EcoStruxure™
Innovation At Every Level

Set Series

PremSet

Catalog 2020

17.5 kV compact modular vacuum switchgear
with Shielded Solid Insulation System

se.com/premset

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

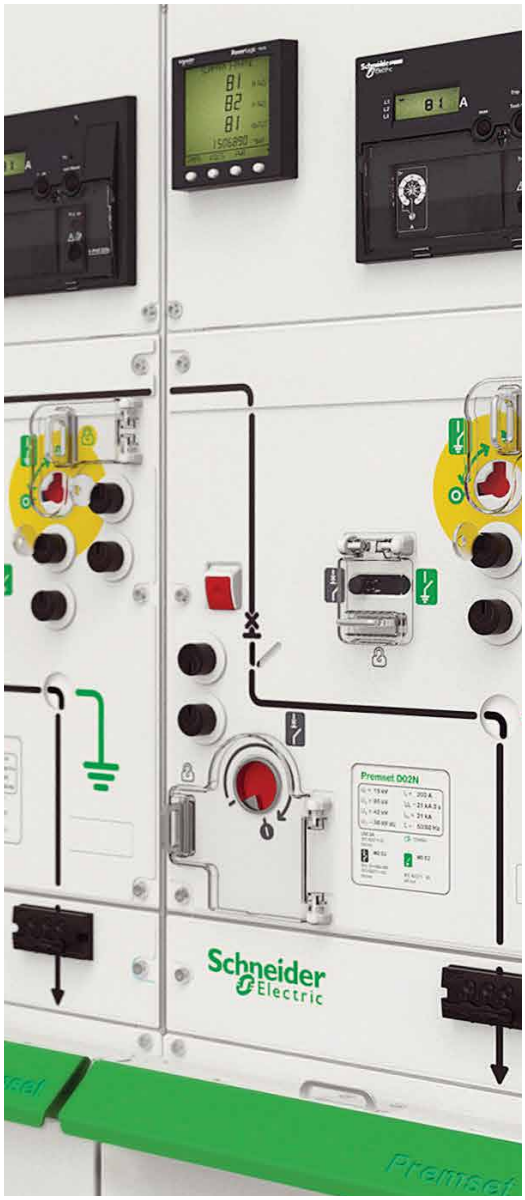
Set Series

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
PremSet

PM103715



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The new generation of medium voltage switchgear

PM105800

Safety

Concentrated innovation to help create protective environments for customers

Reliability

Long-lasting performance helping to secure customer service continuity

Efficiency

A smart solution designed to help optimize customer assets

Flexibility

A compact and modular design to suit all customer applications

Safety

Concentrated innovation to help create protective environments for customers

PM105801

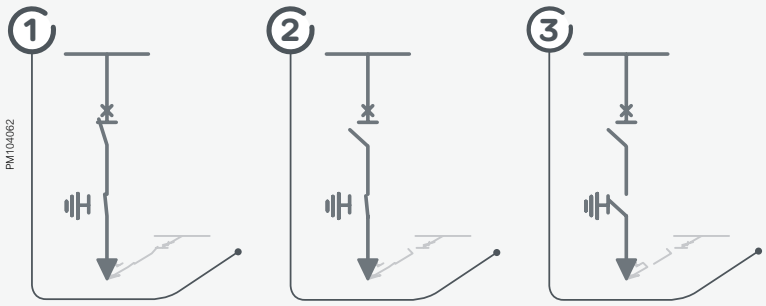
Simple and user-friendly operation

The PremSet 3-in-1 system has proven itself to be a reliable and end-user friendly MV switchgear system, providing:

- Earthing in a single operation
- Intuitive mimic diagram and operation
- Direct downstream earthing
- Positively driven built-in interlocks
- Easy front access to cable test injection points

3 - position scheme

PM104062



Closed | Open and disconnected | Earthed

Peace of mind and protective environment through SSIS technology

Extending protection to the entire switchgear assembly, PremSet switchgear is the first Schneider Electric global product to offer shielded solid insulation.
This specific design helps to improve equipment service life and to lower the total cost of ownership (TCO).

PremSet's innovative design (with no exposed live parts and every part of the main circuit insulated by an earthed shield) helps to reduce the risk of an internal arc, and means that the system is "accidentally touchable".

The system is applicable for network functions, including:

- Load break switches or circuit breaker
- Integrated metering units and current and voltage transformers

Greater protection for the operator during cable testing and diagnosis

This integrated cable test feature, implemented by dedicated earth rods, is accessible from the front, without needing to enter the cable box, operate the main switches, or dismantle cable terminations. This device meets IEC 62271-200 standard requirements.

Efficiency

A smart solution designed to help optimize customer assets

PE90822_1

The efficiency you deserve

Because the range uses the same design for every configuration, customizing your switchgear is easy. And standardized dimensions, reduced footprint, and simple front power connections all help to reduce the time spent installing PremSet.

The system is designed with the intention of making installation and adaptations as seamless as possible, through:

- Straightforward assembly with identical busbar and cable connections for the entire range
- Patented universal flat power connection to facilitate installation
- Easy cabling, since all cable connections are at a height of 700 mm

Intelligent, smart grid-ready solutions

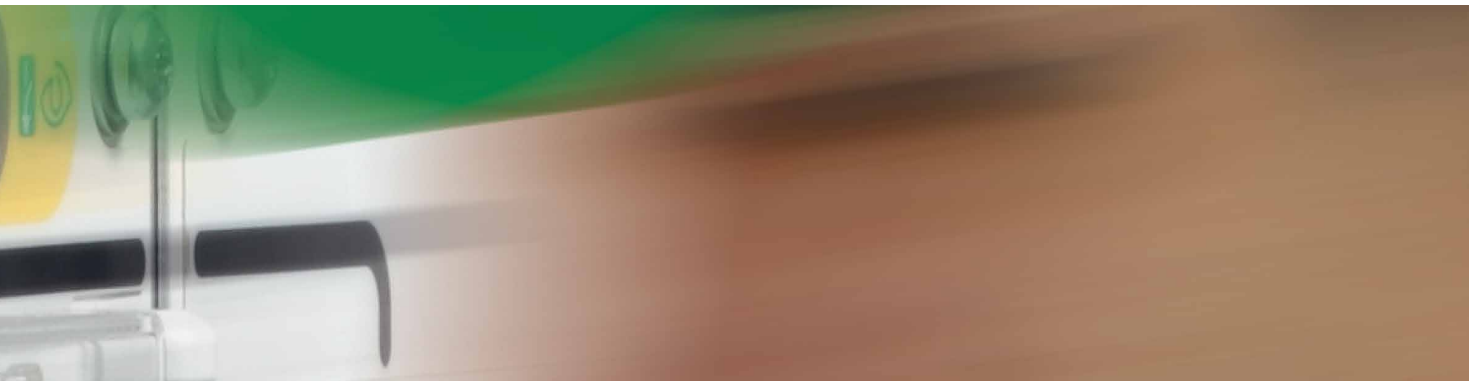
To help enhance your electrical distribution networks through advanced monitoring and control, PremSet architecture is designed with such features as:

- Feeder automation, with switchgear including built-in communication and local intelligence
- Load management, with integrated smart metering
- Asset management, with advanced switchgear and transformer monitoring
- Automatic transfer system, with integrated source transfer solution to reduce power supply interruption

Connected product

Beyond that, PremSet is a connected solution providing a complete new online set of monitoring tools, allowing transition to conditional based maintenance, which helps to reduce downtime and optimize maintenance costs, with real-time data supporting effective decision making, remotely.

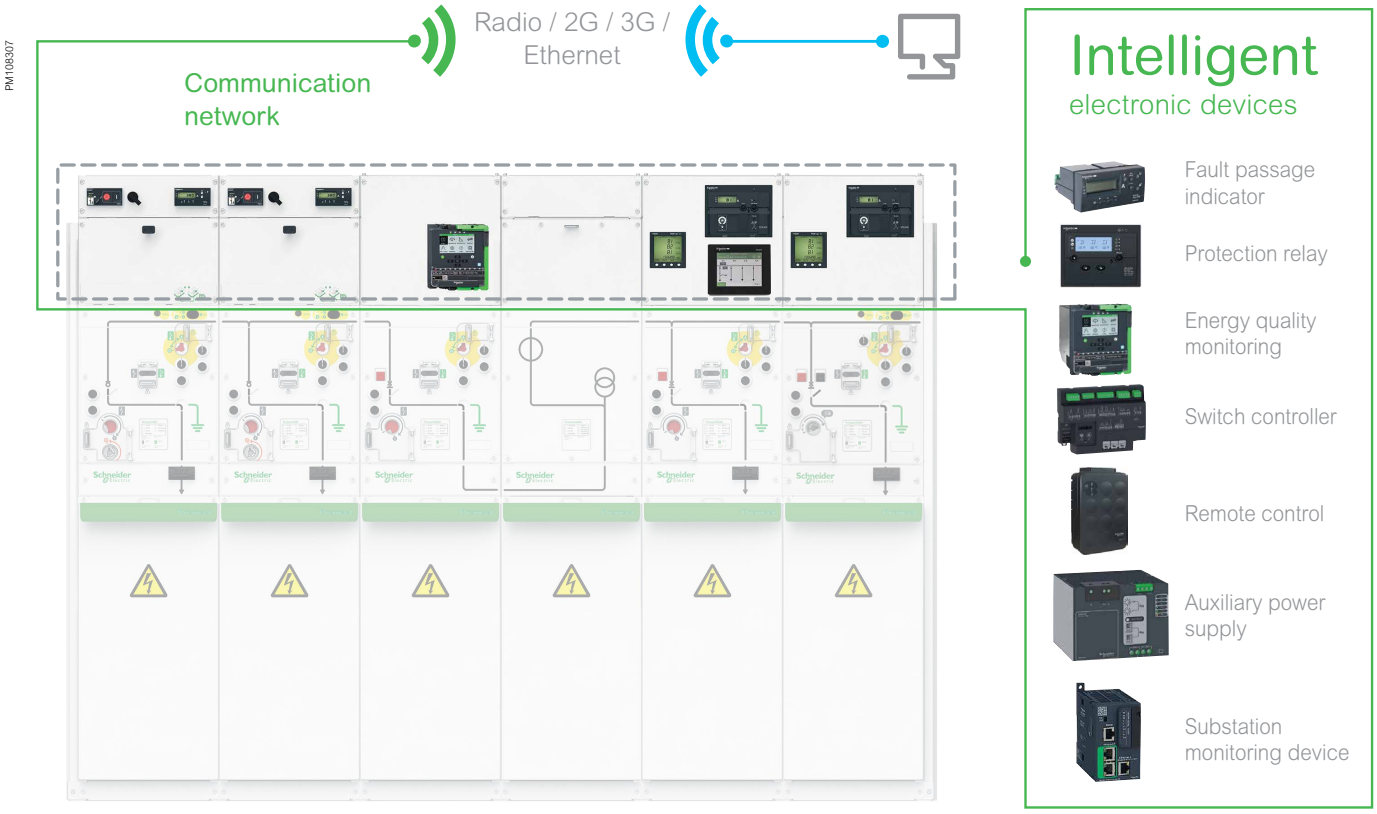
It also provides an enhanced protective environment for people and other equipment operating nearby.



Architecture with distributed intelligence

The intelligent electronic devices (IEDs) used in PremSet solutions allow facilitated integration, based on a standard communications protocol, with a plug-and-play scanning system for easy configuration.

All this adds up to a flexible system with integrated Web technology, pre-engineered and pre-tested, which you can upgrade as necessary. With PremSet architecture, you can build a smarter MV distribution system.



Reliability

Long-lasting performance helping to secure customer service continuity

Extending protection to the entire switchgear assembly, PremSet is the first global product to offer shielded solid insulation throughout, enhancing peace of mind.

The system is applicable for network functions, including:

- Load break switches or circuit breakers
- Integrated metering units
- Current and voltage transformers

Intuitive operation

With only two operations from line to earth (one to open and disconnect, and one to earth), the PremSet range helps to ensure a protective operating environment.

Additionally, standard built-in interlocking between the main and earthing functions is keyless and positively driven, in order to facilitate interaction with the unit.

Long-term reliability

An SF6-free design for freedom from environmental constraints.

- Shielded solid insulation system (SSIS)
- SSIS is applicable for functions such as load break switches or circuit breakers, compact metering functions, or current and voltage transformers

Flexibility

A compact and modular design to suit all customer applications

From standard solutions to very specific needs

PremSet architecture flexibility means standard configurations can be tailored to meet your needs.

The PremSet range offers a wide choice of functions, including switches, circuit breakers, and metering functions, as well as several cabling options, providing a wealth of solutions to suit customer requirements.

PM100021

All-in-one solution

- A unique connection interface (Schneider Electric patented design): one set of three connections for cables that can be used in various directions (front, rear, bottom, and top)
- Embedded voltage and current sensors, optimizing protection and control, with integrated CT or VT around core function: no need for extra or larger cubicle
- A universal flat power connection system, ensuring earth shield continuity (Schneider Electric patented design)
- A large choice of cable box dimensions to adapt to the substation room and cabling, with embedded voltage option

Overview

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Fields of application

Typical applications

PremSet applications can be found in all medium voltage secondary distribution substations.

PE58813

Buildings and industry

- MV/MV consumer substation direct connection
- MV/LV consumer substation double feeder
- MV/LV consumer substation loop connection
- MV/LV consumer substation radial connection
- MV/LV consumer substation with MV backup
- MV private network
- MV/LV substation

PM104063

Distribution networks

- MV/MV switching substation
- MV/LV distribution substation
- MV/LV ring main unit
- MV distributed generation

PremSet advanced communication possibilities open up the way to applications such as:

- Local control up to complex feeder automation
- MV automatic transfer system (ATS)
- RTU with new smart grid functions for load management

PM104065

PM104064

Marine applications

PremSet has DNV-GL type approval certification for marine applications, which offers significant advantages:

- Enhanced protective environment
- Enhanced reliability
- Smaller footprint

PM106692

Fields of application

Marine applications

A Marine version has been developed to meet specific conditions when used onboard ships (vibrations, etc.).

PM106693

PM108308

The PremSet Marine version carries over the electrical and dimensional characteristics of the standard range, adapted to Marine requirements.

- PM (partition class) compartmented cubicle
- Front access
- IP41 or IP32 (IP67 HV parts)
- Easergy P3, Sepam, VIP40 protection and control chain, up to 25 kA 1s
- Thermal diagnostics (optional)

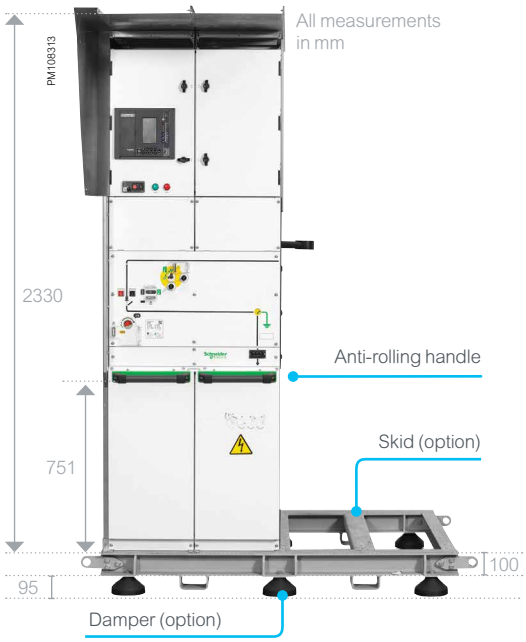
DNV·GL

IACS
INTERNATIONAL ASSOCIATION OF CLASSIFICATION SOCIETIES LTD.

Environmental conditions		
Ambient temperature	-25 to +45 °C	
Humidity	On 24 h	95%
	On 1 month	90%
Vibrations (IEC 60068-2-6)		
Frequency range	2 to 13.2 Hz	1 mm
	13.2 to 100 Hz	0.7 g

Rated voltage (kV)		7.2	12	17.5
Rated insulation level				
Power frequency withstand voltage	50-60 Hz ,1 min (rms kV)	20	28	38
Lightning impulse withstand voltage	1.2/50 µs (kV peak)	60	75	95

PM108313



For PremSet compact marine version (smaller cable compartment and low voltage cabinet), please contact our Customer Care Center.

PremSet suitable for marine requirements

- Internal arcing withstand is ensured inside the room by the use of a tunnel specifically designed for marine applications. Located above the cubicle, it can absorb gases due to arcing effects.
- A large low voltage control cabinet has also been designed to meet the need for using numerous control and monitoring systems and LV components.
- The incoming/outgoing feeder cubicles are connected by cables through the bottom.
- Skids are available as an option to group together several cubicles on a platform for improved rigidity and to absorb vibrations through the use of dampers They also facilitate handling and installation of the switchboard.
- Motor starter applications: see Motorpact catalog.

Functional unit with circuit breaker				
Short-time withstand current	Ik max.	Ik/tk	(kA/3 s)	25
Rated current	Ir max. busbar	Ir	(A)	1 250
	Ir CB	Ir	(A)	630
				1 250

Presentation

PM100595

Shielded Solid Insulation System

Shielded Solid Insulation System

The entire main circuit is solid insulated with epoxy or EPDM so that there are no exposed live parts, offering the following benefits:

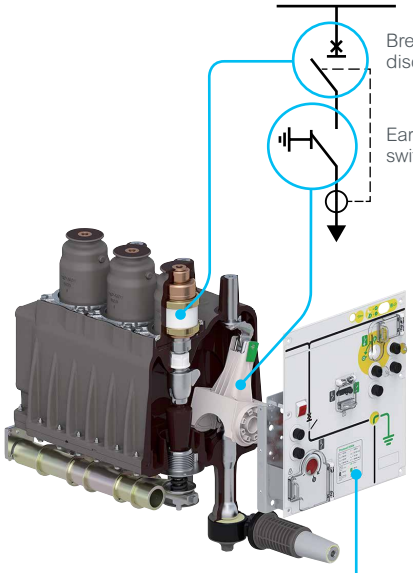
- Insensitive to harsh environments (humidity, dust, pollution)
- Improved reduction of risk of phase-to-phase faults

The solid insulation is shielded, i.e. its surface is at earth potential everywhere (no propagation of electric field into the ambient areas of the switchgear):

- System is “accidentally touchable”, in accordance with PA class of IEC 62271-201
- Extended life expectancy

All functions with a shielded solid insulation design help to improve product life expectancy, including the M06S compact metering unit.

PM100018

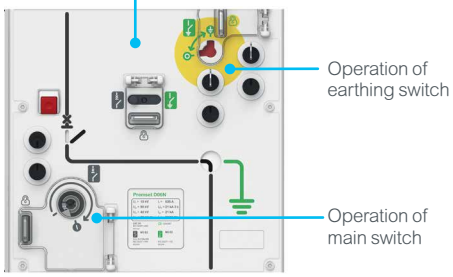


Innovative single line diagram, new arrangement of main functions

The PremSet single line diagram is composed of:

- Switch-disconnector using vacuum interrupters
- Earthing switch within sealed tank with air at atmospheric pressure
  - MV cables can be directly earthed, via the earthing switch, with no contribution required from any other device
  - The arrangement of two devices in series provides double isolation between busbars and cables

PM100015



“3-in-1” integrated core units

All the necessary functions - breaking, disconnection, and earthing - are embedded in a single device:

- Simple operation, with just 3 positions for all units: connected – opened & disconnected – earthed
- Intuitive mimic diagram, with two clear indicators (in accordance with IEC 62271-102)
- All interlocks between functions are built-in as standard, positively driven and without keys.

This applies to circuit breakers and load break switches alike.

Presentation

Consistent range of switches and circuit breakers to suit any application

The range of core units is composed of 3 switches and 5 circuit breakers:

- I06T: simple load break switch for cable incomers or feeders
- I06H/I12H: heavy-duty switch for transfer between multiple sources
- D02N: fast clearing circuit breakers for fuseless MV/LV transformer overcurrent protection
- D06N: simple circuit breaker for general protection
- D06H/D12H: O-CO-CO heavy-duty circuit breaker with fast reclosing capacity for line protection

Modular system architecture, simplifying installation and upgrading

The entire range of core units is optimized for dedicated applications, sharing:

- Same dimensions and footprint, 375 mm width in particular
- Same auxiliaries such as electrical operation devices, accessories, and options
- Same easy operation and possibility of installation against a wall
- Extensive cable entry possibilities including bottom-front, bottom-rear, top-rear
- Same cable connections with type “C” bushings (according to EN 50181), 700 mm above floor

This also applies to the following units:

- M06S and M12S compact metering units with shielded solid insulation
- G06 and G12 bus risers
- VTM and VTM-D voltage metering and VTP and VTP-D power supplies

Presentation

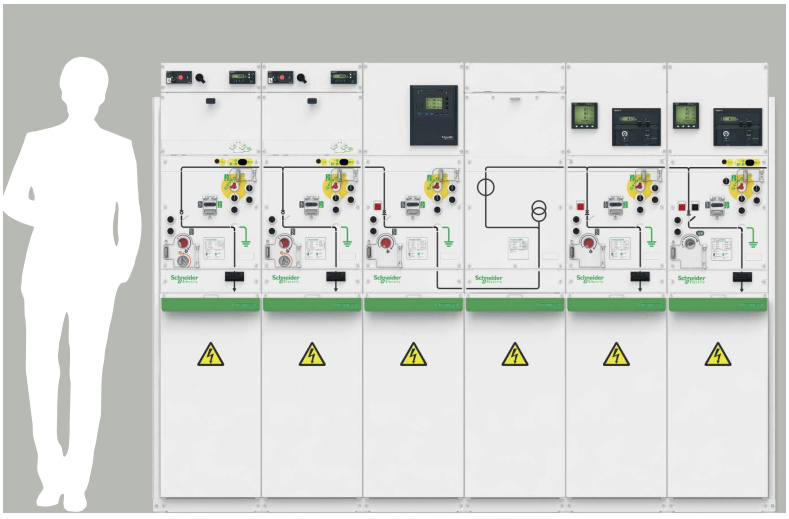
Innovative auxiliary feature (optional)

- Live cable interlock
  - Electrical interlock helps to prevent the earthing of live cables
- Cable testing device, interlocked with earthing switch, simplifying cable testing and diagnostics:
  - Cable testing without accessing cable box or dismantling cable connections
  - Test device connection from the front of the switchboard, while cables remain earthed
  - Interlocks with earthed star point
- Circuit breaker testing with dedicated device for primary injection
  - Primary test current injection without disconnectiong CTs or modifying relay setting
- Source changeover controller devices

Smart grid ready

- D06H heavy-duty circuit breaker:
  - Dedicated to line management (with fast reclosing capacity and O-CO-CO cycle)
  - Very small footprint (375 mm width)
- Built-in self-powered protection and embedded communication
- Integrated metering and power measurement functions:
  - Compact metering unit with 375 mm wide and shielded solid insulation
  - Integration of power measurement in incomers or feeders without additional space
- Feeder automation features:
  - Modular architecture for scalable solutions (distributed intelligence)
  - Linked by fieldbus using standard Modbus RJ45 protocol
  - Easy to integrate in SCADA systems via multiple protocols (IEC 61850)
  - Embedded web interface

PM100567



Architecture and components

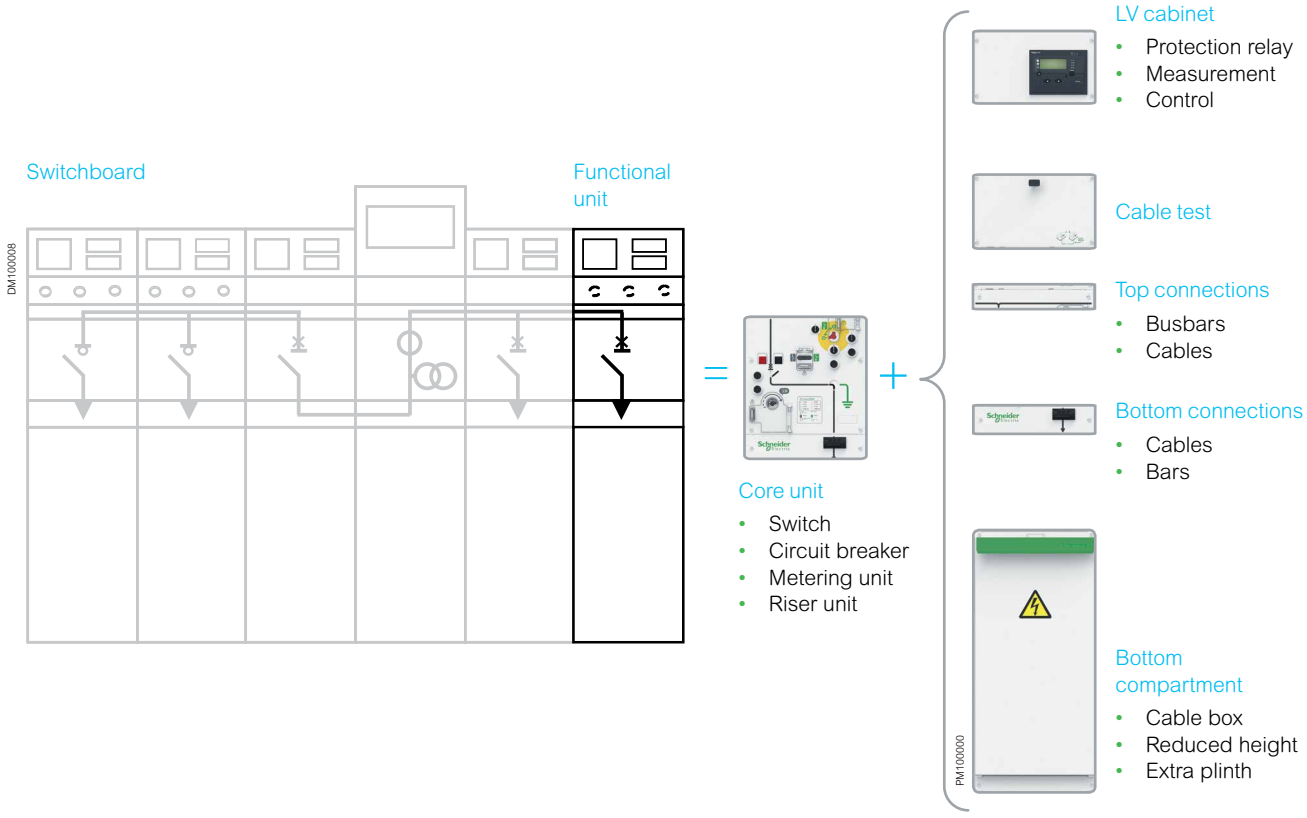
PremSet switchboards are made up of functional units, each representing a type-tested assembly composed of a basic core unit and other functional blocks designed to work together in any combination.

The core units are optimized for each typical application and the assembly forms an insulated functional unit insensitive to the environment.

This PremSet medium voltage system makes it possible to meet the majority of your application needs.

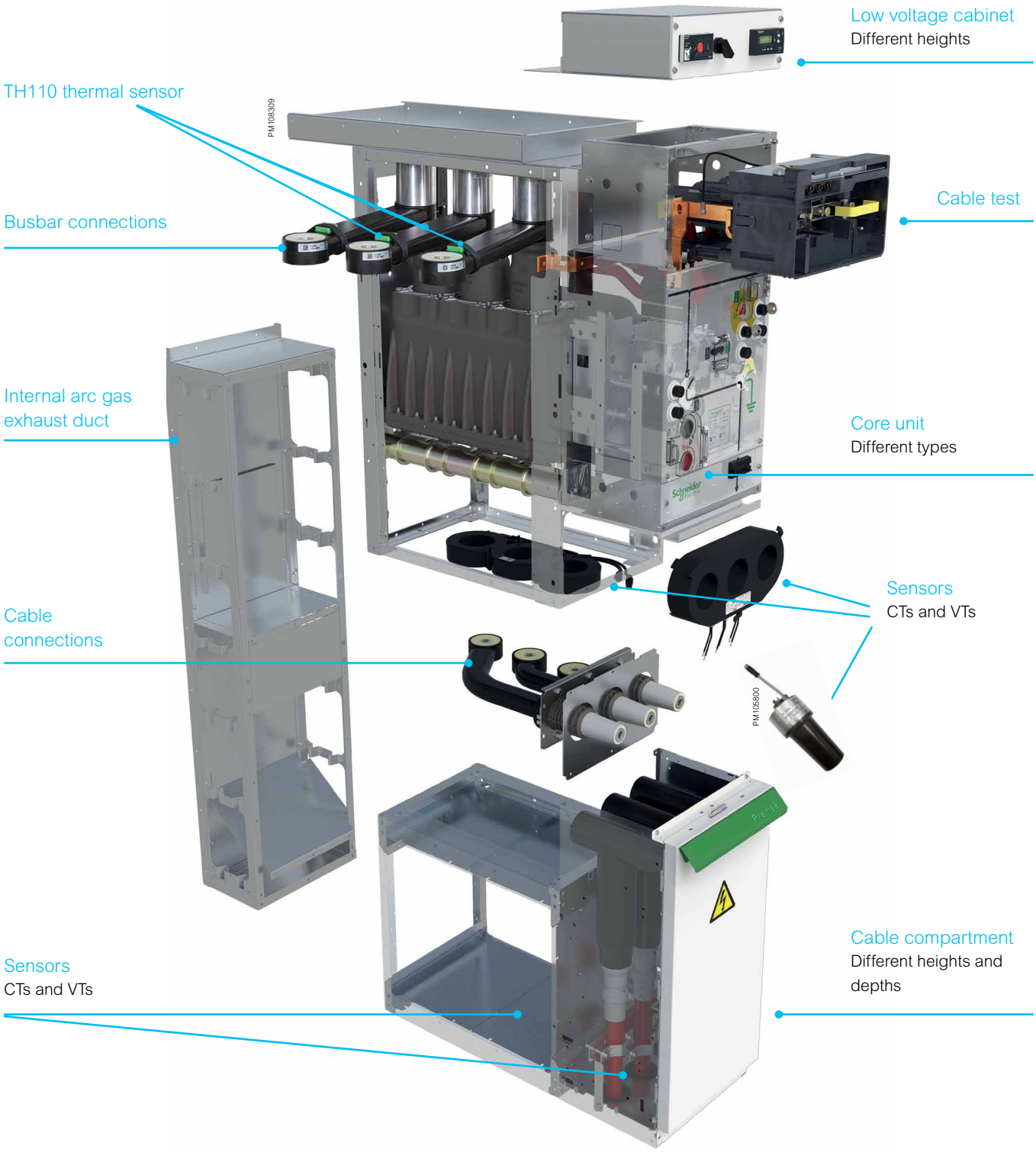
- Flexibility and simplicity in the design of functional units for any application
- Space savings
- Freedom from environmental constraints regarding SF6
- Shorter delivery times and the possibility of making last minute modifications
- Easy extension and upgrades

Functional unit = An assembly of functional blocks



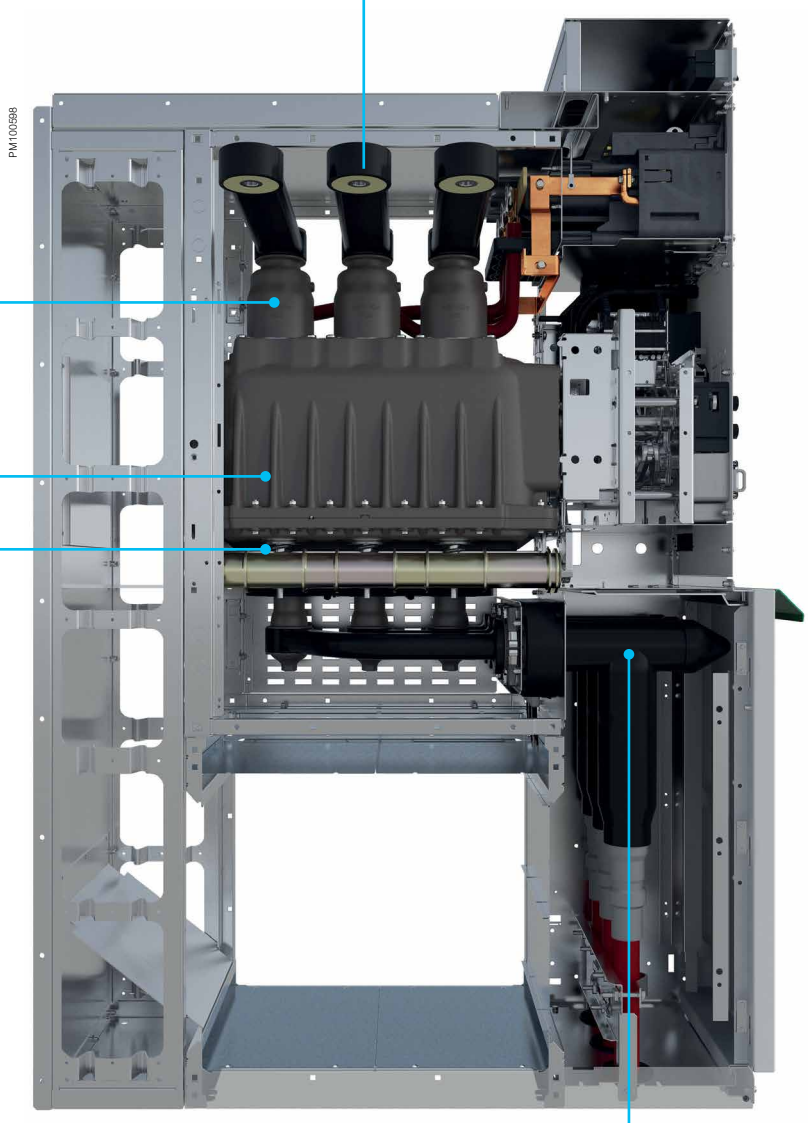
Architecture and components

Unsurpassed simplicity with mix-and-match modular architecture based on functional blocks



Architecture and components

A more protective environment with the SSIS shielded solid insulation system



Modular busbar system
with shielded solid insulation

Vacuum bottles
with shielded solid insulation for breaking and disconnection

Integrated air-insulated line earthing switch
enclosed in a tank with shielded solid insulation

Built-in current sensors
for optimized protection and control, available in versions with shielded solid insulation where required

Front aligned cable connections
with shielded solid insulation, designed for easy clamping

