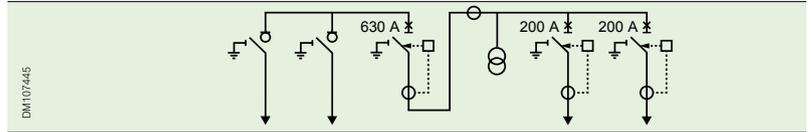
Examples of typical applications
(free combination tank)

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Private metering

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

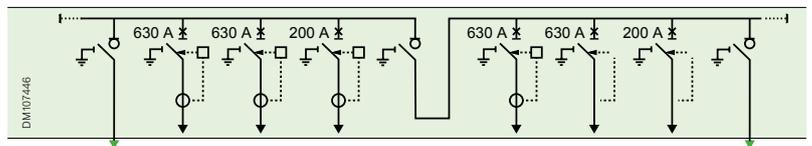


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Switching large sites

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



Connection to MV network

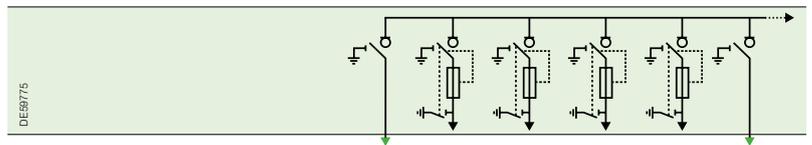
Connection to MV network

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Large transformer substation

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



Connection to MV network

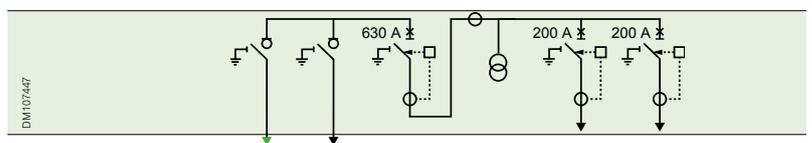
Connection to MV network

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Separate MV consumer substation

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



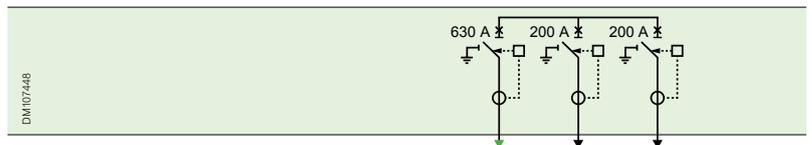
Connection to the open ring

PM107083



Separate 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 the 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

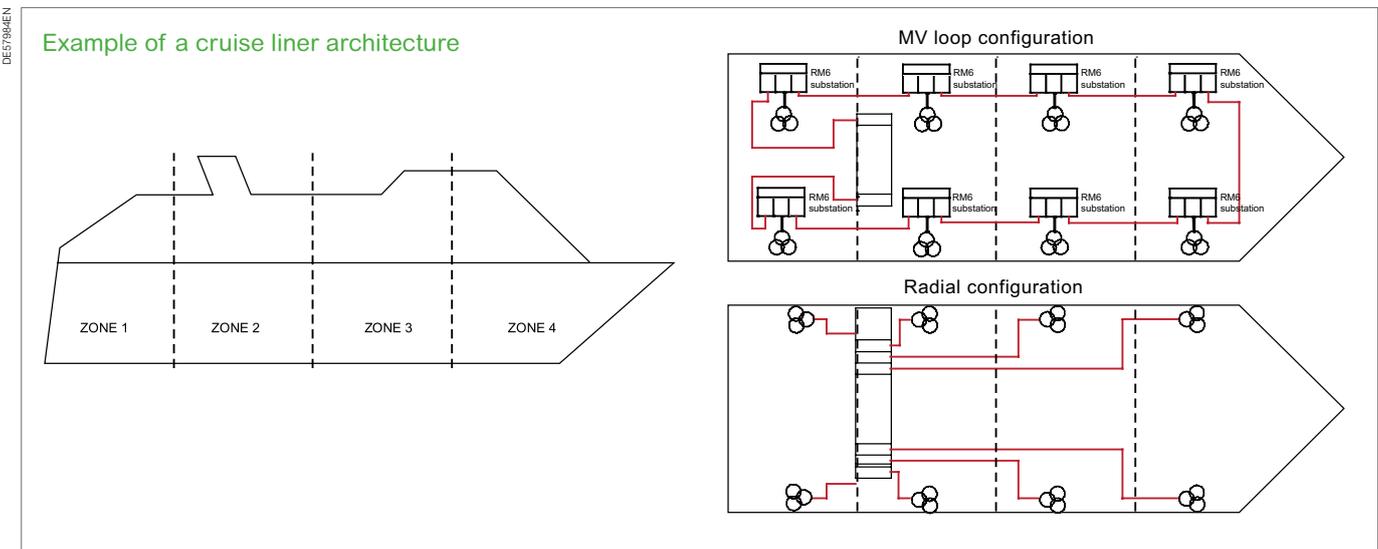
If a RM6 is equipped with a special LRU (internal arc Reduction Unit) "filter", internal arc classification is AFLR 20 kA 1 s as per IEC 62271-200.

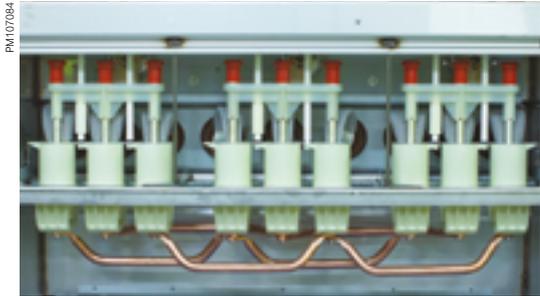
Resistance to vibrations

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

Some Marine references

Aker Yards:	Meyer Werft:
<ul style="list-style-type: none"> • NCL Cruise Liner • Genesis 1 & 2. 	<ul style="list-style-type: none"> • AIDA ships • Norwegian Gem • Norwegian Pearl • Pride of Hawaii • Norwegian Jewel • Jewel of the Seas...





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 (1 sec)	Bottom Exhaust
16 kA A-FL	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 1 second, in order to provide maximum operator protection should an internal arc occur.

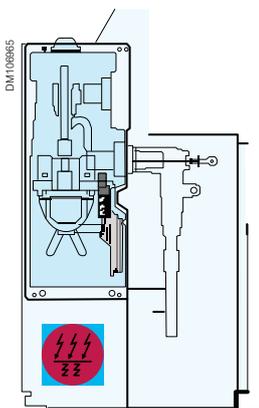
Accidental overpressure due to an internal arc is limited by opening the safety valve at the bottom of the metal enclosure.

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 on non-extensible RM6 or not on the side of an extension.

* Please contact us for different internal Arc options



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Reliable operating mechanisms

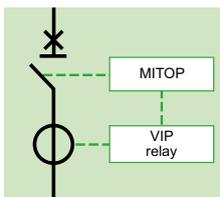
The electrical and mechanical operating mechanisms are located behind a front panel displaying the mimic diagram of the switchgear status (closed, open, earthed):

- **Closing:** the moving contact assembly is manipulated by means of a fast-acting operating mechanism. Outside these operations, no energy is stored. For both the circuit breaker and the fuse switch, the opening mechanism is charged while the contacts are closing.
- **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 in the event of 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 disconnecter 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

PM107087



DE57982EN



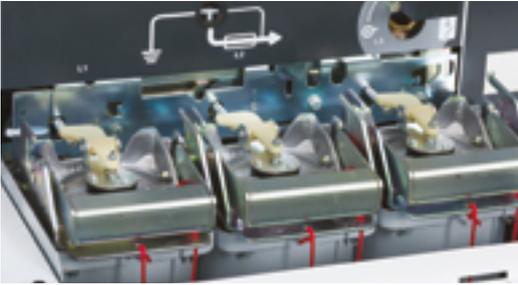
RM6 circuit breaker offers enhanced power availability and lower operating costs

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 for 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 environments
- 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

PM107088



Sealed Pressure system

RM6 benefits from complete insulation:

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

PM107089



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!

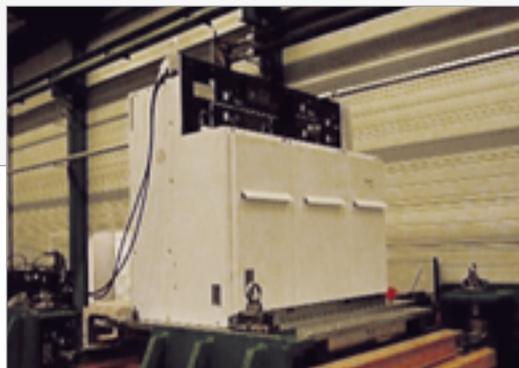
Seismic & Vibration Withstand

In order to overcome the hazards originating from earthquakes and the impact of vibrations in typical applications like wind turbines, mining and marine, the 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

PM107090



RM107091



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 via the busbar using dedicated 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.

RM107092



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.

EcoStruxure™ ready

What is EcoStruxure™?

450 000

EcoStruxure™ systems deployed since 2007 with the support of our 9000 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.

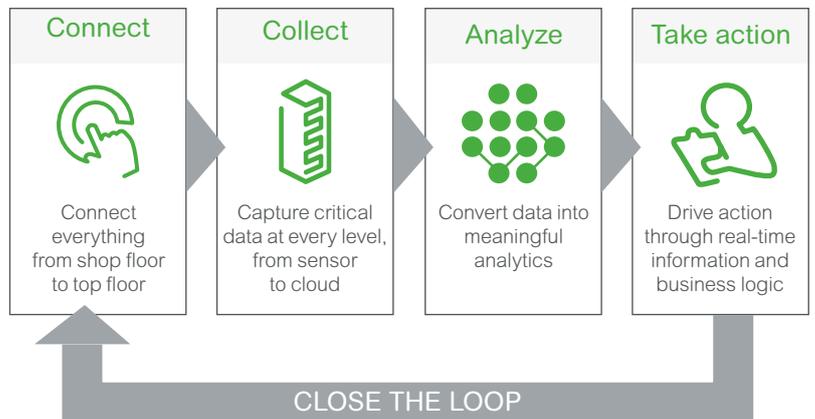
The EcoStruxure™ architecture and interoperable technology platform bring together energy, automation, and software. It provides enhanced value around safety, reliability, efficiency, sustainability and connectivity.

Turn data into action

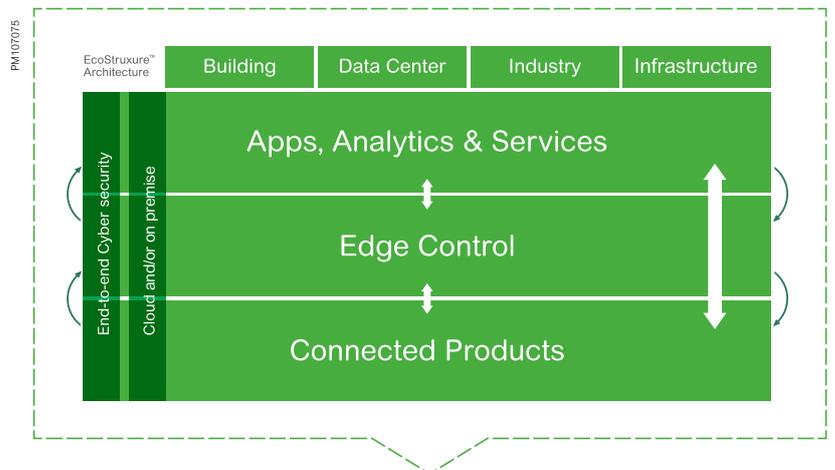
EcoStruxure™ architecture lets customers maximize the value of data.