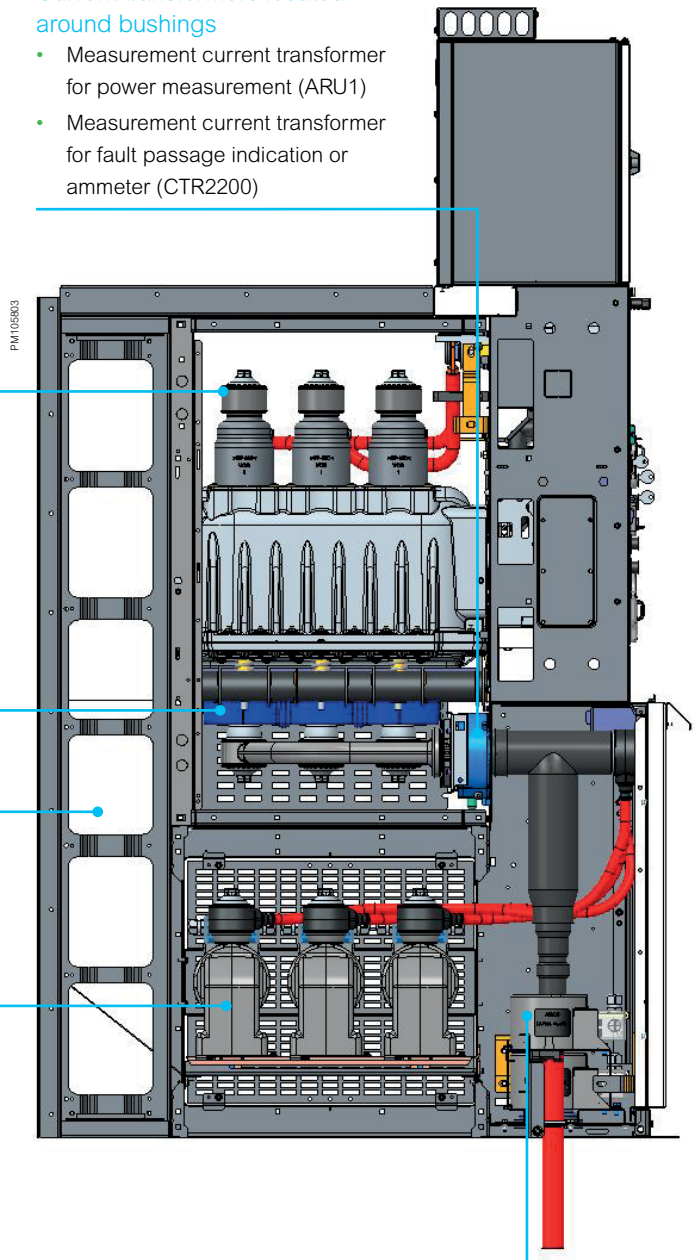
Architecture and components

Current and voltage transformers integrated in main functions

Front bottom connection

Current transformers located around bushings

- Measurement current transformer for power measurement (ARU1)
- Measurement current transformer for fault passage indication or ammeter (CTR2200)



Voltage transformer (LVPT) on busbar (option)

Protection current transformer or sensors located under the core unit

- Dedicated current transformer (CuA, CuB) for VIP integrated self-powered protection
- Low power current transformer (TLPU1) for Sepam
- 1 A ring-type current transformer (ARU2) for Sepam, MiCOM, Easergy range, or any conventional relay

Internal arc gas exhaust duct

Upwards or downwards exhaust

Voltage transformers located behind the cables

Phase-to-earth voltage transformers (VRU1)

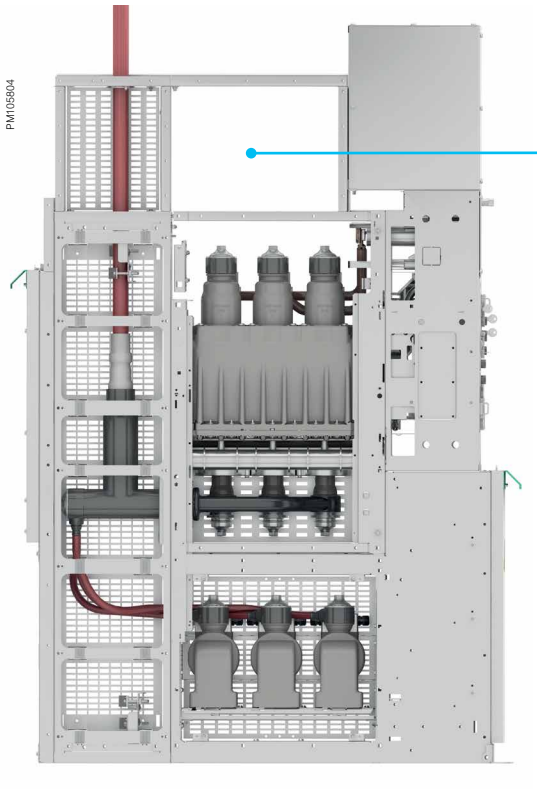
Current transformers located around cables

- Ring-type current transformer for power metering or protection (ARC6)
- Earth fault toroidal current transformer for high sensitivity earth fault protection (CSH120/200)
- Measurement current transformer for fault passage indication or ammeter (MF1)

Architecture and components

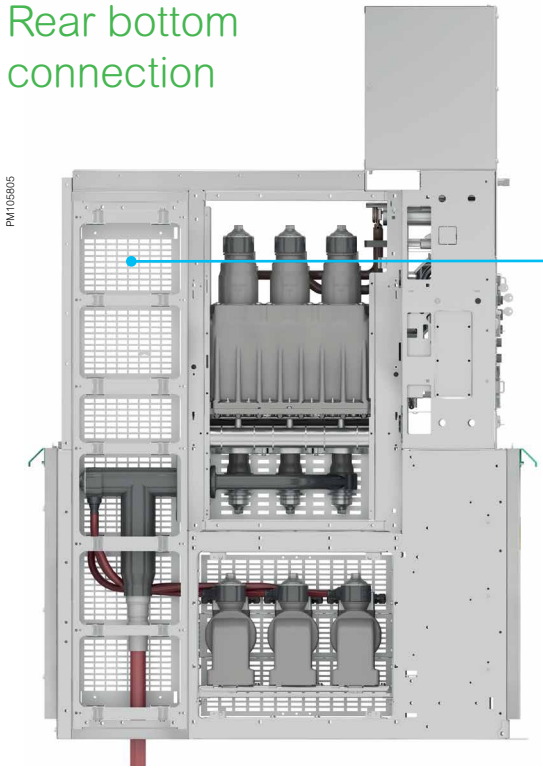
Flexible cable connections facilitate substation arrangement to meet application requirements

Rear top connection



Gas exhaust duct
Internal arc gas upwards exhaust

Rear bottom connection



Internal arc gas exhaust duct
Upwards exhaust or downwards exhaust

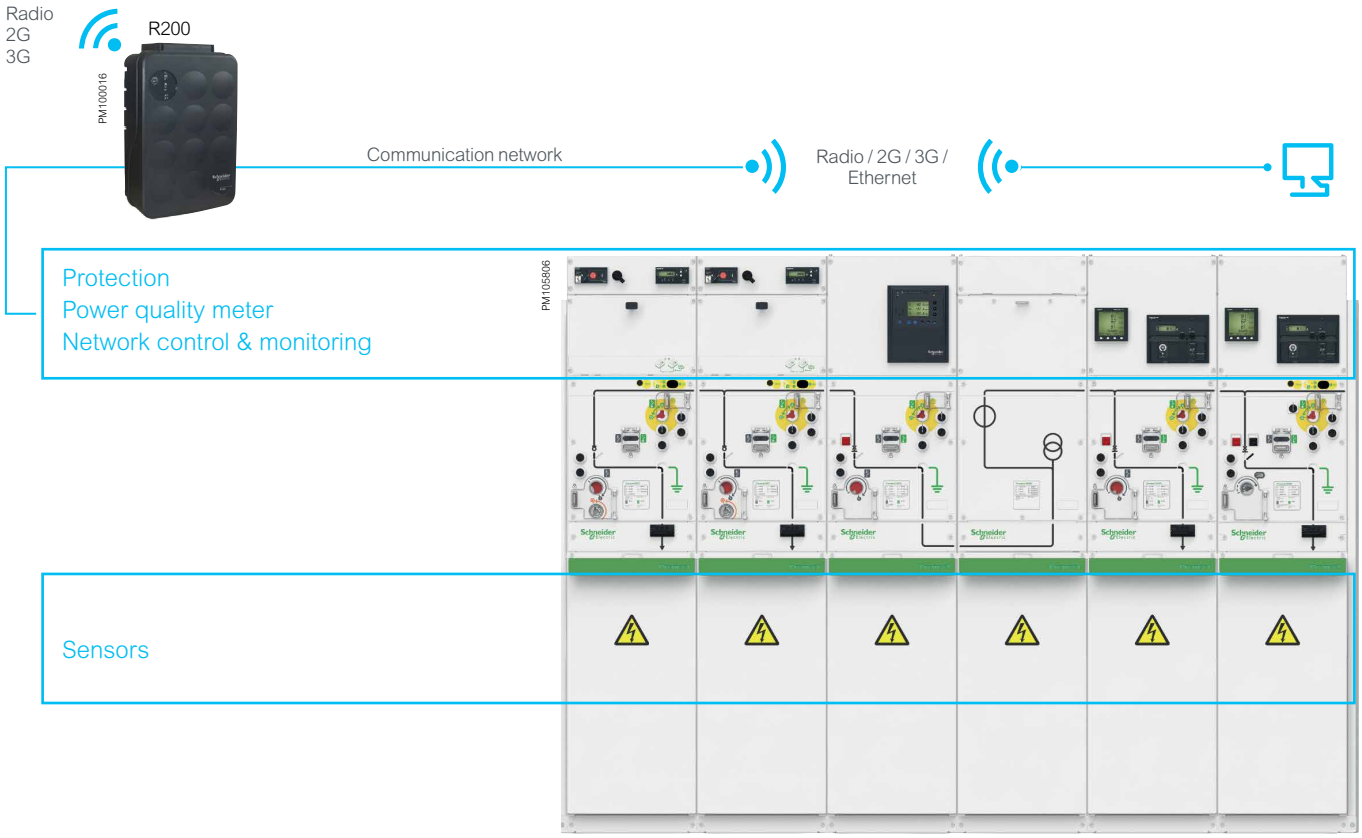
Distributed intelligence

PremSet is Web-enabled to let you access information on your electrical installation via a PC with a standard Web browser.

With PremSet, intelligence can be added to functional units by integrating protection, control, and monitoring intelligent electrical devices (IEDs).

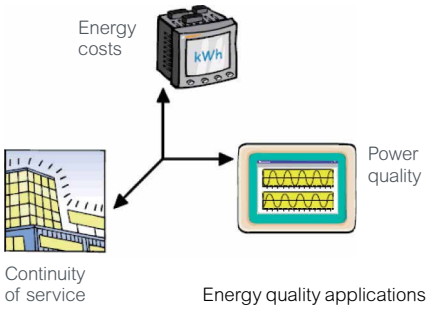
The IEDs have dedicated locations and cabling and are daisy-chained throughout the various functional units using RJ45 connectors and the Modbus protocol.

A gateway can be used to connect the IEDs to supervision systems via Ethernet, TCP-IP, and/or radio-frequency communication.



Distributed intelligence

DM100033



PremSet switchboards are designed to integrate distributed intelligence for feeder automation, protection, and energy quality applications.

LOCAL CONTROL

- Motor control: SC110
- Control panel: SC-MI20

SC-MI20

SUBSTATION MONITORING DEVICES

- Embedded intelligent devices

- Switch controller for remote communication network: SC110
- Remote communication network (2G/3G/Ethernet/Radio): R200
- Automatic transfer system: ATS100
- Backup power supply: PS100

PS100

R200

ATS100

SC110A

PM100310

PROTECTION RELAYS

- Self-powered: VIP 40 and VIP 45, VIP 400 and VIP 410
- Auxiliary powered: Sepam, MiCOM, and Easergy ranges

VIP 410

Sepam

MiCOM

Easergy P3

Easergy P5

MEASUREMENT

- Ammeter: AMP21D
- Power meter: PM5000
- Power quality meter: PM8000

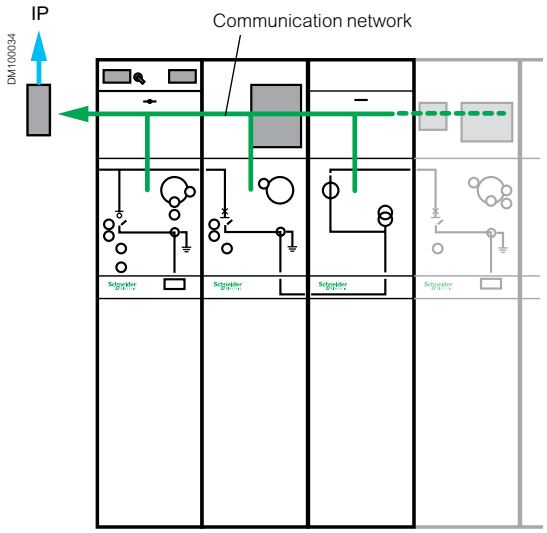
PM8000

FAULT DETECTION

- Fault passage indicators: Flair 21D/22D, Flair 23DM
- Voltage indicators: VPIS, VDS
- Voltage relay: VD23

Flair 23DM

Distributed intelligence

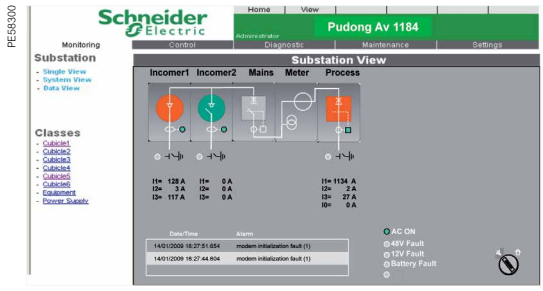


Distributed architecture to facilitate installation, operation, and scalability

The IEDs used in the PremSet system have been designed to optimize substation performance and compactness.

They can be used to build a robust distributed architecture suited to harsh environments.

- Modular architecture for scalable solutions from local control up to complex feeder automation, helping to optimize cost and performance by letting you choose only what you need
- Each IED is fully integrated in a functional unit with a dedicated location and cabling
- Pre-engineered, pre-tested, and cost effective, the system includes the sensors, switchgear interfaces, power supplies, communication solutions, and HMIs
- Facilitated integration based on fieldbus communication between IEDs with a plug and play system that scans and configures the system
- The fieldbus uses standard Modbus RJ45 protocol open to third-party devices
- Each IED has a compatible XML description file based on CIM (Common Information Model)/IEC 61850 standard. This makes it possible to communicate with any RTU (remote teminal unit) or SCADA (supervisory control and data acquisition) system.



Smart grid ready

In the 80s and 90s, RTUs were mainly used in feeder automation applications to improve energy availability and reduce the number and duration of outages. Today, RTUs have evolved to integrate functions such as automatic meter reading and load management.

Ready for the future, the PremSet system R200 RTU has downloadable firmware to keep pace with these and other evolving possibilities of smart grids.

Web technology

PremSet integrates Web technologies so that access to information on your electrical installation is as easy as opening a Web page.

All you need is a standard Web browser and a PC connected via:

- Your local area network
- A pluggable connection to the PremSet switchboard
- Mobile network access (3G, 4G, GPRS)

Distributed intelligence

PM100576

VIP 400/410

VIP self-powered protection relay

For higher MV network availability

VIP relays are self-powered while Sepam relays require an auxiliary power supply.

Self-powered protection relays increase the availability of the MV network and are suited to most applications.

- Designed to respond to voltage drop
- Not dependent on UPS systems
- Less dependent on the external environment (EMC, LV overvoltages) because they require no external connections

In addition, the VIP 410 offers enhanced sensitivity to low earth-fault currents and provides additional diagnostics with time-stamped logs thanks to a dual power supply and a communication port.

PM100573

VIP 40/45

Circuit breaker

For improved MV/LV transformer protection

With the VIP 40/45, PremSet circuit breakers provide MV/LV transformers superior protection compared with traditional MV switch-fuse solutions - at an equivalent lifetime cost.

The main advantages are:

- Better discrimination with other MV and LV protection devices
- Improved protection performance for inrush current, overloads, low magnitude phase-faults, and earth-faults
- Greater harsh environment withstand
- Fast clearing time, to limit the consequences of internal arcing in the transformer

EMS58355

Flair FPI

Auto-adapting fault passage indicator

With remote communication for higher power network availability

The Flair range offers cost-effective auto-adapting fault passage indicators (FPI) that can be fully integrated in the cubicle.

In addition to the Flair 21D/22D self-powered FPIs, the range includes the Flair 23DM, a powerful IED with a communication port.

- The Flair 23DM is linked to the voltage presence indication system (VPIS)to confirm faults by undervoltage instead of current measurement, thereby avoiding transient faults
- The Flair 23DM provides an integrated output voltage relay for automatic transfer switch (ATS100) or other applications
- Phase fault and standard earth fault detection are maintained even if the power supply is lost. The auxiliary power supply is only needed for communication and the voltage presence relay
- The communication port provides the current values, records diagnostic information (voltage drops, transient fault indications), and makes it possible to modify settings remotely

Distributed intelligence

PE88030

Sepam range

PM105840

MiCOM range

Easergy P3U 10/20/30

- Feeder and transformer
- Motor
- Voltage
- Frequency
- Capacitor

PM106572

PM106362

Easergy P3 SmartApp

Easergy P5 provides access to an extended warranty program when users register their product using the QR code and follow a simple process with the mySchneider mobile app.

PM104085

PM108232

Easergy P5 SmartApp

Full range of protection relays

Schneider Electric is a trusted, global provider of protection relays and control solutions, as well as a leader in electical distribution innovation.

Our ranges of protection relays are the result of more than 100 years of manufacturing and power system experience.

Sepam range

Sepam series digital protection relays take full advantage of Schneider Electric's experience in electrical network protection to meet your needs with effective protection of life and property.

MiCOM range

MiCOM protection provides the user with a choice of cost-optimized solutions for specific protection requirements within the distribution network. The MiCOM relay series offers comprehensive protective function solutions for all power supply systems, as well as for various functional and hardware project.

Easergy P3 Universal protection

The Easergy P3 protection relay family has been developed to cover standard protection needs for industrial and commercial building applications. Thanks to its cost-effective and flexible design, Easergy P3 provides an excellent alternative for various protection applications.

User-friendliness has always been a core value for Schneider Electric products, and the Easergy P3 is no exception, with the unique option to operate though your smartphone or tablet using the "Easergy SmartApp".

Rapid configuration is achieved using the unique "eSetup Easergy Pro" parameter-setting software, which improves usability.

Easergy P5: a fusion of new ideas and proven expertise

Easergy P5 combines fresh thinking on modern electrical challenges with a strong heritage from two popular protection relay ranges: Sepam and MiCOM.

Easergy P5's modern, digital features provide a unique combination of services designed to boost operational efficiency and safety for the user.

Product selection, configuration, and ordering have been made easy with the latest online tools. The asset database provides a management platform, which stores and organizes all information securely and is quickly accessible. Easergy SmartApp provides simple access to key functions and settings for nonexpert users and enables quick access to information and documentation.

Distributed intelligence

Backup power supply

PM100592

PS100

Backup power supplies (UPSs or batteries) are now common in industrial and commercial premises. However, they often represent a weak link in the power supply chain and their improper functioning can have serious consequences.

Given the harsh environment and critical nature of substations, the PremSet system includes the PS100, a dedicated solution with a high insulation level designed to provide 24 hours of backup power to electronic devices.

Maintenance is easy with:

- Just one battery to replace
- End-of-life alarm possible via Modbus communication

Easergy R200 and ATS100

PE57570p

R200

DM1031001

ATS100

The power and experience of Easergy FRTUs embedded in cubicles for cost-effective remote control and monitoring of MV substations:

- **Easergy R200** is a remote terminal unit (RTU) that integrates all the functions for remote supervision and control of an MV switchboard cubicle
- The **ATS100** drives automatic transfer from the normal MV source to the backup source in order to keep supplying the MV substation in case the normal source is defaulting. ATS100 can drive either a load break switch or a circuit breaker

Easergy TH110 wireless thermal sensor*

PM105623

TH110

The power connections in the medium voltage products are one of the most critical points in substations. Loose and inoperable connections cause increased resistance in localized points that will lead to thermal runaway and eventually complete failure of the connections.

Easergy TH110 is part of the new generation of wireless smart sensors that help to ensure the continuous thermal monitoring of all critical connections made on site, helping to:

- **Prevent** unscheduled downtimes
- **Enhance** the protective environment for operators and equipment
- **Optimize** maintenance with predictive information

* Please contact our Customer Care Center for availability

Substation monitoring device (SMD)

PM105452

PM108312

- **To monitor** the **major causes of incidents or unexpected events** in substations: The SMD allows you to monitor the critical points in an MV/LV sustation and provides alarms to help prevent major causes of incidents or unexpected events

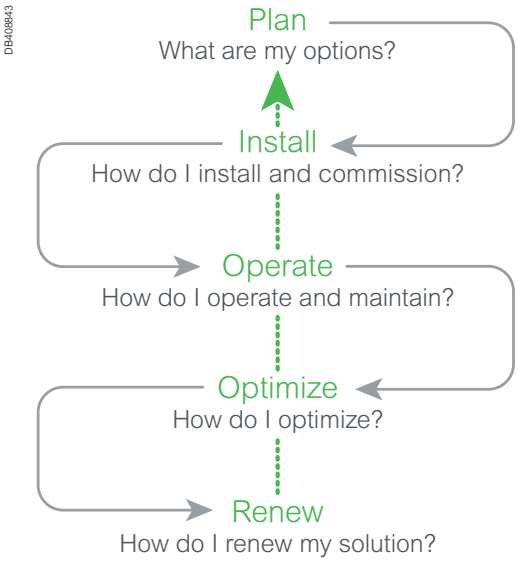
Schneider Electric Services

Greater peace of mind throughout your installation lifecycle

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.

Lifecycle services



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

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

CONTACT US!

https://www.schneider-electric.com/en/work/services/

Plan

Schneider Electric helps you plan the design and execution of your solution, looking at how to make your process more dependable and optimize 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 more efficient, more reliable 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 expenditures through its services offering.

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

Optimize

Schneider Electric proposes recommendations to help with vailability, reliability, and quality.

- **MP4 electrical assessment:** Defines an improvement and risk management program

Renew

Schneider Electric's solutions extend the original life of your system, while providing upgrades.

Green Premium™

An industry leading portfolio of offers delivering sustainable value

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 number of PEPs*
- 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.

CO_2 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 CO_2 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)

Range description

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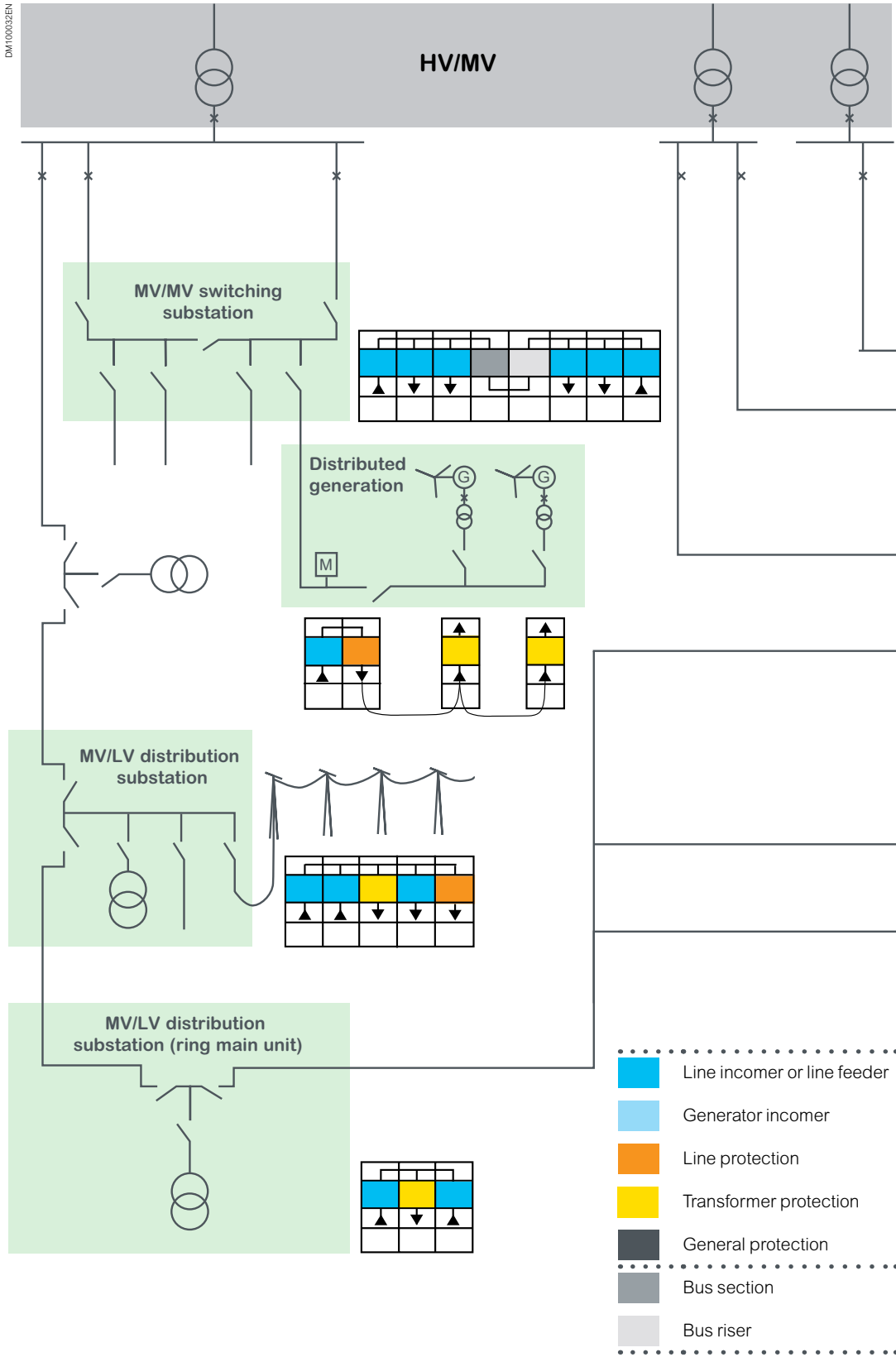
Selection chart

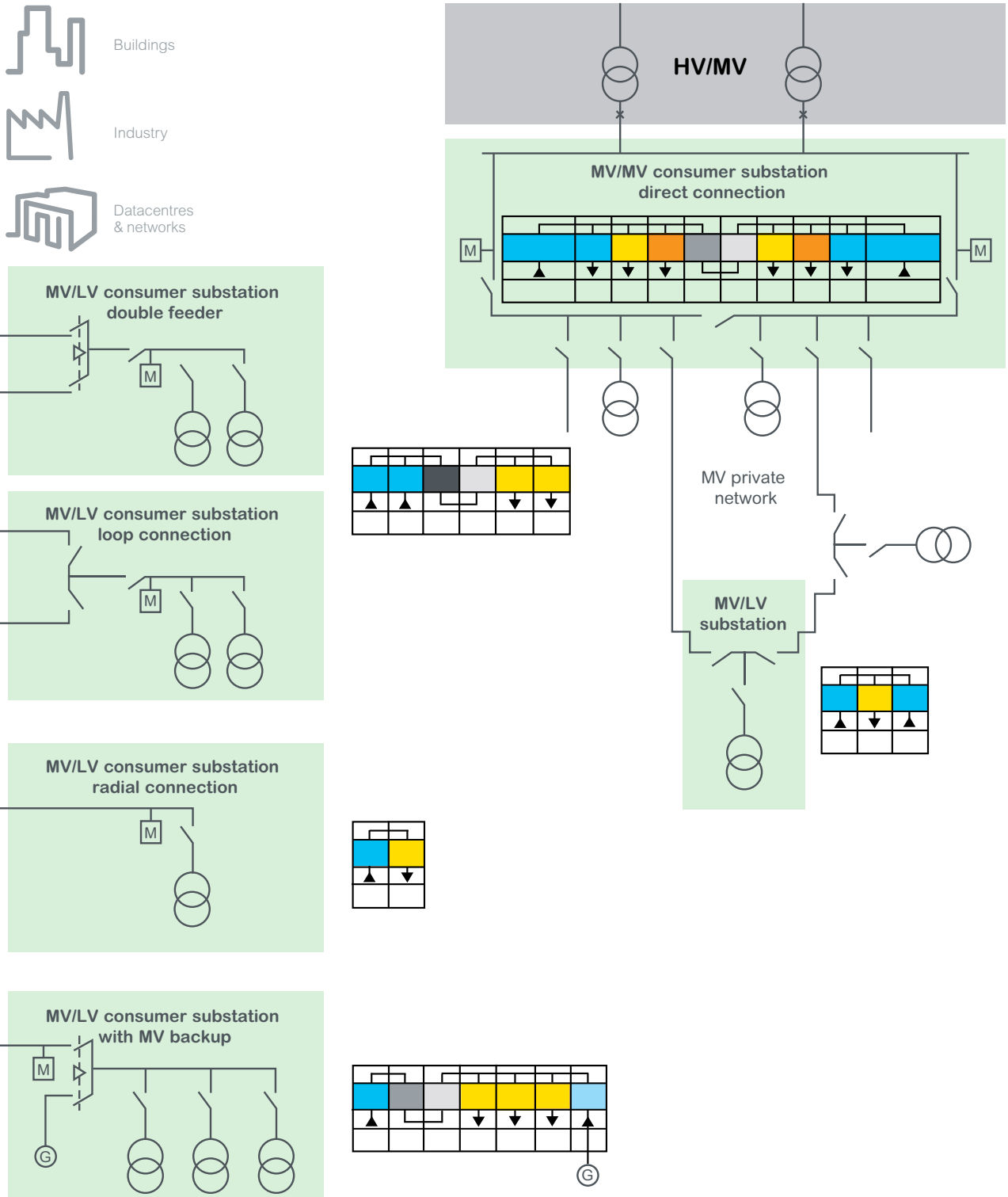
Distribution network

Energy &
infrastructure



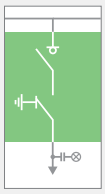
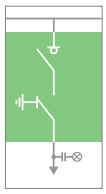
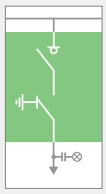
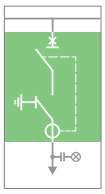
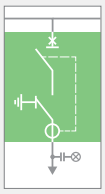
Selection chart

Buildings and Industry



Selection chart

Incomer and feeder functions

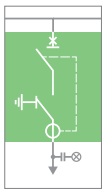
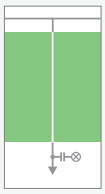
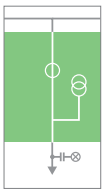
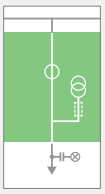
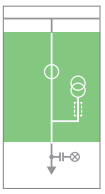
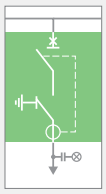
Function			Line incomer or line feeder				
Core unit type			**I12H**	**I06H**	**I06T**	**D12H**	**D06H**
Typical application of protection			■ Line incomer or line feeder			■ Line protection ■ Generator protection	
Core unit			Disconnecting switch with stored-energy OCO mechanism and integrated earthing switch	Disconnecting switch with stored-energy OCO mechanism and integrated earthing switch	Disconnecting switch with lever-operated CIT mechanism and integrated earthing switch	Disconnecting circuit breaker with stored-energy OCO mechanism and integrated earthing switch	Disconnecting circuit breaker with stored-energy OCO mechanism and integrated earthing switch
Dimensions: width (mm)			750	375	375	750	375
Single-line diagram							
See details ▶		Page	52	50	48	60	58
Earthing switch			●	●	●	●	●
Cable testing device		128	o	o	o	o	o
Live cable interlock		109	o	o	o	o	o
Protection relay [1]							
VIP 40/45	Self-powered	98					
VIP 400	Self-powered	99					o
VIP 410	Dual powered	99					o
Sepam	Auxiliary powered	96				o	o
MiCOM	Auxiliary powered	96				o	o
Easergy P3 or P5	Auxiliary powered	96				o	o
FPI [2] **- Flair 21/22D/23DM** [1]		104		o	o		
Integrated measurement [1]							
AMP21D	Ammeter	110		o	o		o
PM5000	Power meter	111	o	o	o	o	o
PM8000	Power quality meter	112	o	o	o	o	o
Control							
Electrical operation		113	o	o	o	o	o
Additional opening coil (MX or MN)		76					o [3]
Auxiliary contacts		77	o	o	o	o	o
Voltage indication [1]							
VPIS or VDS	Voltage indication	107	●	●	●	●	●
VD23	Voltage relay	108	o	o	o	o	o
Metering current transformers [1]							
ARU1	Ring CTs	85	o	o	o	o	o
ARC6	Ring CTs	86	o	o	o	o	o
ARC5	Ring CTs	86					
ARM3/AD12	Block CTs	89					
ARPJ3/AD13	Block CTs	89					
Metering voltage transformers [1]							
Phase-to-earth	LPVT	LPVT (C), (B)	84	o (C) (B)	o (C) (B)	o (C) (B)	o (C) (B)	o (C) (B)
Phase-to-earth	VRU1	Screened VTs	87	o	o	o	o	o
Phase-to-earth	VDF11/VDF21	DIN VTs	90					
Phase-to-earth	VRQ2	Block VTs	91					
Phase-to-phase	VRU2	Auxiliary power	87					
Phase-to-phase	VDC11/VDC21	DIN VTs	90					
Phase-to-phase	VRC2	Block VTs	91					
Fuses - VT protection								
Thermal sensor: TH110		114	o	o	o	o	o

● Standard offer o Option

(1) Only one option possible/(2) FPI: fault passage indicator/(3) Option only possible with VIP relay/(C) LPVT on cable side/(B) LPVT on busbar side

Selection chart

Incomer and feeder functions (cont.)/ Transformer protection functions

	Line incomer or line feeder					Transformer protection
	D06N	G06	M06S	M12A	M06A	D02N
	■ General protection	■ Line incomer or line feeder				■ Transformer protection
	Disconnecting circuit breaker with latching CI1 mechanism and integrated earthing switch	Direct connection to busbars	Solid-insulated earth-screened metering unit	Air-insulated metering unit	Air-insulated metering unit	Disconnecting circuit breaker with latching CI1 mechanism and integrated earthing switch
	375	375	375	750	750	375
						
	56	62	63	64	64	54
	●					●
	o					o
	o					o
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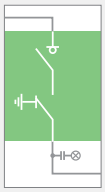
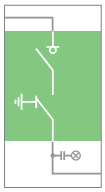
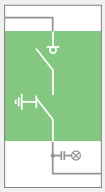
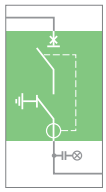
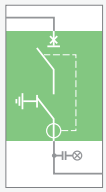
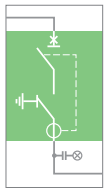
	o	o	o	o	o	o
	o					o
	o (3)					o (3)
	o					o
	●	●	●	o	o	●
	o	o	o	o	o	o
	o	o				o
	o	o				o
			o			
				o	o	
				o	o	
	o (C) (B)	o (C) (B)	o (C) (B)			o (C) (B)
	o		o			o
				o	o	
					o	
	o	o	o	o	o	o