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



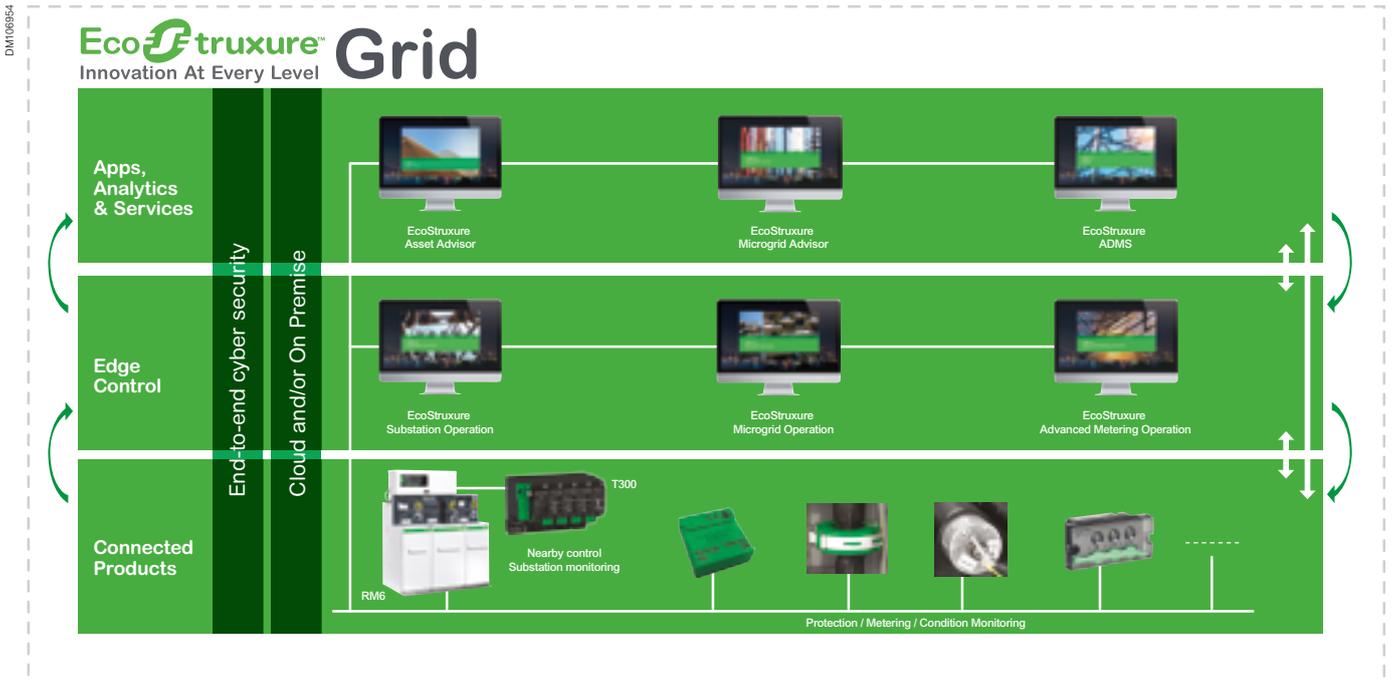
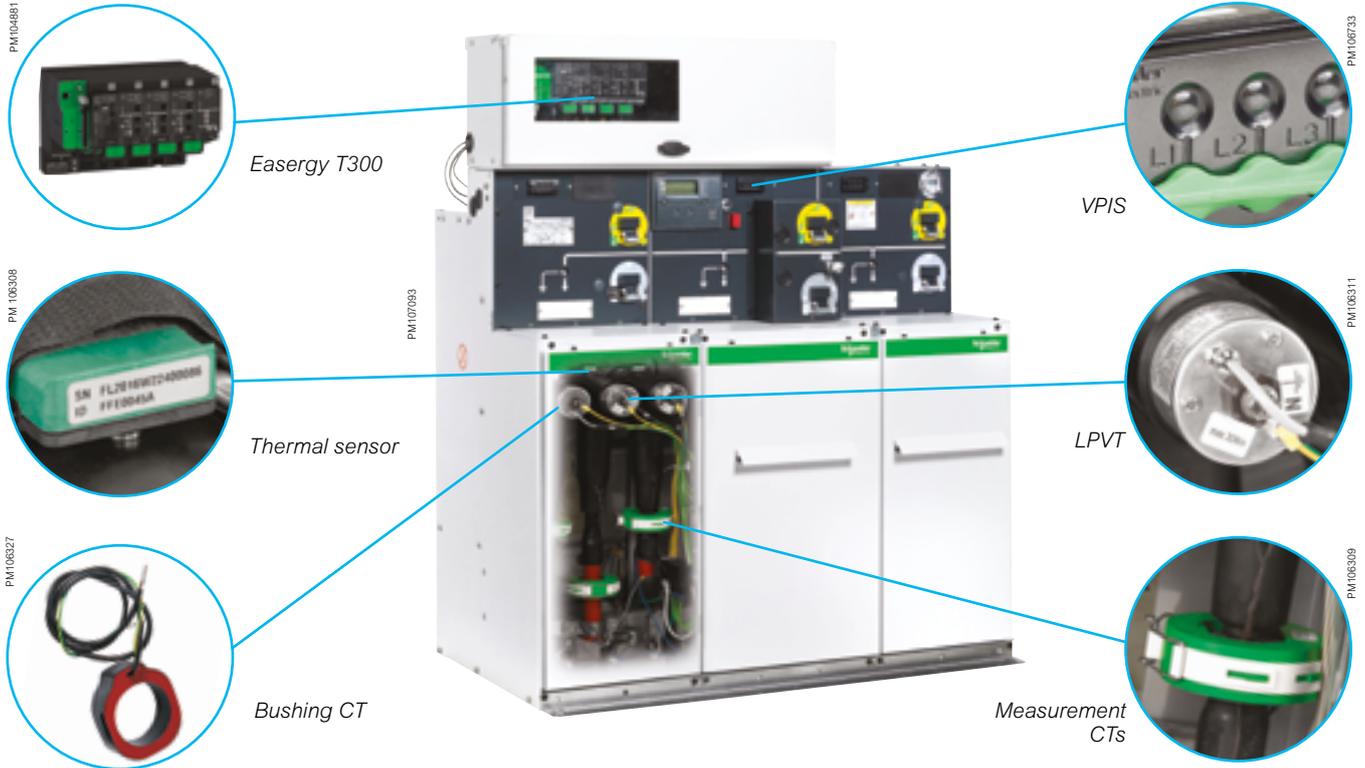
EcoStruxure™ Building | EcoStruxure™ Power | EcoStruxure™ IT | EcoStruxure™ Machine | EcoStruxure™ Plant | EcoStruxure™ Grid

EcoStruxure™ ready

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.



EcoStruxure™ ready

IoT connected MV equipment

Offer structures for our connected MV products

Our RM6 connected is bringing new functionalities and therefore new opportunities. In parallel, our customer needs are diverse and raise different expectations. For this reason, we have introduced scalable architectures to better meet your needs: **Enabled**, **Enabled plus** (under development), and **Advanced**.

Scalability for fit for purpose solutions

Enabled

The Enabled solution as an entry level offer.

For customers who prefer an incremental approach, we propose an efficient and cost effective alternative to [cable thermo scanning](#) using temperature wireless sensors and a smart phone app.



RM6



TH110



Thermal app



Advanced

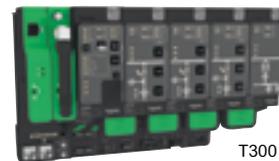
And finally for customers willing to move full speed, an all in one Box offer.

Based on our latest developments: Easergy T300 is the "one box" solution to perform protection, metering, and condition monitoring functions, all in one.

A fully integrated solution with optimized architecture.



RM6



T300



TH110



CL110



CT



LPVT



VPIS

EcoStruxure™ ready IoT connected MV equipment



RM6 connected **Enabled**: effective asset management

Electrical connections can start to deteriorate due to:

- Physical connections (improper tightening torque, vibrations)
- Surface damage (due to corrosion, excessive pressure or friction)

Deterioration can then be accelerated by:

- Increase of contact electrical resistance that induces an increase in temperature
- The resulting thermal runaway can cause a connection failure. Fires, flashover or explosions can occur, leading to the destruction of the switchgear, or even worse

Therefore, insurance companies consider poor electrical connections to be a major fire or failure hazard (loss of production) and some request annual surveys.

The National Fire Protection Administration recommends an annual thermal survey (standard NFPA 70B).

The answer is simple, regular monitoring of your power system equipment will help it to remain in good condition, with less risk of downtime. Meet the RM6 Connected Enabled.

The **RM6 Connected Enabled** cubicle includes:

- A proven and robust RM6 RMU
- An innovative thermal sensor, TH110, strategically placed on critical connection points
- A dedicated thermal connect app to access temperature information

DM1106969



RM6

Supported by our App to view & share temperature information



Schneider Electric cloud/customer database

Temperature info acquired through a Zigbee protocol into a Zigbee concentrator



TH110



TH110



TH110

TH110 mounted on cable termination

EcoStruxure™ ready

IoT connected MV equipment

RM6 connected **Enabled**: effective asset management

RM6 Connected Enabled

EcoStruxure Architecture



DM1106989



EcoStruxure™ ready

IoT connected MV equipment

RM6 connected **Advanced**: suitable for complex and smart grids

Advanced features

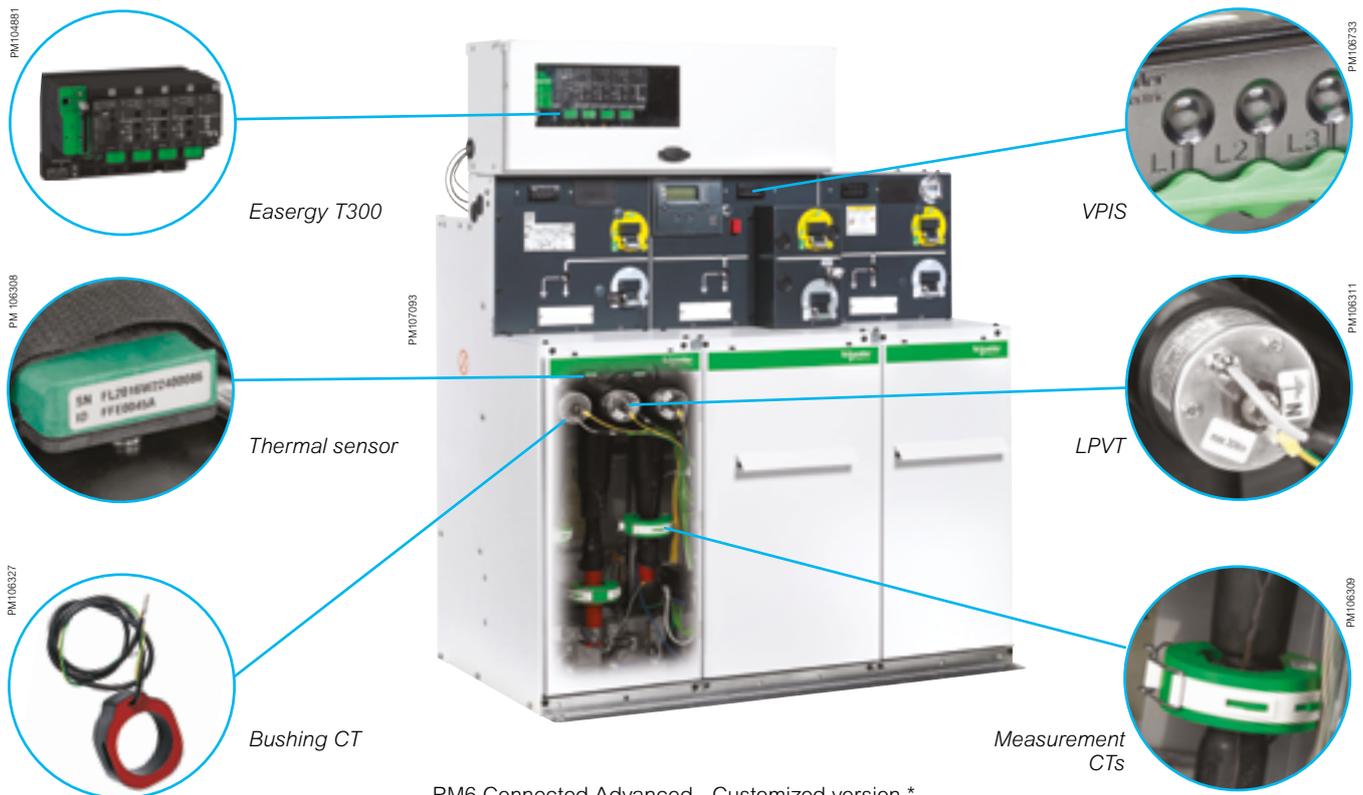
Effective asset management, increased safety, 24/7 connectivity, network management

The **RM6 Connected Advanced** solution is designed to leverage solution benefits, in addition to bringing the best IoT capabilities for reliable and efficient asset management.

The **RM6 Connected Advanced** solution contributes to an open and transparent information solution for smart grid medium voltage distribution networks.

The **RM6 Connected Advanced cubicle** is a complete integrated solution that consists of:

- A proven and robust RM6 RMU with voltage and current sensors
- An RTU (T300) located in an LV cabinet, located on top of the RM6
- A fully tested solution for peace of mind
- Plug and play installation



RM6 Connected Advanced - Customized version *

* Contact us for further details

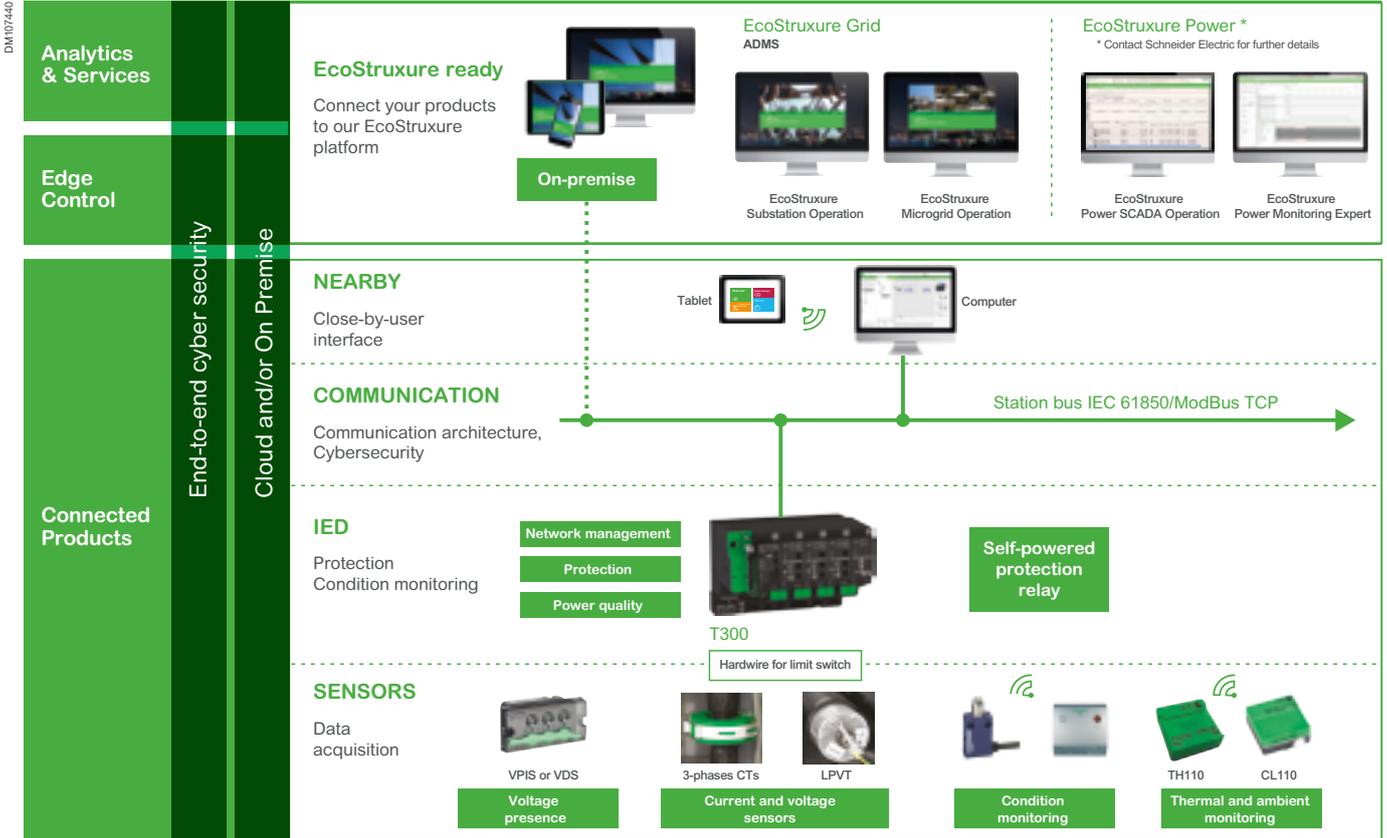
EcoStruxure™ ready

IoT connected MV equipment

RM6 connected **Advanced**: suitable for complex and smart grids

RM6 Connected Advanced

EcoStruxure Architecture



RM6 Connected Advanced Key Features

- Simplify installation and commissioning
- Reduce outage time and network losses
- Cut down maintenance costs
- Optimize investments
- Offer network facilities adapted to smart grid applications
- Make available automatic network reconfiguration capabilities
- Improve fault management
- Improve power quality
- Compliance with latest polices and standards such as cyber security and IEC 61850