● Standard offer o Option

(1) Only one option possible/(2) FPI: fault passage indicator/(3) Option only possible with VIP relay/(C) LPVT on cable side/(B) LPVT on busbar side

Selection chart

Bus section functions

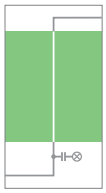
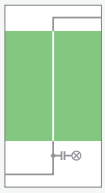
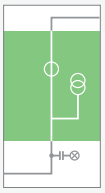
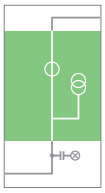
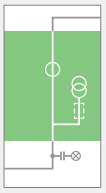
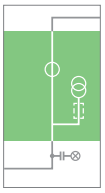
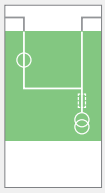
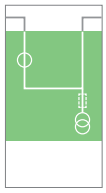
Function			Bus section					
Core unit type			**I12H**	**I06H**	**I06T**	**D12H**	**D06H**	**D06N**
Typical application of protection			■ Bus section					
Core unit			Disconnecting switch with stored-energy OCO mechanism and integrated earthing switch	Disconnecting switch with stored-energy OCO mechanism and integrated earthing switch	Disconnecting switch with lever-operated CIT mechanism and integrated earthing switch	Disconnecting CB with stored-energy OCO mechanism and integrated earthing switch	Disconnecting CB with stored-energy OCO mechanism and integrated earthing switch	Disconnecting circuit breaker with latching CI1 mechanism and integrated earthing switch
Dimensions: width (mm)			750	375	375	750	375	375
Single-line diagram								
See details ▶		Page	52	50	48	60	58	56
Earthing switch			●	●	●	●	●	●
Cable testing device		128	o	o	o	o	o	o
Live cable interlock		109	o	o	o	o	o	o
Protection relay (1)								
VIP 40/45	Self-powered	98						
VIP 400	Self-powered	99					o	o
VIP 410	Dual powered	99					o	o
Sepam	Auxiliary powered	96				o	o	o
MiCOM	Auxiliary powered	96				o	o	o
Easergy P3 or P5	Auxiliary powered	96				o	o	o
FPI (2) **- Flair 21/22D/23DM** (1)		104						
Integrated measurement (1)								
AMP21D	Ammeter	110						
PM5000	Power meter	111	o	o	o	o	o	o
PM8000	Power quality meter	112	o	o	o	o	o	o
Control								
Electrical operation		113	o	o	o	o	o	o
Additional opening coil (MX or MN)		76					o(3)	o(3)
Auxiliary contacts		77	o	o	o	o	o	o
Voltage indication (1)								
VPIS or VDS	Voltage indication	107	●	●	●	●	●	●
VD23	Voltage relay	108	o	o	o	o	o	o
Metering current transformers (1)								
ARU1	Ring CTs	85						
ARC6	Ring CTs	86						
ARC5	Ring CTs	86						
ARM3/AD12	Block CTs	89						
ARPJ3/AD13	Block CTs	89						
Metering voltage transformers (1)								
Phase-to-earth	LPVT	LPVT (C), (B)	84	o(B)	o(B)	o(B)	o(B)	o(B)	o(B)
Phase-to-earth	VRU1	Screened VTs	87						
Phase-to-earth	VDF11/VDF21	DIN VTs	90						
Phase-to-earth	VRQ2	Block VTs	91						
Phase-to-phase	VRU2	Auxiliary power	87						
Phase-to-phase	VDC11/VDC21	DIN VTs	90						
Phase-to-phase	VRC2	Block VTs	91						
Fuses - VT protection								
Thermal sensor: TH110		114	o	o	o	o	o	o

● Standard offer o Option

(1) Only one option possible/(2) FPI: fault passage indicator/(3) Option only possible with VIP relay/(C) LPVT on cable side/(B) LPVT on busbar side

Selection chart

Bus riser functions/
Metering and measurement functions

	Bus riser				Metering and measurement			
	G12	G06	M12S	M06S	M12A	M06A	M12A	M06A
	Bus riser		Metering and measurement					
	SSIS bus riser	SSIS bus riser	SSIS metering unit	SSIS metering unit	Air-insulated metering unit	Air-insulated metering unit	Air-insulated metering unit	Air-insulated metering unit
	375	375	375	375	750	750	750	750
								
	62	62	63	63	64	64	64	64
	o	o	o	o	o	o	o	o
	o	o	o	o	o	o	o	o
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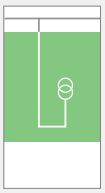
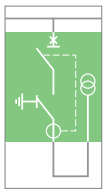
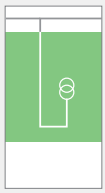
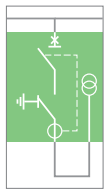
	o	o	o	o	o	o	o	o
			o	o				
					o	o	o	o
					o	o	o	o
	o(B)	o(B)						
			o	o				
					o	o	o	o
					o	o	o	o
	o	o	o	o	o	o	o	o

● Standard offer o Option

(1) Only one option possible/(2) FPI: fault passage indicator/(3) Option only possible with VIP relay/(C) LPVT on cable side/(B) LPVT on busbar side

Selection chart

Metering and measurement functions (cont.)/ Special functions

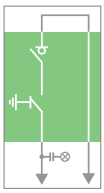
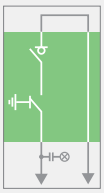
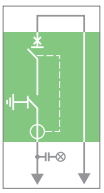
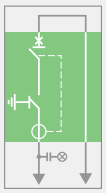
Function			Metering & measurement		Special functions	
Core unit type			**VTM**	**VTM-D**	**VTP**	**VTP-D**
Typical application of protection			Metering and measurement		Special functions	
Core unit			Metering voltage transformer: three SSIS phase-to-earth VTs	Metering voltage transformer: three SSIS phase-to-earth VTs, with D02N circuit breaker	Auxiliary power supply, voltage transformer: one SSIS phase-to-phase VT	Auxiliary power supply, voltage transformer: one SSIS phase-to-phase VT, with D02N circuit breaker protection
Dimensions: width (mm)			375	375	375	750
Single-line diagram						
See details ▶		Page	65	66	68	69
Earthing switch				●		●
Cable testing device		128				
Live cable interlock		109				
Protection relay (1)						
VIP 40/45	Self-powered	98		o		o
VIP 400	Self-powered	99				
VIP 410	Dual powered	99				
Sepam	Auxiliary powered	96				
MiCOM	Auxiliary powered	96				
Easergy P3 or P5	Auxiliary powered	96				
FPI (2) **- Flair 21/22D/23DM** (1)		104				
Integrated measurement (1)						
AMP21D	Ammeter	110				
PM5000	Power meter	111				
PM8000	Power quality meter	112				
Control						
Electrical operation		113		o		o
Additional opening coil (MX or MN)		76		o		o
Auxiliary contacts		77		o		o
Voltage indication (1)						
VPIS or VDS	Voltage indication	107				
VD23	Voltage relay	108				
Metering current transformers (1)						
ARU1	Ring CTs	85				
ARC6	Ring CTs	86				
ARC5	Ring CTs	86				
ARM3/AD12	Block CTs	89				
ARPJ3/AD13	Block CTs	89				
Metering voltage transformers (1)						
Phase-to-earth	LPVT	LPVT (C), (B)	84			
	VRU1	Screened VTs	87	o	o		
	VDF11/VDF21	DIN VTs	90				
	VRQ2	Block VTs	91				
Phase-to-phase	VRU2	Auxiliary power	87			o	o
	VDC11/VDC21	DIN VTs	90				
	VRC2	Block VTs	91				
Fuses - VT protection							
Thermal sensor: TH110		114	o	o	o	o

● Standard offer o Option
(1) Only one option possible/(2) FPI: fault passage indicator/(3) Option only possible with VIP relay/(C) LPVT on cable side/(B) LPVT on busbar side

Selection chart

Special functions (cont.)

Special functions

ES-B	I06T Cable in/out	I06H Cable in/out	D01/S02/D06N Cable in/out	D06H Cable in/out
Special functions				
Dedicated to busbar earthing	Disconnecting switch with lever-operated CIT mechanism and integrated earthing switch	Disconnecting switch with stored-energy OCO mechanism and integrated earthing switch	Disconnecting circuit breaker with latching CI1 mechanism and integrated earthing switch	Disconnecting circuit breaker with stored-energy OCO mechanism and integrated earthing switch
375	375	375	375	375
				
71	72, 48	72, 50	72, 54, 56	72, 58
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	o	o	o	o
	o	o	o	o
	o	o	o	o
			o(3)	o(3)
	o	o	o	o
	●	●	●	●
	o	o	o	o
	o	o		
	o	o		
o(B)	o(C)	o(C)	o(C)	o(C)
o	o	o	o	o

● Standard offer o Option

(1) Only one option possible/(2) FPI: fault passage indicator/(3) Option only possible with VIP relay/(C) LPVT on cable side/(B) LPVT on busbar side

Characteristics

Main electrical characteristics

Voltage							
Rated voltage	U_r		kV	7.2	12		17.5
Rated frequence	**fr**		Hz	50/60			
Insulation level							
Rated short-duration power frequency withstand voltage	U_d						
• phase-to-phase, phase-to-earth, open contact gap				20	28	42	38
• across the isolating distance				23	32	48	45
Rated lightning impulse withstand voltage	U_p						
• phase-to-phase, phase-to-earth, open contact gap				60	75	75 (1)	95
• across the isolating distance				70	85	85 (1)	110
Current							
Rated normal current for the busbar	I_r		Up to A	1250			
Rated short-time withstand current	I_k	For switchgear with tk=1 s	Up to kA	25			
		For switchgear with tk=3 s	Up to kA	25			
		For switchgear with tk=4 s	Up to kA	20			
Rated short-circuit breaking current Isc							
Circuit breaker: D02N,D06N, D06H, D12H			Up to kA	25			
Internal arc withstand							
A-FLR			kA/1s	21			
A-FLR			kA/1s	25 (2)			

(1) Higher values of the rated lightning impulse withstand voltage available with 95 kV for phase-to-phase, phase-to-earth, open contact gap as well as 110 kV across the isolating distance

(2) Except M06A and M12A

(3) LSC1 for bus riser and metering functions

Dimensions

Uniform dimensions for the entire system

- Width: 375 mm for all 630 A switch, circuit breaker, and metering units with shielded solid insulation
- 1250 A switch, circuit breaker, and air insulation metering units: 750 mm wide, but still fully compatible with the rest of the system
- Depth: 910 mm (1146 mm for cable front connection with arc control design, 1262 mm for cable rear connection with arc control design)
- Cable connections: 700 mm high front-aligned connections (500 mm with low-height bottom compartment)
- Height: 1350 to 2195 mm, depending on the LV cabinet (can be reduced to a minimum of 1350 mm with low-height bottom compartment)

Standards

IEC standards

PremSet units meet all the following recommendations and standards:

- IEC 62271-1:
  High voltage switchgear and controlgear - Part 1: Common specifications
- IEC 62271-200:
  Part 200: AC metal-enclosed switchgear and controlgear for rated voltage above 1 kV and up to and including 52 kV
- IEC 62271-103:
  Part 103: Switches for rated voltages above 1 kV and less than 52 kV
- IEC 62271-100:
  Part 100: High-voltage alternating current circuit breakers
- IEC 62271-102:
  Part 102: High-voltage alternating current disconnectors and earthing switches
- IEC 62271-206:
  Part 206: High-voltage prefabricated switchgear and controlgear assemblies - Voltage presence indicating systems
- IEC 60529:
  Degrees of protection provided by enclosures (IP Code)
- IEC 60044-8:
  Instrument transformers - Part 8: Low power current transducers
- IEC 61869-2:
  Instrument transformers – Part 2: Current transformers
- IEC 61869-3:
  Instrument transformers – Part 3: Voltage transformers
- IEC 60255:
  Measuring relays and protection equipment
- IEC 62271-210:
  Part 210: Seismic qualification for metal enclosed switchgear up to 52 kV
- IEC 62271-206:
  High-voltage prefabricated switchgear and controlgear assemblies - Voltage presence indicating systems

Internal arc fault withstand

Standard IEC 62271-200 defines internal arc classifications to characterize the performance level for protection of persons against the effects of an internal arcing fault. It also defines the testing procedure and acceptance criteria.

The aim of this classification is to show that an operator standing close to the switchboard would be protected against the effects of an internal arc fault.

Standard version

Qualified for neutral networks with earthing system

The effect of low phase-to-earth internal faults has been type-tested for the standard version of PremSet.

PremSet is IAC-qualified for an earth fault current of 100 A (IAe). This demonstrates the ability of standard PremSet to withstand internal arcing for tuned (Petersen coil) neutral networks without any specific precautions.

Arc-control version, 21 kA 1s or 25 kA 1s [1] class A-FLR [2]

Four-sided internal arc protection

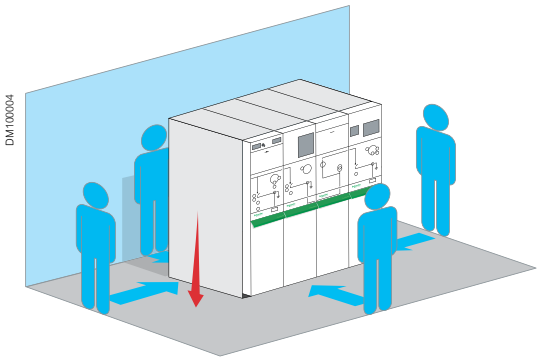
The effect of high internal faults, up to 25 kA 1s, has been type-tested on a special version of PremSet designed for arc control with two options for gas exhausting (upwards exhaust or downwards exhaust).

PremSet has successfully passed all the type tests of standard IEC 62271-200 (5 acceptance criteria).

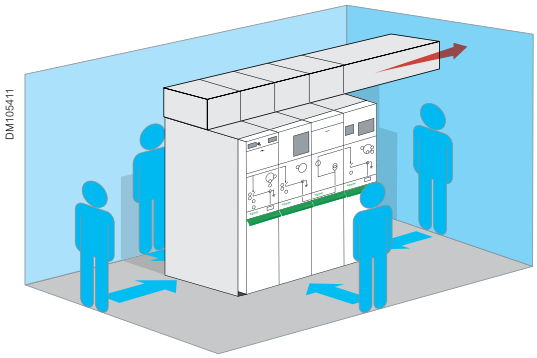
The thermal and mechanical forces that an internal arc can produce are absorbed by the enclosure.

Operator protection is improved, whatever the installation layout:

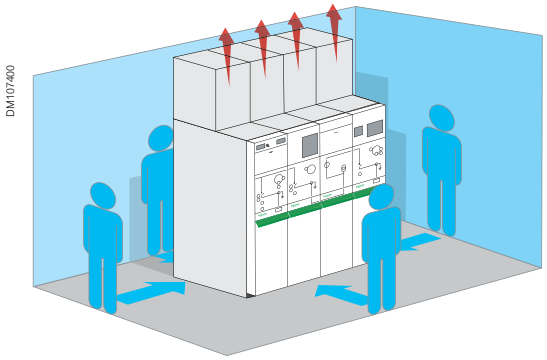
- Access to all four sides when not installed against a wall
- Front or lateral access when installed against a wall at the rear



Downwards exhaust



Upwards exhaust, with gas releases outside the room



Top exhaust, with gas releases inside the room

[1] Except for M06A and M12A

[2] IAC (internal arc classification): classification code refers to different types of accessibility according to standard IEC 62271-200.

Class A-FLR:

- A: access restricted to authorized personnel only
- F: access from the front
- L: access from the lateral sides
- R: access from the rear

Internal arc fault withstand

Drastically reduced risk of internal arc fault

PremSet shielded solid insulation technology provides phase-to-phase insulation and screening, thereby helping to reduce the possibility of a phase-to-phase fault by design (proven by testing). For all networks earthed through an impedance, this is of great advantage, as the phase-to-earth fault is limited to a low value, drastically mitigating the effects of the internal arc.

The PremSet arc-controlled version has been successfully type-tested in accordance with Edition 2 of the IEC 62271-200 standard, 25 kA-1s, A-FLR. Thus, all types of earthing systems are covered, including solidly earthed and isolated systems.

Three gas exhausting options

- **Downwards exhaust 21 kA 1s or 25 kA 1s** (for more detailed information, see the "Civil engineering, and gas exhaust" section)
- **Upwards exhaust, gas releases outside the room 21 kA 1s or 25 kA 1s A-FLR** (for more detailed information, see the “Civil engineering, and gas exhaust“ section)
- **Upwards exhaust, gas releases inside the room up to 25 kA 1s** (for more detailed information, see the “Civil engineering, and gas exhaust“ section)

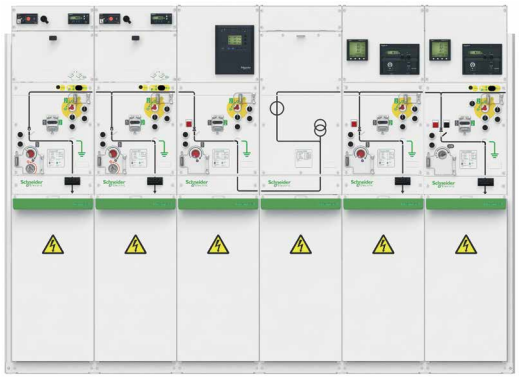
Installation against a wall

For detailed civil engineering information, please refer to page 135.

Note: When a 500 mm cable termination height is selected, 16 kA/1 s IAC is the maximum reached.

Operating conditions

PM100567b



Indoor PremSet

Partition class and loss of service continuity category

- Partition class: PM (1)
- Loss of service continuity category: LSC2 (2) (3)

Protection index

- All external faces of the switchgear: **IP3X/IP41** (available as option) / **IP32 - IP42** (available as option)
- Between compartments: **IP2X**
- Main circuit and all HV parts: IP67 (except for air-insulated metering cubicles: **M06A and M12A**).

Mechanical impact strength

IK07 for standard version.

Seismic

Seismic withstand, tested in accordance with standards:

- Chinese standard: GB/T 13540: level AG5
- IEC standard: IEC 62271-210: 0.33 g horizontal and 0.33 g vertical, class 2
- US standard: ASCE 7-10/IBC 2012/CBC 2013 and ICC-ES AC156: Level 3

Flooding

- Service continuity reached for **96 hours** of flooding for all MV functions (except for air-insulated units M06A and M12A)
- After flooding, accessories, auxiliaries and relays may require maintenance or replacement

Environmental characteristics

Altitude	• Up to 3000 m, no particular precautions except screened cable connections • Over 3000 m, please contact our Customer Care Center
Temperature (indoor version)	• Storage: from –40 °C to +80 °C • Operation: from –25 °C to +40 °C (normal conditions) IEC 60721 - level 3K6 • Operation: from +40 °C to +55 °C (please contact our Customer Care Center for special precautions)
Condensation/humidity	IEC 60721: level 3K6 & 3Z7
Chemical/pollution	IEC 60721: level 3C2
Dust	IEC 60721: level 3S2
Fire and extinguishability	Test at 850 °C according to IEC 60695-2-10 /-11 /-12

UL version PremSet

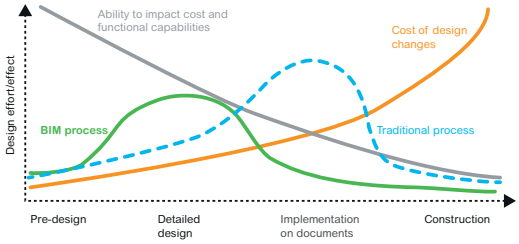
Please contact our Customer Care Center for UL version PremSet

(1) PM class according to IEC 62271-200: metallic partitioning between compartments.
(2) LSC2 (loss of service continuity) according to IEC 62271-200: this category offers the possibility of keeping other compartments energized when opening a main compartment.
(3) LSC1 for metering and bus riser functions.

BIM models

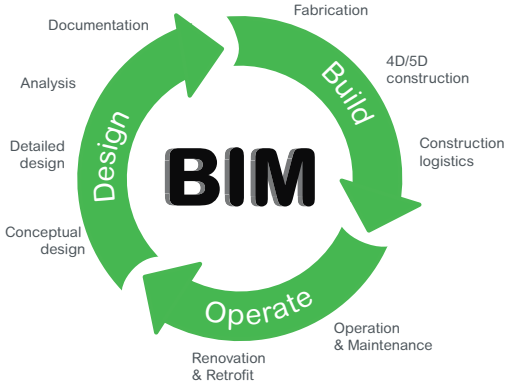
A unique opportunity to improve the key driver of the Building market
Interoperability is still a challenge

DM105306



BIM and the Building lifecycle

DM105307



Benefits of BIM

- Saves time on designs
- Cuts project costs
- Improves co-ordination and collaboration
- Minimizes risk
- Helps to easily maintain building lifecycle

PM108314

What is BIM

- BIM (building information modeling) is an evolution of the computer-aided design (CAD) and modeling software market and is key to digitization
- It improves on traditional CAD drawings by not only including geometry, but also information that helps with technical and budget calculations
- BIM also refers broadly to the collaborative processes between and/or within companies to leverage the value of the models throughout the building design and lifecycle
- It is used to create, construct, manage, and operate projects more economically and with less environmental impact

Customer requirements

Business

- High value business

Efficiency

- Reduce the time and effort required for work
- Eliminate the pain point of having disconnected tools and no ability to share and interact with others

Collaboration

- Have efficient and productive project management across multiple design environments, design team members, and stakeholders
- Eliminate the pain point of having no collaborative platform to support the electrical industry to perform electrical tasks and share experience seamlessly between companies on a global scale

PremSet 3D drawing

- **Objective:**
  3D drawings are useful for our partners (contractor and panel builders) for simulating the installation conditions (fixation points, connection points, etc.) in a 3D environment.
- **Customer values:**
  Reduction of design time. Fewer chances of making a mistake at the installation site.

PremSet BIM repositories

TraceParts Online application

PM108315

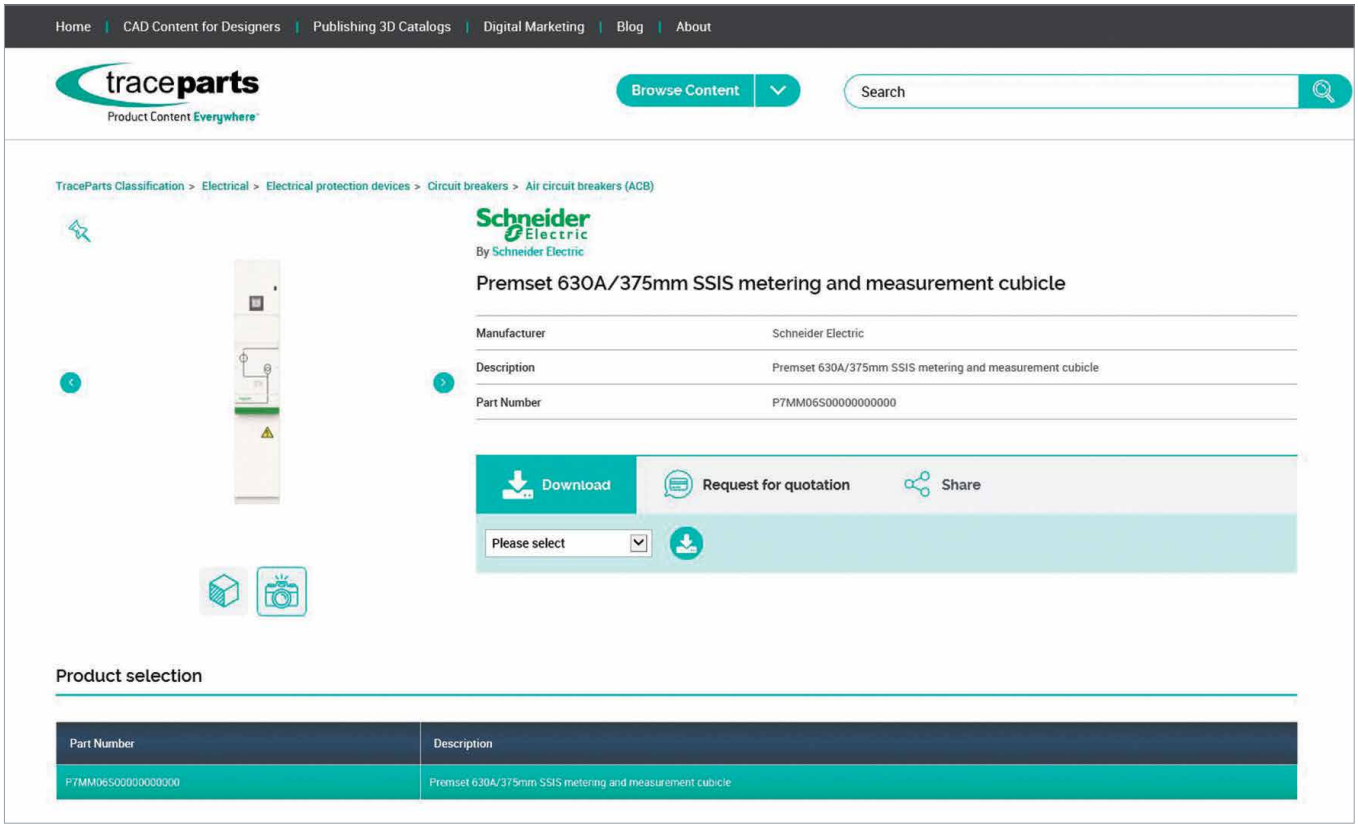
TracePartsOnline is an accessible component library that includes free 2D CAD drawings and 3D models from Schneider Electric's PremSet offering.

The components are available in different standard formats (ISO, DIN, ANSI, etc.) and also in all formats compatible with native CAD software,including PTC Creo Parametric, SolidWorks, CATIA, Pro/Engineer, Inventor, Solid Edge, TopSolid, thinkdesign, Unigraphics, Alibre Design, ACIS, STEP, IGES, DWG, and DXF.

This platform allows engineers and designers to download and use the CAD files of this offer directly.

PremSet Traceparts repositories

PM108316



Function/modules description

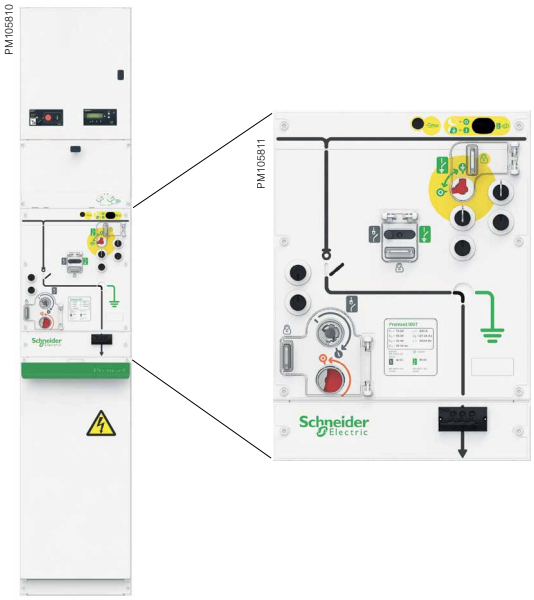
Disconnecting switch	**48**
I06T - General purpose	48
I06H - Heavy-duty	50
I12H - Heavy-duty	52
Disconnecting circuit breaker	**54**
D02N - MV/LV transformer protection	54
D06N - General protection	56
D06H - Heavy-duty line protection	58
D12H - Heavy-duty line protection	60
Bus riser	**62**
G06 - Bus riser	62
G12 - Bus riser	62
Metering	**63**
M06S - M12S compact metering	63
M06A - M12A Air-insulated metering	64
VTM - Voltage transformer	65
VTM-D - Voltage transformer with circuit breaker protection	66
Special functions	**68**
VTP - Auxiliary power supply	68
VTP -D - Auxiliary power supply with circuit breaker protection	69
ES-B - Busbar earthing switch	71
Cable in/out function	72

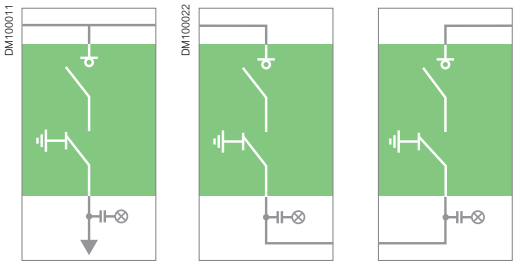
Disconnecting switch

I06T - General purpose

The I06T uses vacuum and SSIS technology:

- Compact solution, only 375 mm wide
- Rated current is 630 A





Basic equipment

'3-in-1'' core unit	• Vacuum disconnecting load break switch providing both load breaking and disconnection function • Earthing switch using air technology in sealed-for-life tank at atmospheric pressure
Mechanism	• Operating load switch with anti-reflex lever-operated mechanism (CIT type), independent of operator action • Operating earthing switch with anti-reflex lever-operation mechanism, indepent of operator action • Interlocking between the main switch and earthing switch
Three-phase busbars for top connection (630 A)	
Bottom connection	• C-type bushing for dry type cable connection or • Three-phase bottom busbar for bus coupling
Voltage presence indicator	
Cable box	With 700 mm cable connection and 290 mm deep door
Standard built-in padlocking facility	For main switch, earthing switch, and operation selector (shackle diameter < 9 mm)

Accessories

Operation accessory options

- Visibility of earthing contacts
- Electrical operation
- Auxiliary contacts on switch and earthing switch
- Voltage present/absent contact
- Local/remote control switch
- Auxiliary power shutdown switch
- Operation counter

Connection options

- 1250 A three-phase upper busbars with cable connection
- Rear cable entry (top or bottom) connection
- Deeper cable box door (500 mm)
- Compact cable box with 500 mm cable connection
- Extended low-voltage cabinet
- Raising plinth (260 mm or 520 mm)
- Dropdown cable box

Locking options

- Key-type interlocking
  - Main switch in open-disconnected position (1 or 2 keylocks)
  - Earthing switch in cable earthed position (1 or 2 keylocks)
  - Earthing switch in 'line' position (1 or 2 keylocks)
- Interlocking between cable box door and main switch and earthing switch for front cable connection
- Live cable interlocking

Functional options

- Cable current measurement CT: ARU1 or ARC6
- Cable voltage measurement VT: VRU1 or LVPT (SMVS-UV1001)
- Busbar voltage measurement VT: LPVT (VLPU1)

Disconnecting switch

I06T - General purpose

Technical characteristics

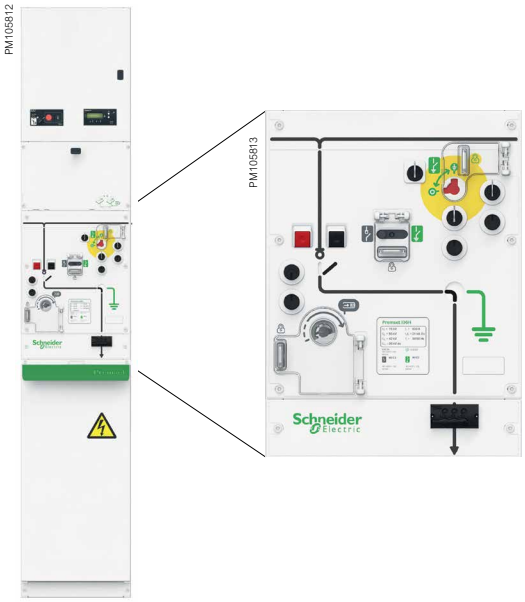
Rated voltage	**U_r**		**(kV)**	**7.2**		**12**		**17.5**	
Rated current	I_r		A	630					
Rated short-time withstand current and duration	I_k	For switchgear with tk=1 s	Up to kA	21	25	21	25	21	25
		For switchgear with tk=3 s		21	25	21	25	21	25
		For switchgear with tk=4 s		20	-	20	-	20	-
Rated making capacity of main switch and earthing switches	I_{ma}	When fr=50 Hz	kA peak	52	62	52	62	52	62
		When fr=60 Hz	kA peak	54	65	54	65	54	65
No-load mechanical endurance of main switch	M1 class (IEC 62271-103)	Number of operating cycles		1 000					
Electrical endurance of main switch	E3 class (IEC 62271-103)	Number of operating cycles		100					
Making capacity endurance of main switch	E3 class (IEC 62271-103)	Number of operating cycles		5					
No-load mechanical endurance of earthing switch	M0 class (IEC 62271-102)	Number of operating cycles		1 000					
Making capacity endurance of earthing switch	E2 class (IEC 62271-102)	Number of operating cycles		5					

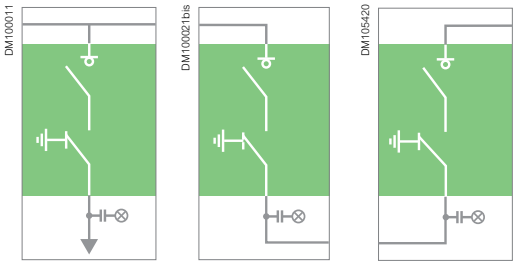
Disconnecting switch

I06H - Heavy duty

The I06H uses vacuum and SSIS technology:

- Compact solution, only 375 mm wide
- Rated current is 630 A





Basic equipment

'3-in-1'' core unit	• Vacuum disconnecting circuit breaker providing both breaking and disconnection function • Three-phase bottom busbar for outgoing feeder
Mechanism	• Operating load switch with stored-energy type operating mechanism (OCO type) with pushbutton opening and closing and spring charging using a lever • Heavy-duty operating cycle (O-0.3 s-CO-15 s-CO) • Anti-reflex lever-operated mechanism for earthing switch, independent of operator action • Interlocking between the main switch and earthing switch
Three-phase busbars for top connection (630 A)	
Bottom connection	• C-type bushing for dry type cable connection or • Three-phase bottom busbar for bus coupling
Voltage presence indicator	
Cable box	With 700 mm cable connection and 290 mm deep door
Standard built-in padlocking facility	For main switch, earthing switch, and operation selector (shackle diameter < 9 mm)

Accessories

Operation accessory options

- Visibility of earthing contacts
- Electrical operation
- Auxiliary contacts on switch and earthing switch
- Voltage present/absent contact
- Local/remote control switch
- Auxiliary power shutdown switch
- Operation counter
- Pushbutton protective cover

Connection options

- 1250 A three-phase upper busbars with cable connection
- Rear cable entry (top or bottom) connection
- Deeper cable box door (500 mm)
- Compact cable box with 500 mm cable connection
- Extended low-voltage control cabinet
- Raising plinth (260 mm or 520 mm)
- Dropdown cable box

Locking options

- Key-type interlocking
  - Main switch in open-disconnected position (1 or 2 keylocks)
  - Earthing switch in cable earthed position (1 or 2 keylocks)
  - Earthing switch in 'line' position (1 or 2 keylocks)
- Interlocking between cable box door and main switch and earthing switch for front cable connection
- Live cable interlocking

Functional options

- Cable current measurement CT: ARU1 or ARC6
- Cable voltage measurement VT: VRU1 or LVPT (SMVS-UV1001)
- Busbar voltage measurement VT: LPVT (VLPU1)

Disconnecting switch

I06H - Heavy duty

Technical characteristics

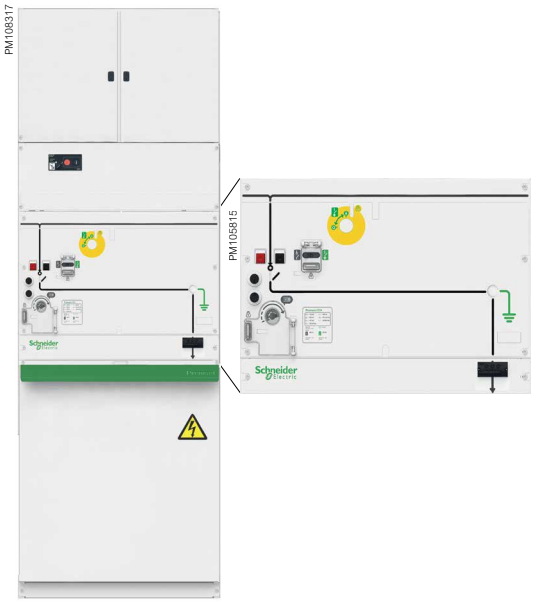
Rated voltage	**Ur**		**(kV)**	**7.2**		**12**		**17.5**	
Rated current	Ir		A	630					
Rated short-time withstand current and duration	Ik	For switchgear with tk=1 s	Up to kA	21	25	21	25	21	25
		For switchgear with tk=3 s		21	25	21	25	21	25
		For switchgear with tk=4 s		20	-	20	-	20	-
Rated making capacity of main switch and earthing switches	Ima	When fr=50 Hz	kA peak	52	62	52	62	52	62
		When fr=60 Hz	kA peak	54	65	54	65	54	65
No-load mechanical endurance of main switch	M2 class (IEC 62271-103)	Number of operating cycles		5 000					
Electrical endurance of main switch	E3 class (IEC 62271-103)	Number of operating cycles		100					
Making capacity endurance of main switch	E3 class (IEC 62271-103)	Number of operating cycles		5					
No-load mechanical endurance of earthing switch	M0 class (IEC 62271-102)	Number of operating cycles		1 000					
Making capacity endurance of earthing switch	E2 class (IEC 62271-102)	Number of operating cycles		5					

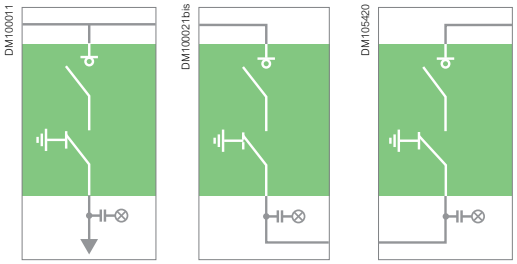
Disconnecting switch

I12H - Heavy duty

The I12H uses vacuum and SSIS technology:

- Compact solution, only 750 mm wide
- Rated current is 1250 A





Basic equipment

'3-in-1'' core unit	• Vacuum disconnecting load break switch providing both load breaking and disconnection function • Earthing switch using air technology in sealed-for-life tank at atmospheric pressure
Mechanism	• Operating load switch with stored-energy type operating mechanism (OCO type) with pushbutton opening and closing and spring charging using a lever • Heavy-duty operating cycle (O-0.3 s-CO-15 s-CO) • Anti-reflex lever-operated mechanism for earthing switch, independent of operator action • Interlocking between the main switch and earthing switch
Three-phase busbars for top connection (1250 A)	
Bottom connection	• C-type bushing for dry type cable connection or • Three phase bottom busbar for bus coupling
Voltage presence indicator	
Cable box	With 700 mm cable connection and 290 mm deep door
Standard built-in padlocking facility	For main switch, earthing switch, and operation selector (shackle diameter < 9 mm)

Accessories

Operation accessory options

- Visibility of earthing contacts
- Electrical operation
- Auxiliary contacts on switch and earthing switch
- Voltage present/absent contact
- Local/remote control switch
- Auxiliary power shutdown switch
- Operation counter
- Pushbutton protective cover

Connection options

- Rear cable entry (top or bottom) connection
- Deeper cable box door (500 mm)
- Extended low-voltage control cabinet
- Raising plinth (260 mm or 520 mm)
- Dropdown cable box

Locking options

- Key-type interlocking
  - Main switch in open-disconnected position (1 or 2 keylocks)
  - Earthing switch in cable earthed position (1 or 2 keylocks)
  - Earthing switch in 'line' position (1 or 2 keylocks)
- Interlocking between cable box door and main switch and earthing switch for front cable connection
- Live cable interlocking

Functional options

- Cable current measurement CT: ARU1
- Cable voltage measurement VT: VRU1 or LVPT (SMVS-UV1001)
- Busbar voltage measurement VT: LPVT (VLPU1)

Disconnecting switch

I12H - Heavy duty

Technical characteristics

Rated voltage	**U_r**		**(kV)**	**7.2**		**12**		**17.5**	
Rated current	I_r		A	1250					
Rated short-time withstand current and duration	I_k	For switchgear with tk=1 s	Up to kA	21	25	21	25	21	25
		For switchgear with tk=3 s		21	25	21	25	21	25
		For switchgear with tk=4 s		20	-	20	-	20	-
Rated making capacity of main switch and earthing switches	I_{ma}	When fr=50 Hz	kA peak	52	62	52	62	52	62
		When fr=60 Hz	kA peak	54	65	54	65	54	65
No-load mechanical endurance of main switch	M2 class (IEC 62271-103)	Number of operating cycles		5 000					
Electrical endurance of main switch	E3 class (IEC 62271-103)	Number of operating cycles		100					
Making capacity endurance of main switch	E3 class (IEC 62271-103)	Number of operating cycles		5					
No-load mechanical endurance of earthing switch	M0 class (IEC 62271-102)	Number of operating cycles		1 000					
Making capacity endurance of earthing switch	E2 class (IEC 62271-102)	Number of operating cycles		5					

Disconnecting circuit breaker

D02N - MV/LV transformer protection

The D02N uses vacuum and SSIS technology:

- The smallest VCB in the world, only 375 mm wide
- Rated current is 200 A: dedicated design for transformer protection
- With self-powered relay to optimize performance and fast clearing time of transformer short-circuit < 60s

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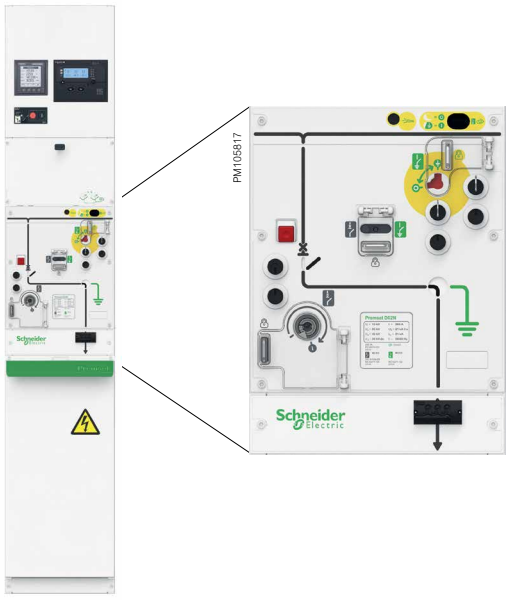

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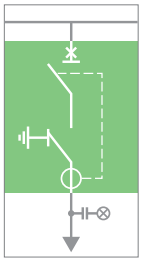


Basic equipment

'3-in-1'' core unit	• Vacuum disconnecting circuit breaker providing both breaking and disconnection function • Earthing switch using air technology in sealed-for-life tank at atmospheric pressure
Mechanism	• Operating circuit breaker with CI1 type operating mechanism featuring pushbutton opening and anti-reflex lever-operated closing • Operation speed is independent of operator action • Interlocking between the circuit breaker and earthing switch
Three-phase busbars for top connection (630 A)	
Bottom connection	C-type bushing for dry type cable connection
Voltage presence indicator	
Cable box	With 700 mm cable connection and 290 mm deep door
Standard built-in padlocking facility	For main switch, earthing switch, and operation selector (shackle diameter < 9 mm)

Accessories

Operation accessory options

- Visibility of earthing contacts
- Electrical operation
- Auxiliary contacts on switch and earthing switch
- Voltage present/absent contact
- Local/remote control switch
- Auxiliary power shutdown switch
- Operation counter
- Additional opening coil (1)
- Pushbutton protective cover

Connection options

- 1250 A three-phase upper busbars
- Rear cable entry (top or bottom) connection
- Deeper cable box door (500 mm)
- Compact cable box with 500 mm cable connection
- Extended low-voltage control cabinet
- Raising plinth (260 mm or 520 mm)
- Dropdown cable box

Locking options

- Key-type interlocking
  - Main switch in open-disconnected position (1 or 2 keylocks)
  - Earthing switch in cable earthed position (1 or 2 keylocks)
  - Earthing switch in 'line' position (1 or 2 keylocks)
- Interlocking between cable box door and main switch and earthing switch for front cable connection
- Live cable interlocking

Functional options

- Cable current measurement CT: ARU1 or ARC6
- Cable voltage measurement VT: VRU1 or LVPT (SMVS-UV1001)
- Busbar voltage measurement VT: LPVT (VLPU1)

Protection relay and transformer options

Protection relay

- VIP 45/410
- Easergy Sepam
- Easergy MiCOM
- Easergy P3
- Easergy P5

Protection current transformer

- CuA
- TLPU1
- ARU2
- ARC6

Protection voltage transformer

- VRU1
- LPVT on cable side or/and busbar

(1) With VIP relay only

Disconnecting circuit breaker

D02N - MV/LV transformer protection

Technical characteristics

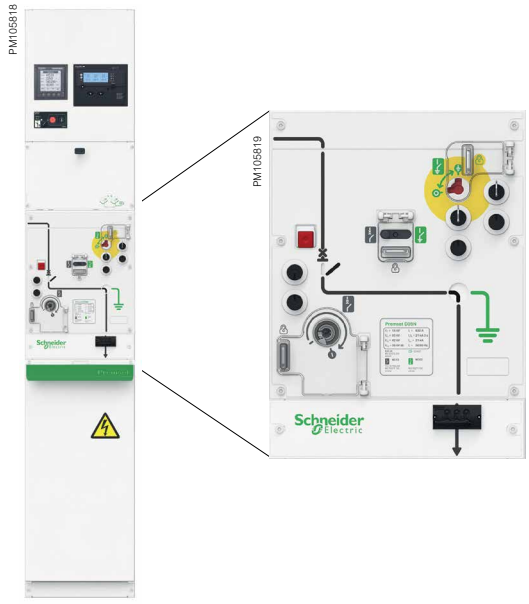
Rated voltage	**U_r**		**(kV)**	**7.2**		**12**		**17.5**	
Rated current	I_r		A			200			
Rated short-time withstand current and duration	I_k	For switchgear with tk=1 s	Up to kA	21	25	21	25	21	25
		For switchgear with tk=3 s		21	25	21	25	21	25
		For switchgear with tk=4 s		20	-	20	-	20	-
Short-circuit breaking capacity	I_{sc}		Up to kA	21	25	21	25	21	25
Rated making capacity of main switch and earthing switches	I_{ma}	When fr=50 Hz	kA peak	52	62	52	62	52	62
		When fr=60 Hz	kA peak	54	65	54	65	54	65
Capacitive breaking capacity	(IEC 62271-100)	Capacitive breaking class		Line charging current 10A, class C2 Cable charging current 25A, class C2					
No-load mechanical endurance of circuit breaker	M1 class (IEC 62271-100)	Number of operating cycles		2 000					
Electrical endurance of circuit breaker	E2 class (IEC 62271-100)			25 kA					
Operating sequence (when electrical operation on circuit breaker)				CO-15s-CO					
Maximum number of operations at 100% Isc				5					
Total clearing time at Isc		Fault detection to arc extinguishing	ms	< 60					
No-load mechanical endurance of earthing switch	M0 class (IEC 62271-102)	Number of operating cycles		1 000					
Making capacity endurance of earthing switch	E2 class (IEC 62271-102)	Number of operating cycles		5					

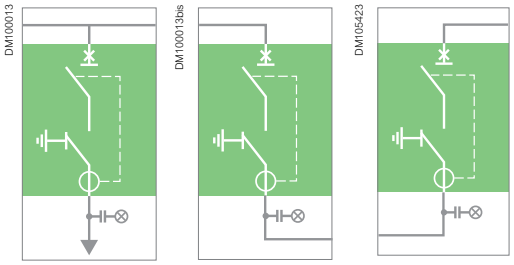
Disconnecting circuit breaker

D06N - General protection

The D06N uses vacuum and SSIS technology:

- The smallest VCB in the world, only 375 mm wide
- Rated current is 630 A
- With self-powered relay to optimize performance, it is also compatible with other kinds of auxilairy power relay





Basic equipment

'3-in-1'' core unit	• Vacuum disconnecting load break switch providing both load breaking and disconnection function • Earthing switch using air technology in sealed-for-life tank at atmospheric pressure
Mechanism	• CI1 type operating mechanism featuring pushbutton opening and anti-reflex lever-operated closing • Operation speed is independent of operator action • Interlocking between the circuit breaker and earthing switch
Three-phase busbars for top connection (630 A)	
Bottom connection	• C-type bushing for dry type cable connection or • Three-phase bottom busbar for bus coupling
Voltage presence indicator	
Cable box	With 700 mm cable connection and 290 mm deep door
Standard built-in padlocking facility	For main switch, earthing switch, and operation selector (shackle diameter < 9 mm)

Accessories

Operation accessory options

- Visibility of earthing contacts
- Electrical operation
- Auxiliary contacts on switch and earthing switch
- Voltage present/absent contact
- Local/remote control switch
- Operation counter
- Additional opening coil (1)
- Pushbutton protective cover

Connection options

- 1250 A three-phase upper busbars with cable connection
- Rear cable entry (top or bottom) connection
- Deeper cable box door (500 mm)
- Compact cable box with 500 mm cable connection
- Extended low-voltage control cabinet
- Raising plinth (260 mm or 520 mm)
- Dropdown cable box

Locking options

- Key-type interlocking
  - Main switch in open-disconnected position (1 or 2 keylocks)
  - Earthing switch in cable earthed position (1 or 2 keylocks)
  - Earthing switch in 'line' position (1 or 2 keylocks)
- Interlocking between cable box door and main switch and earthing switch for front cable connection
- Live cable interlocking

Functional options

- Cable current measurement CT: ARU1 or ARC6
- Cable voltage measurement VT: VRU1 or LVPT (SMVS-UV1001)
- Busbar voltage measurement VT: LPVT (VLPU1)

Protection relay and transformer options

Protection relay

- VIP 400/410
- Easergy Sepam
- Easergy MiCOM
- Easergy P3
- Easergy P5

Protection current transformer

- CuB
- TLPU1
- ARU2
- ARC6

Protection voltage transformer

- VRU1
- LPVT on cable side or/and busbar

(1) With VIP relay only

Disconnecting circuit breaker

D06N - General protection

Technical characteristics

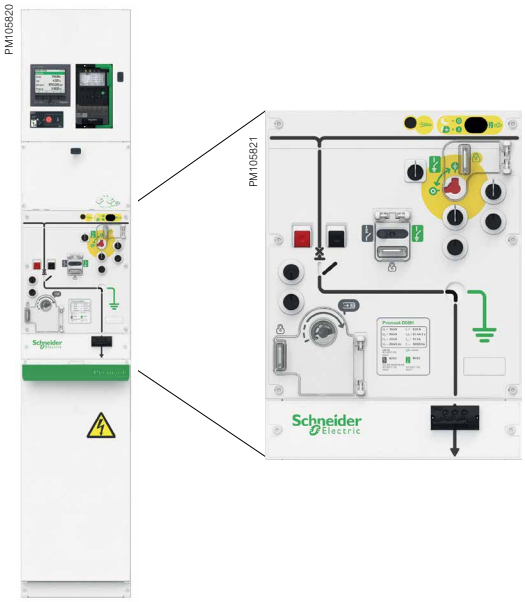
Rated voltage	**U_r**			**(kV)**	**7.2**		**12**		**17.5**	
Rated current	I_r			A	630					
Rated short-time withstand current and duration	I_k	For switchgear with tk=1 s		Up to kA	21	25	21	25	21	25
		For switchgear with tk=3 s			21	25	21	25	21	25
		For switchgear with tk=4 s			20	-	20	-	20	-
Short-circuit breaking capacity	I_{sc}			Up to kA	21	25	21	25	21	25
Rated making capacity of main switch and earthing switches	I_{ma}	When fr=50 Hz		kA peak	52	62	52	62	52	62
		When fr=60 Hz		kA peak	54	65	54	65	54	65
Capacitive breaking capacity	(IEC 62271-100)	Capacitive breaking class			Line charging current 10A, class C2 Cable charging current 25A, class C2					
No-load mechanical endurance of circuit breaker	M1 class (IEC 62271-100)	Number of operating cycles			2 000					
Electrical endurance of circuit breaker	E2 class (IEC 62271-100)				25 kA					
Operating sequence (when electrical operation on circuit breaker)					CO-15s-CO					
Maximum number of operations at 100% Isc					30					
Total clearing time at Isc		Fault detection to arc extinguishing		ms	< 100					
No-load mechanical endurance of earthing switch	M0 class (IEC 62271-102)	Number of operating cycles			1 000					
Making capacity endurance of earthing switch	E2 class (IEC 62271-102)	Number of operating cycles			5					

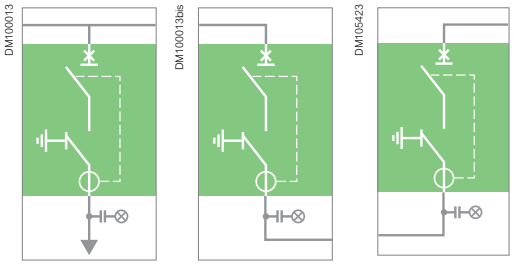
Disconnecting circuit breaker

D06H - Heavy-duty line protection

The D06H uses vacuum and SSIS technology:

- The smallest VCB in the world, only 375 mm wide
- Rated current is 630 A
- With fast reclose function operating mechanism that can be motorized, used for line protection and generator protection





Basic equipment

'3-in-1'' core unit	• Vacuum disconnecting load break switch providing both load breaking and disconnection function • Earthing switch using air technology in sealed-for-life tank at atmospheric pressure
Mechanism	• Operating circuit breaker with stored-energy type operating mechanism (O-CO-CO) with pushbutton opening and closing and spring charging using a lever, independent of operator action • Heavy-duty operating cycle (O-0.3 s-CO-15 s-CO) • Anti-reflex lever-operated mechanism for earthing switch, independent of operator action • Interlocking between the circuit breaker and earthing switch
Three-phase busbars for top connection (630 A)	
Bottom connection	• C-type bushing for dry type cable connection or • Three phase bottom busbar for bus coupling
Voltage presence indicator	
Cable box	With 700 mm cable connection and 290 mm deep door
Standard built-in padlocking facility	For main switch, earthing switch, and operation selector (shackle diameter < 9 mm)

Accessories

Operation accessory options

- Visibility of earthing contacts
- Electrical operation
- Auxiliary contacts on switch and earthing switch
- Voltage present/absent contact
- Local/remote control switch
- Operation counter
- Additional opening coil (1)
- Pushbutton protective cover

Connection options

- 1250 A three-phase upper busbars with cable connection
- Rear cable entry (top or bottom) connection
- Deeper cable box door (500 mm)
- Compact cable box with 500 mm cable connection
- Extended low-voltage control cabinet
- Raising plinth (260 mm or 520 mm)
- Dropdown cable box

Locking options

- Key-type interlocking
  - Main switch in open-disconnected position (1 or 2 keylocks)
  - Earthing switch in cable earthed position (1 or 2 keylocks)
  - Earthing switch in 'line' position (1 or 2 keylocks)
- Interlocking between cable box door and main switch and earthing switch for front cable connection
- Live cable interlocking

Functional options

- Cable current measurement CT: ARU1 or ARC6
- Cable voltage measurement VT: VRU1 or LVPT (SMVS-UV1001)
- Busbar voltage measurement VT: LPVT (VLPU1)

Protection relay and transformer options

Protection relay

- VIP 45/400 /410
- Easergy Sepam
- Easergy MiCOM
- Easergy P3
- Easergy P5

Protection current transformer

- CuA or CuB
- TLPU1
- ARU2
- ARC6

Protection voltage transformer

- VRU1
- LPVT on cable side or/and busbar

(1) With VIP relay only

Disconnecting circuit breaker

D06H - Heavy-duty line protection

Technical characteristics

Rated voltage	**U_r**		**(kV)**	**7.2**		**12**		**17.5**	
Rated current	I_r		A	630					
Rated short-time withstand current and duration	I_k	For switchgear with tk=1 s	Up to kA	21	25	21	25	21	25
		For switchgear with tk=3 s		21	25	21	25	21	25
		For switchgear with tk=4 s		20	-	20	-	20	-
Short-circuit breaking capacity	I_{sc}		Up to kA	21	25	21	25	21	25
Rated making capacity of main switch and earthing switches	I_{ma}	When fr=50 Hz	kA peak	52	62	52	62	52	62
		When fr=60 Hz	kA peak	54	65	54	65	54	65
Capacitive breaking capacity	(IEC 62271-100)	Capacitive breaking class		Line charging current 10A, class C2 Cable charging current 25A, class C2 Single capacitor bank: class BC2					
No-load mechanical endurance of circuit breaker	M2 class (IEC 62271-100)	Number of operating cycles		10 000					
Electrical endurance of circuit breaker	E2 class (IEC 62271-100)			25 kA, reclosing duty					
Operating sequence (when electrical operation on circuit breaker)				O - 0.3s - CO-15s - CO					
Maximum number of operations at 100% Isc				50					
Total clearing time at Isc		Fault detection to arc extinguishing	ms	< 100					
No-load mechanical endurance of earthing switch	M0 class (IEC 62271-102)	Number of operating cycles		1 000					
Making capacity endurance of earthing switch	E2 class (IEC 62271-102)	Number of operating cycles		5					

Disconnecting circuit breaker

D12H - Heavy-duty line protection

The D12H uses vacuum and SSIS technology :

- 750 mm wide
- Rated current is 1250 A
- With fast reclose function operating mechanism that can be motorized, used for line protection and generator protection
- With Easergy Sepam auxiliary power relay, it is compatible with other kinds of auxiliary power relay

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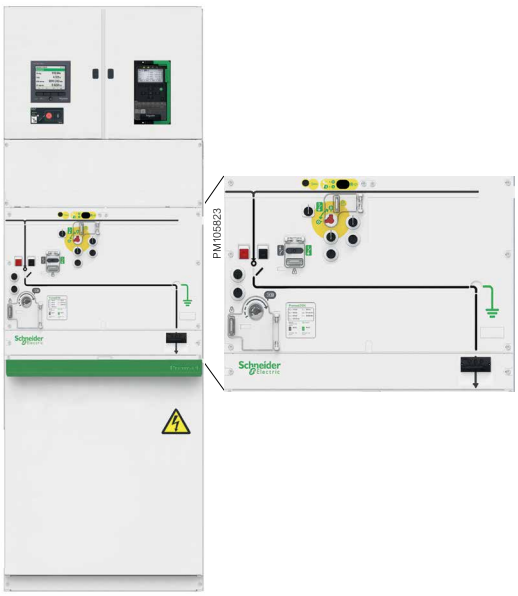

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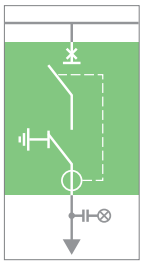

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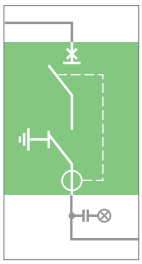

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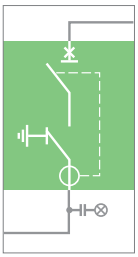


Basic equipment

'3-in-1'' core unit	• Vacuum disconnecting load break switch providing both load breaking and disconnection function • Earthing switch using air technology in sealed-for-life tank at atmospheric pressure
Mechanism	• Operating circuit breaker with stored-energy type operating mechanism (O-CO-CO) with pushbutton opening and closing and spring charging using a lever, independent of operator action • Heavy-duty operating cycle (O-0.3 s-CO-15 s-CO) • Anti-reflex lever-operated mechanism for earthing switch, independent of operator action • Interlocking between the circuit breaker and earthing switch
Three-phase busbars for top connection (1250 A)	
Bottom connection	• C-type bushing for dry type cable connection or • Three-phase bottom busbar for bus coupling
Voltage presence indicator	
Cable box	With 700 mm cable connection and 290 mm deep door
Standard built-in padlocking facility	For main switch, earthing switch, and operation selector (shackle diameter < 9 mm)

Accessories

Operation accessory options

- Visibility of earthing contacts
- Electrical operation
- Auxiliary contacts on switch and earthing switch
- Voltage present/absent contact
- Local/remote control switch
- Operation counter
- Pushbutton protective cover

Connection options

- Rear cable entry (top or bottom) connection
- Deeper cable box door (450 mm)
- Extended low-voltage control cabinet
- Raising plinth (260 mm or 520 mm)
- Dropdown cable box

Locking options

- Key-type interlocking
  - Main switch in open-disconnected position (1 or 2 keylocks)
  - Earthing switch in cable earthed position (1 or 2 keylocks)
  - Earthing switch in 'line' position (1 or 2 keylocks)
- Interlocking between cable box door and main switch and earthing switch for front cable connection
- Live cable interlocking

Functional options

- Cable current measurement CT: ARU1
- Cable voltage measurement VT: VRU1 or LVPT (SMVS-UV1001)
- Busbar voltage measurement VT: LPVT (VLPU1)

Protection relay and transformer options

Protection relay

- Easergy Sepam
- Easergy MiCOM
- Easergy P3
- Easergy P5

Protection current transformer

- ARU2

Protection voltage transformer

- VRU1
- LPVT on cable side or/and busbar

(1) With VIP relay only

Disconnecting circuit breaker

D12H - Heavy-duty line protection

Technical characteristics

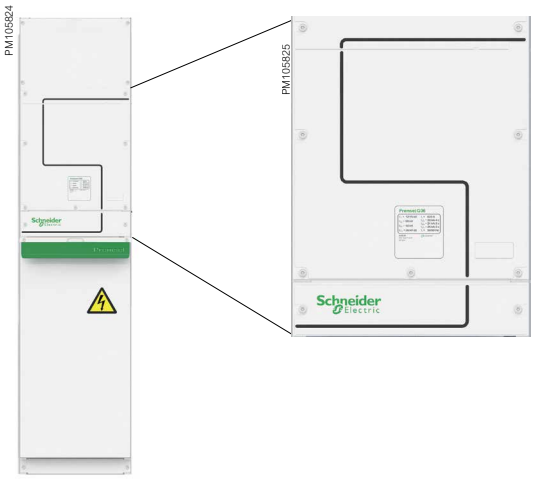
Rated voltage	**U_r**		**(kV)**	**7.2**		**12**		**17.5**	
Rated current	I_r		A	1250					
Rated short-time withstand current and duration	I_k	For switchgear with tk=1 s	Up to kA	21	25	21	25	21	25
		For switchgear with tk=3 s		21	25	21	25	21	25
		For switchgear with tk=4 s		20	-	20	-	20	-
Short-circuit breaking capacity	I_{sc}		Up to kA	21	25	21	25	21	25
Rated making capacity of main switch and earthing switches	I_{ma}	When fr=50 Hz	kA peak	52	62	52	62	52	62
		When fr=60 Hz	kA peak	54	65	54	65	54	65
Capacitive breaking capacity	(IEC 62271-100)	Capacitive breaking class		Line charging current 10A, class C2 Cable charging current 25A, class C2 Single capacitor bank: class BC2					
No-load mechanical endurance of circuit breaker	M2 class (IEC 62271-100)	Number of operating cycles		10 000					
Electrical endurance of circuit breaker	E2 class (IEC 62271-100)			25 kA, reclosing duty					
Operating sequence (when electrical operation on circuit breaker)				O - 0.3s - CO-15s - CO					
Maximum number of operations at 100% Isc				50					
Total clearing time at Isc		Fault detection to arc extinguishing	ms	< 100					
No-load mechanical endurance of earthing switch	M0 class (IEC 62271-102)	Number of operating cycles		1 000					
Making capacity endurance of earthing switch	E2 class (IEC 62271-102)	Number of operating cycles		5					

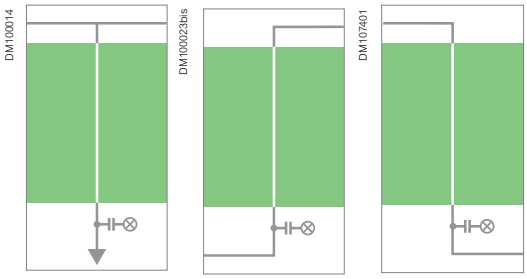
Bus riser

G06 and G12

The G06 and G12 core units are simple bus risers

- G06 can be used in various functional units: direct cable incomer, bus riser G12 is only a bus riser
- 375 mm wide





G06 G06/G12 G06/G12

Basic equipment

Three-phase busbars for top connection (630 A for G06, 1250 A for G12)

Bottom connection	• C-type bushing for dry type cable connection for G06 • Three-phase bottom busbar for bus coupling
Voltage presence indicator	
Cable box	With 700 mm cable connection and 290 mm deep door

Accessories

Connection options

- 1250 A three-phase upper busbars with cable connection (G06 only)
- Rear cable entry (top or bottom) connection (G06 only)
- Deeper cable box door (500 mm)
- Compact cable box with 500 mm cable connection (G06 only)
- Extended low-voltage control cabinet
- Raising plinth (260 mm or 520 mm)
- Dropdown cable box (for G06 incomer/feeder only)

Functional options

- Cable current measurement CT: ARU1 or ARC6
- Cable voltage measurement VT: VRU1 or LVPT (SMVS-UV1001)
- Busbar voltage measurement VT: LPVT (VLPU1)

Technical characteristics

Rated voltage	**U_r**		**(kV)**	**7.2**		**12**		**17.5**	
Rated current	I_r		A	630 (G06), 1250 (G12)					
Rated short-time withstand current and duration	I_k	For switchgear with tk=1 s	Up to kA	21	25	21	25	21	25
		For switchgear with tk=3 s		21	25	21	25	21	25
		For switchgear with tk=4 s		20	-	20	-	20	-

Metering

M06S and M12S - SSIS compact metering

The M06S and M12S core units are compact metering units, insensitive to harsh environments thanks to SSIS design

- A cost-effective alternative to traditional air-insulated metering units
- Fully compatible with the PremSet system
- M06S units are be used in a wide variety of applications: tariff metering, metered incomer, feeders and risers, cable with VT incomer and feeder
- Easy to disconnect VT from front of cubicle
- Compact soluton, only 375 mm wide

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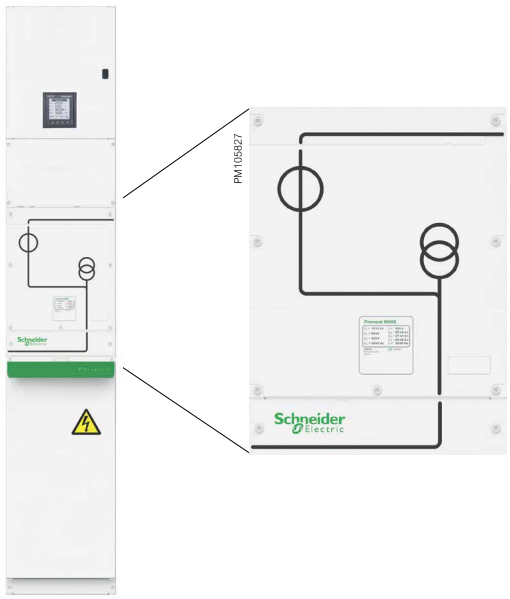

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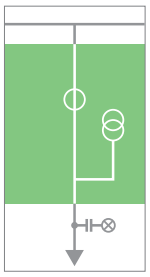

M06S

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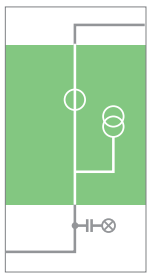

M06S/M12S

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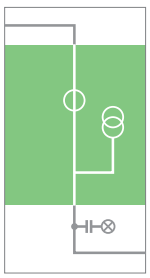

M06S/M12S

Basic equipment

Three-phase busbar riser with shielded solid insulation

Three ring-type current transformer with shielded solid insulation (ARC5)

Three-phase-to-earth voltage transformer	• With shielded solid insulation (VRU1), located in front compartment to provide easy access for maintenance and esay disconnection for commissioning

Three-phase busbars for top connection

Bottom connection	• C-type bushing for dry type cable connection (M06S only) • Three-phase bottom busbar for bus coupling

Voltage presence indicator

Cable box	With 700 mm cable connection and 290 mm deep door

Accessories

Connection options

- 1250 A three-phase upper busbars with cable connection (M06S only)
- Rear cable entry (top or bottom) connection (M06S only)
- Deeper cable box door (500 mm)
- Compact cable box with 500 mm cable connection (M06S only)
- Extended low-voltage control cabinet
- Raising plinth (260 mm or 520 mm)
- Dropdown cable box (for M06S incomer/feeder only)

Locking options

- Keylocking of front panel to prevent access to voltage transformer when busbar/cable energized

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Technical characteristics

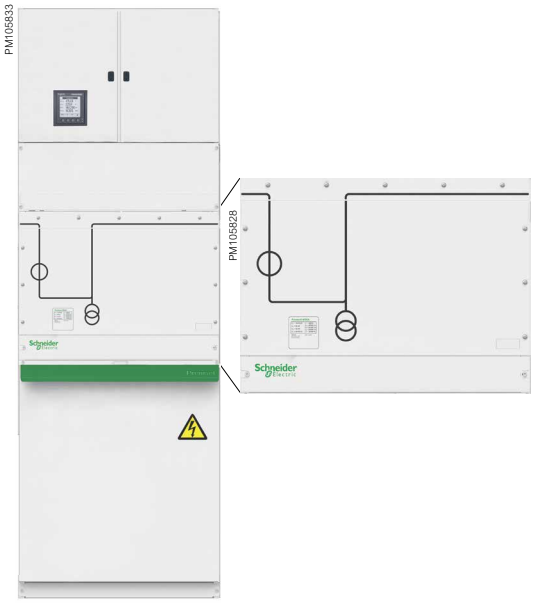
Rated voltage	**U_r**		**(kV)**	**7.2**		**12**		**17.5**	
Rated current	I_r		A	630 (M06S), 1250 (M12S)					
Rated short-time withstand current and duration	I_k	For switchgear with tk=1 s	Up to kA	21	25	21	25	21	25
		For switchgear with tk=3 s		21	25	21	25	21	25
		For switchgear with tk=4 s		20	-	20	-	20	-

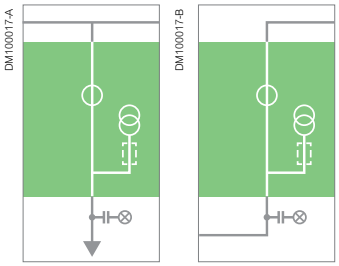
Metering

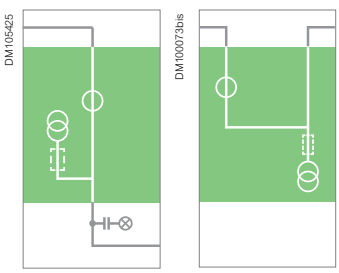
M06A, and M12A - Air-insulated metering

The M06A and M12A core units are traditional air-insulated metering units

- Designed for easy adaptation to any type of conventional block CT or VT
- Bare copper primary circuit in totally closed IP3X metal housing
- Wide choice of arrangement, including metered incomer, feeder, busbar metering and risers
- Compatible with PremSet connection system
- 750 mm wide







Basic equipment

Three-phase busbar riser: bare copper bar	
Two or three block-type current transformer	
Two or three phase-to-phase or phase-to-earth voltage transformer	
Three-phase busbars for top connection	
Bottom connection	• Connection pads for dry type cable or • Three-phase bottom busbar for bus coupling
Voltage presence indicator for metering incomer or feeder	
Cable box	With 700 mm cable connection and 290 mm deep door

Accessories

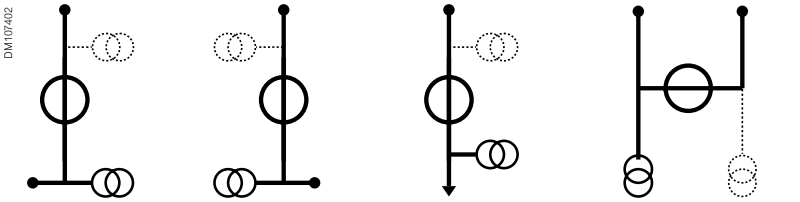
Connection options

- 1250 A three-phase upper busbars for cable connection (M06A only)
- Fuses for voltage transformer: length 360 mm, diameter 45 mm
- Extended low-voltage control cabinet
- Raising plinth (260 mm or 520 mm)

Locking options

- Keylocking of front panel to prevent access to voltage transformer when busbar/cable energized

Choice of arrangements



Bus riser metering | Bus riser metering | Metered feeder/incomer | Busbars metering

Technical characteristics

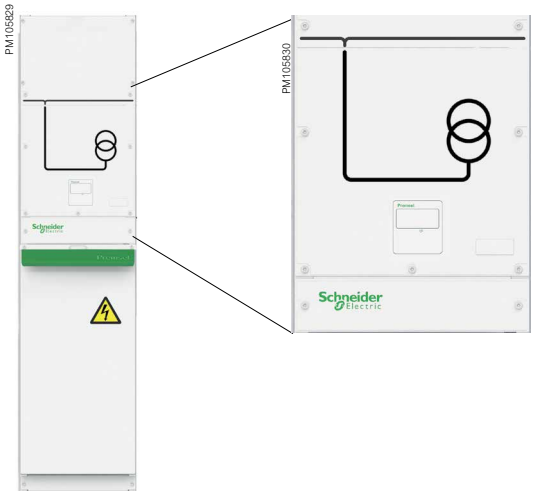
Rated voltage	**U_r**		**(kV)**	**7.2**		**12**		**17.5**	
Rated current	I_r		A	630 (M06A), 1250 (M12A)					
Rated short-time withstand current and duration	I_k	For switchgear with tk=1 s	Up to kA	21	25	21	25	21	25
		For switchgear with tk=3 s		21	25	21	25	21	25
		For switchgear with tk=4 s		20	-	20	-	20	-
Internal arc proof, type tested				A-FLR: 21kA 1 s					

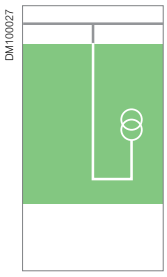
Metering

VTM - Voltage transformer

The VTM core units are voltage transformer units.