Schneider Electric services

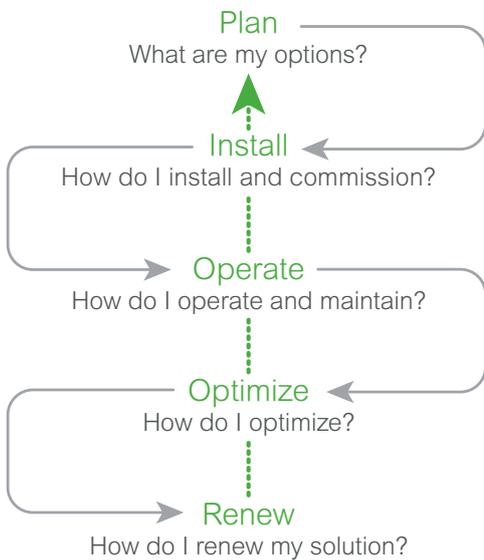
Peace of mind throughout your installation life cycle

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

DB403843



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 an 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 installations:** 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



Green Premium™



More than 75% of our product sales offer superior transparency on the material content, regulatory information and environmental impact of our products:

- RoHS compliance
- REACH substance information
- Industry leading # of PEP's*
- Circularity instructions



Discover what we mean by green
[Check your products!](#)

The Green Premium program stands for our commitment to deliver customer valued sustainable performance. It has been upgraded with recognized environmental claims and extended to cover all offers including Products, Services and Solutions.

CO₂ and P&L impact through... Resource Performance

Green Premium brings improved resource efficiency throughout an asset's lifecycle. This includes efficient use of energy and natural resources, along with the minimization of CO₂ emissions.

Cost of ownership optimization through... Circular Performance

We're helping our customers optimize the total cost of ownership of their assets. To do this, we provide IoT-enabled solutions, as well as upgrade, repair, retrofit, and remanufacture services.

Peace of mind through... Well-being Performance

Green Premium products are RoHS and REACH compliant. We're going beyond regulatory compliance with step-by-step substitution of certain materials and substances from our products.

Improved sales through... Differentiation

Green Premium delivers strong value propositions through third-party labels and services. By collaborating with third-party organizations we can support our customers in meeting their sustainability goals such as green building certifications.

*PEP: Product Environmental Profile (i.e. Environmental Product Declaration)



...SUSTAINABILITY READY



Boost your operational sustainability with RM6

We are helping our customers and partners to create more sustainable and efficient operations by reducing their carbon footprint and operating costs.

Durability: the RM6's design has been endorsed by accelerated aging and a thorough evaluation of its materials (such as EPDM for gaskets, or stainless steel for the cover). This ensures a long service life under normal operating conditions. In addition, current user feedback indicates a high MTTF (Mean Time To Failure).

Upgradeability: The RM6 can be digitally upgraded with the addition of our EcoStruxure system:

- TH110: Battery free temperature monitoring
- CL110: Ambient condition monitoring
- T300

Lower your environmental impact with RM6



Circular performance



Resource performance



Well-being performance



Achieve LEED™ credits with RM6

- Building Product Disclosure and Optimization
- Advanced Energy Metering



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 in every department and are 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 (AFAQ)). 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, the 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.

Environment

Schneider Electric is committed to a long term environmental approach.

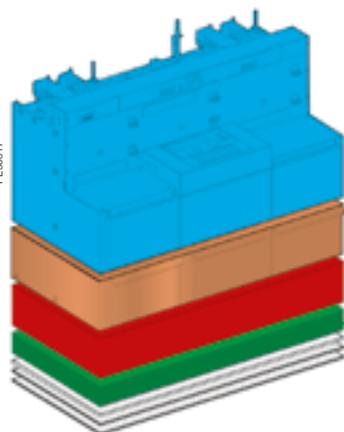
Schneider Electric's recycling procedure for SF6 based products is subject to rigorous management to allow each device to be traced through to end of life.

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%



Range description

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RM6 connected Enabled	33
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RM6 is an indoor gas-insulated switchgear up to 24kV for secondary distribution networks.



Electrical characteristics

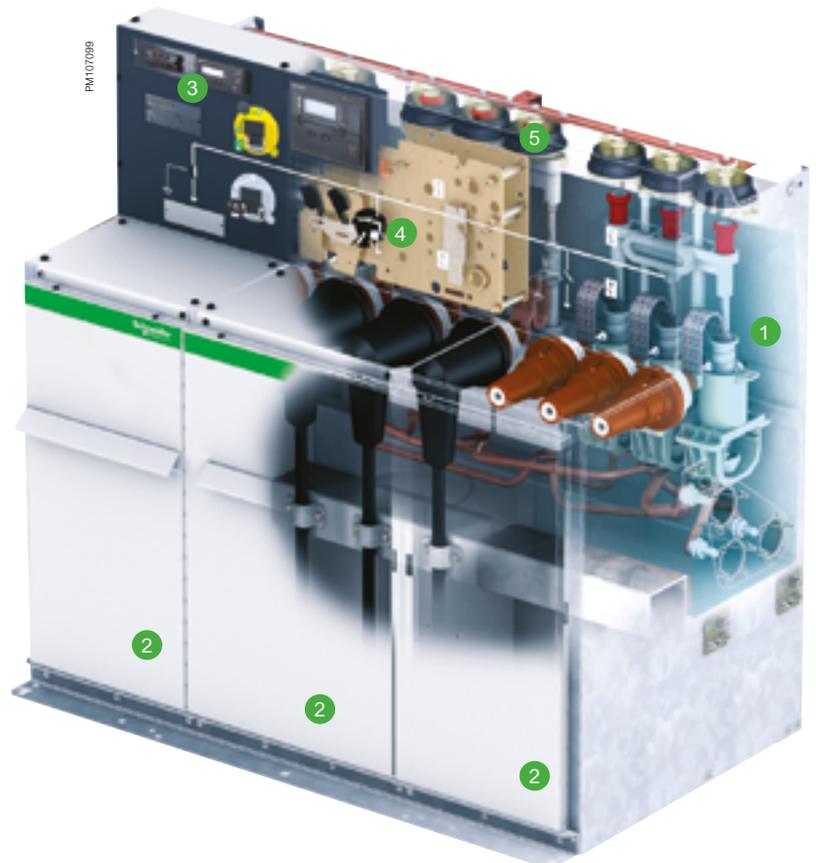
Rated voltage	Ur (kV)	12	17.5	24
Frequency	f (Hz)	50 or 60		
Insulation level				
Industrial frequency 50 Hz 1 mn	Insulation (1) Ud (kV rms)	28	38	50
	Isolation (2) Ud (kV rms)	32	45	60
Impulse 1.2/50 μs	Insulation (1) Up (kV peak)	75	95	125
	Isolation (2) Up (kV peak)	85	110	145
Tank internal arc withstand		20 kA 1 s		
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 disconnecter, 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



General characteristics

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

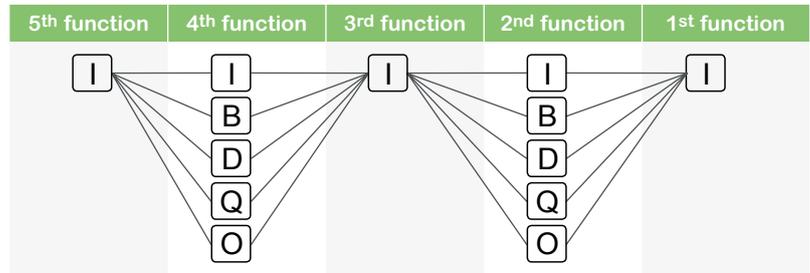
RM6 Flexibility

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

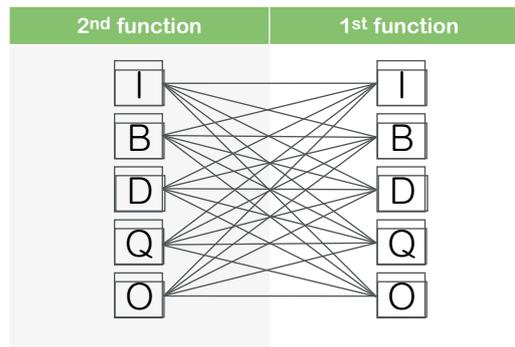
Possible combinations for RM6 five function tanks:



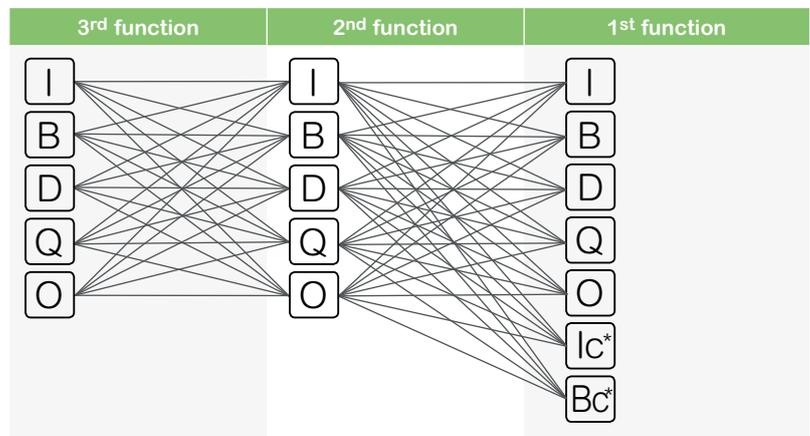
Free Combination range

700 possible combinations for RM6 2 or 3 function tanks.

Possible combinations of RM6 2 functions



Possible combinations of RM6 3 functions

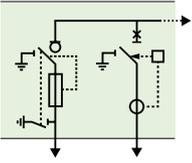


* Only possible when RM6 is RE or DE.

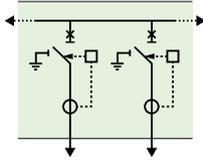
Examples

RM6 2 function combinations

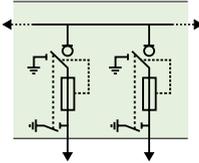
RE-QD



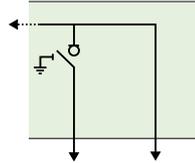
DE-DD



DE-QQ

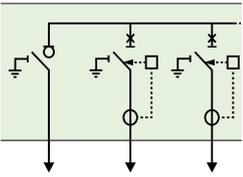


LE-IO

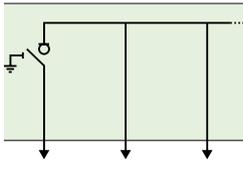


RM6 3 function combinations

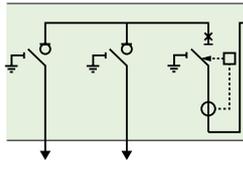
RE-IDD



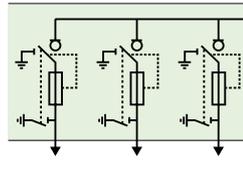
RE-IOO



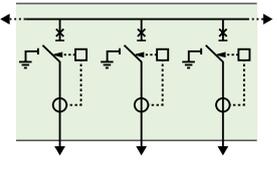
RE-IIBc



RE-QQQ



DE-BBD



General characteristics

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	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	20	
	Duration (s)	1	1	1	1	1	3	1	3	1	1	1	1	1	1	1	3	1	3	
Rated current	(A)	200	630	200	630	200	200	630	630	200	400	630	200	400	630	200	200	630	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.B.: D and Q functions limited to 200 A
 NE: non-extensible, RE: right-extensible, LE: left-extensible, DE: double-extensible.
 All performances are available for RM6 Free Combination cubicles.

RM6 Connected Enabled switchgear has thermal sensors that are mounted on the cable bushings, which allows you to have a real time, **instantaneous temperature measurement** via a dedicated Thermal Connect application on your smart phone or tablet.

Continuous Thermal Monitoring

The power connections in medium voltage products are one of the most critical points of the substation, especially for the MV cable connections made on site. Poor electrical connections can cause an increase of resistance in localized points that can lead to thermal runaway until the connection fails completely. Preventive maintenance can be complicated by accessibility and visibility in severe cases. Continuous thermal monitoring is the most appropriate way to detect a compromised connection early.

DM107441



Key benefits

- Battery free
- Wireless communication
- Great performance
- In-contact measuring point
- Easy installation
- Compact footprint
- Remote monitoring and alarms

Easergy TH110 Thermal Sensors

The **Easergy TH110** thermal sensor is part of the new generation of wireless smart sensors that enable continuous thermal monitoring of all the critical connections made in the field. The benefits include:

- Preventing unscheduled downtime
- Improved operator and equipment safety
- Maintenance optimization and transition to predictive maintenance

Thanks to its very compact footprint and wireless communication capabilities, the **Easergy TH110** is easy to install in critical locations without affecting the MV switchgear's performance.