- Three phase-to-earth voltage transformer with shielded solid insulation (VRU1)
- VTM directly connected to the busbars, dedicated to voltage metering
- Compact solution, only 375 mm wide
- Insensitive to harsh environments thanks to SSIS design
- Easy to disconnect VT from front of cubicle





Basic equipment

Three-phase busbar riser with shielded solid insulation

Three phase-to-earth voltage transformer with shielded solid insulation (VRU1)

Three-phase busbars for top connection (630 A)

Cable box	With 700 mm high and 290 mm deep door

Front panel which access to voltage transformer

Accessories

Connection options

- 1250 A three-phase upper busbars
- Deeper cable box door (500 mm)
- Compact cable box with 500 mm high
- Extended low-voltage control cabinet
- Raising plinth (260 mm or 520 mm)

Locking options

- Keylocking of front panel to prevent access to voltage transformer when the busbar is energized

Technical characteristics

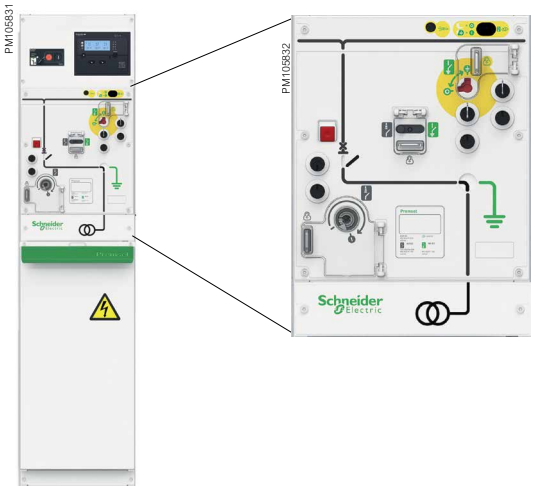
Rated voltage	**U_r**		**(kV)**	**7.2**		**12**		**17.5**	
Rated current	I_r		A	630					
Rated short-time withstand current and duration	I_k	For switchgear with tk=1 s	Up to kA	21	25	21	25	21	25
		For switchgear with tk=3 s		21	25	21	25	21	25
		For switchgear with tk=4 s		20	-	20	-	20	-

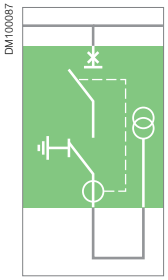
Metering

VTM-D - Voltage transformer with circuit breaker protection

The VTM-D dedicated core unit features a D02N circuit breaker to protect three phase-to-earth screened voltage transformers (VRU1).

- Directly connected to the busbars, dedicated to voltage metering
- Very compact solution, only 375 mm wide
- Insensitive to harsh environments thanks to SSIS design





Basic equipment

100 A disconnecting circuit breaker	With associated earthing switch (see D02N, page 54)
Three-phase busbars for top connection (630 A)	
Cable box	With 700 mm high and 290 mm deep door

Accessories

Operation accessory options

Refer to the accessories for the D02N core unit, on page 54.

Metering

VTM-D - Voltage transformer with circuit breaker protection

Technical characteristics

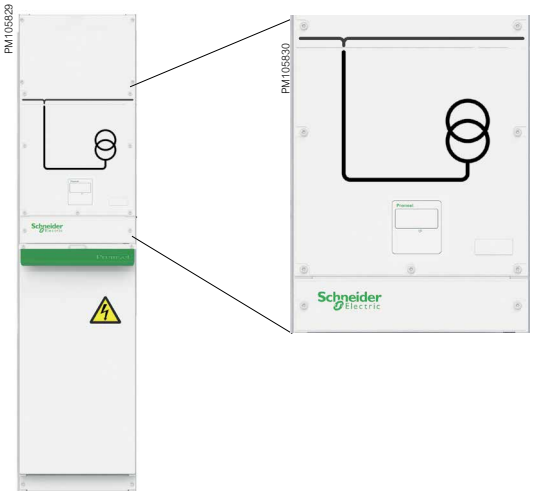
Rated voltage	**U_r**		**(kV)**	**7.2**		**12**		**17.5**	
Rated current	I_r		A rms	100					
Rated short-time withstand current and duration	I_k	For switchgear with tk=1 s	Up to kA	21	25	21	25	21	25
		For switchgear with tk=3 s		21	25	21	25	21	25
		For switchgear with tk=4 s		20	-	20	-	20	-
Short-circuit breaking capacity	I_{sc}		Up to kA	21	25	21	25	21	25
Rated making capacity of main switch and earthing switches	I_{ma}	When fr=50 Hz	kA peak	52	62	52	62	52	62
		When fr=60 Hz	kA peak	54	65	54	65	54	65
No-load mechanical endurance of circuit breaker	M1 class (IEC 62271-100)	Number of operating cycles		2 000					
Electrical endurance of circuit breaker	E2 class (IEC 62271-100)			25kA					
Operating sequence (when electrical operation on circuit breaker)				CO-15s-CO					
Maximum number of operations at 100% Isc				5					
Total clearing time at Isc	Fault detection to arc extinguishing		ms	< 60					
No-load mechanical endurance of earthing switch	M0 class (IEC 62271-102)	Number of operating cycles		1 000					
Making capacity endurance of earthing switch	E2 class (IEC 62271-102)	Number of operating cycles		5					

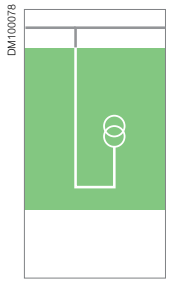
Special functions

VTP - Auxiliary power supply

The VTP core units are voltage transformer units.

- VTP directly connected to the busbars and dedicated to auxiliary power supply
- Compact solution, only 375 mm wide
- Insensitive to harsh environments thanks to SSIS design
- Easy to disconnect VT from front of cubicle





Basic equipment

Three-phase busbar riser	With shielded solid insulation
Screened voltage transformer	One VRU2 phase-to-phase screened voltage transformer, dedicated to auxiliary power supply
Three-phase busbars for top busbar connection (630 A)	
Cable box	With 700 mm high

Accessories

Connection options

- 1250 A three-phase upper busbars
- Deeper cable box door (500 mm)
- Compact cable box with 500 mm high
- Extended low-voltage control cabinet
- Raising plinth (260 mm or 520 mm)

Technical characteristics

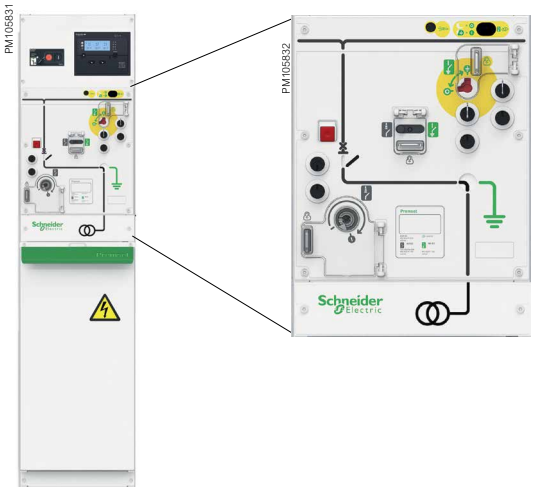
Rated voltage	**U_r**		**(kV)**	**7.2**		**12**		**17.5**	
Rated current	I_r		A	630					
Rated short-time withstand current and duration	I_k	For switchgear with tk=1 s	Up to kA	21	25	21	25	21	25
		For switchgear with tk=3 s		21	25	21	25	21	25
		For switchgear with tk=4 s		20	-	20	-	20	-

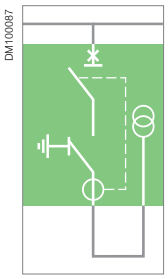
Special functions

VTP-D - Auxiliary power supply with circuit breaker protection

The VTP-D dedicated core unit features a D02N circuit breaker to protect the phase-to-phase screened voltage transformer (VRU2).

- Directly connected to the busbars, dedicated to auxiliary power supply
- 375 mm wide
- Insensitive to harsh environments thanks to SSIS design





Basic equipment

SSIS design (shielded solid insulation system) composed of:

100 A disconnecting circuit breaker	With associated earthing switch (see D02N, page 54)
Three-phase busbars for top busbar connection (630 A)	
Cable box	With 700 mm high and 290 mm deep door
Screened voltage transformer	One VRU2 phase-to-phase screened voltage transformer, dedicated to auxiliary power supply

Accessories

Operation accessory options

Refer to the accessories for the D02N core unit on page 54.

Special functions

VTP-D - Auxiliary power supply with circuit breaker protection

Technical characteristics

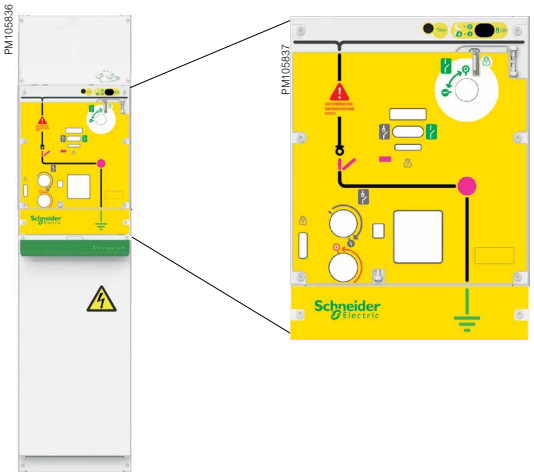
Rated voltage	**U_r**		**(kV)**	**7.2**		**12**		**17.5**	
Rated current	I_r		A rms	100					
Rated short-time withstand current and duration	I_k	For switchgear with tk=1 s	Up to kA	21	25	21	25	21	25
		For switchgear with tk=3 s		21	25	21	25	21	25
		For switchgear with tk=4 s		20	-	20	-	20	-
Short-circuit breaking capacity	I_{sc}		Up to kA	21	25	21	25	21	25
Rated making capacity of main switch and earthing switches	I_{ma}	When fr=50 Hz	kA peak	52	62	52	62	52	62
		When fr=60 Hz	kA peak	54	65	54	65	54	65
No-load mechanical endurance of circuit breaker	M1 class (IEC 62271-100)	Number of operating cycles		2 000					
Electrical endurance of circuit breaker	E2 class (IEC 62271-100)			25 kA					
Operating sequence (when electrical operation on circuit breaker)				CO-15s-CO					
Maximum number of operations at 100% Isc				5					
Total clearing time at Isc	Fault detection to arc extinguishing		ms	< 60					
No-load mechanical endurance of earthing switch	M0 class (IEC 62271-102)	Number of operating cycles		1 000					
Making capacity endurance of earthing switch	E2 class (IEC 62271-102)	Number of operating cycles		5					

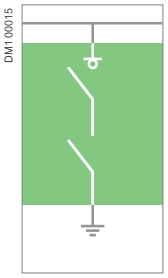
Special functions

ES-B - Busbar earthing switch

The ES-B core unit is dedicated to busbar earthing:

- The main application is coupled busbars (2 incomers + 1 bus coupler system) but it can also be used for any application requiring busbar earthing prior to accessing the busbars





Basic equipment

Earthing switch air technology	Earthing switch using air technology in sealed-for-life tank at atmospheric pressure with shielded solid insulation, totally SF6-free solution.
Mechanism	Operating load switch with anti-reflex lever-operated mechanism (CIT type), independent of operator action
Three-phase busbars for top busbar connection (630 A)	
Cable box	With 700 mm high and 290 mm deep door
Standard built-in padlocking facility	For earthing switch (shackle diameter < 9 mm)

Accessories

Connection options

- 1250 A three-phase upper busbars
- Compact cable box with 500 mm high
- Deeper cable box door (500 mm)
- Extended low-voltage control cabinet
- Raising plinth (260 mm or 520 mm)

Locking options

- Optional keylocking facilities with flat or tubular key types
  - 1 or 2 keylocks for locking the ES-B fonction in "open" position

Auxiliary switches

- Auxiliary contacts on earthing switch

Technical characteristics

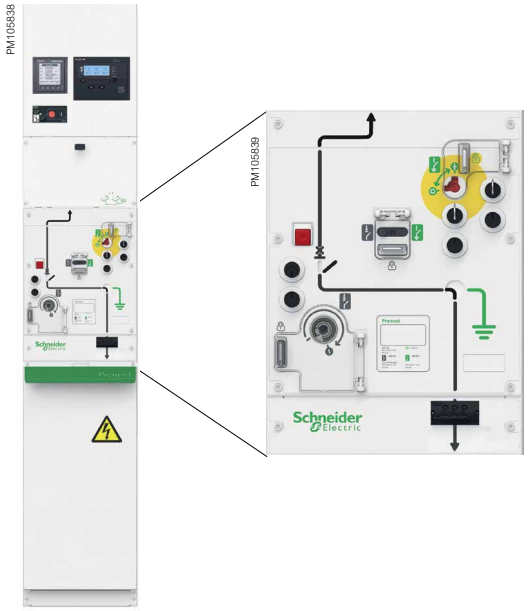
Rated voltage	**U_r**		**(kV)**	**7.2**		**12**		**17.5**	
Rated current	I_r		A rms	630					
Rated short-time withstand current and duration	I_k	For switchgear with tk=1 s	Up to kA	21	25	21	25	21	25
		For switchgear with tk=3 s		21	25	21	25	21	25
		For switchgear with tk=4 s		20	-	20	-	20	-
No-load mechanical endurance of main switch	M1 class (IEC 62271-103)	Number of operating cycles		1 000					
Making capacity endurance of earthing switch	E2 class (IEC 62271-102)	Number of operating cycles		5					

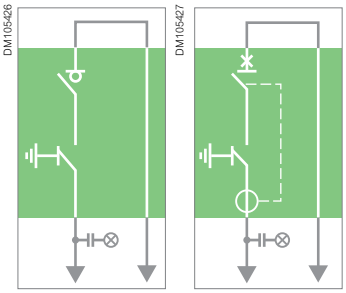
Special functions

Cable in/out function

The cable in/out function uses vacuum and SSIS technology

- Compact solution, only 375 mm wide
- Rated current is 630 A
- Standalone solution, the application can be to protect one transformer
- Core unit can be I06T, I06H, D02N, D06N, or D06H





Basic equipment

'3-in-1'' core unit	For details, refer to I06T, I06H, D02N, D06N, or D06H page.
Top connection	C-type bushing for dry type cable connection (1 cable/phase)
Bottom connection	C-type bushing for dry type cable connection (1 cable/phase)
Voltage presence indicator (for front cable only)	
Front cable box	With 700 mm cable connection and 290 mm deep door
Rear cable box	290 mm deep
Standard built-in padlocking facility	For main switch, earthing switch, and operation selector (shackle diameter < 9 mm)

Standard version only, withstand internal arc (IAe 100A) (for tuned neutral network)

Accessories

Operation accessory options

Refer to I06T, I06H, D02N, D06N, or D06H information on page 48, 50, 54, 56, or 58.

Locking options

- Key-type interlocking
  - Main switch in open-disconnected position (1 or 2 keylocks)
  - Earthing switch in cable earthed position (1 or 2 keylocks)
  - Earthing switch in 'line' position (1 or 2 keylocks)
- Interlocking between cable box door and main switch and earthing switch for front cable connection
- Live cable interlocking (for front cable only)

Other options

- Fault passage indicators for front cable
- Cable testing device (for front cable only)
- Visibility of earthing contacts

Functional options

- Cable current measurement CT: ARU1 or ARC6
- Cable voltage measurement VT: VRU1 or LVPT (SMVS-UV1001)

Note: Cubicle is non-IAC version

Components and accessories

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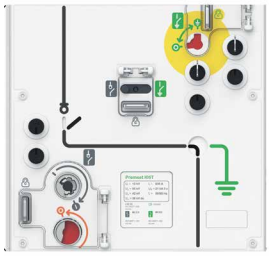
Operating mechanisms
Introduction

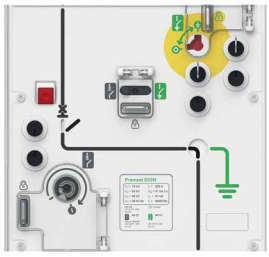
Three spring charge stored-energy operating mechanisms meet all the needs of the various core units of the PremSet range.
They provide user-friendly operation over the entire life of your switchgear.
They share the same range of auxiliairies for electrical operation and remote indications.

PM100511



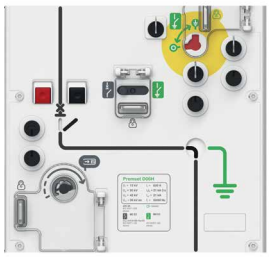
CIT mechanism
in I06T unit

PM100009



CI1 mechanism
in D02N unit

PM100600



OCO mechanism
in D06H unit

A rational range of operating mechanisms

Units	CIT	CI1	OCO
	Type of operating mechanism		
I06T	●		
I06H			●
I12H			●
D01N,D02N,D06N		●	
D06H			●
D12H			●
VTM-D,VTP-D		●	
ES-B	●		

Three operating mechanisms have been designed together with the core units to optimize performance and ensure user-friendly operation.
They are totally integrated within the core units and will operate over the entire life span of the switchgear.
The mechanism can be checked periodically to ensure performance depending on the environmental conditions.

All three mechanisms share the same features:

- Intuitive operation principles
- Position indications and easy-to-read mimic diagrams
- Range of auxiliaries, including motor-mechanism, opening coils (MX, MN), closing coils (XF), and auxiliary switches
- Range of accessories, including padlocking and keylock devices
- Earthing switch mechanism, fully interlocked with the main device

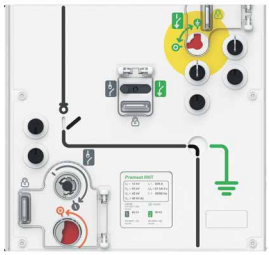
Specific care has been taken to reinforce the harsh environment withstand on mechanisms and auxiliaries alike:

- Specific care has been taken to select the plating on the mechanism parts, which has been tested accordingly in harsh environments
- Tripping and operating coils are encased in a sealed core, to protect them against condensation and dripping water
- The motor is encased in a protective aluminum cover
- Auxiliary switches are sealed to help protect against water ingress

Operating mechanism type	CIT		CI1		OCO		
Unit application	Load break switch		Circuit breaker		Load break switch & circuit breaker		
Main circuit switch	Closing	Opening	Closing	Opening	Mechanism charging	Closing	Opening
Manual operating mode	Hand lever	Hand lever	Hand lever	Pushbutton	Hand lever	Pushbutton	Pushbutton
Electrical operating mode (option)	Motor	Motor	Motor	Coil	Motor	Coil	Coil
Network application	Remote control network management		Remote control transformer protection		Remote control network management, need for quick reconfiguration (generator source, loop)		
Earthing switch	Closing	Closing	Closing	Closing	N/A	Closing	Opening
Manual operating mode	Hand lever	Hand lever	Hand lever	Hand lever	Hand lever	Hand lever	Hand lever

Operating mechanisms
Introduction

PM100511

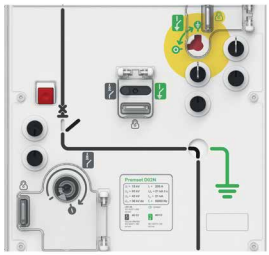


CIT mechanism in I06T unit

CIT double function operating mechanism

- **Switch function**
  Independent-operation opening or closing by lever or motor
- **Earthing switch function**: Independent-operation opening or closing by lever operating energy is provided by a compressed spring that causes the contacts to open or close when released
- **Auxiliary contacts**
  - Switch with 1 or 2 blocks (2NO+2NC/block)
  - Earthing switch with 1 or 2 blocks (1NO+1NC/block) (1)
- **Motor option**
- **Operation counter**

PM100009

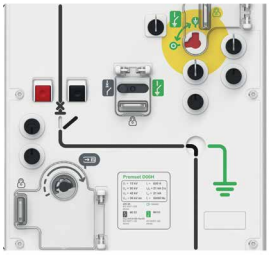


CI1 mechanism in D02N unit

CI1 double function operating mechanism

- **Circuit breaker function**
  - Independent-operation closing by lever or motor
  - Operating energy provided by a compressed spring which causes the contacts to open or close when released
  - Independent-operation opening or closing by pushbutton (O) or trip unit
- **Earthing switch function**: Independent-operation opening or closing by lever. Operating energy is provided by a compressed spring that causes the contacts to open or close when released
- **Auxiliary contacts**
  - Switch with 1 or 2 blocks (2NO+2NC/block)
  - Earthing switch with 1 or 2 blocks (1NO+1NC/block) (1)
- **Motor option**
- **opening releases**
  - Low energy release (Mitop) with SDE contact
  - Shunt trip release (MX)
  - Undervolatge release (MN)
- **Operation counter**

PM100600



OCO mechanism in D06H unit

OCO double function operating mechanism

- **Switch or circuit breaker function**
  - Independent-operation closing:
    1. Operating mechanism recharging by lever or motor
    2. Stored energy released by pushbutton (I) or trip unit
  - Independent-operation opening by pushbutton (O) or trip unit
- **Earthing switch function**: Independent-operation opening or closing by lever. Operating energy is provided by a compressed spring that causes the contacts to open or close when released
- **Auxiliary contacts**
  - Switch with 1 or 2 blocks (2NO+2NC/block)
  - Earthing switch with 1 or 2 blocks (1NO+1NC/block) (1)
- **Motor option**
- **Closing releases**
- **Opening releases**
  - Low energy release (Mitop) with SDE contact
  - Shunt trip release (MX)
  - Undervolatge release (MN)
- **Operation counter**

(1) When motor is selected, only 1-block earthing switch auxiliary contact is available

Operating mechanisms

Accessories

PM100392

Motor mechanism (MCH)

The MCH electrical motor mechanism is used to charge the main springs that store the operating energy for the core unit mechanism.

- On the CIT mechanism, it allows electrical opening and closing of the core unit.
- On the CI1 mechanism, it allows electrical charging and closing of the core unit.
- On the OCO mechanism, it allows electrical charging of the core unit

The motor mechanism is equipped with a “spring-charged” limit switch that stops spring charging when the springs are fully charged. This contact is also used to indicate the “spring-charged” status.

Characteristics

Power supply		• 24-30 VDC • 48-60 VDC/VAC • 100-130 VDC/VAC • 200-250 VDC/VAC
Threshold		0.85 to 1.1 Un
Consumption (VA or W)		180
Motor overcurrent		2 to 3 In for 0.1 s

PM100002

Shunt closing release (XF) and opening release (MX)

XF shunt closing release: This release, dedicated to the OCO mechanism, allows electrical closing as soon as the springs are charged.

MX shunt trip release: This release, dedicated to the CI1 or OCO mechanisms, allows electrical opening of the core unit. It can lock the unit in the open position as long as the remote order is maintained.

Characteristics

Power supply		• 24-30 VDC • 48-60 VDC/VAC • 100-130 VDC/VAC • 200-250 VDC/VAC
Threshold	XF	0.85 to 1.1 Un *
	MX	0.7 to 1.1 Un
Consumption (VA or W)	Triggering	250
	Latched	2.5

* Please contact our Customer Care Center if you need more than 1.1 Un

PM100001

Undervoltage release (MN)

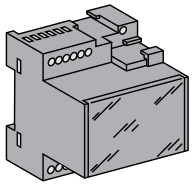
This release allows the electrical opening of the core unit in the event of an undervoltage. It can also be used for positive opening and locking in case of an emergency caused by a voltage drop or loss of auxiliary power. It can be associated with a time delay unit.

Characteristics

Power supply		• 24-30 VDC • 48-60 VDC/VAC • 100-130 VDC/VAC • 200-250 VDC/VAC
Threshold	Opening	0.35 to 0.7 Un
	Closing	0.85 Un
Consumption (VA or W)	Triggering	250
	Latched	2.5

Operating mechanisms
Accessories

MT66042



PM105391

Time delay for MN

To eliminate spurious tripping of the circuit breaker when there are brief voltage drops, the MN action is controlled with a time delay.

This function is achieved by adding a time delay unit outside of the undervoltage release (MN) circuit (adjustable time delay).

This unit is placed outside the circuit breaker and can be inhibited by an emergency stop button to obtain instant circuit breaker opening.

Characteristics

Power supply		
Threshold	Opening	0.35 to 0.7 Ur
	Closing	0.85 Ur
Consumption (VA or W)	Triggering	200 (for 200 ms)
	Latched	4.5
Time delay		0.5 s - 0.9 s - 1.5 s - 3 s

PM100032

Rotary type contacts (OC)

"On/Off" auxiliary position contacts

These auxiliary contacts indicate the "open" or "closed" position of the circuit breaker.

- Rotary type changeover contacts directly controlled by the circuit breaker mechanism
- Indication contacts are proposed:
  - for standard relaying applications
  - for low level control applications with PLCs or electronic circuits

This version is compatible with Easergy Sepam series 20, series 40, and series 80 units.

Characteristics

Breaking capacity (A)	**Standard**		**Minimum load: 100 mA/24 V**
Cos φ: 0.3 Utilization category: AC12/DC12	VAC	240/380	10/6 (1)
		480	10/6 (1)
		690	6
	VDC	24/48	10/6 (1)
		125	10/6 (1)
		250	3

(1) Standard contacts: 10 A
Optional contacts: 6 A (temperature derating)

Possible trip coil combinations

	WITHOUT MOTORIZATION								WITH MOTORIZATION				
	No VIP relay**				With VIP relay				No VIP relay*		With VIP relay*		
Release type	Combinations				Combinations				Combinations		Combinations		
	1	2	3	4	1	2	3	4	1	2	1	2	3
Mitop					■	■	■	■			■	■	■
Shunt closing release (XF) *									●	●	●	●	●
Shunt trip release (MX1)		■		■		■		■	●	●	●	●	●
Shunt trip release (MX2)	■	■			■	■			■			■	
Undervoltage release (MN)			■	■			■	■		■			■

* Only for D06H, D12H, I06H, I12H; not for D02N or D06N
** No VIP relay: the relay could be Easergy Sepam, Easergy MiCOM, Easergy P3, P5, etc.

● Used for motorization only
■ Used with VIP protection relay only
■ Shunt trip release for tripping circuit use

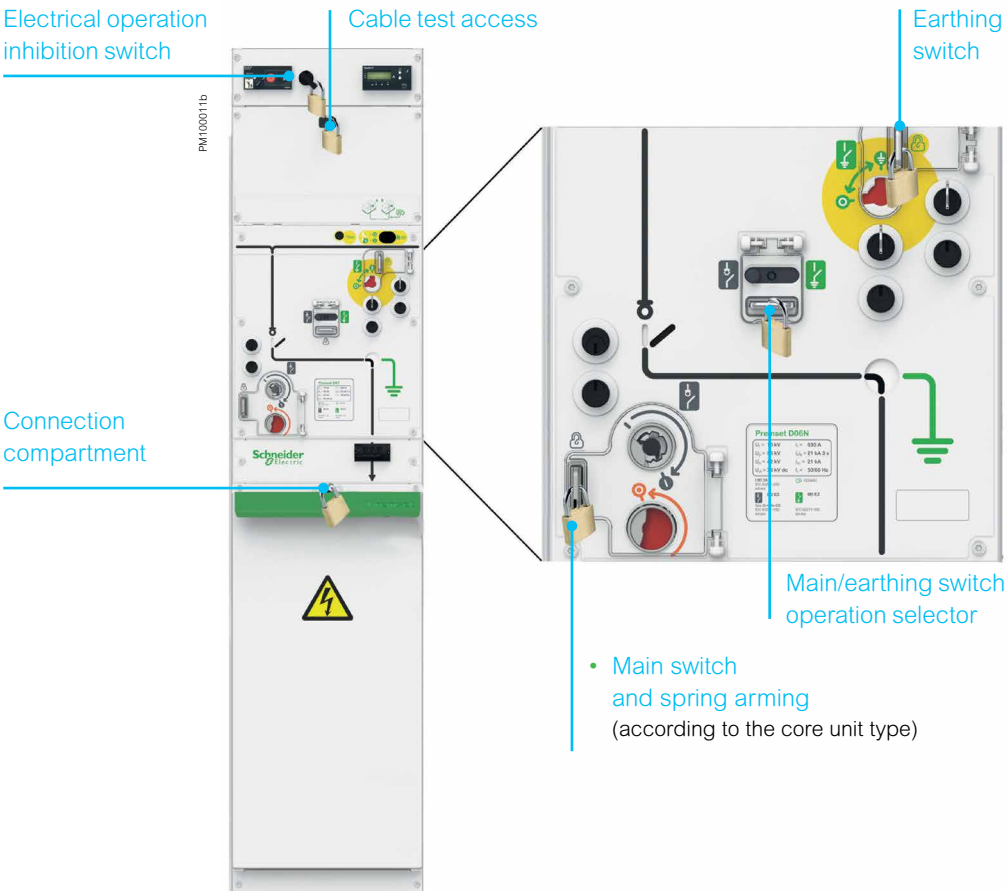
Operating mechanisms

Padlocking and keylocking

It is also possible to padlock the pushbutton cover (option).