By using a Zigbee communication protocol, **Easergy TH110** provides robust communication that can be used to create interoperable solutions for devices in the age of Industrial Internet of Things (IoT).

Easergy TH110 is self powered by the network current. It provides great performance and accurate thermal monitoring because it is in direct contact with the measured point.

Characteristics

Power supply	Self powered Energy harvested from the power circuit
Minimum activation current	5 A
Accuracy	+/- 1 °C
Range	-25 °C /+115 °C
Wireless communication	ZigBee Green Power 2.4 GHZ
Dimension weight	31 x 31 x 13 mm – 15 g

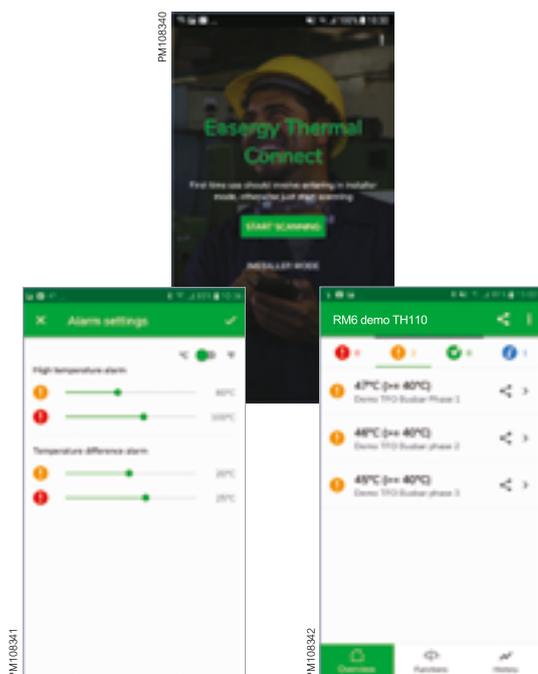
Easergy Thermal Connect app

Thermal monitoring gives you access to the temperatures of the substation's main electrical components.

It replaces thermal camera diagnostics. You no longer need to disconnect the breaker or to install a window on the cubicle to carry out the thermal analysis. Communication is wireless and does not require substation shutdown.

Key benefits

- Nearby stand-alone detection
- Easy temperature access during maintenance
- Data may be stored in a cloud-based safe repository
- Alarms can be configured within the app.



Connected characteristics

RM6 connected **Advanced**

PM109338



RM6 Connected Advanced IDI configuration

The RM6 Connected Advanced cubicle is a complete integrated solution that consists of:

- A proven and robust RM6 RMU with voltage and current sensors
- An RTU (T300) located in a LV cabinet placed on top of the RM6
- Sensors for condition monitoring
- A fully tested solution
- Plug and play installation

Cubicle configuration

Cubicle configuration includes:

- Compact or extensible
- 3 or 4 functions
- Available single extensible function: network switch and transformer feeder functions

Cubicle	Width (mm)	Depth (mm)	Height (mm)	Weight (kg)
IQI	1216	670	1142/1492 (*)	275/295 (1)
IDI	1216	670	1142/1492 (*)	240/260 (1)
DIDI	1649	670	1142/1492 (*)	340/360 (1)
DE-I	532	670	1142	135
DE-D	632	670	1142	135

(*): With LV cabinet

(1): With all optional modules and accessories, without battery

LV cabinet	Width (mm)	Depth (mm)	Height (mm)	Weight (kg)
	360.5	383	348.5	20

Main characteristics

RM6	IQI	IDI	DIDI	DE-I	DE-D
Voltage	12 kV/17.5 kV/24 kV				
Operational voltage	6.6 kV/13.8 kV/22 kV				
Extensible	Yes/No	Yes/No	Yes/No	Double	Double
IAC	AFL or AFLR				
Cable box	Single/3 cores				
Cable box interlocking	Bolted/Interlock	Bolted/Interlock	Bolted/Interlock	Bolted/Interlock	Bolted/Interlock
Gas pressure	Manometer or Densimeter with pressure contact				
Switch motorization	Yes	Yes	Yes	Yes	N/A
CB motorization	N/A	Option	Option	N/A	Option
Voltage motorization	24 Vdc or 48 Vdc				
Auxiliary contact	Yes	Yes	Yes	Yes	Yes

 Selectable /  Option

Components	IQI	IDI	DIDI	DE-I	DE-D
Voltage detection	VPIS or VDS				
VDS type	Wega 1.2c				
VPIS type	VPIS V3 VO				
Current acquisition	Bushing	Bushing	Bushing	Bushing	Bushing
CB Protection relay	N/A	VIP410	VIP410	N/A	VIP410
Phase overcurrent 50/51	N/A	Yes	Yes	N/A	Yes
Earth fault 51N	N/A	Yes	Yes	N/A	Yes
Thermal overload 49	N/A	Yes	Yes	N/A	Yes
Communication to RTU	N/A	Yes	Yes	N/A	Yes

 Selectable

RTU communication characteristics

RTU (T300)		IQI	IDI	DIDI	DE-I	DE-D
HU250						
Upstream communication	<ul style="list-style-type: none"> 2 modem interface(s): 2G/3G, 3G/4G, RS232 1 RJ45 ETH for WAN not selectable, 2 Ethernet ports Protocols: IEC 60870-5-101/104, DNP3 serial and IP, Modbus Serial/TCP, IEC61850 	Yes	Yes	Yes	Available from main cubicle	Available from main cubicle
Local and downstream communication	<ul style="list-style-type: none"> Local HMI Wi-Fi interface for PC, smart phone, digital tablet 	Yes	Yes	Yes	Available from main cubicle	Available from main cubicle

Selectable

RTU switch controller characteristics

RTU (T300)		Function I	Function Q	Function D
SC150				
Protection functions	50/51 - 50N/51N	Yes	N/A	N/A
	59/59N	Yes	N/A	N/A
	67/67N	Yes	N/A	N/A
	27	Yes	N/A	N/A
	37	Yes	N/A	N/A
	47	Yes	Option	N/A
Power measurement	-	Option	N/A	N/A
Power quality	-	Option	N/A	N/A

LV150 (Option)		Function I	Function Q (option)	Function D (option)
LV protection	59/59N	N/A	Yes	Yes
	47	N/A	Yes	Yes
	27	N/A	Yes	Yes
	Blown fuse	N/A	Yes	Yes
LV power quality	-	N/A	Option	Option

Option

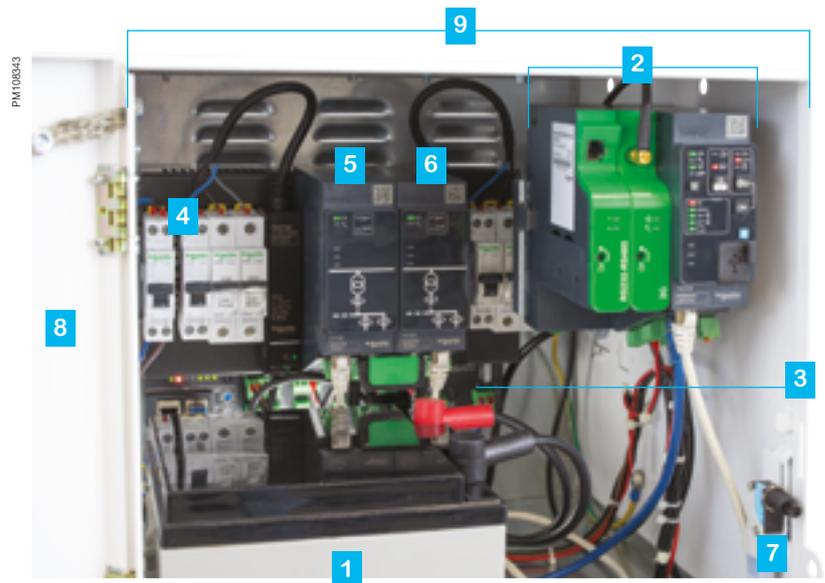
Condition monitoring and IoT characteristics

Sensors	RM6 status	Substation Status	Description
Low gas pressure	Tank leakage	-	Tank leakage
RTU cabinet opening	RTU access	-	Intrusion
TH110	Temperature monitoring	-	Thermal Monitoring
CL110	Environmental monitoring		Temperature, Humidity Monitoring
Flooding	Anti Flooding monitoring		Flooding presence
Fuse blown(only for IQI)	Fuse Status		Fuse Blown

Option

LV cabinet description (all options)

Compact LV cabinet located on top of a Q or D function: IQI or IDI (on the first D function of a four-function cubicle DIDI).



1. Battery* and battery belt
2. T300 modules (HU250 and communication modules)
3. Power supply PS50
4. Main LV cabinet power switch
5. LV component parts first D function (switches, voltage adaptor, LV150) - option
6. LV component parts second D function (switches, voltage adaptor, LV150) - option
7. LV cabinet switch (door opening)
8. LV cabinet door
9. LV cabinet

* Battery Temperature

- Storage temperature -20 °C to +60 °C
- Charge temperature -15 °C to +50 °C
- Discharge temperature -20 °C to +60 °C

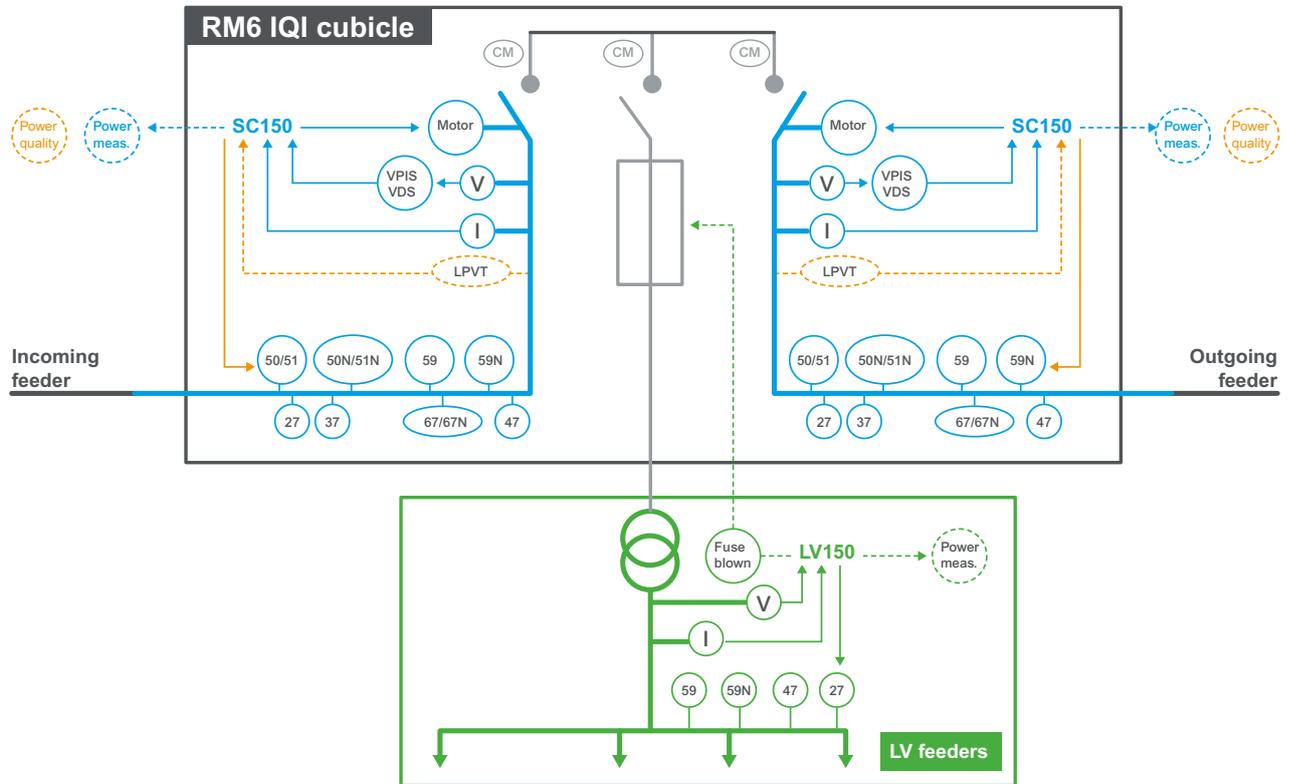
For other temperature ranges, please contact us

Connected characteristics

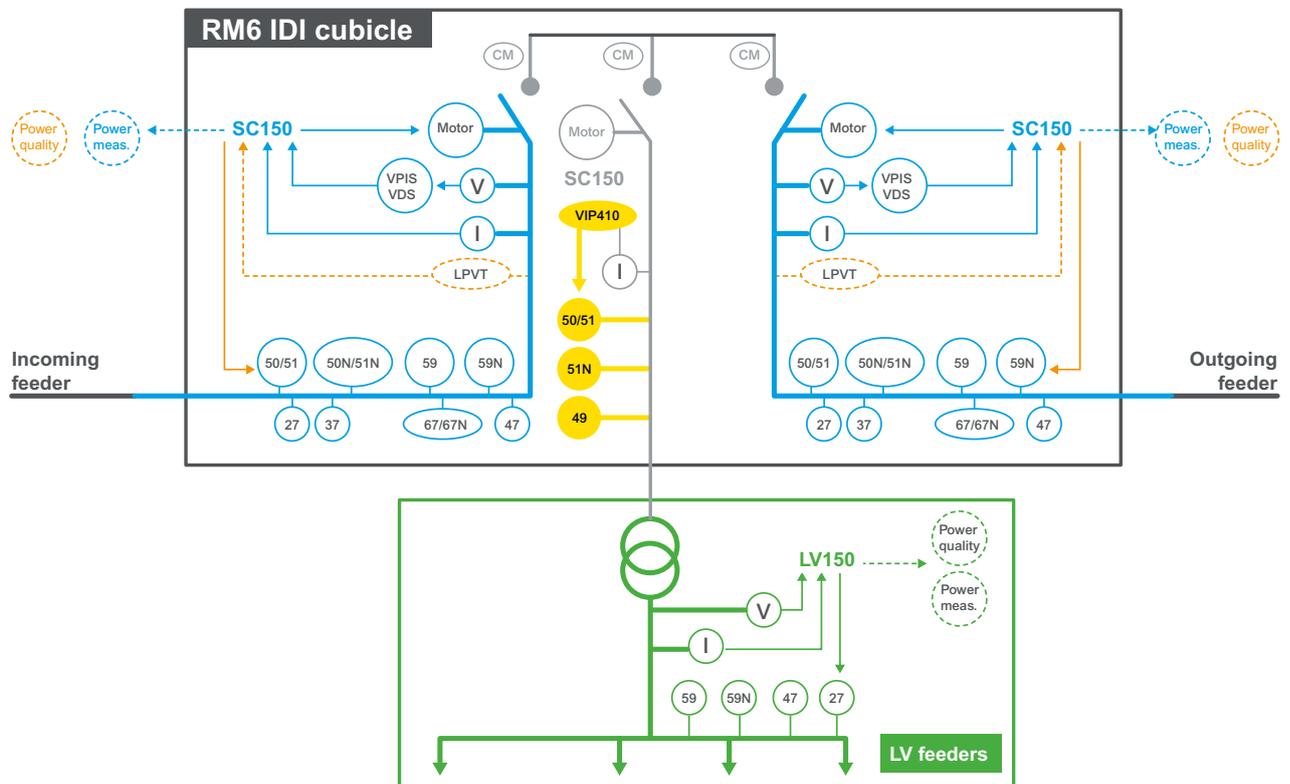
RM6 connected **Advanced**

Application schematics for IQI and IDI cubicles

DM107442



DM107443



Operating conditions and standards



RM6 performance meets 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.

The 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 on average without derating
- Greater than or equal to –25 °C: please contact us for details

Altitude:

- Lower than or equal to 1000 m
- Above 1000 m, and up to 2000 m with direct field connectors
- Greater than 2000 m: please contact us for further details

DE-Mt needs voltage derating after 1000 m.

Please consider altitude and temperature when selecting Q function fuses.

Current derating in accordance with 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/module description

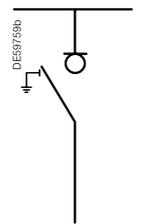
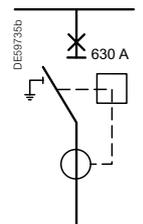
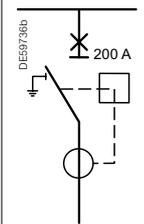
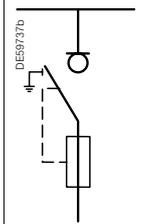
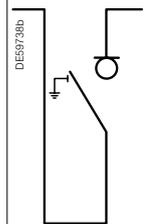
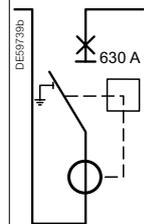
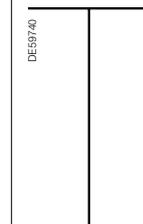
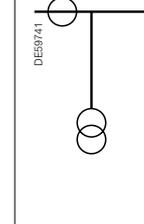
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B, D, BC functions	46
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A wide choice of RM6 functions

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 via the busbar using dedicated field bushings.

There are different types of extensible RM6:

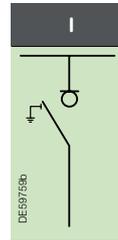
- Right-extensible (-RE type)
- Left-extensible (-LE type)
- Extensible on both sides (-DE type)
- Non-extensible (-NE type)

Functional overview

I, Ic functions

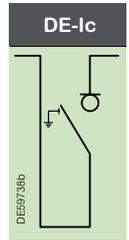
I function

- 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

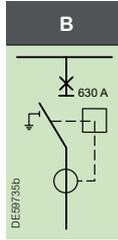
(1) No bushing for IC function

Functional overview

B, D, BC functions

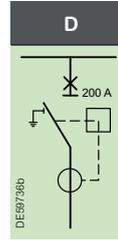
B function

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



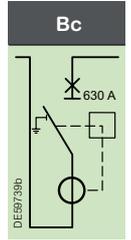
D function

- Transformer feeder 200 A with disconnecting circuit breaker



DE-Bc function

- Bus coupler by 630 A circuit breaker



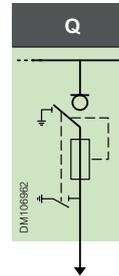
Rated voltage	Ur	kV	12	17.5	24						
Rated frequency	Fr	Hz	50 or 60	50 or 60	50 or 60						
Insulation level											
Industrial frequency 50Hz/1min	Phase-to-phase, phase-to-earth	Ud	kV rms	28	38	50					
	Across isolating distance Ud		kV rms	32	45	60					
Lightning impulse withstand	Phase-to-phase, 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	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

Q function

- Transformer feeder with fuse-switch protection



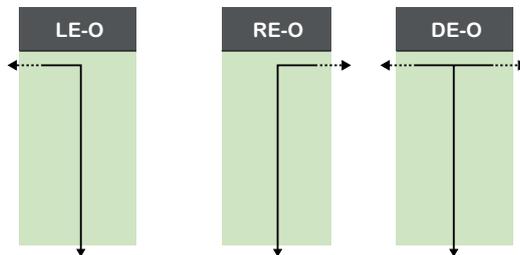
Rated voltage	Ur	kV	12	17.5	24					
Rated frequency	Fr	Hz	50 or 60	50 or 60	50 or 60					
Insulation level										
Industrial frequency 50Hz/1min	Phase-to-phase, phase-to-earth	Ud	kV rms	28	38	50				
		Across isolating distance	Ud	kV rms	32	45	60			
Lightning impulse withstand	Phase-to-phase, phase-to-earth	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



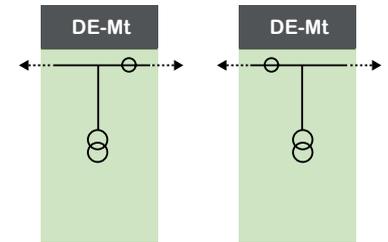
Rated voltage	Ur	kV	12	12	17.5	17.5	24	24	24
Rated current busbars	Ir	A	630	630	630	630	630	630	630
Rated current	Ir	A	200	630	200	630	200	630	630
Short-time withstand current	Ik	kA rms	25	25	21	21	16	16	20
	tk	Duration (s)	1	1	3	3	1	1	1 or 3
Bushing			C	C	C	C	C	C	C

Functional overview

DE-Mt function

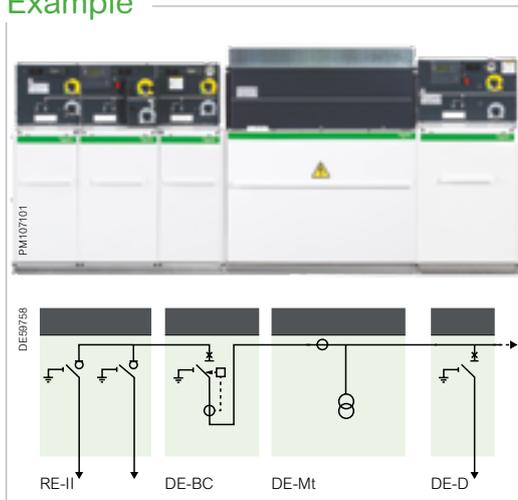
DE-Mt function

- 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

All measures are taken to avoid operating on the MV compartment.
The secondary CT and VTs 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 and accessories

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Tripping and position indication	54
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Key locking	56
Cable compartment	57
Protection relays	58
Fuses	65
Fault passage indicators	66
Voltage indicators and relays	70
Other components	72
Easergy Remote Terminal Units	73
Automatic transfer system	76

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)

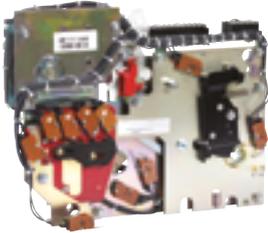
(1) See specific page for DE-Mt

(2) Available for non extensible cubicles

Motorization

Switch, circuit breaker and fuse-switch combination

PM107102



PM107103



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.

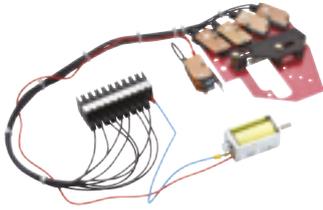
		DCw					AC (50 Hz) *		
Un power supply	(V)**	24	48	60	110	125	220	120	230
Power	(W)	240							
	(VA)						280		

(*) 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 the 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

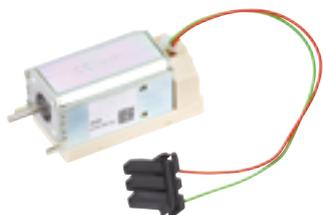
Each circuit breaker or fuse-switch combination can be fitted with a switch-on opening release (shunt trip).

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 that is less than 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

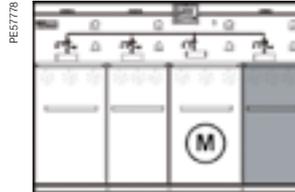
There are 3 types of operating handle for each RM6 cubicle combination:

- Standard
- Long
- Super long



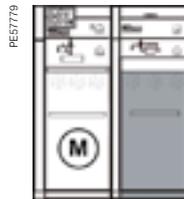
The long operating handle is required:

- 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

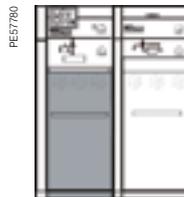
- For the extensible RM6 1 function, when the circuit breaker is motorized and is on the left side of a fuse-switch function



(M): The circuit breaker function is motorized

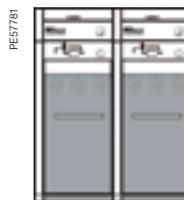
The super long operating handle is required:

- For the 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 a long or super long handle to be operated.

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



Functional unit marked in orange needs a 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 a 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

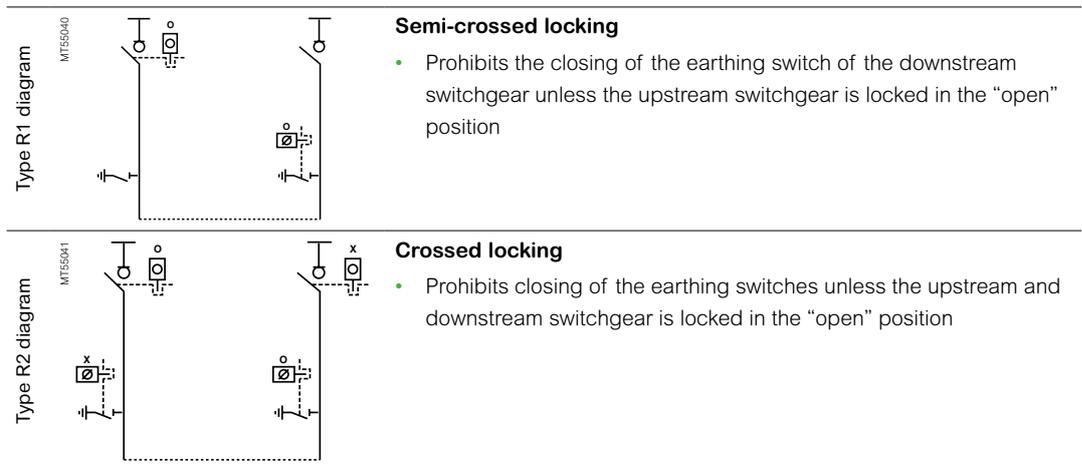
RM107108



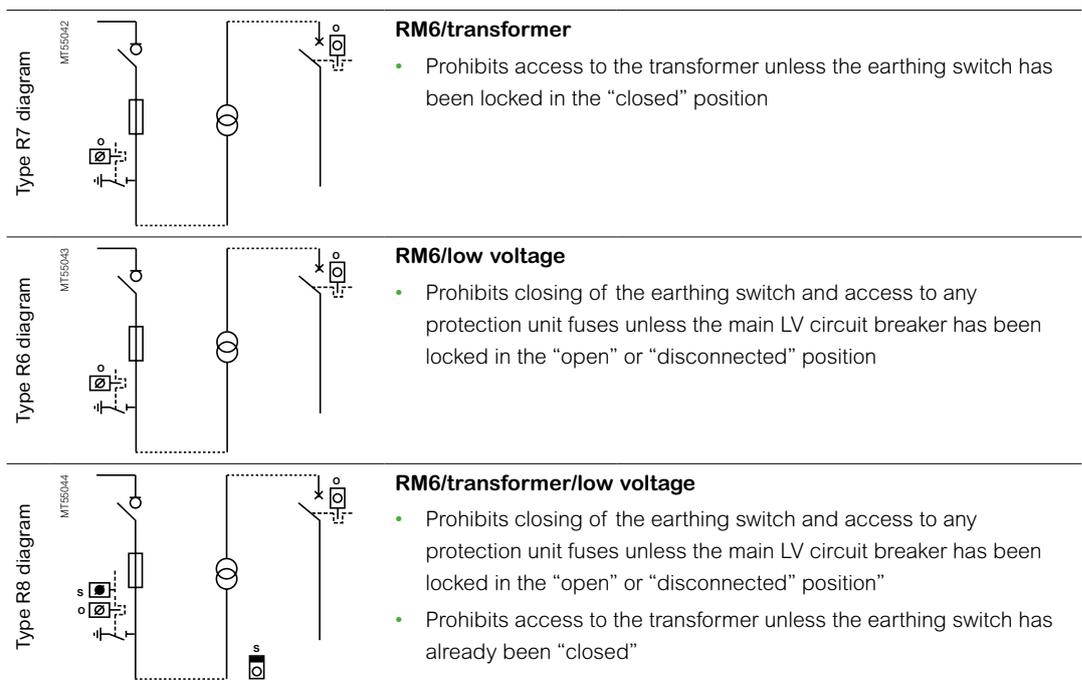
As an additional safety feature, the RM6 can be fitted with keys to lock operations. For instance the RM6 remote control can be disabled when the switchgear is locked in the "open" position.