Padlocking

Current cubicle design provides the possibility to padlock the following devices:



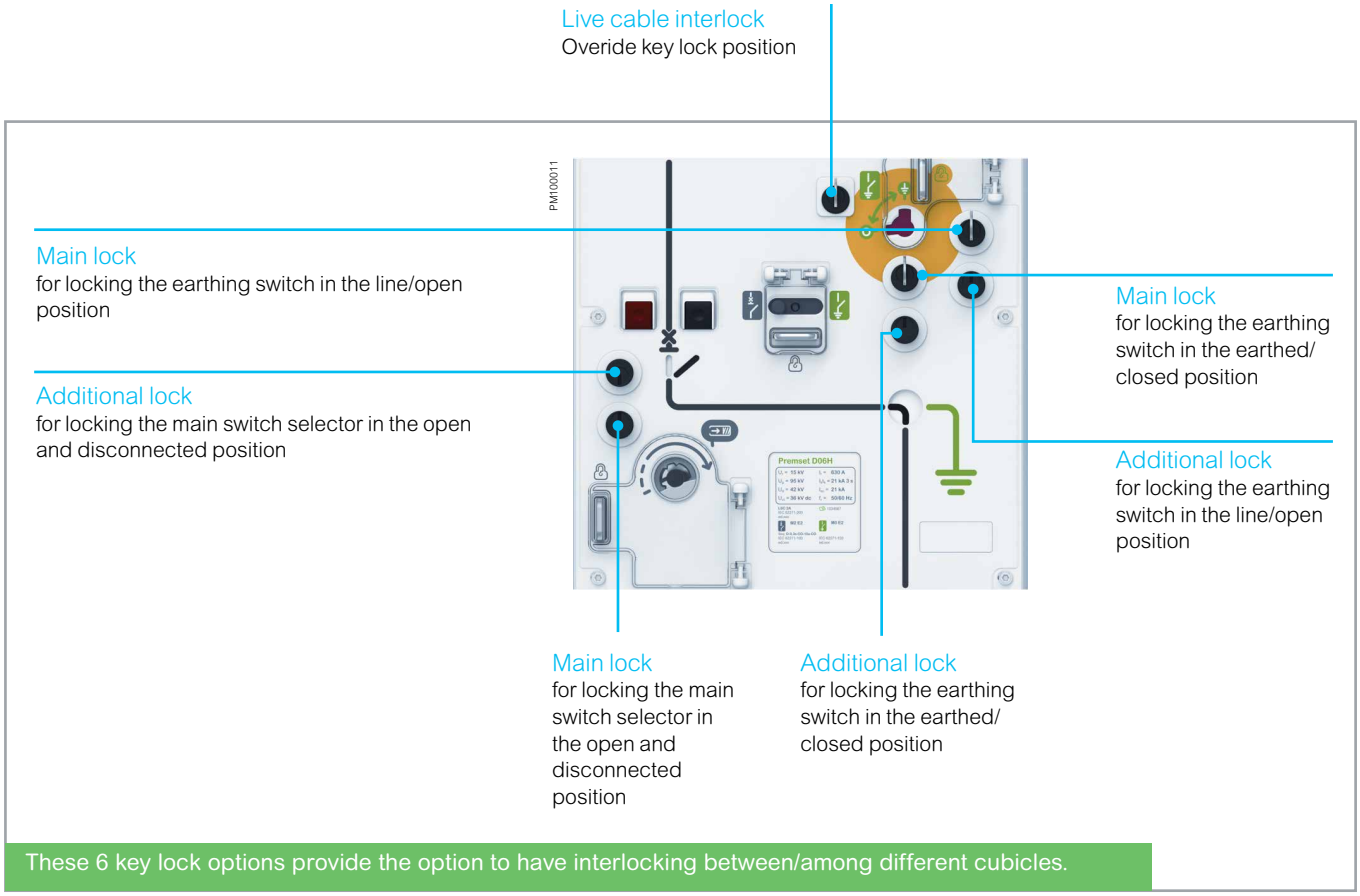
Operating mechanisms

Padlocking and keylocking

The key lock configuration can be modified after commissioning.

Keylocking (optional)

Up to 7 key locks are available as an option on the switching device.



These 6 key lock options provide the option to have interlocking between/among different cubicles.

Operating mechanisms

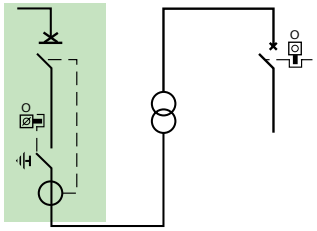
Padlocking and keylocking

MV/LV substations key-type interlocks

Interlock units	A1	C1	C4	A3	A4	A5	Ax	P1
I06T/I06H				●	●	●	●	●
D02N/D06H	●	●	●	●			●	●
D06N/D06H/D12H				●		●	●	●
ES-B				●			●	

Outgoing units

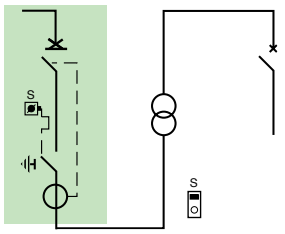
DM107403



A1 type

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

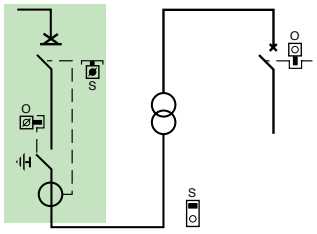
DM107404



C1 type

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

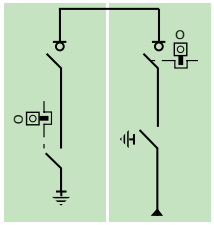
DM107405



C4 type

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

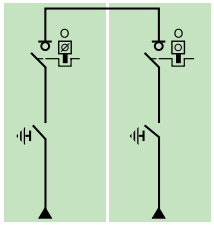
DM107406



A3 type

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

DM107407



A4 type

- To prevent simultaneous closing of two switches

Legend for key-type interlocks:

MT20240EN

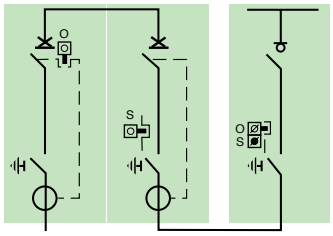
Operating mechanisms

Padlocking and keylocking

Key-type interlocks

Outgoing units

DM107408



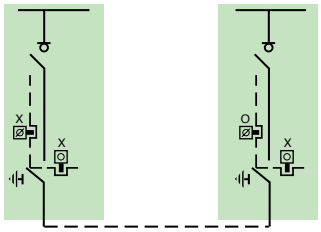
A5 type

- To prevent closing of the earthing switch on the casing unit unless the downstream and upstream switches are locked in the “open” position

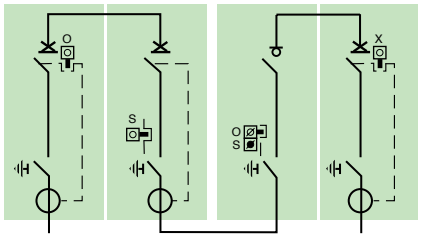
P1 type

- To prevent closing on an earthing switch if the switch of the other unit has not been locked in the “open” position

DM107409



DM107410



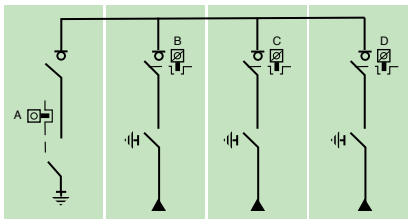
Legend for key-type interlocks:

No key | Key released | Key captive | Panel or door

MT20240EN

Ax keylock: MV/MV antenna interlocking system

DM107411



To prevent closing of the bus earthing switches until all incoming/feeder switches or breakers are not locked in the “open” position

Legend for keylocks:

Key exchange box
B C D A

Mechanical interlock

A For A: bolt out and key in. Locked in the OPEN position.

B For B: bolt out and key away. Earthing switch locked in the OPEN position.

DM107412

SSIS current and voltage

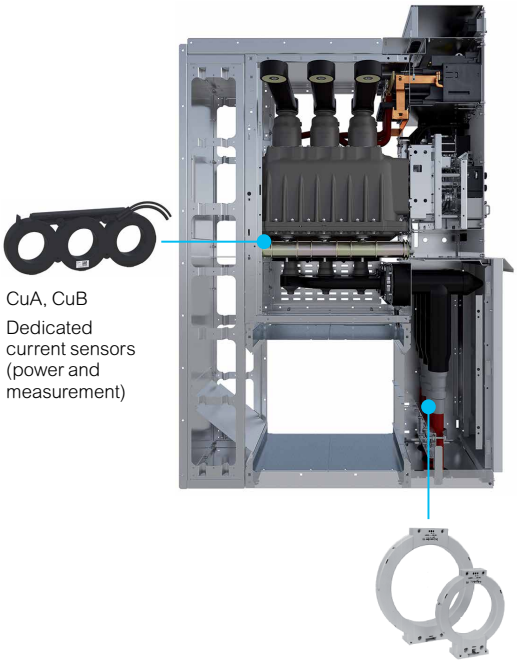
Transformers for PremSet

Summary table by unit

	Current sensors									Voltage sensors			
	Protection sensors			Zero sequence	FPI & ammeter		Metering CT			Screened		LPVT	
	Under-core unit			Cable	Bushing	Cable	Bushing	Cable	Rising CT	Busbar or cable	Busbar	Cable	Busbar
Unit type	CuA CuB	TLPU1	ARU2	CSH120 CSH200	CTR2200 (1)	MF1	ARU1 (1)	ARC6	ARC5	VRU1	VRU2	SMVS-UV1001	VLPU1
I06T					●	●	●	●		●		●	●
I06H					●	●	●	●		●		●	●
I12H							●	●		●		●	●
D02N	●	●	●	●	●	●	●	●		●		●	●
D06N	●	●	●	●	●	●	●	●		●		●	●
D06H	●	●	●	●	●	●	●	●		●		●	●
D12H			●	●			●	●		●		●	●
G06							●	●		●		●	●
G12													●
M06S									●	●			●
M12S									●	●			●
M06A													●
M12A													●
VTM										●			
VTM-D										●			
VTP											●		●
VTP-D											●		●
ES-B													●

(1) CRT2200 and ARU1 cannot be selected at the same time

DM100035



CuA, CuB

Dedicated current sensors (power and measurement)

CSH120/200

Optional zero sequence sensor for high sensitive earthing fault protection

CuA and CuB

These sensors are specifically designed for the PremSet self-powered protection system which includes sensors, VIP relay, and an actuator.

The sensors are made up of one block of three CTs. They provide protection and measurement functions, as well as providing power for an actuator.

The sensors are located under the core unit:

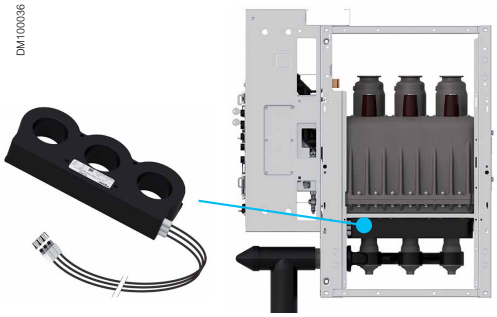
- Characteristics according to IEC 60044-8
- Double secondary winding for measurement and protection
- Frequency 50-60Hz

Characteristics

Highest voltage for equipement	Um	0.72 kV
Power frequency withstand voltage		3 kV - 1 min
Rated short-time withstand current	Ith (kA)	25
Withstand time	t (s)	3
Rated primary current	Ipr	CuA: 0-200 A, CuB:0- 630 A
Secondary voltage	Us	22.5 mV at rated primary current
Rated burden		> 2 kΩ
Measurement	Accuracy class	Cl 1.0
Protection		5P30

SSIS current and voltage

Transformers for PremSet



CSH120/200

- For Easergy Sepam or third-party protection relays, if sensitive earth fault protection is required, an earth fault toroidal CT of the CSH120 or CSH200 type should be installed around the cables
- CSH120 and CSH200 zero sequence CTs provide more sensitive protection through the direct measurement of earth fault currents
- CSH120 - 120 mm internal diameter
- CSH200 - 200 mm internal diameter

TLPU1 (LPCT)

TLPU1 low power current transfomers (LPCT) use optimized technology that offers a number of advantages in PremSet cubicles.

- **Simpler selection:** A single sensor can be used for both measurement or protection over the entire range of operating currents
- **Easy and safe installation:** The LPCT output is plugged directly into the Easergy Sepam relay with no risk of overvoltage when disconnecting
- **Flexibility of use:** Easy adaptation to changes in power levels and/or protection settings during MV system design or service life
- **High accuracy** up to the short-time circuit current with low saturation
- **Compact design:** Small size and low weight allow easy integration in PremSet cubicles
- Comply with **IEC 60044-8**
- One **secondary winding** for measurement or protection
- Frequency 50-60Hz

Characteristics

Highest voltage for equipement	Um	0.72 kV
Power frequency withstand voltage		3 kV - 1 min
Rated short-time withstand current	Ith (kA)	25
Withstand time	t (s)	3
Rated primary current	Ipr	100 A
Secondary voltage	Us	22.5 mV
Rated burden		> 2 kΩ
Measurement	Accuracy class	0.5 up to Ipr 630 A
Protection		5P250

SSIS current and voltage

Transformers for PremSet

PM105800

SMVS-UW1001

PM109318

VLPU1/VLPU2

VLPU1 and SMVS-UW1001 (low power voltage transformers)

PremSet can now be specified with a compact high-accuracy low power voltage transformer (LPVT). The innovative sensors are ideal for the new generation of electronic protection devices and monitor energy consumption:

- 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
- Increased performance under overvoltage, open circuit, or short circuit conditions
- Easy to install, operate, and test
- Comply with IEC 61869-11
- Installed at the back of the cable T-connector instead of the insulating plug for SMVS-UW1001
- Installed on the busbar instead of the caps for VLPU1 or VLPU2
- Rated voltage: 10/r3 kV and 20/r3 kV (phase/earth)
  - Secondary voltage 3.25 V/√3
  - Accuracy class 0.5 (1) and 3P
  - Rated burden 200 kOhms ±1%
  - No calibration or adjustment to primary voltage needed

Characteristics

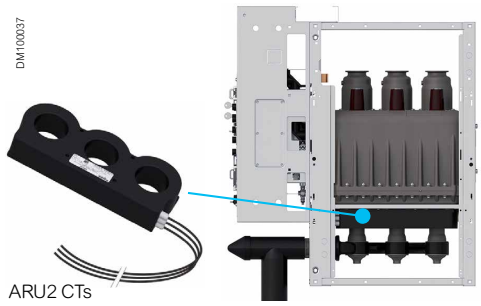
Rated voltage	**kV**	**7**	**12**	**17.5**
Primary voltage	kV	3 to 8.8		8.8 to 15
Rated insulation and lightning impulse voltage	kV	28/75 or 42/75		38/95
Secondary voltage	V	3.25V/√3		
Burden and accuracy class		200 kOhms ±1% , Class 0.5 (1) and 3P		

Please contact our Customer Care Center for availability of current ratios and performance levels.

(1) Up to +50 °C

SSIS current and voltage

Transformers for PremSet



ARU2

A standard ring type current transformer of the ARU2 type (1A, 5P20 class) can be located under the core unit.

- Characteristics according to IEC 61869-2
- One secondary winding for protection
- Frequency 50-60Hz

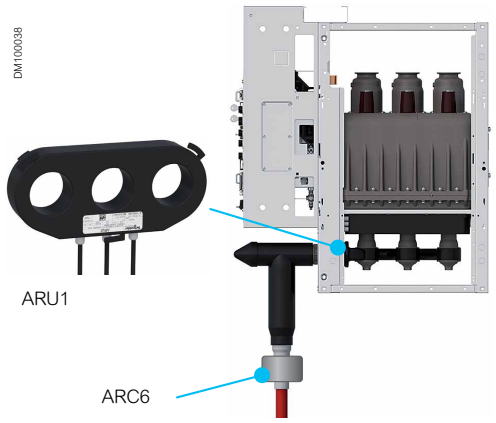
Characteristics		D02N,D06N,D06H				D12H		
Rated primary and secondary current	Ipr/Isr(A)	100/1	200/1	400/1	600/1	800/1	1000/1	1250/1
Rated short-time withstand current	Ith (kA)	25				25		
Withstand time	t (s)	3 s				3 s		
Protection	Rated burden	1.5 VA	2.5 VA			5 VA		
	Accuracy class	5P-20						

Please contact our Customer Care Center for availability of current ratios and performance levels.

Three different types of current transformer (ARU1, ARC6, and ARC5) are used for tariff metering on PremSet switchboards.

They are all designed for easy installation and long service life.

All the current transformers are compliant with standard IEC 61896-2 and operate at 50/60 Hz frequency.



ARU1

The ARU1 is a block comprising three ring-type current transformer.

The ARU1 is located around abushing the following switchgear units: I06T, I06H, D02N, D06N, D06H, I12H, and D12H.

Characteristics		I06H, I06T, D02N, D06N, D06H, G06				I12H, D12H					
Rated primary and secondary current	Ipr/Isr(A)	100/1	200/1	400/1	600/1	300/5	400/5	600/5	800/5	1000/5	1250/5
Rated short-time withstand current	Ith (kA)	25				25					
Withstand time	t (s)	3 s				3 s					
Measurement	Rated burden	2.5 VA				5 VA					
	Accuracy class	Cl 0.5 s Fs ≤ 10				Cl 0.2 s Fs ≤ 5					

Please contact our Customer Care Center for availability of current ratios and performance levels.

SSIS current and voltage

Transformers for PremSet

ARC6

The ARC6 is a ring-type current transformer.

The ARC6 is located around a cable the following switchgear units: I06T, I06H, D02N, D06N, and D06H.

The ARC6 offers higher accuracy than ARU1 when the primary current is less than 630 A.

The ARC6 is only installed on single-core screened cable, with a deeper cable compartment door.

Characteristics

Rated primary and secondary current	Ipr/Isr(A)	100/5	150/5	200/5	300/5	400/5	600/5
Rated short-time withstand current	Ith (kA)	25					
Withstand time	t (s)	3 s					
Measurement	Rated burden	5 VA			15 VA		
	Accuracy class	Cl 0.2s FS ≤5					

Note: For ARC6 for D12H, please contact our Customer Care Center for availability of other current ratios, performance levels, or protection uses.

ARC5

The ARC5 is a ring-type current transformer used in M06S and M12S metering core units.

- Compact dimensions for easy installation on a PremSet bus riser
- Cost-effective compared with standard MV CT block or DIN solutions

Characteristics		M06S				M12S		
Rated primary and secondary current	Ipr/Isr(A)	100/5	200/5	400/5	600/5	800/5	1000/5	1205/5
Rated short-time withstand current	Ith (kA)	25				25		
Withstand time	t (s)	3 s				3 s		
Measurement	Rated burden	5 VA				5 VA		
	Accuracy class	Cl 0.2s FS ≤5						

Please contact our Customer Care Center for availability of current ratios and performance levels.

SSIS current and voltage

Transformers for PremSet

Different types of voltage transformer (VT) are used for tariff metering on PremSet switchboards. They are all designed for easy installation and long service life. They are all compliant with standard IEC 61869-3 and operate at 50/60 Hz frequency.

Using phase-to-earth VTs connected between phase and earth in a system that does not have a solid-earthed neutral is the most favorable scenario for ferroresonance to occur. To overcome ferroresonance issues, one of the following solutions must be used mandatorily:

- Use a dumping resistor connected to the open delta terminals of the residual voltage secondary circuit will help to dump ferroresonance.
- Use of VTs working at a lower induction level will help avoid to prevent overvoltages from initiating ferroresonance.

Lower induction VTs are available on request depending on the neutral system status. Fore more information, please contact our Customer Care Center.

PE58411

VRU1

The VRU1 is a phase-to-earth screened voltage transformer used in SSIS M06S, M12S, VTM, and VTM-D metering core units. VRU1 is also used in incomer or feeder cubicles (I06T, I06H, I12H, D02N, D06N, D06H, or D12H) for embedded metering, installed behind the cable.

- Compact dimensions and design for easy installation in PremSet core units
- Easy front access for disconnection for commissioning
- SSIS design for insensitivity to harsh environments

Characteristics

Rated voltage	**kV**	**7.2**			**12**			**17.5**		
Primary voltage	kV	6/√3	6.6/√3	6/√3	10/√3	11/√3	10/√3	11/√3	13.8/√3	15/√3
Rated insulation and lighting impulse voltage	kV	20/60	20/60	32/60	28/75	28/75	42/75	38/95	38/95	38/95
First secondary voltage	V	100√3	110√3	100√3	100√3	110√3	100√3	110√3	110√3	100√3
Rated burden and accuracy class		10 VA Cl 0.2								
Second secondary voltage	V	100/3	110/3	100/3	100/3	110/3	100/3	110/3	110/3	100/3
Rated burden and accuracy class		30 VA 3P								

Please contact our Customer Care Center for availability of current ratios and performance levels.

PE58412

VRU2 for auxiliary power supply

The VRU2 is a phase-to-phase screened voltage transformer used in VTP and VTP-D auxiliary power supply functions.

- Compact dimensions and screened design for easy installation in PremSet core units, with insensitivity to harsh environments
- Designed to withstand power frequency tests (no need for disconnection during commissioning)
- Thermal limiting output: 300 VA continuous, 500 VA for 1 minute

Characteristics

Rated voltage	**kV**	**7.2**			**12**			**17.5**	
Primary voltage	kV	6	6.6	6	10	11	10	13.8	15
Rated insulation and lighting impulse voltage	kV	20/60	20/60	32/60	28/75	28/75	42/75	38/95	38/95
First secondary voltage	V	230							
Rated burden and accuracy class		30 VA cl 3							

AIS current and voltage

Transformers for PremSet

Summary table by unit

Unit type	Current sensors				Voltage sensors			
	Block DIN		Block		Block DIN		Block	
	AD12	AD13	ARM3	ARJP3	VDF11/21	VDC11/21	VRQ2	VRC2
M06A	●		●		●	●	●	●
M12A		●		●	●	●	●	●
					Phase-to-earth	Phase-to-phase	Phase-to-earth	Phase-to-phase

Three different types of current transformer are used for tariff metering on PremSet switchboards. They are all designed for easy installation and long service life.

All the current transformers are compliant with standard IEC 61896-2 and operate at 50/60 Hz frequency.

AD12

AD13

AD12 and AD13

AD12 and AD13 are medium voltage current transformer sused in M06A and M12A air-insulated metering core units.

- Widely used type of current transformer with overall dimensions in accordance with DIN standard 42600 part 8 for 12 kV size
- High accuracy over the entire measurement range
- Single primary winding
- One secondary winding for metering

AD12 characteristics

Rated primary and secondary current	Ipr/Isr (A)	50/5	100/5	200/5	400/5	600/5
Rated short-time withstand current	Ith (kA)	25				
Withstand time	t (s)	1				
Measurement	Rated burden (min-max)	2.5 - 10 VA	2.5 - 15 VA			
	Accuracy class	Cl 0.2s Fs<5				

AD13 characteristics

Rated primary and secondary current	Ipr/Isr (A)	800/5	1000/5	1200/5
Rated short-time withstand current	Ith (kA)	25		
Withstand time	t (s)	1		
Measurement	Rated burden (min-max)	2.5 - 15 VA		
	Accuracy class	Cl 0.2 s Fs<5		

Please contact our Customer Care Center for availability of current ratios and performance levels.

AIS current and voltage

Transformers for PremSet

PE59383

ARM3

The ARM3 is a block type medium voltage current transformer used in the M06A and M12A air-insulated metering core unit.

- Standard type of current transformer for Schneider Electric applications
- High accuracy over the entire measurement range
- Single primary winding
- One secondary winding for metering

Characteristics

Rated primary and secondary current	Ipr/Isr (A)	50/5	100/5	200/5	400/5	600/5
Rated short-time withstand current	Ith (kA)	25				
Withstand time	t (s)	1				
Measurement	Rated burden (min-max)	2.5 - 15 VA				
	Accuracy class	Cl 0.2 s Fs<5				

Please contact our Customer Care Center for availability of current ratios and performance levels.

PM109319

ARJP3

The ARJP3 is a block type medium voltage current transformer used in the M12A air-insulated metering core unit.

- Standard type of current transformer for Schneider Electric applications
- High accuracy over the entire measurement range
- Single primary winding
- One secondary winding for metering and one for protection

Characteristics

Rated primary and secondary current	Ipr/Isr (A)	800/5-5	1000/5-5	1200/5-5
Rated short-time withstand current	Ith (kA)	25		
Withstand time	t (s)	1		
Measurement	Rated burden and accuracy class	30 VA Cl 0.5		
	Rated burden and accuracy class	10 VA 5P20		

Please contact our Customer Care Center for availability of current ratios and performance levels.

AIS current and voltage

Transformers for PremSet

Different types of voltage transformer are used for tariff metering on PremSet switchboards. They are all designed for easy installation and long service life.

All the voltage transformers are compliant with standard IEC 61896-3 and operate at 50/60 Hz frequency.

Using phase-to-earth VTs connected between phase and earth in a system that does not have a solid-earthed neutral is the most favorable scenario for ferroresonance to occur.

To overcome ferroresonance issues, one of the following solutions must be used mandatorily:

- Use of a dumping resistor connected to the open delta terminals of the residual voltage secondary circuit will help to dump ferroresonance
- Use of VTs working at a lower induction level will help to prevent overvoltages from initiating ferroresonance

Lower induction VTs are available on request depending on the neutral system status. Fore more information, please contact our Customer Care Center.

VDF11

VDF21

VDF11 and VDF21

VDF11 and VDF21 phase-to-earth voltage transformers are used in M06A and M12A air-insulated metering units. They are a widely used type of voltage transformer with overall dimensions in accordance with DIN standard 42600 part 9 for 17.5 kV size.

Easy to adapt to local practices or specifications.

Characteristics		VDF11				VDF21
Rated voltage	kV	**7.2**		**12**		**17.5**
Primary voltage	kV	$3/\sqrt{3}$ to $6.6/\sqrt{3}$	$6/\sqrt{3}$	$6/\sqrt{3}$ to $11/\sqrt{3}$	$10/\sqrt{3}$	$10/\sqrt{3}$ to $15/\sqrt{3}$
Rated insulation and lighting impulse voltage	kV	20/60	32/60	28/75	42/75	38/95
First secondary voltage	V	$100/\sqrt{3}$ or $110/\sqrt{3}$	$100/\sqrt{3}$	$100/\sqrt{3}$ or $110/\sqrt{3}$	$100/\sqrt{3}$	$100/\sqrt{3}$ or $110/\sqrt{3}$
Rated burden and accuracy class		5 VA to 10 VA class 0.2, or 5 VA to 20 VA class 0.5				
Second secondary voltage	V	100/3 or 110/3	100/3	100/3 or 110/3	100/3	100/3 or 110/3
Rated burden and accuracy class		30 VA 3P				

Please contact our Customer Care Center for availability of current ratios and performance levels.

VDC11

VDC21

VDC11 and VDC21

VDC11 and VDC21 phase-to-phase voltage transformers are used in M06A and M12A air-insulated metering units.

- Widely used type of voltage transformer with overall dimensions in accordance with DIN standard 42600 part 9 for 17.5 kV size
- Easy to adapt to local practices or specifications

Characteristics		VDC11				VDC21
Rated voltage	kV	**7.2**		**12**		**17.5**
Primary voltage	kV	3 to 6.6	6	6 to 11	10	10 to 15
Rated insulation and lighting impulse voltage	kV	20/60	32/60	28/75	42/75	38/95
First secondary voltage	V	100 or 110	100	100 or 110	100	100 or 110
Thermal power and accuracy class		5 VA to 10 VA class 0.2, or 5 VA to 20 VA class 0.5				

Please contact our Customer Care Center for availability of current ratios and performance levels.

AIS current and voltage

Transformers for PremSet

PE59408

VRQ2

VRQ2

VRQ2 phase-to-earth voltage transformers are used in M06A and M12A air-insulated metering units.

- Standard type of voltage transformer for Schneider Electric applications, VRQ2 and VRQ2 are already used in SM6 and RM6 metering cubicles.

Characteristics

Rated voltage	kV	**7.2**		**12**		**17.5**
Primary voltage	kV	$3/\sqrt{3}$ to $6.6/\sqrt{3}$	$6/\sqrt{3}$	$6/\sqrt{3}$ to $11/\sqrt{3}$	$10/\sqrt{3}$	$10/\sqrt{3}$ to $15/\sqrt{3}$
Rated insulation and lighting impulse voltage	kV	20/60	32/60	28/75	42/75	38/95
First secondary voltage	V	$100/\sqrt{3}$ or $110/\sqrt{3}$	$100/\sqrt{3}$	$100/\sqrt{3}$ or $110/\sqrt{3}$	$100/\sqrt{3}$	$100/\sqrt{3}$ or $110/\sqrt{3}$
Rated burden and accuracy class		5 VA to 30 VA class 0.2, or 5 VA to 50 VA class 0.5				
Second secondary voltage	V	100/3 or 110/3	100/3	100/3 or 110/3	100/3	100/3 or 110/3
Rated burden and accuracy class		30 VA 3P				

Please contact our Customer Care Center for availability of current ratios and performance levels.

PE59403

VRC2

VRC2

VRC2 phase-to-earth voltage transformers are used in M06A and M12A air-insulated metering units.

- Standard type of voltage transformer for Schneider Electric applications, VRC2 is already used in SM6 and RM6 metering cubicles

Characteristics

Rated voltage	kV	**7.2**		**12**		**17.5**
Primary voltage	kV	3 to 6.6	6	6 to 11	10	10 to 15
Rated insulation and lighting impulse voltage	kV	20/60	32/60	28/75	42/75	38/95
First secondary voltage	V	100 or 110	100	100 or 110	100	100 or 110
Rated burden and accuracy class		5 VA to 30 VA class 0.2, or 5 VA to 50 VA class 0.5				

Please contact our Customer Care Center for availability of current ratios and performance levels.

Protection
Selection guide

PM100573

VIP 40 and VIP 45

PM100576

VIP 400 and VIP 410

VIP self-powered integrated protection

Optimized performance for PremSet

- Integrated protection relay
  - Complete engineered and pre-tested protection system: dedicated CT and low power actuator (Mitop)
  - Savings on space and cabling time
- Self-powered protection
- Optimized for PremSet: core unit switchgear and protection designed to work together in an optimum manner:
  - Optimized breaking time
- Simple protection, easy to implement
- Perfectly adapted to dedicated applications

VIP 40 and VIP 45: designed for D02N transformer protection circuit breakers

- MV/LV transformer protection
- Dedicated protection curve to protect against overloads, short circuits and earth faults with straight-forward settings
- Fast clearing time or transformer short circuits (< 60 ms): no fuse needed.

VIP 400 and VIP 410: designed for D06N and D06H general protection circuit breakers

- Substation protection (incomers, feeders, bus risers) using D06N (standard duty) or D06H (heavy duty) 630 A circuit breakers
- MV/LV transformer protection instead of VIP 40 and VIP 45 if more functions are required
- DT (definite time) and standard IDMT (inverse definite minimum time) tripping curves
- Switchgear diagnostics
- Multi-language display
- VIP 410 includes a dual supply (self-powered plus auxiliary) for communication and high sensitivity earth fault protection.

High sensitivity sensors

A 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 and VIP 410 and 5 A to 20 In for VIP 40 and VIP 45 (see page 98).

Protection
Selection guide

PE88030

Easergy Sepam series

Easergy Sepam series

Easergy Sepam series protection relays are also available and have the following characteristics:

- External auxiliary power
- Open range
- From basic to more sophisticated protection
- Standard CTs and trip actuators

PM105840

Easergy MiCOM series

Easergy MiCOM series

Easergy MiCOM protection provides the user with a choice of cost-optimized solutions for specific protection requirements within the distribution network.

The Easergy MiCOM relay series offers comprehensive protective function solutions for all power supply systems as well as for various functional and hardware project stages.

PM106572

Easergy P3 series

Easergy P3

The Easergy P3 protection relay is based on proven technology concepts and developed in close cooperation with customers, so it is built to meet your toughest demands. It's available in two sizes to best fit your needs:

- The Easergy P3 Standard combines protection functions such as directional earth fault for feeder and motor protection in a one-box solution.
- The Easergy P3 Advanced features a modular design that allows user-defined conventional protection and arc flash protection solutions in both new and existing power distribution systems.

Easergy products are designed to be user friendly, a feature that is proven in our customer reports day after day. You will benefit from features that include:

- A complete set of protection functions, related to the application
- Arc detection (Easergy P3 Advanced)
- Dedicated circuit breaker control with single-line diagram, pushbuttons, programmable function key and LEDs, and a customizable alarm
- Multilingual HMI for customized messaging
- Settings tool relay management software for setting parameters, configuring, and network fault simulation
- Both serial and Ethernet communication, including redundancy
- IEC 61850 standard Ed.1 & Ed.2

Protection

Selection guide

PM104085

Easergy P5 series

Easergy P5 series: a fusion of new ideas and proven expertise

Easergy P5 relays provide best-in-class protection for all types of installations, together with new smart grid features and a lower total cost of ownership.

Fast delivery and multivendor interoperability make the range that much simpler to integrate into your electrical network. Furthermore, a unique combination of modern features and proven components make it the right choice for forward-looking network operators.

Easergy protection relays bring new benefits in addition to compliance with the latest international standards:

- Protective environment and security
- Outstanding ease of use
- Greater efficiency
- Optimized total cost of ownership

The Easergy P5 series includes a variety of models:

	P5 (20TE) **Current or voltage**	**P5 (30TE) *** **Current and voltage**
Feeder	P5F20	P5F30 With directional protection
Voltage	P5V20	
Motor	P5M20	P5M30
Generator		P5G30

* Please contact our Customer Care Center for availability.

Protection

Selection guide

		VIP series				Sepam/MiCOM series		Easergy series
		Integrated self-powered protection optimized for PremSet				General		
		Transformer protection		General protection				
		VIP 40	VIP 45	VIP 400	VIP 410	Sepam	MiCOM	P3 or P5
Protection functions								
Phase overcurrent (ANSI 50-51)		●	●	●	●	●	●	●
Earth fault phase (ANSI 51N)	Standard (sum of current method)		●	●	●	●	●	●
	High sensitivity (earth fault CTs)				●	●	●	●
Thermal overload (ANSI 49)				●	●	●	●	●
Cold load pick-up					●	●	●	●
Other protection functions [1]						●	●	●
Measurement functions								
Phase current		●	●	●	●	●	●	●
Earth current			●	●	●	●	●	●
Phase peak demand current		●	●	●	●	●	●	●
Load history	Cumulative time			●	●	●	●	●
Control and monitoring functions								
Trip indication	Local (with origin of the fault)	●	●	●	●	●	●	●
	Remote (one contact)	●	●	●	●	●	●	●
	Output relays				● [2]	●	●	●
Trip circuit supervision (ANSI 74TC)		●	●	●	●	●	●	●
Time-tagged events	Local on display (last 5 trips)			●	●	●	●	●
	Remote, via communication				●	●	●	●
External tripping input					●	●	●	●
Overcurrent and breaking profile	Number of phase and earth trips [3]			●	●	●	●	●
Serial communication port	Modbus RS485				●	●	●	●
Digital I/O for control functions						●	●	●
Power supply								
Type of supply	Self-powered or auxiliary	Self	Self	Self	Dual [4]	Auxiliary	Auxiliary	Auxiliary
	Minimum 3-phase load currents to activate the VIP	4 A	4 A	7 A [5]	–			

(1) See Sepam user guide

(2) Signaling relays: (use of output relays can be changed):
O1 = phase fault (I>, I>>, I>>>)
O2 = earth fault (Io>, Io>>)
O3 = thermal overload alarm

(3) 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

(4) The protection is self-powered. Auxiliary power is used only for communication and high sensitivity earth fault protection

(5) 14 A with 630 A circuit breakers

Protection

Protection relay selection

Easergy Sepam, Easergy MiCOM, and Easergy P3 & P5

Protection function		Sepam series 20/40	MiCOM series 20	Easergy P3	Easergy P5
		 PE90511	 PE90366	New  PM107416	New  PM104085
Feeder	Phase and earth fault	●	●	●	●
	Directional	● (1)	●	●	●
	Line differential		●	●	● (3)
	Distance			●	
Voltage	Voltage and frequency	● (1)	●	●	●
Transformer	Phase and earth fault	●	●	●	●
	Transformer differential			●	● (3)
Motor	Phase and earth fault	●	●	●	●
	Voltage	● (1)	●	●	●
	Machine differential			●	
Generator	Phase and earth fault	●		●	● (3)
	Directional	● (1)		●	● (3)
	Machine differential			●	
Busbar	Busbar differential				
Capacitor bank				●	●
Sensors		• CT (1 or 5 A) or LPCT • VT	• CT (1 or 5 A) • VT	• CT (1 or 5A) or LPCT • VT or LPVT	• CT (1 or 5A) or LPCT • VT or LPVT
Display		• Standard UMI • Remote UM	• Standard UMI	• B&W display with single-line diagram	• Standard UMI • Colored display with single-line diagram
Other characteristics			• Withdrawable hardware	• Detachable connector	• Withdrawable hardware
Max. inputs/outputs		10/8	12/11	16/8	22/15
I/O terminals		• Screw type • Ring lug	• Ring lug	• Screw type	• Screw type
Max. temp. sensors		8 or 16 (1)	10 (motor)	12	8 or 16
Communication protocol		• Modbus RTU • IEC 60870-5-103 • DNP3 • Modbus TCP/IP • IEC 61850 (1) (2) • RSTP	• Modbus RTU • IEC 60870-5-103 • DNP3	• Modbus RTU • Modbus TCP/IP • DNP3 Serial and Ethernet • IEC 60870-5-103 • IEC 60870-5-101 • IEC 61850 ed. 1 and ed. 2 • Ethernet IP • Profitbus • DeviceNet • SPA-Bus	• Modbus RTU • Modbus TCP/IP • DNP3 Serial and Ethernet • IEC 60870-5-103 • IEC 60870-5-101 • IEC 61850 Ed. 1 and Ed. 2 • Ethernet IP
Logic equations		• Comprehensive logic equations (1)	• Basic logic equations	• Comprehensive logic equations (1) and matrix	• Comprehensive logic equations (1) and matrix
Standards		• IEC, EAC, CE, UL, CSA	• IEC, EAC, CE, UL, CSA	• IEC, EAC, CE, UL, CSA	• Cyber security (IEC 62351) • IEC, EAC, CE, UL, CSA

(1) Easergy Sepam 40 series / (2) Without GOOSE message / (3) Coming soon

Protection

Protection relay selection

Easergy Sepam and Easergy MiCOM

Protection function		Easergy Sepam series 60	Easergy Sepam series 80	Easergy Micom series 30
		 PE90488	 PE90512	 PE90622
Feeder	Phase and earth fault	•	•	•
	Directional	•	•	•
	Line differential			•
	Distance			•
Voltage	Voltage and frequency	•	•	•
Transformer	Phase and earth fault	•	•	•
	Transformer differential		•	•
Motor	Phase and earth fault	•	•	•
	Voltage	•	•	•
	Machine differential		•	
Generator	Phase and earth fault	•	•	
	Directional	•	•	
	Machine differential		•	
Busbar	Busbar differential			
Capacitor bank		•	•	
Sensors		• CT (1 or 5 A) or LPCT • VT	• CT (1 or 5 A) or LPCT • VT	• CT (1 or 5 A) • VT
Display		• Standard UMI • Remote UM • Mimic-based UMI	• Standard UMI • Remote UM • Mimic-based UMI	• Standard UMI • Remote UMI • Mimic-based UMI
Other characteristics		Removable S/W cartridge	Removable S/W cartridge	• Bay controller • High firmware/hardware variability
Max. inputs/outputs		28/16	42/23	80/45
I/O terminals		• Screw type • Ring lug	• Screw type • Ring lug	• Screw type • Ring lug
Max. temp. sensors		8 to 16	8 to 16	10
Communication protocol		• Modbus RTU • IEC 60870-5-103 • DNP3 • Modbus TCP/IP • IEC 61850 with GOOSE • RSTP	• Modbus RTU • IEC 60870-5-103 • DNP3 • Modbus TCP/IP • IEC 61850 with GOOSE • RSTP	• Modbus RTU • IEC 60870-5-101/103 • DNP3 • IEC 61850 with GOOSE • RSTP/SHP/DHP • PRP
Logic equations		Comprehensive logic equations	Control logic by ladder diagram	Comprehensive logic equations
Standards		UL, CSA, EAC, ATEX	IEC 61508-SIL2, UL, CSA, EAC, ATEX	IEC, EAC, ATEX

Protection

VIP 40 and 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, lifetime costs are now equivalent to those of traditional MV switch fuse solutions.

PM100574

Application

- 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

Designed for PremSet to protect transformers

- Designed for D02N 200 A circuit breakers to replace fuse-switch solutions
- Setting is as simple as fuse selection
- Maximum setting possibilities consistent with circuit breaker characteristics

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: Io> (phase current sum method) and 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>, Io>, to>) protected by a lead-sealable cover
- Trip indication powered by dedicated integrated battery with reset by pushbutton or automatically

Protection

VIP 400 and VIP 410

- 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

PM100580

Applications

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

VIP 410 ready for smart grids

Dual supply for communication with:

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

Dedicated to intelligent MV loops with automation:

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

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

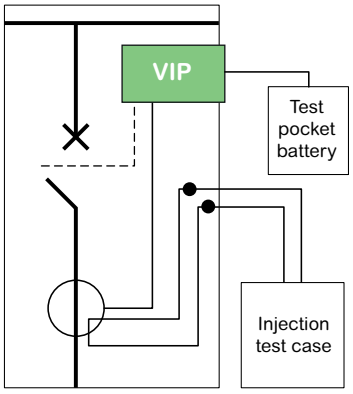
VIP 410: Dual powered protection relay

- Offers the same self-powered functions as the VIP 400
- In addition, the VIP 410 has an AC or DC auxiliary supply to power the following:
  - 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

Protection

VIP 400 and VIP 410

DM100040



Tests of protection system and circuit breaker

Other features

- Designed for PremSet D02N 200 A and D06N 630 A 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

Primary injection test

A primary injection circuit may be permanently installed (option) through the CTs, inside the PremSet cubicle, to test the physical integrity of the complete protection system including the CTs.

- The test is carried out without disconnecting the CTs and the VIP relay displays the injected current during testing
- If required, a temporary VIP test mode can be activated to test the tripping of the circuit breaker by pressing a test pushbutton

Test with the pocket battery module

- This accessory can be connected on the VIP relay front plate to energize the relay to carry out a quick test even though the relay is not powered. This module also makes it possible to test the circuit breaker.

PB103790

Pocket battery

Pocket battery for VIP

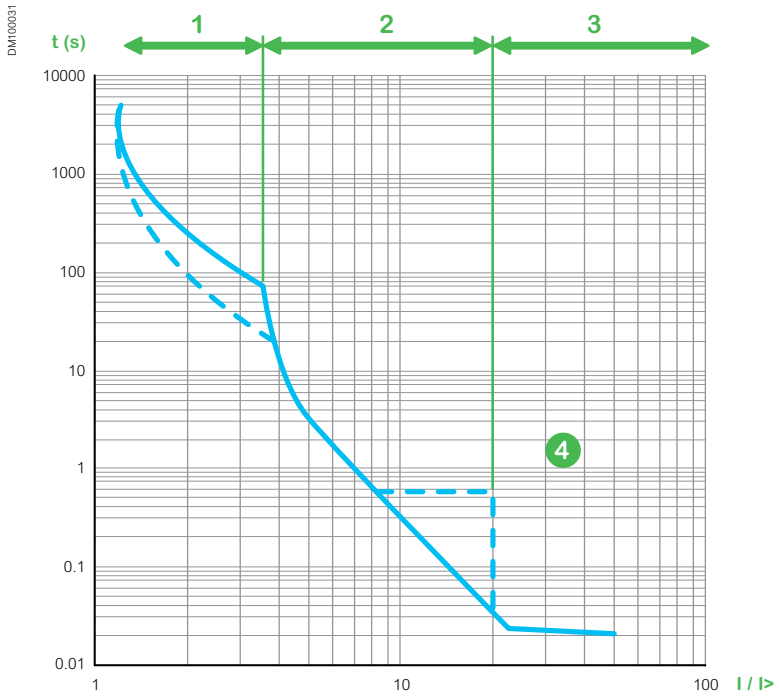
This unit is used to power the VIP 40, VIP 45, VIP 400, and VIP 410 units, making it possible to operate and test the protection system.
It can also be used to power Schneider Electric LV circuit breakers.

Protection

VIP tripping curves

VIP 40 and VIP 45 tripping curves

Phase overcurrent protection (ANSI 50-51)

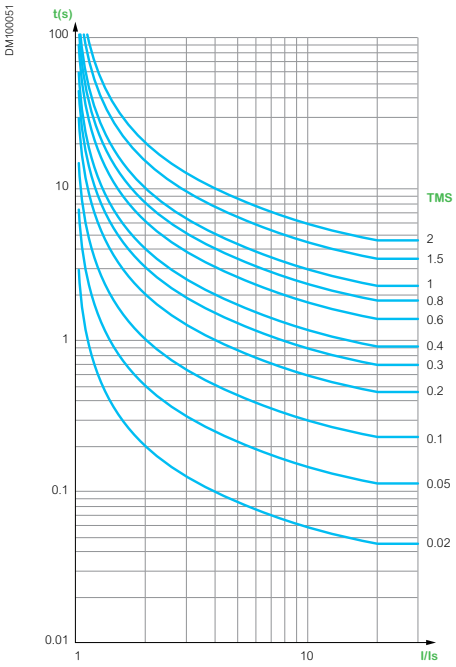


1. Overload
2. Secondary short circuit
3. Primary short circuit
4. Activation of discrimination with a low voltage circuit breaker

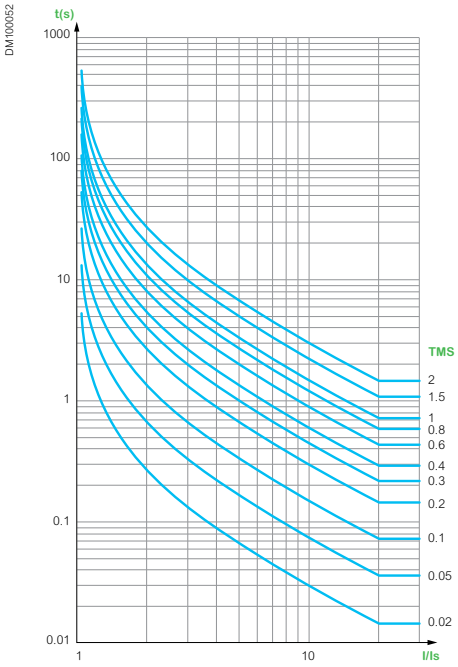
Protection

VIP 400 and VIP 410 tripping curves

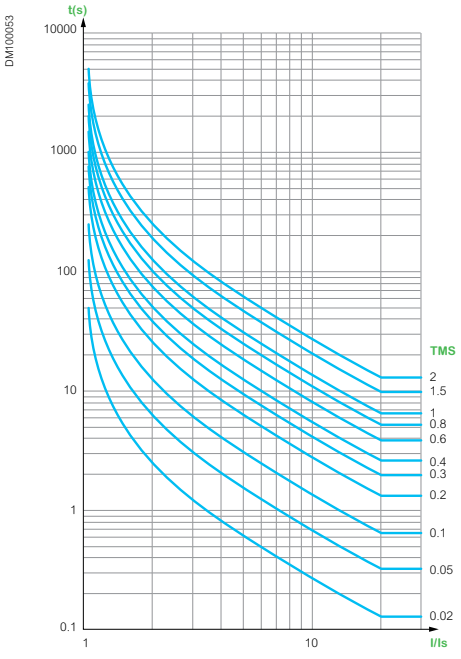
IEC standard inverse time curve (IEC/SIT or IEC/A)



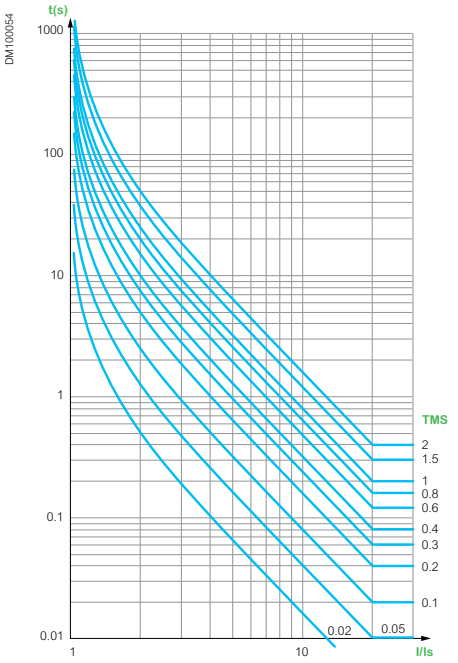
IEC very inverse time curve (IEC/VIT or IEC/B)



IEC long time inverse curve (IEC/LTI)



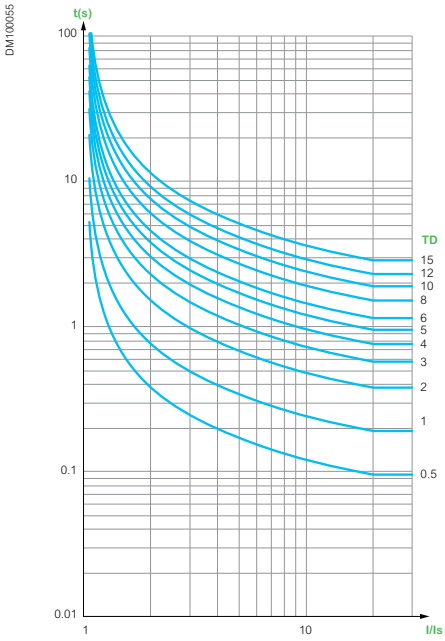
IEC extremely inverse time curve (IEC/EIT or IEC/C)



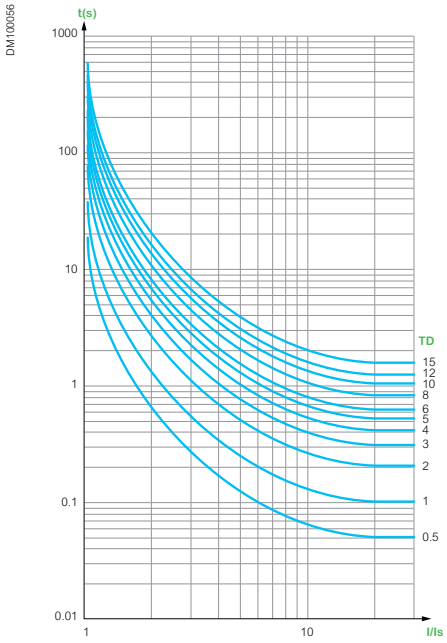
Protection

VIP 400 and VIP 410 tripping curves

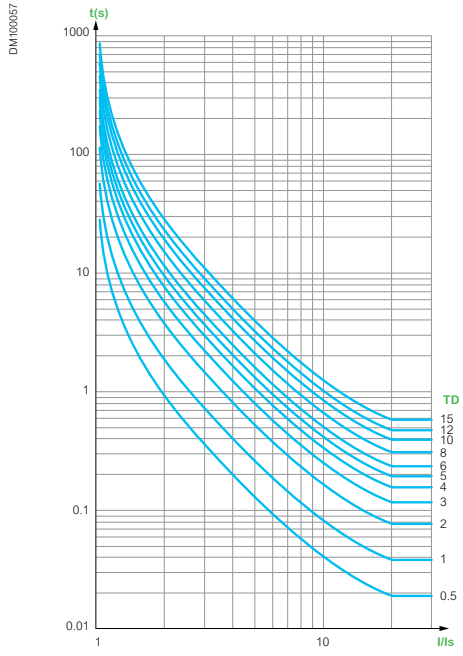
IEEE moderately inverse curve (IEEE/MI or IEC/D)



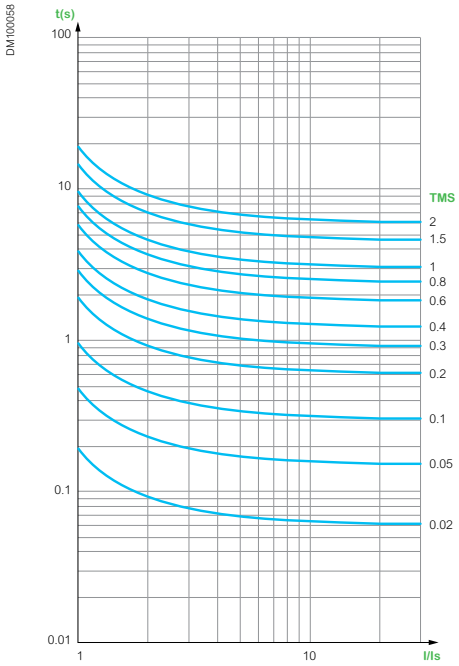
IEEE very inverse curve (IEEE/VI or IEC/E)



IEEE extremely inverse curve (IEEE/EI or IEC/F)



RI curve



Fault passage indicators

Flair 21D, 22D, and 23DM

Flair 21D, 22D, 23DM is a family of DIN-format fault passage indicators.

They are small in size, self-powered, and adapt automatically to the network.

These devices use cutting-edge technology to detect earth faults on underground MV networks with isolated, resistor-earthed, or directly-earthed neutral and overcurrents on all networks.

- Self-powered, the fault current passage detection and indication system operates continuously
- Adjustment-free, they are immediately operational (numerous manual adjustments are possible, however)
- Compact, their DIN format easily fits in MV cubicles
- Smart, they offer an ammeter/digital maximeter function
- Comprehensive, the Flair 23DM version incorporates a highly sophisticated voltage presence/absence relay function with Modbus RJ45 communication.

Applications and main features

The Flair range increases your power availability by providing indicators suitable for fault locating and MV network load management.

- Indication of phase-to-phase and phase-to-earth faults
- Display of settings
- Indication of the faulty phase
- Display of the load current including peak demand and frequency
- Fault passage indication and voltage detection combination (Flair 23DM)
- RJ45 communication (Flair 23DM only)

These fault passage indicators are easy to use.

- Automatic setting on the site
- Fault indication with LED or outdoor lamp
- 15-year battery life for Flair 22D
- More accurate fault detection if Flair 22D or 23DM is connected to voltage presence indication system (VPIS) voltage output
- Can be factory-mounted in PremSet cubicles or added on site
- Easy on-site addition without removing MV cables using split-type current sensor

Fault detection functions

Overcurrent detection

- Automatic mode for adjustment-free calibration of detection thresholds
- Manual mode for special override settings:
  - Flair 21D: 4 detection thresholds from 200 A to 800 A, in 200 A increments, selectable via microswitches
  - Flair 22D and Flair 23DM: 8 detection thresholds from 100 A to 800 A, in 50 A increments, configurable via the front panel keypad
- Fault acknowledge time:
  - Flair 21D: 60 ms
  - Flair 22D and Flair 23DM (configurable via the front panel keypad):
    - From 40 to 100 ms in 20 ms increments
    - From 100 to 300 ms in 50 ms increments

Earth fault detection

The detector checks the three phases for current variations (di/dt).
A time delay of 70 s is applied for fault confirmation by the upstream protective device.

- Automatic mode for adjustment-free calibration of detection thresholds
- Manual mode for special override settings:
  - Flair 21D: 6 detection thresholds from 40 to 160 A, via microswitches
  - Flair 22D and Flair 23DM (configurable via the front panel keypad):
    - Type A from 20 to 200 A, in 10 A increments
    - Type B from 5 to 30 A in 5 A increments and 30 to 200 A in 10 A

Inrush function: Prevents unnecessary detection in the event of load switch-on.
Incorporates a 3 s time delay for fault filtering at network power up.
The inrush function can be disabled by configuration on Flair 22D and 23DM.

Fault passage indicators

Flair 21D, 22D, and 23DM

- Earth fault sensitivity as low as 5 A
- Display of settings and faulty phase
- Automatic reset

PM108331

Flair 21D

PM108332

Flair 22D

PM106082

Flair 23DM

Fault indication function

Signaling

As soon as a fault is confirmed, the indication device is activated.

- Fault indication via a red LED on the front panel
- Indication of the faulty phase (earth fault) on LCD display
- Optional remote indication via external flashing lamp
- Activation of a contact for retransmission to the SCADA system

Indication reset

- Automatic resetting upon load current recovery or on voltage return if VPIS-VO option present (configurable time on Flair 22D and Flair 23DM)
- Manual reset via front panel button
- Reset via external Reset input
- Reset by time delay: fixed (4 hr) for Flair 21D and adjustable using front panel keypad (1 hr to 24 hr) for Flair 22D and Flair 23DM
- Reset via communication (Flair 23DM)

Fault passage indicators

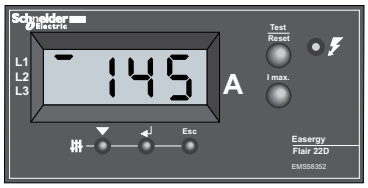
Flair 21D, 22D, and 23DM

Sensors

The Flair 21D, 22D, 23DM range uses an integrated detection system composed of indicators and dedicated CTs.

Integrated sensors are normally placed around the bushings. Split CTs can be placed around cables for retrofit purposes.

DE58715



Clear, comprehensive display

Display principle

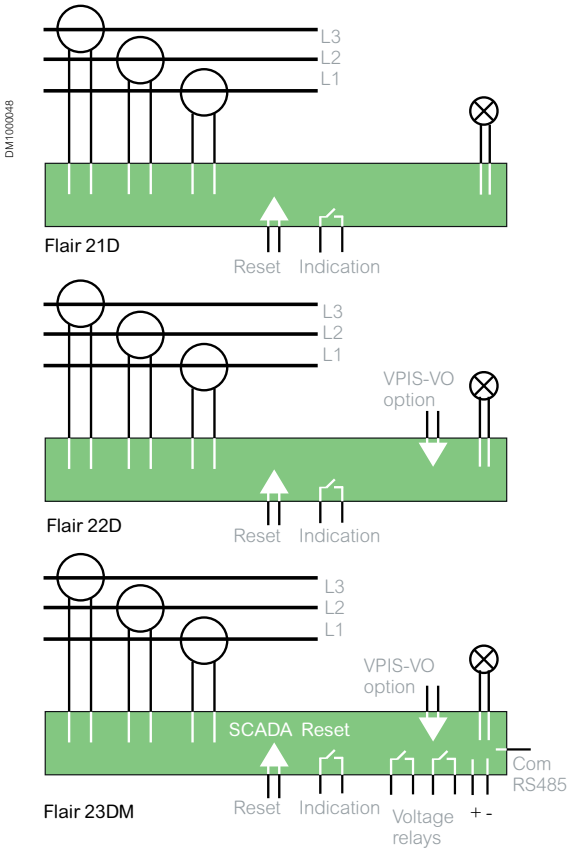
- The load current is displayed continuously
- When a fault is detected, the faulty phase is indicated
- Use the buttons on the front panel to scroll through settings and measurements.

		Flair		
		21D	22D	23DM
Power supply	Self-powered	●	●	●
	Dual-powered		●(1)	●
Detection	Overcurrent	●	●	●
	Earth fault	●	●	●
Display (4-digit LCD)	Ammeter	●	●	●
	Maximeter	●	●	●
Options	SCADA interface (relay)	●	●	●
	External lamp	●	●	●
	External reset		●	●
	Extended setting (keypad)		●	●
Communication	2-voltage output relays			●
	Serial communication port			●

(1) By lithium battery

Connection diagrams

DM1000048



Characteristics per product

Model	Description
Fault passage indicator with single power supply (self-powered)	
Flair 21D	• Detector with autonomous power supply • External indicator lamp output powered by battery (BVP)
Fault passage indicator with dual power supply	
Flair 22D	• Detector with autonomous power supply and lithium battery • External indicator lamp output powered by the Flair (BVE) • Interface with VPIS-VO possible to confirm the fault by voltage absence • Service life: 15 years
Fault passage indicator with dual power supply and voltage presence/absence	
Flair 23DM	• Detector with 24-48 VDC external and autonomous power supply • External indicator lamp output powered by the Flair (BVE) • Voltage presence and absence detector (same as for VD23) • Interface with VPIS-VO needed for the voltage presence • Communication on an RS485 serial link with Modbus protocol with access to states and measurements and remote parameter-setting
Standard applications	
Flair 21D	Maintenance-free, adjustment-free fault detector
Flair 22D	Fault detector for networks with very low load current (< 2 A) with possibility of manual adjustments
Flair 23DM	• Adapted to feeder automation. Forwarding of current measurement, fault passage indication, and voltage outage information to the SCADA via a serial communication port • Combination fault passage indicator and voltage detector, ideal for use with an automatic transfer system

Voltage indicator and relay

VPIS and VDS

PE56366

VPIS

Voltage presence indicators

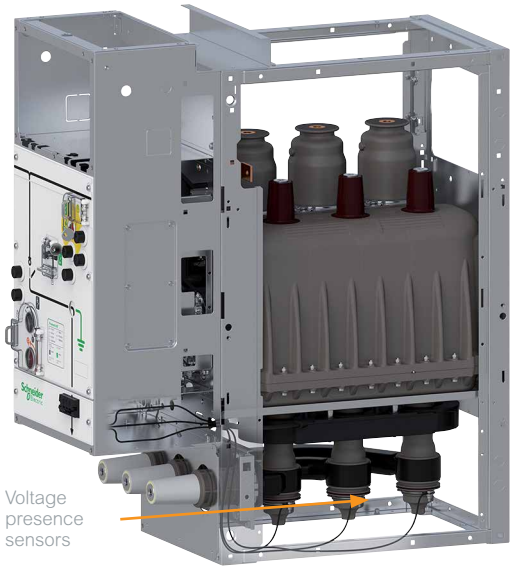
A voltage presence indicating device can be integrated in all the functional units, either on the cable or busbar side. It can be used to check whether or not a voltage is present across the cables.

Two devices are available:

- **VPIS**: voltage presence indicator system, as defined by standard IEC 62271-206
- **VDS**: voltage detecting system, as defined by standard IEC 61243-5

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, or live cable earthing switch lockout.

PM100033



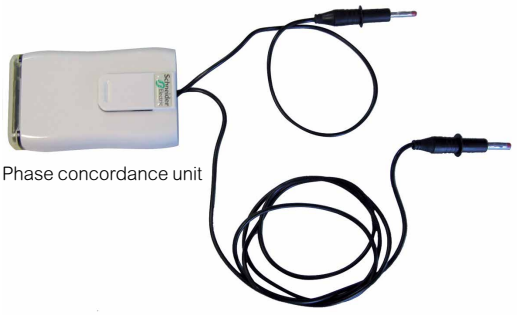
Voltage presence sensors on busbars or cables

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 fix the busbar or cable connections. The voltage can be detected either on the cable side or the busbar side.

PE56830



Phase concordance unit

Phase concordance unit

This unit is used to check phase concordance.

Voltage indicator and relay

VD23 voltage relay

The VD23 is a voltage detecting system for automatic transfer system or interlock applications.

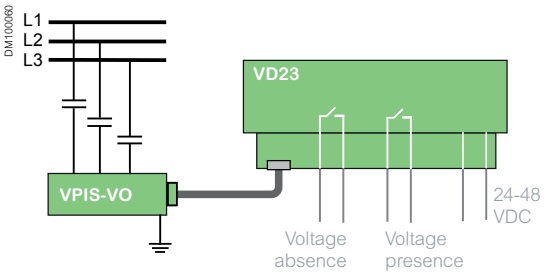
Various combinations:

- Presence or absence voltage relay
- Zero sequence voltage relay
- Phase-to-neutral or phase-to-phase voltage
- Phase selection.

Easy to install:

- Compact 96 x 48 mm DIN format
- Terminal connection for VPIS-VO
- No need for HV transformer
- Hot installation
- Auto-adaptation of nominal voltage.
- Optional communication port and fault detector (Flair 23DM)

VD23



Features

The VD23 is a compact voltage relay for 3 kV to 36 kV, 50/60 Hz medium voltage networks. It is associated with a capacitive divider and a VPIS-VO.

- 2 output relays based on 2 functional modes:
  - R1 = Voltage presence (typically used for automatic transfer switching)
  - R2 = Voltage absence (typically used for interlocking of earthing switch)
- Thresholds can be set as a percent of phase-to-neutral voltage (V) phase-to-phase voltage (U), or residual voltage (VO)
- All combinations of voltage conditions are possible:
  - Three phases and residual: V1+V2+V3+VO
  - Three phases: V1+V2+V3 or U12+U13+U23
  - Single phase: Vo, V1, V2, V3, U12, U13, or U23
- Output is a tripping order via two output relays with a normal or inverse active position
- Signalling and tripping outputs may be set with a delay

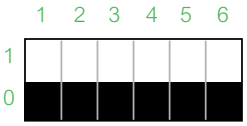
Display principle

- Voltage value (% of Un) of L1, L2, and L3 shown on the display
- Voltage presence/absence indication via LED
- Settings by front pushbuttons and LCD
  - Thresholds, delays and smart parameters
  - Display of all settings on LCD
- Auto-adaptation of the nominal system voltage
- Check on voltage status

Advanced settings

All the combinations can be set with microswitches on the rear of the device. The use of two relays provides backup operation for each combination.

6 microswitches:



1. Ph-N voltage (V)/Ph-Ph voltage (U)
2. Direct/inverse action on output relays
3. Phase 1 used/not used
4. Phase 2 used/not used
5. Phase 3 used/not used
6. Residual voltage used/not used

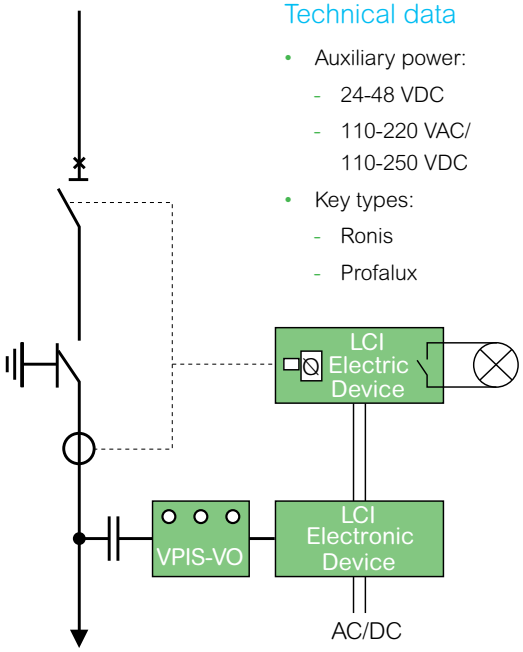
Wiring (with VPIS-VO)

All the combinations can be set with microswitches on the rear of the device. The use of two relays provides backup operation for each combination.

Live cable interlock

Functions

DM107413



Technical data

- Auxiliary power:
  - 24-48 VDC
  - 110-220 VAC/ 110-250 VDC
- Key types:
  - Ronis
  - Profalux

The “live cable interlock” function is an electrical interlock helping to prevent the operator from closing the earthing switch on live cables.

Even if all the earthing switches integrated in PremSet core units have full making capacity performance, it may be useful to avoid creating unintended faults by inadvertently earthing live cables.

Principle

The system is composed of:

- A mechanical locking assembly acting directly on the line/earth selector, including an override key that can be used to bypass the locking device
- An undervoltage coil for high failsafe operation of the mechanical lockout system (see MN)
- A dedicated electronic auxiliary-powered voltage relay (ESL) equipped with an auxiliary contact for remote indication of “locked” position
- A VPIS indicator on the cable side, with a voltage output (VPIS-VO), to detect and send the voltage signal to the relay

Operation

- Normal case: The system is powered by auxiliary power. It is then impossible to move the selector from “line” to “earth”, as long as voltage is detected on the cable by the VPIS.

In case of auxiliary power loss, regardless of whether the cables are live or not, a failsafe feature blocks the system so the selector cannot be operated.
Override is possible only by unlocking the system with a key or when auxiliary power is restored.

Technical data	
Auxiliary power	• 24-48 VDC: ESL100 A • 110-220 VAC/110-250 VDC: ESL100 E
Key types	• Tubular • Flat
Undervoltage coil	

Integrated measurement

AMP 21D ammeter

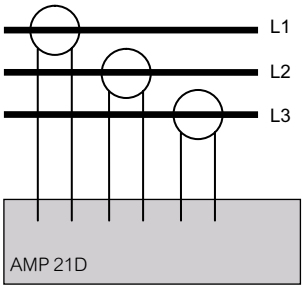
- Traditionally, three analog dial-type ammeters were installed on MV feeders with a costly and bulky TC to power them. These devices had poor accuracy (cl. 1.5) and no maximeters to provide feedback on the maximum load.
- Now, with the AMP 21D digital ammeter, all feeders can be equipped with small CTs that provide accurate measurements and a maximeter function, all at a lower price.
- The AMP 21D is self-powered to display currents continuously.
- Its compact DIN format easily fits in PremSet MV cubicles.
- Versatile, it displays phase current and maximum current.

PE57786

AMP 21D

Connection diagram

DM100050



Functions

The Easergy Amp 21D is an ammeter dedicated to the display of the load current on medium voltage networks.

It is particularly suited to network load management applications.

- Display of the three phase currents: I1, I2, and I3 (range: 3 A to 800 A)
- Display of the three phase current maximums: M1, M2, and M3 (range: 3 A to 800 A)

Display principle

- Load currents are displayed by default, with continuous scrolling of L1, then L2, then L3
- The maximeter is displayed by pressing a dedicated pushbutton, with continuous scrolling of maximum currents M1, then M2, then M3
- The maximums are reset by pressing a combination of two pushbuttons

Design

Small enclosure

- DIN format: 93 x 45 mm
- Secured, extraction-proof mounting
- Terminal connections

Technical data

Frequency			50 Hz and 60 Hz
Load current		Minimum current	3 A
Measurement	Range	Phase current	3 to 800 A
		Accuracy (I < 630 A)	±3%, ±2 A
	Reset of maximeter	Manual from device	Yes
Power supply	Self-powered	From the current sensors	I load > 3 A
	Battery		No
	Auxiliary supply		No
Display	Display • Current per phase • Maximeter current per phase	4-digit LCD • Yes (resolution 1 A) • Yes	
Sensors	Phase CTs	3 ring or split core CT(1)	
Other	Test	Yes	

(1) For CT selection, refer to page 82.