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

On network switches or a 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 only used 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: $I_{o>}$ (phase current sum method) and $I_{to>}$
- Second harmonic restraint element

Measurement

- Load current on each phase
- Peak demand current

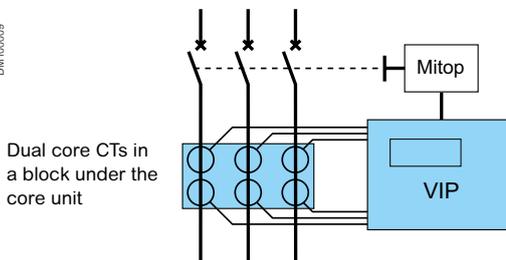
Front panel and settings

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

PM100574



DM100009



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 the 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 fails during an MV short-circuit, the protection functions are maintained.

Ready for smart grids

Dual supply for communication with:

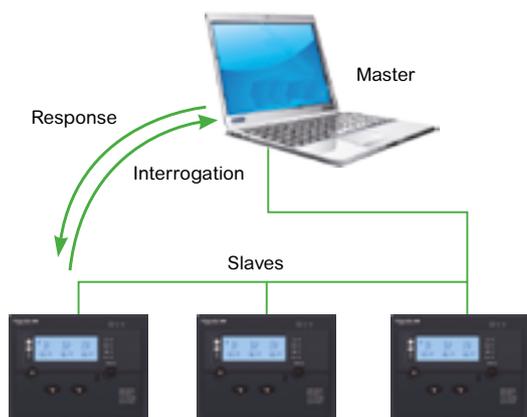
- DMS and RTUs
- Remote alarms
- Time stamped events
- Measurements of current, load history, overcurrent and breaking profile



Protection relays

VIP 400, VIP410

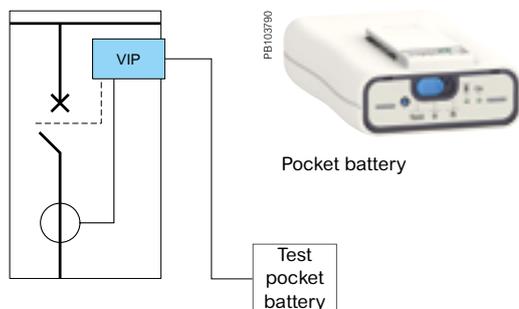
DM106855



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 IEC 60870-104, DNP3, IEC 61850 protocols, 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

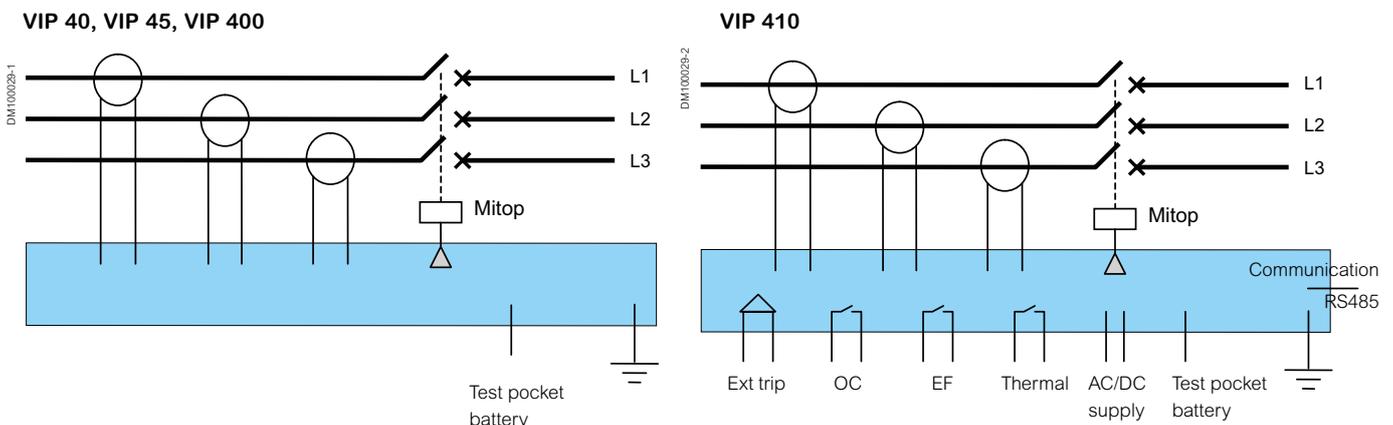
The sensors are made up of one block of three CTs with rated and insulation voltages of 0.72 kV/3 kV - 1 min, providing both measurement and power outputs.

- 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 to operate the VIP 400 with a 200 A circuit breaker, up to its saturation level
 - e.g. 4 A is used to operate the VIP 40 up to its saturation level.
- Optionally, the VIP 410 can be connected to 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

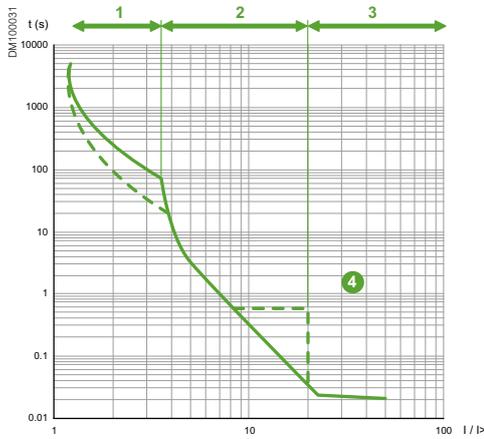
- The actuator is a dedicated low power tripping coil (Mitop) specifically designed to operate with the sensors and the processing unit with minimum energy.
- The integrity of the Mitop circuit is continuously supervised (Trip Circuit Supervision function).

Connection diagrams



Protection relays

VIP40, VIP45, VIP400 and VIP410 tripping curves

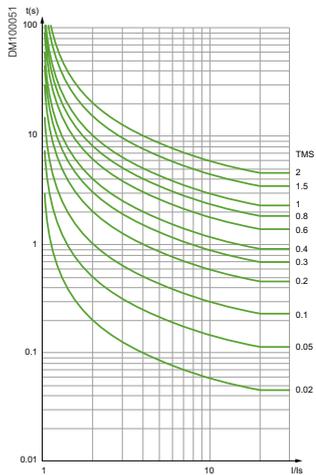


VIP40, VIP45

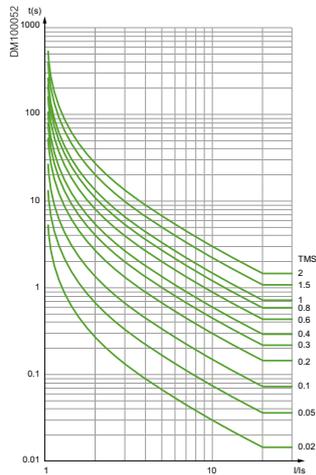
Phase overcurrent protection (ANSI 50-51).

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

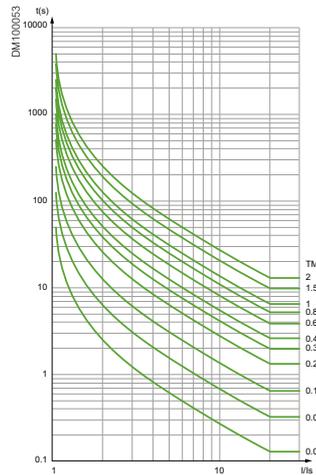
VIP400, VIP410



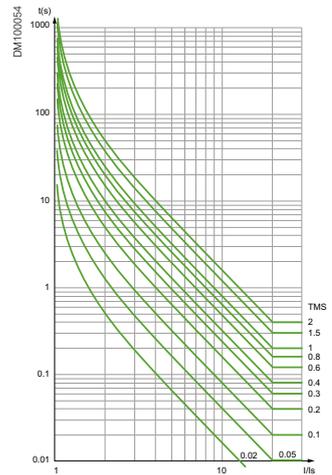
IEC Standard Inverse Time Curve (IEC/SIT or IEC/A)



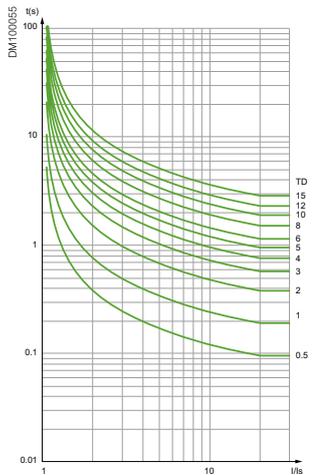
IEC Very Inverse Time Curve (IEC/VIT or IEC/B)



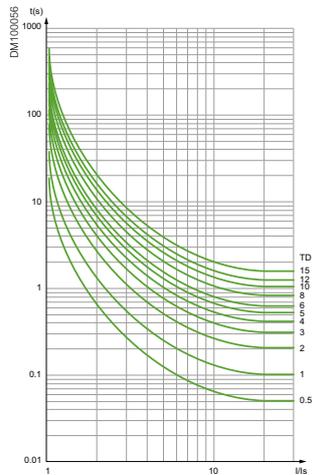
IEC Long Time Inverse Curve (IEC/LTI)



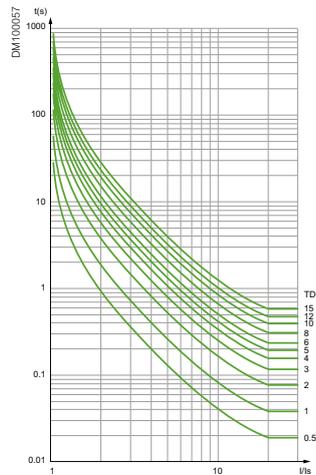
IEC Extremely Inverse Time Curve (IEC/EIT or IEC/C)



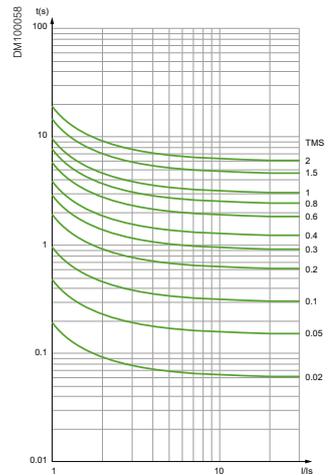
IEEE Moderately Inverse Curve (IEEE/MI or IEC/D)



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



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



RI Curve

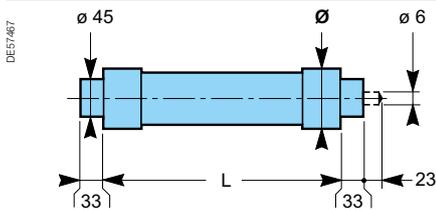
Note: Please contact us for the required protection low earth faults

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) For 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.

For 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



Amp 21D

Fault current indicators

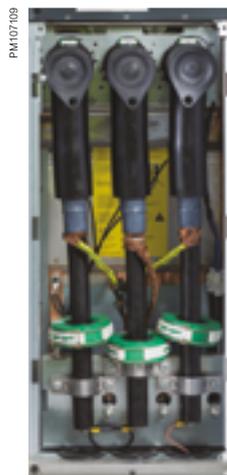
The Easergy Flair (21D - 22D - 23D - 23DM) range of fault passage indicators has been improved to provide indicators in DIN format that are efficient, self-powered and self-adapting to the network to provide hassle-free installation. Flair indicators work with all types of neutral networks and benefit 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)
- Preassembled 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 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 Vdc (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 relays

VPIS and VDS



VPIS V3



VPIS V2



Phase
concordance unit



VD23

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

This unit is used to check phase concordance.

VD23 voltage detection relay

VD23 is a compact voltage detection relay for MV networks for voltages from 3 kV to 36 kV, 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.

PM108344



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 42 kV/15 min
- Complies with international standard: IEC 60044-7

Metering Components

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.

PE91030



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.

PE91031



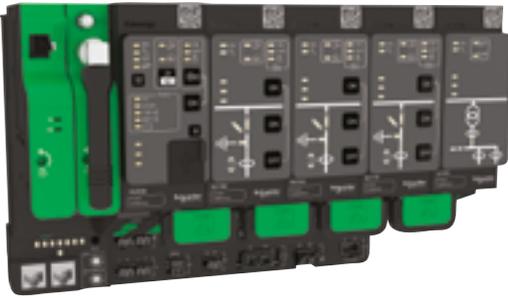
ARC5 ring current transformer

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

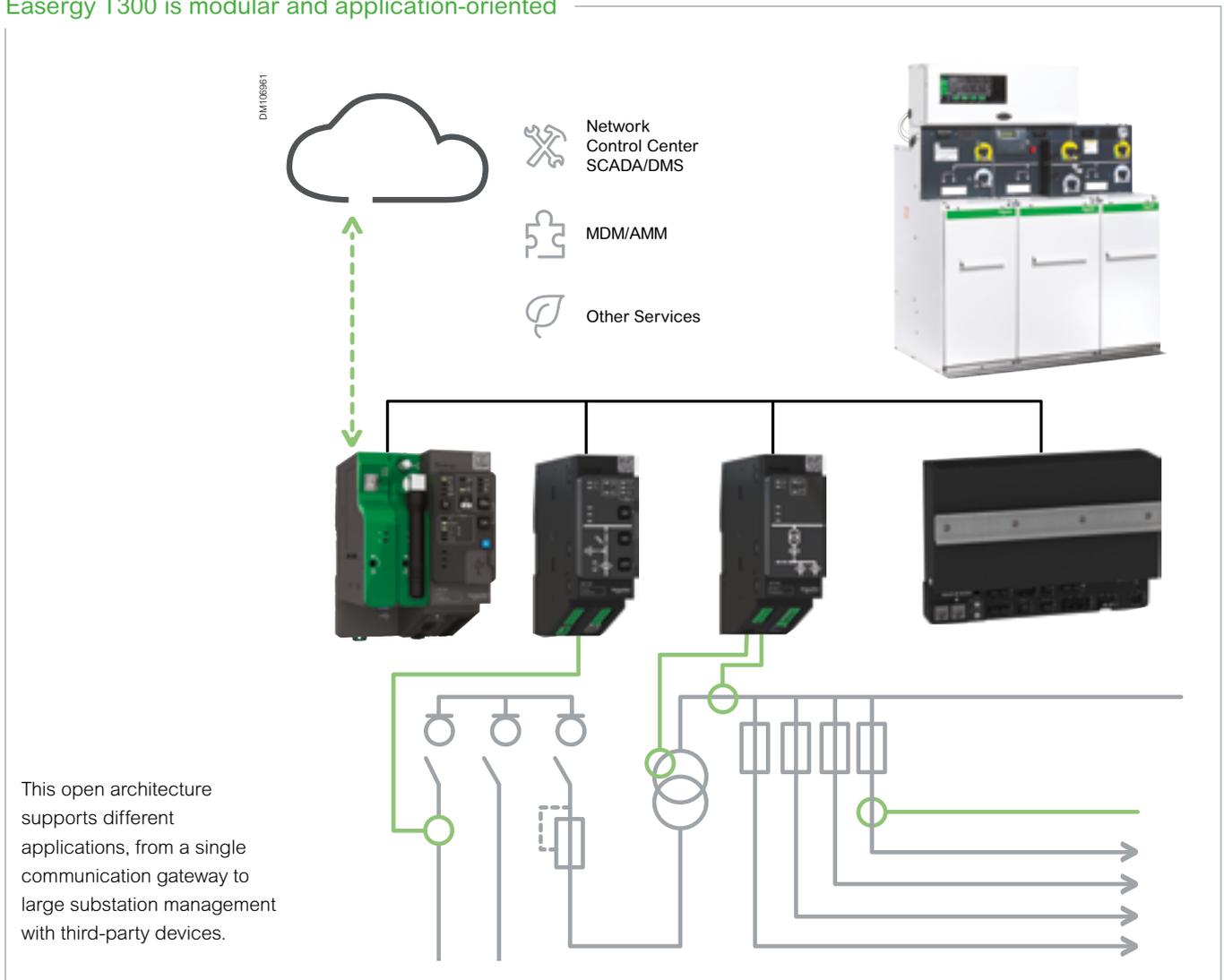
PW104388



Easergy T300: the 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 modules

These modules, with their supported applications, are:

PM104385



Easergy HU250 – Head Unit communication gateway

- Flexible communication gateway to control centers 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 applications
 - Flexible communication media (Ethernet, USB, GPRS, 2G, 3G, 4G)
- Flexible local communication (Ethernet, Wi-Fi, ZigBee, RS232)
- Cybersecurity management in accordance with IEC 62351
- 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
- Auto-Transfer-Switch Automation between two switch control modules
- Thermal and environment condition monitoring, with integrated wireless sensor communication

PM104382



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
- MV Voltage monitoring ANSI 27, 59, 59N
- MV Current monitoring ANSI 37
- Large current and voltage measurement capabilities: standard CT, LPVT, VT from the capacitor divider and a voltage presence indicator (VDS, VPIS) for voltage
- Power measurement in accordance with IEC 61557-12
- Power quality in accordance with IEC 61000-4-30 class S:
- Specific application automation: sectionalizer
- Disturbance recording

Easergy Remote Terminal Units

Easergy T300 modules



Easergy LV150 – Transformer and Low Voltage monitoring

- Transformer temperature measurement and monitoring
- Power measurement in accordance with IEC 61557-12
- Broken conductor detection (one phase lost MV or LV) ANSI 47
- LV Voltage monitoring ANSI 27, 59, 59N
- Power quality in accordance with IEC 61000-4-30 class S



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

- PS25 monitoring solution with only one voltage output (12 Vdc or 24 Vdc)
- PS50 is a harsh environment power supply for MVLV substation control with power supply for:
 - Switch control: 48 Vdc or 24 Vdc
 - Telecom devices: 12 Vdc
 - Easergy T300: 12 Vdc

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, the 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/T300*.

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.

* Contact us for more details

PM107110



An ATS solution consists of:

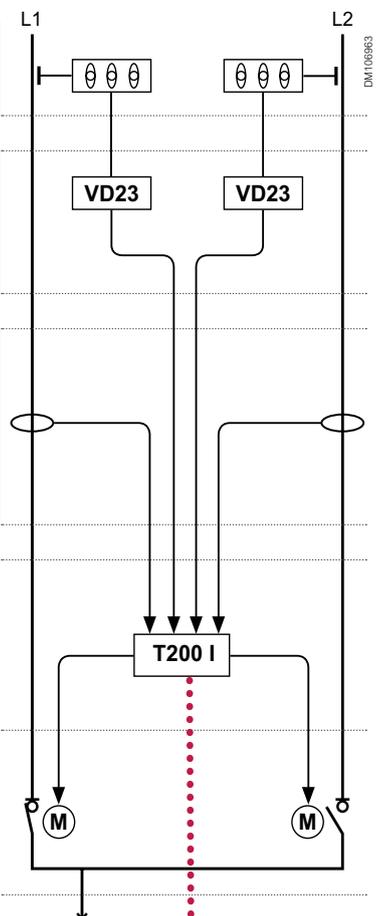
- 2 VPIS-VO

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

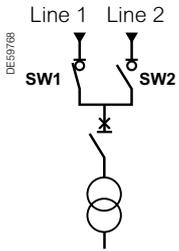
From the VD23 digital input and the FPI information, T200 I makes the decision to switch from one line to the other.



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



SCADA



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]

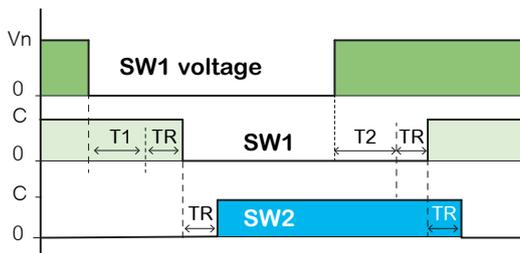
The ATS does not change back to the main line, except in the event of a voltage loss on the backup line [opening of SW2, closing of SW1]

3. Semi-Auto SW1VSW2 or Semi-Auto SW2VSW1

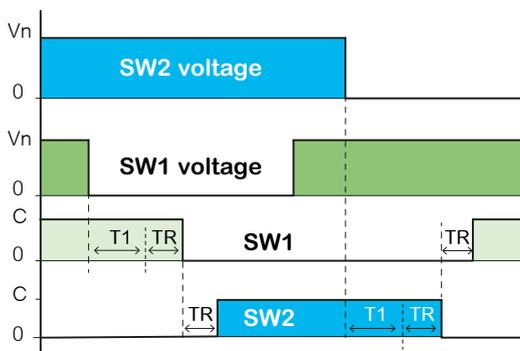
In the event of a voltage loss on the distribution line in service (SW1), the ATS changes over to the backup line (SW2) after an adjustable time delay (T1).
[opening of SW1, closing of SW2]

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)



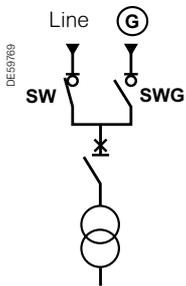
Network ATS: Semi-auto mode
(without paralleling upon automatic return)



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)



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.

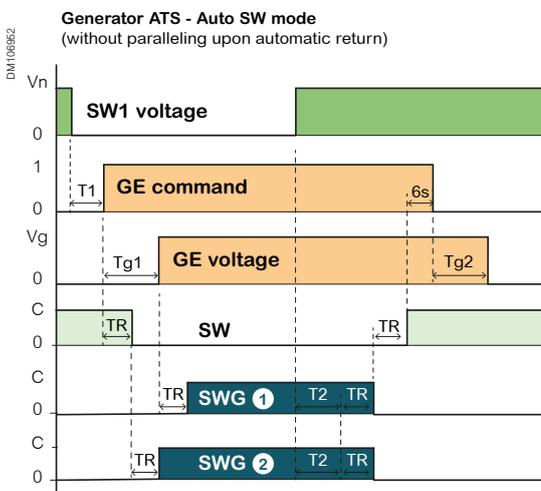
3. Semi-Auto SWVSWG

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

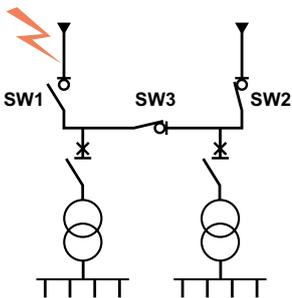
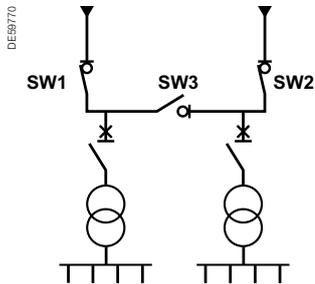
TR: switch response time

- 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]

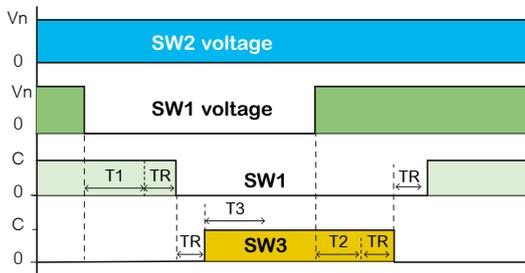
As soon as voltage returns on the main line (SW1), the ATS changes back to the main line after a time delay (T2).
[opening of SW3, closing of SW1 if the paralleling option is not activated]
[closing of SW1, opening of SW3 if the paralleling option is activated]

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 Generator transfer can be activated via an order: remotely or through a dedicated digital input.

Applications:

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

During peak hours, and if the network is overloaded, the Utility can send a remote order that will activate the Generator. With this facility, private customers can negotiate a better electricity price.

Installation and connection

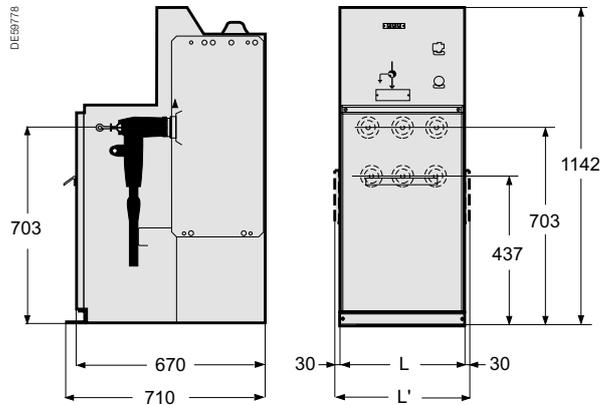
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Dimensions and installation conditions

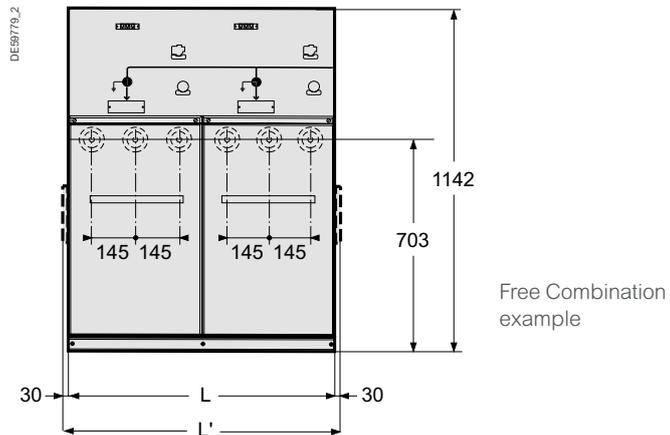
1 function module

	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



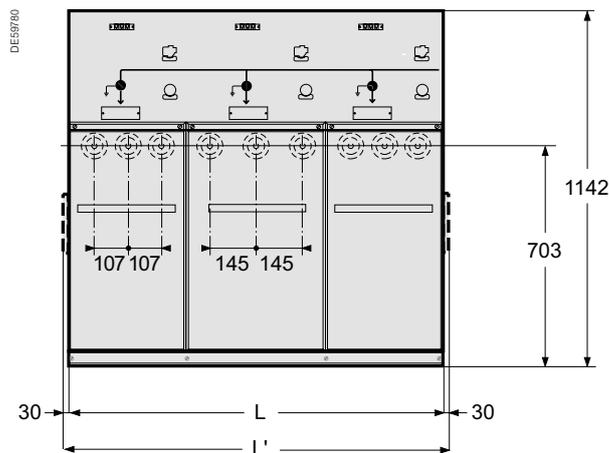
2 function modules

	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
RE	IBI	250	L = 1186
	IQI		L' = 1186 + 30 = 1216
	III		L' = 1186 + 30 = 1216
DE	IDI	240	L' = 1186 + 30 = 1216
	IBI		L' = 1186 + 30 = 1216
	IQI		L' = 1186 + 30 + 30 = 1246
DE	III	240	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

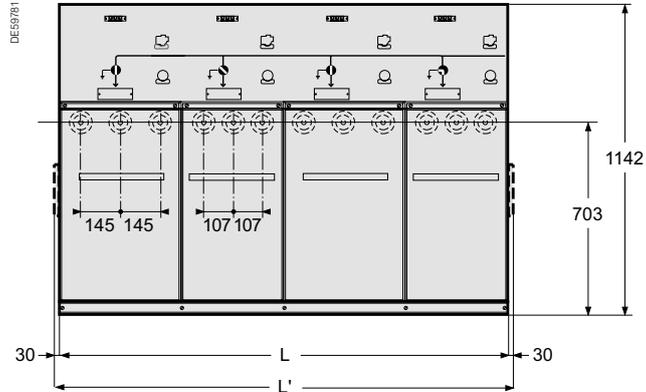


Type of tank

NE: non-extensible
 RE: right-extensible
 LE: left-extensible
 DE: left- and right-extensible

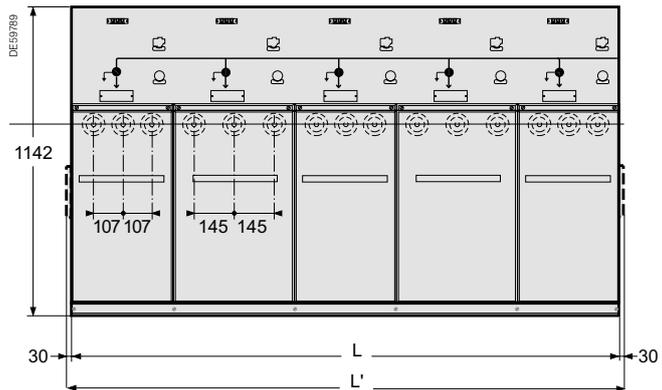
4 function modules

	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

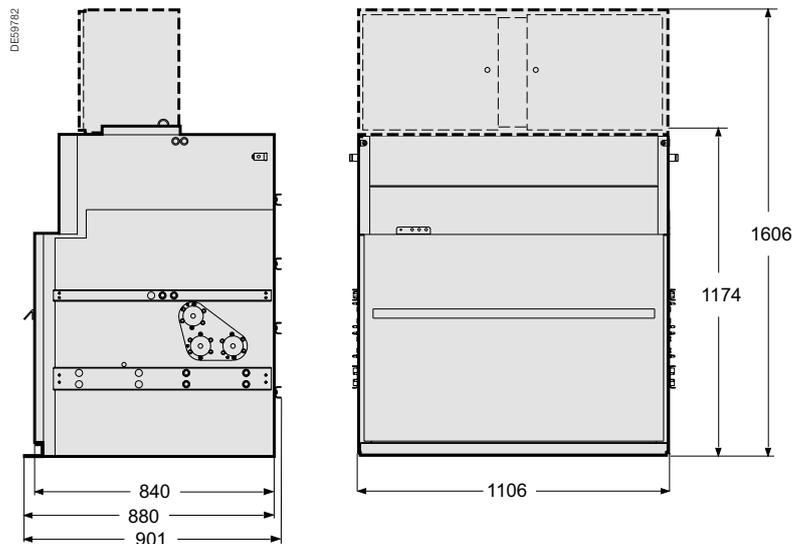
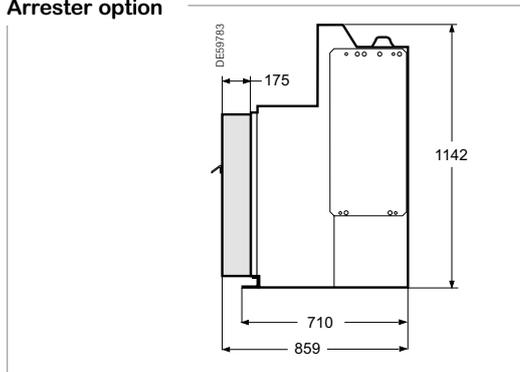
	Function	Weight (kg)	Length (mm)
Regular RM6			
NE	IDIDI	470	L = 2000
	IQIQI	520	L = 2000
	IBIQI	495	L = 2000
RE	IDIDI	475	L' = 2000 + 30 = 2030
	IIII	455	L' = 2000 + 30 = 2030
DE	IDIDI	480	L' = 2000 + 30 + 30 = 2060
	IIIQI	495	L' = 2000 + 30 + 30 = 2060



Metering cubicle

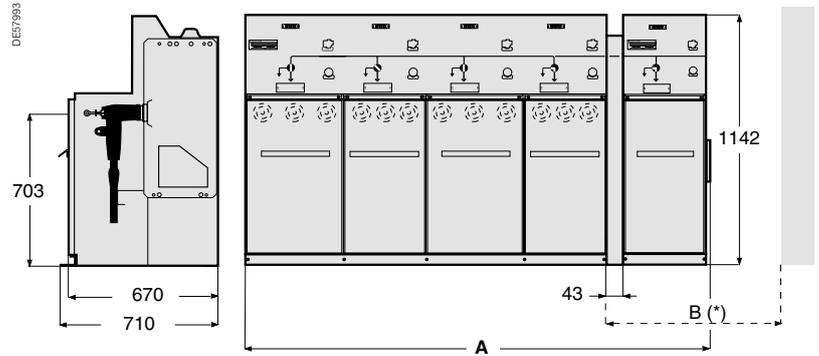
	Function	Weight (kg)	Length (mm)
RM6 metering cubicle with LV compartment			
DE	DE-Mt	420	L = 1106
RM6 metering cubicle without LV compartment			
DE	DE-Mt	400	L = 1106

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

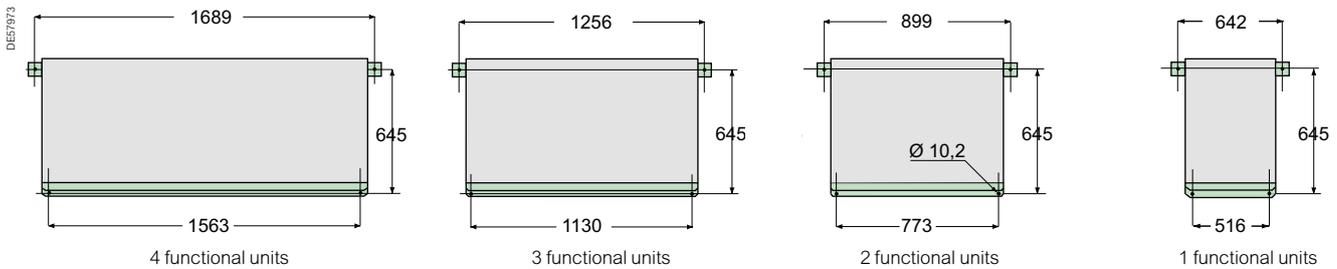
The RM6 is supported by 2 metal feet with holes for mounting:

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

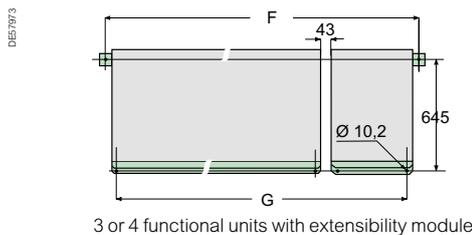
Options for adding a cubicle	1st position	2nd position	3rd position	Last position
∅	RE-x	DE-x	DE-x	LE-x
RE-x*	DE-x	DE-x	LE-x	∅

* 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)

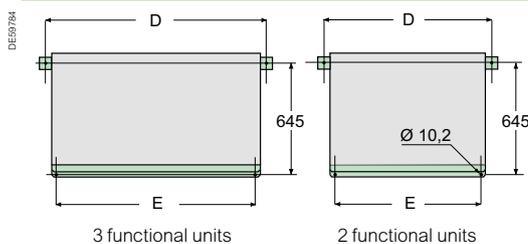


Extensible RM6 (top view)



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)

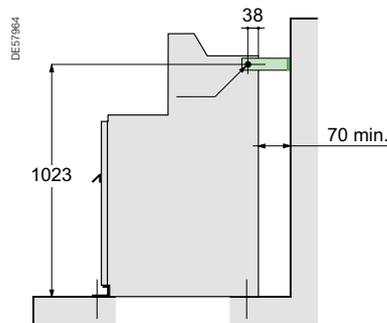


No. of units	Length (mm)	
	D	E
RM6 Free Combination functional units		
2 units	1122	996
3 units	1602	1476

Dimensions and installation conditions

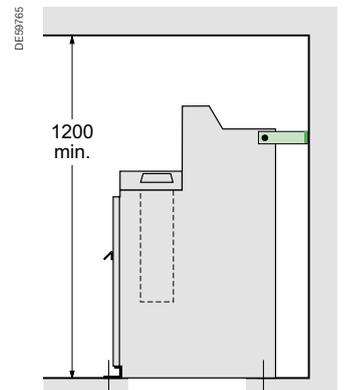
Wall mounting

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



Ceiling clearance

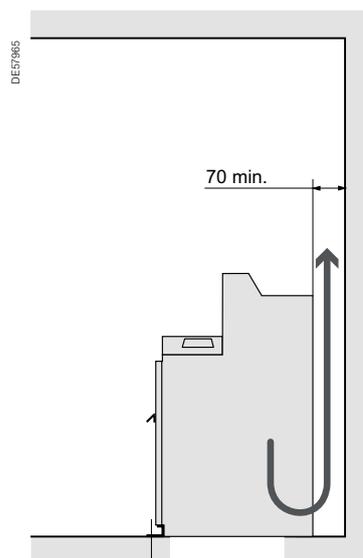
For substations with fuse-holders, provide a minimum ceiling clearance of 1200 mm.



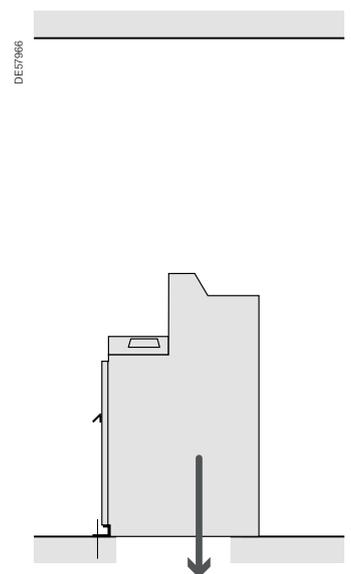
Installing the substation for internal arc withstand

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



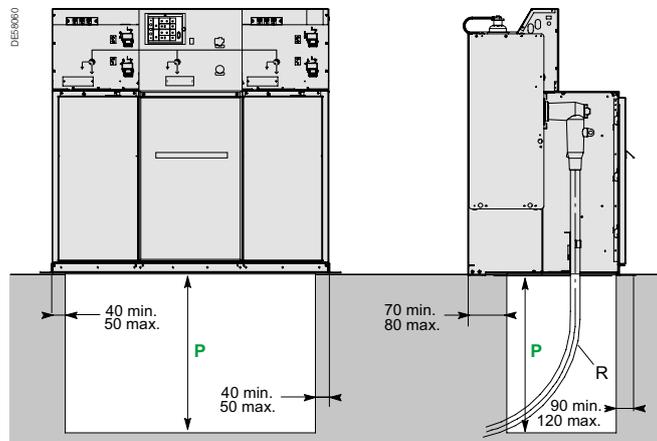
N.B.: parts for guiding the gases to vent openings and cooling walls are not part of the switchgear supply. These must be adapted to each specific case.

For connection to a “network” or “transformer” via a 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.

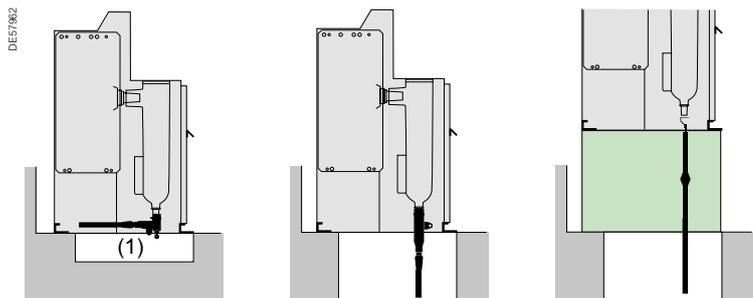
For “transformer” connection via a fuse-switch

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:

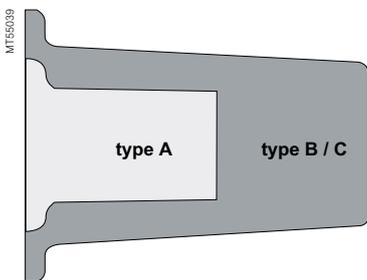
Installation

- 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

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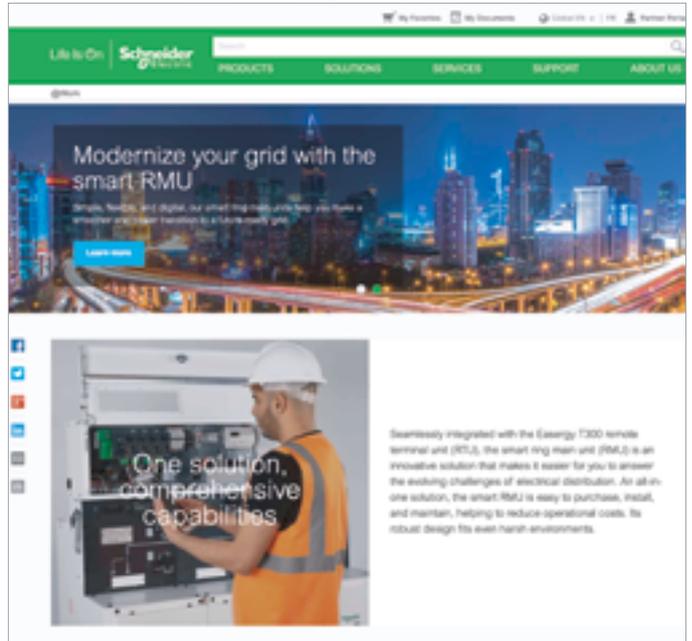
<https://www.schneider-electric.com/en/work/products/product-launch/smart-ring-main-unit/>



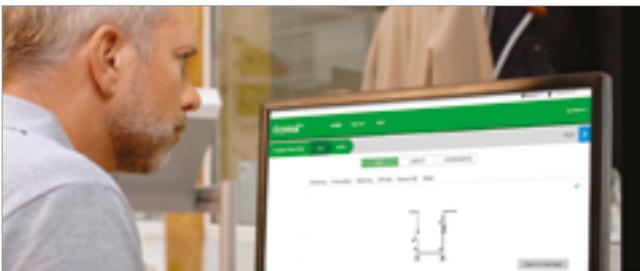
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26, November, 2019
AMTED398032EN

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