Integrated measurement

PM5000 series power meter

PowerLogic PM5000 series help you:

- Reduce energy costs
- Simplify installation
- Improve continuity of service for optimal management of your electrical installation and higher productivity

PB111776

PM5000 series power meter

Applications and main features

The PowerLogic PM5000 power meter is the ideal fit for cost management applications. It provides the measurement capabilities needed to allocate energy usage, perform tenant metering and sub-billing, pinpoint energy savings, optimize equipment efficiency and utilization, and perform a high level assessment of the power quality of the electrical network.

In a single 96 x 96 mm unit, with a graphical display (plus optional remote display), all three phases, neutral, and earth can be monitored simultaneously.

These meters are highly accurate devices with third party certification.

The PM5000 series is available in multiple versions including:

- PM5100, basic version with pulse output, class 0.5S accuracy
- PM5110, RS485 port with Modbus communication, class 0.5S accuracy
- PM5340, multi-tariff, data logging, Ethernet communication, class 0.5S accuracy
- PM5560, multi-tariff, data logging, WAGES metering, Gateway, class 0.2S accuracy, simultaneous communication via Modbus TCP and BACnet/IP

Characteristics

- High-accuracy energy metering: IEC 62053-22 Class 0.5S or Class 0.2S
- Multiple communication options: RS485, Ethernet, or both
- Dual Ethernet ports (PM5560 models) to daisy chain meters together - less wiring, simpler installation
- Ethernet-to-serial gateway functionality (PM5560)
- Protocol options include Modbus RTU, Modbus TCP, and BACnet/IP
- Data logging (PM5340 and PM5560 models)
- Multiple tariffs (PM5340 and PM5560 models)
- Complete WAGES monitoring with 4 digital inputs and 2 digital outputs
- Onboard web pages (PM5560 models) for viewing real-time and logged information
- Bright, anti-glare graphical display with intuitive menu-driven navigation

Integrated measurement

PM8000 series power quality meter

PowerLogic PM8000 series:

Compact, high-performance meters for cost and network management applications on feeders and critical loads.

- Detailed PQ compliance reporting, and expert-level root-cause analytics.
- Power monitoring, logging, and forecasting to help ensure your electrical system stays within safe operating tolerances, avoiding the risk of overloads, unbalances, or high peak demand.

PB113683

PM8000 series power quality meter

Applications and main features

The PowerLogic PM8000 series meter is a highly accurate, extremely reliable power and energy meter with unmatched flexibility and usability. The meter combines accurate 3-phase energy and power measurements with data logging, power quality analysis, alarming, and I/O capabilities not typically available in such a compact meter.

The PM8000 series meters are compliant with stringent international standards that help to ensure their metering accuracy and power quality measurements. They are ideal for use in industrial and critical power installations that are responsible for maintaining the operation and profitability of a facility.

The PM8000 series is available in the following versions:

- **PM8240**, panel mounted, integrated display
- **PM8244**, DIN rail mounted, remote display

Characteristics

- High-accuracy energy metering: IEC 62053-22 Class 0.2S
- Time synchronization
- Multi-tariff support
- WAGES metering support
- PQ compliance monitoring: IEC 61000-4-30 class S, IEC 62586, EN 50160, IEEE 519
- PQ analysis capabilities: Dip & swell detection, waveform capture, disturbance direction detection, trending, and forecasting
- Protocols: ION, Modbus, DNP3, IEC 61850
- Ports: RS-485, dual-port Ethernet, Ethernet-to-serial gateway
- Graphical, color display
- Onboard, customizable web pages
- Modular I/O extension modules

Control

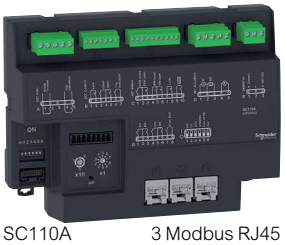
SC110: Electrical operation auxiliaries

The SC110 is an intelligent electronic device designed to control and monitor all the components involved in the remote control of core units.

It integrates all the necessary functions for reliable remote control:

- Electrical interlocking
- Remote control supervision
- Front panel interface for local operation
- Built-in Modbus communication and "Plug and play" design makes the SC110 and the remote control facility:
  - easy to use
  - easy to upgrade

PM100043

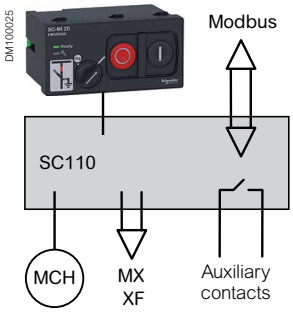


SC110A 3 Modbus RJ45 plugs

PM100038

SC-MI control panel

DM100025



The SC110 is installed in the Low Voltage cabinet of the functional unit. It controls and monitors all the devices needed for electrical operation: MCH, MX, XF, auxiliary contacts.

SC110 universal intelligent controller

SC110 is a compact device with digital inputs and outputs to monitor all the components (e.g. MCH, MX, XF, auxiliary contacts) associated with electrical operation of the core unit.

It can be associated with a control panel (SC-MI).

Switchgear control functions

- Coil and motor operation
- Information on core unit status: main switch, earthing switch, lever insertion
- Built-in electrical interlocks: anti-pumping and anti-reflex functions
- External interlocking feature
- Lockout of electrical operation after tripping (option)
- Modbus communication for remote control via data transmission

Switchgear monitoring

- Diagnosis information: motor consumption
- Core unit auxiliary contacts status
- Logging of time-stamped events
- Modbus communication for remote indication of monitoring information

SC110 types	SC110-A	SC110-E
24-60 VDC	●	
110 VDC/VAC - 240 VAC/250 VDC		●
Network communication	●	●

SC-MI control panels	SC-MI 10	SC-MI 20
On/Off pushbuttons	●	●
Remote/local switch		●

Control

Easergy TH110 thermal monitoring

PM108320

Continuous thermal monitoring

The power connections in medium voltage products are one of the most critical points in substations, especially for those made on site like:

- MV cable connections
- Busbar connections

Loose and faulty connections cause increased resistance in localized points that will lead to thermal runaway and eventually complete failure of the connections.

Preventive maintenance can also be complicated in severe operating conditions due to limited accessibility and visibility of the contacts.

Continuous thermal monitoring is the most appropriate way to detect a compromised connection early.

PM105623

Easergy TH110

Easergy TH110 thermal sensor

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

- Prevent unscheduled downtimes
- Enhance protection for operators and equipment
- Optimize predictive maintenance

Thanks to its very compact footprint and wireless communication, Easergy TH110 allows easy and widespread installation in every possible critical point without impacting the performance of the MV switchgear.

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

Easergy TH110 is self-powered by the network current and can help to ensure high performance by providing accurate thermal monitoring in direct contact with the measured point.

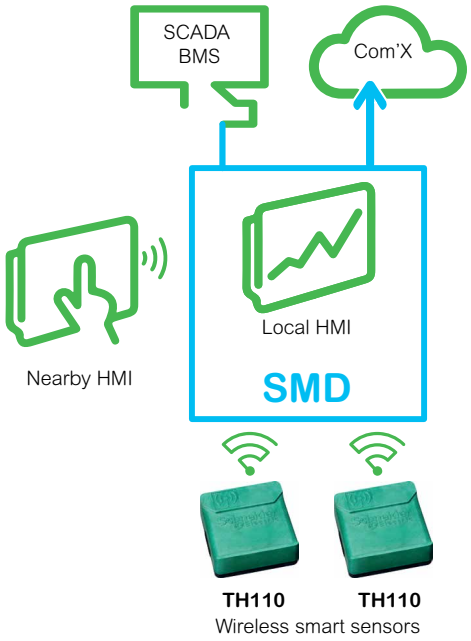
Control

Easergy TH110 thermal monitoring

Key benefits

- Battery-free
- Wireless communications
- In-contact measuring point
- Easy installation
- Compact footprint
- Remote monitoring and alarming

DM105320b



Substation monitoring device

Easergy TH110 is **connected** to the substation monitoring device (SMD) that harvests the data for local signaling, data analyses, and nearby control.

Specific **monitoring algorithms** allow to drifts from the threshold to be detected based on the specific installation characteristics, as well as compared with the variable loads or abnormal behaviors coming from the phases..

Remote monitoring and alarming ensure 24/7 monitoring thanks to remote connection for SCADA or Services, access **to Cloud-based apps. and digital services and alarming through SMS.**

Characteristics

Power supply	• Self powered • Energy harvested from power circuit
Minimum activation current	5 A
Accuracy	+/-1 °C
Range	-25 °C/+115 °C
Wireless communication	ZigBee Green Power 2.4 GHz
Dimensions - Weight	31 x 31 x 13 mm - 15 g

Control

Feeder automation architecture

Schneider Electric offers you a complete solution, including:

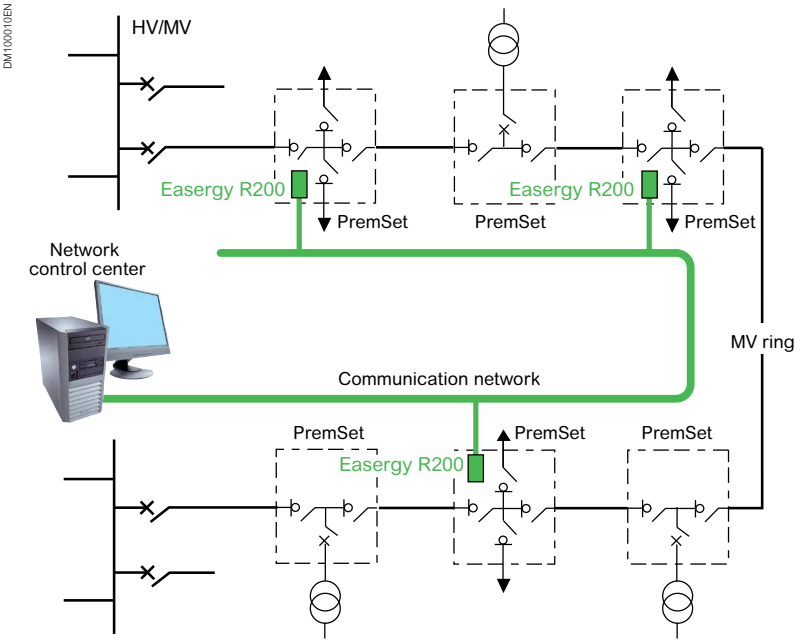
- The Easergy R200 remote control interface
- PremSet switchgear that can be easily adapted for remote control
- The SCADA and DMS system

PremSet range, more than ready

PremSet switchgear is suited to remote control thanks to options such as:

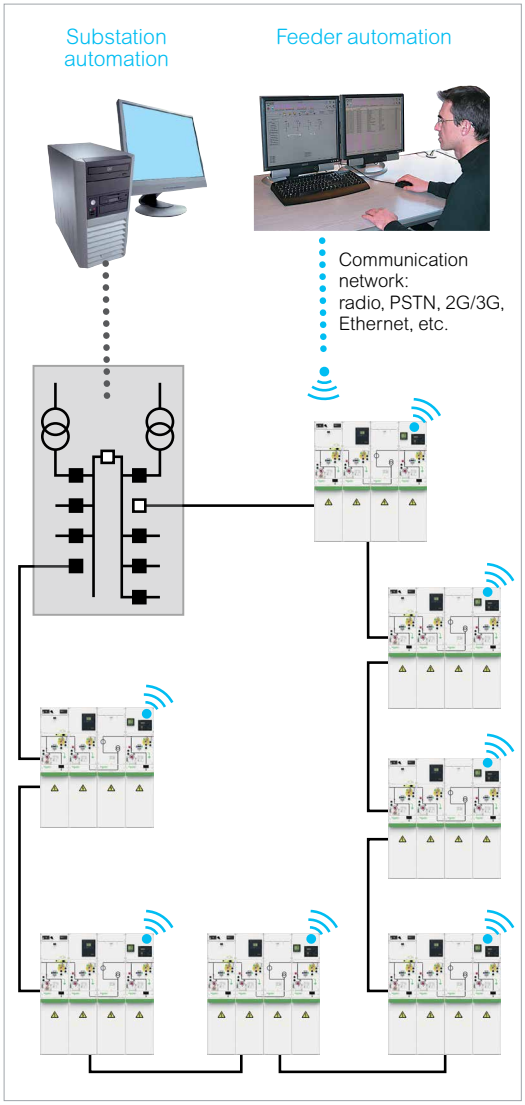
- LV control cabinet including an R200 RTU
- Motorized operating mechanism
- Auxiliary fault and position indication contacts
- Current sensors for fault detection

DM100010EN

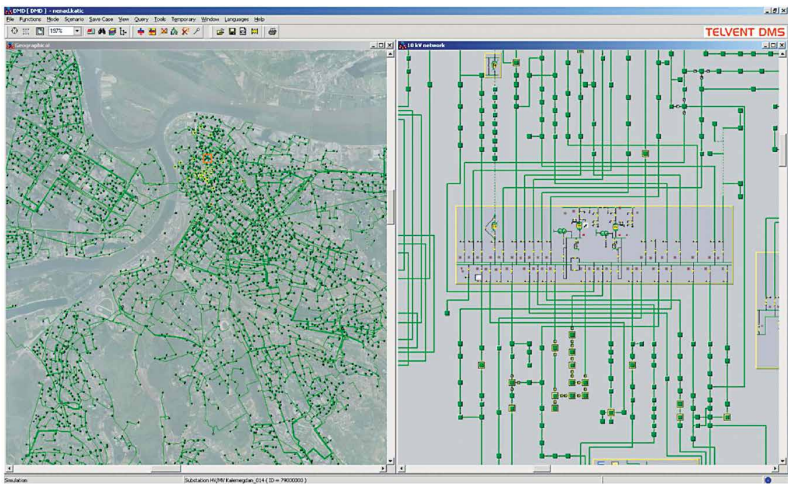


Continuity of service supervised by an overall remote control solution

DM100007



PE58301



DMS system

Control

Easergy R200 control unit

Easergy R200 is a remote terminal unit (RTU) intended for typical remote management applications in the energy industry and for MV infrastructures in general.

PE57570p

Easergy R200: an interface designed for remote control of MV networks

The Easergy R200 “plug and play” RTU integrates all the functional units necessary for remote supervision and control of an MV switchboard cubicle:

- Transmission of switch open/close orders
- Exchanges with the control center

Easergy R200 is of proven reliability and availability, ready to ensure switchgear operation at any time. It is simple to set up and to operate.

Communication

Easergy R200 can manage both “serial type” and IP protocols.

It is thus possible to mix serial and IP transmission media in a given application. Communication possibilities are continuously evolving to keep pace with your needs:

- IEC 870-5-101 and IEC 870-5-104 protocols
- DNP3 serial and TCP protocols
- Modbus serial and TCP protocols
- Other proprietary protocols

An extensive choice of integrated modems and interfaces:

- RS232/485 serial interface
- 2G/3G
- 3G Modem
- Voice modem (PSTN)
- FSK radio modem
- FFSK radio modem
- Ethernet port

Local control in SCADA

Easergy R200 incorporates a Web data server in HTML page form for data configuration and monitoring. All that is needed to log on is a PC with a Web browser.

Remote access is possible via 2G/3G, Ethernet, or PSTN transmission networks and can be implemented in parallel from the remote control center.

Thanks to this remote access and its capability to send e-mails and SMS text messages,
the R200 offers you a cost-effective solution to monitor your MV substation without a SCADA system.

The embedded Web server allows local monitoring of the substation.

Control

Easergy R200 control unit

Built-in solutions for protecting, monitoring, and controlling your installation

Energy availability

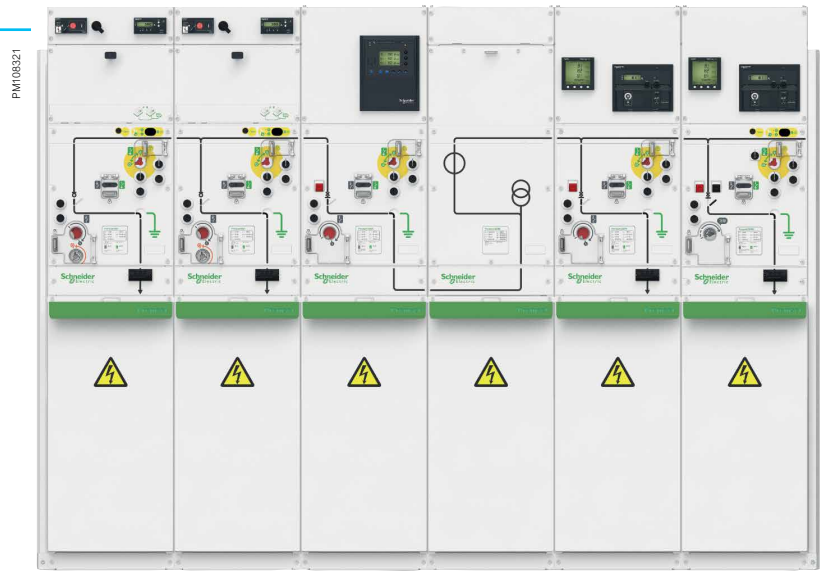
- Measurement
- Remote fault detection
- Remote control and protection devices

Easy to use

- Compact design with built-in devices - no engineering required
- Scalable with “just enough” dedicated solutions from monitoring to remote control
- Robust devices designed for harsh environments
- Easy and safe plug and play connection
- Open to standard protocols, ensuring easy SCADA connection

R200

PremSet



Control

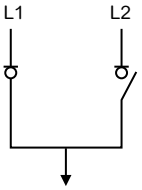
ATS100 automatic transfer system

An MV power supply interruption is unacceptable, especially in critical applications.

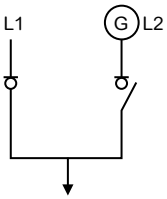
The PremSet system therefore offers an automatic source transfer solution.

DM1031001

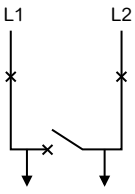
ATS100



ATS100-ACO:
2 line incomers



ATS100-GEN:
1 line incomer and
1 generator incomer



ATS100-BTA :
2 line incomers
with bus tie

Source transfer

The ATS100 drives automatic transfer from the normal MV source to the backup source in order to keep supplying the MV substation in case of failure of the normal source. ATS100 can drive either a load break switch or a circuit breaker.

There are three types of ATS100 depending on the single-line diagram and sources.

ATS100-ACO: 2 line incomers

L1 and L2 can be either the normal or the backup source. In the event of a loss of the normal source, the backup source will automatically supply the substation. When the normal source is restored, there are three possibilities depending on the configuration:

- Self-return: The normal source will automatically supply the substation
- No-return: The normal source will only be able to supply the substation again following a manual operation
- Auto-return: The normal source will automatically supply the substation only if there is a loss of the backup source

ATS100-GEN (*): 1 line incomer and 1 generator incomer

L1 and L2 can be either the line or the generator source. Only the line can be the normal source. On a loss of the normal source, the generator source will automatically supply the substation. When the line source recovers, there are three possibilities depending on the configuration:

- Self-return: The line source will automatically supply the substation and the generator will be shut down
- No-return: The line source will only be able to supply the substation again following a manual operation
- Auto-return: The line source will automatically supply the substation only if there is a loss of the generator source

ATS100-BTA: 2 line incomers with bus tie

The normal situation in this case is L1 and L2 are closed and the bus tie is open. In the event of loss of one of the lines, the bus tie is automatically closed to recover the substation supply. When both lines are restored, the normal situation may or may not be automatically recovered, depending on the configuration.

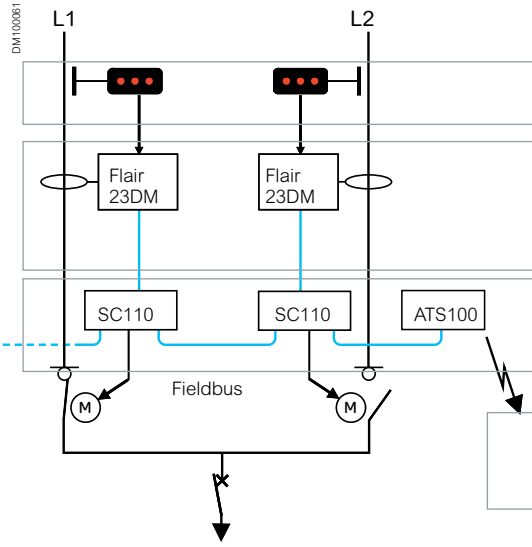
* Please contact our Customer Care Center for availability

Control

ATS100 automatic transfer system

Characteristics	
Switch response time	0.5 s to 3 s
Parallel coupling	Configurable to avoid blackout when restoring the normal situation
Load shedding	Configurable to adapt load to the capacity of the generator or to restart loads in sequence after blackout
Time delay before source changeover	Configurable up to 120 s
Time delay before recovering normal situation	Configurable up to 30 mn
Remote communication	Ethernet, or 3G communication with: • IEC 870-5-101 and IEC 870-5-104 protocols • DNP3 serial and TCP protocols • Modbus serial and TCP protocols
Web server	Easergy ATS100 incorporates a Web data server in HTML page form for data configuration and monitoring. All that is needed to log on is a PC with a Web browser.

Typical diagram



2 VPIS-VOs	**Voltage sensor:** Dedicated version of VPIS with voltage output (VO) signal.
2 Flair 23DMs	**Voltage detector + fault passage indicator:** A relay is activated when a loss of voltage is detected from the VPIS voltage output signal. If a fault current is detected, the automatic transfer system is locked out in order to avoid closing the healthy line on the fault.
1 ATS100 + switch or CB function	Based on inputs coming from the Flair 23DMs, the decision is made to switch from one line to the other.
SCADA, BMS	• Communication facilities may be added • Communication to SCADA or BMS (optional) • Web server: configuration, diagnostics, alarms, logs

Control

PS100 high-availability power supply

Backup solution for MV switchgear power needs in the event of micro outages and power interruptions

- Easy maintenance with only one battery
- Remote battery monitoring
- High level of insulation to protect the electronic devices in harsh MV environments
- End-of-life alarm possible via Modbus communication
- Compliant with standards IEC 60 255-5 (10 kV level)

PM100592

PS100

PS100 backup power supply for MV substations

Applications

The power supply unit supplies backup operating power for:

- MV switchgear motor mechanisms and circuit breaker coils
- Transmission equipment (e.g. radio)
- Control units such as RTU (R200) or automatic transfer system (ATS100)
- Protection relays, fault passage indicators and other electronic devices

High-availabilty power supply

A battery provides uninterrupted operation of the whole substation in the event of loss of the main supply. The backup power supply unit:

- Includes a regulated and temperature-compensated charger
- Stops the battery before deep discharge
- Carries out a battery check every 12 hours
- Measures battery aging
- Forwards monitoring information via a Modbus communication port and output relays

PS100 benefits

Only one battery

Traditional backup power supplies require a set of 2 or 4 batteries to produce 24 V or 48 V, with complicated replacement and adjustment of the battery pack.

The PS100 needs only one battery, simplifying replacement.

The battery is a standard sealed lead-acid 12 V battery with a 10-year life. It can be purchased easily, anywhere in the world.

Improved availability of MV substations

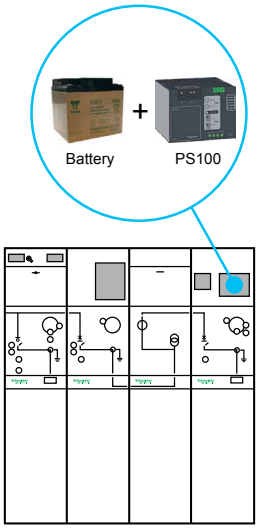
The PS100 is designed to ride through power network interruptions of up to 48 hours. It is associated with a battery selected to meet the required backup time. For example, a 38 Ah battery provides 12 hours of backup time to a PremSet switchboard including 4 Sepam units.

The PS100 protects and optimizes the battery with state-of-the-art monitoring. A Modbus communication port forwards monitoring data to allow optimized maintenance operations.

Control

PS100 high-availability power supply

DM100006



Additional energy backup

The PS100 stops supplying power and reserves an “additional energy backup” to restart the installation after an extended power interruption.

The “additional energy backup” can be enabled with a local pushbutton to provide energy for restarting the protection relays and operating the MV switchgear.

Withstands severe substation environments

The PS100 includes 10 kV insulation, electronic protection against overvoltage and overloads, and automatic restart after a fault.

Main features	
DIN rail mounting for easy integration in any LV cabinet	
2 power supply outputs	• 12 VDC - 18 W continuous - 100 W 20 s (for modem, radio, RTU) • 48 VDC or 24 VDC - 300 W/1 minute (for switchgear operating mechanism motors) and 90 W/continuous for protection relays, electronic devices
Modbus RJ45 communication port	
2 output relays (AC supply ON, battery ON)	
Diagnostic LEDs	
1 sealed lead-acid 12 V battery with a 10-year life (from 24 Ah to 40 Ah)	
Power supply paralleling available with a second PS100	
-40 °C to +70 °C operating temperature	

Range	
PS100-48V	48 VDC power supply and battery charger
PS100-24V	24 VDC power supply and battery charger
Bat24AH	24 Ah long life battery
Bat38AH	38 Ah long life battery

Installation and connection

Busbar and cable arrangements 124

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Arc control design (downwards exhaust) 139
Raising plinths 141

Busbar and cable arrangements

- SSIS connections with shielded solid insulation, eliminating all electric fields in open air
- Flat and smooth interface between connections, allowing flexibility and misalignment in any direction: easier floor installation
- Only one cable connection set, used everywhere: multiple possibilities for cable entry arrangements

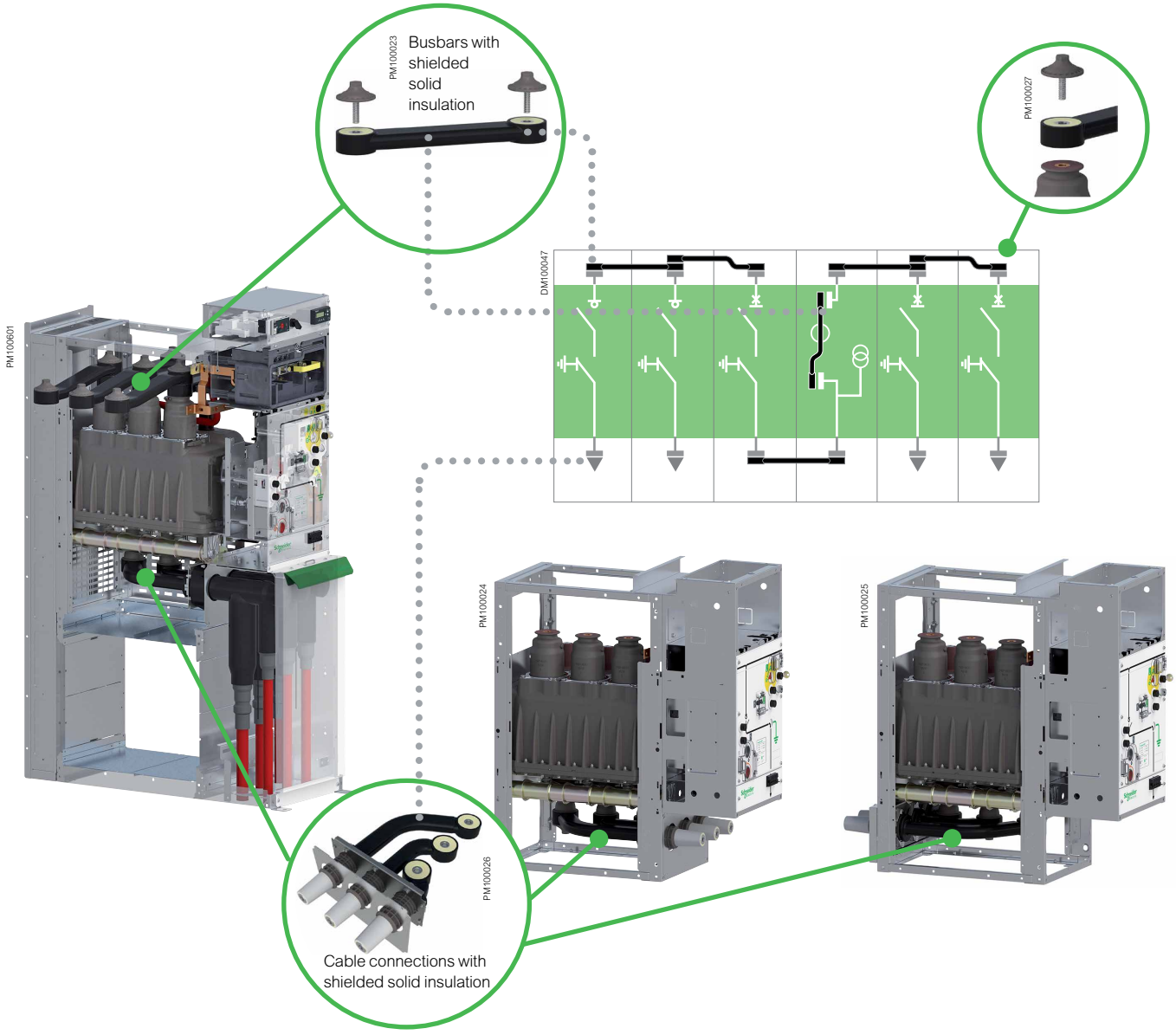
Universal system of power connections

The PremSet system is based on a set of common elements, used throughout the system:

- Two types of bar elements, used to make up the busbar system, as well as risers and downstream connections between cubicles
- One set of three connections for cables, used in various directions: front, rear, bottom, top, etc.

The connection interface between these elements is always the same (Schneider Electric patented design), allowing a wide variety of arrangements.

For example, the set of cable connections can be mounted in different directions to implement various cable entry arrangements: front bottom, top rear, bottom rear, direct connection to busbars, cable in/cable out.



Cable connections

- Only one type of bushing to simplify installation, but various arrangements of connections to fit any application
- Large choice of cable box and bottom compartment dimensions

PM100000

LV cabinet

Cable test

Top connection

Core unit

Bottom connection

Bottom compartment

D06H

Bottom compartment

The bottom compartment is the lower part of PremSet cubicles. It has been designed separately from the rest of the cubicle to offer different versions.

It comes in two different heights to match the space required for cable bending and switchgear installation:

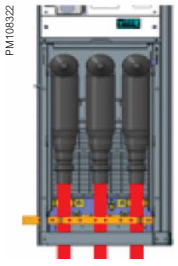
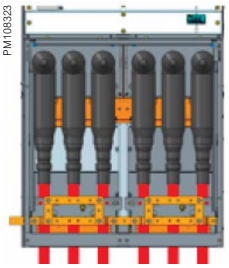
- Standard height, for cable connections at a height of 700 mm
- Low-height version for cable connections at a height of 500 mm, allowing installation of switchgear in rooms with low ceilings (total height of switchgear as low as 1350 mm, depending on the LV cabinet dimensions)
- For higher installations, raising plinths can be fitted as accessories, with two different heights

Cable connections

- Cable boxes are available in two different depths to meet the needs of various types of installations: number of cables, type of connections, bending radius of cables, surge arresters
  Cable boxes can be interlocked with main and earthing switches (see core unit pages) and can be fitted with two transparent windows (not compatible with internal arc performance)
- Cable bushings are standardized Type "C" (EN 50181), M16 screw type bushings as defined by standard IEC 60137, in order to simplify the choice and installation of connections
- Cable connections are always horizontally aligned, 700 or 500 mm high depending on height of the bottom compartment (please refer to dimension drawings in the technical appendix)

Cable connections

Compatible cable connections

	630 A cubicle	1250 A cubicle
	 PM108322	 PM108323
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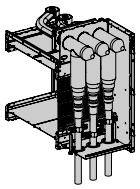
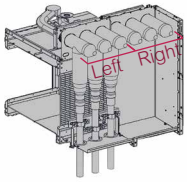
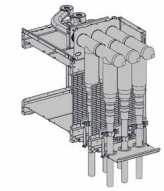
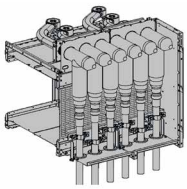
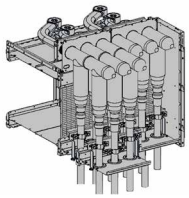
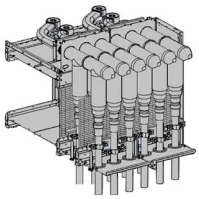
1 cable/phase	 SM100726	 DM107414 Current max.: 800 A
2 cables/phase	 DM107415	 DM107416
3 cables/phase		 DM107417
4 cables/phase		 DM107418

Dry-type single-core cable				
Performance	Cable and terminal type	Cross-section mm²	Number of cables	Comments
3 to 17.5kV, ≤630 A	Connected with C type bushing	50 to 300	1 or 2 cables per phase*	For larger x-sections, or more cables, please contact us.
3 to 17.5kV, ≤1250 A	Connected with C type bushing	50 to 300	2 to 4 cables per phase*	

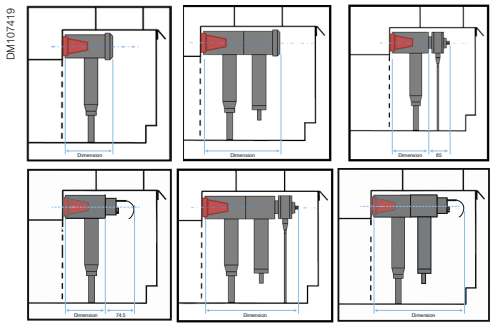
Three-core, dry cable				
Performance	Cable and terminal type	Cross-section mm²	Number of cables	Comments
3 to 17.5kV, ≤630 A	Connected with C type bushing	50 to 300	1 cable per phase*	For larger x-sections, or more cables, please contact us.
3 to 17.5kV, ≤1250 A	Connected with C type bushing	50 to 300	2 cables per phase*	

* For 1250 A cubicle 2 cables/phase = 1 cable/bushing, 4 cables/phase=2 cables/bushing

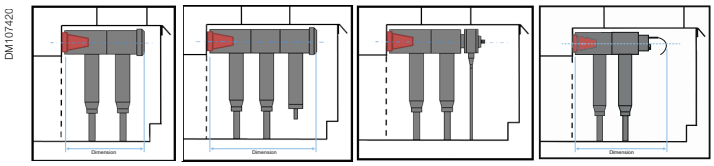
Cable connections

Compatible cable connections

1 cable/bushing

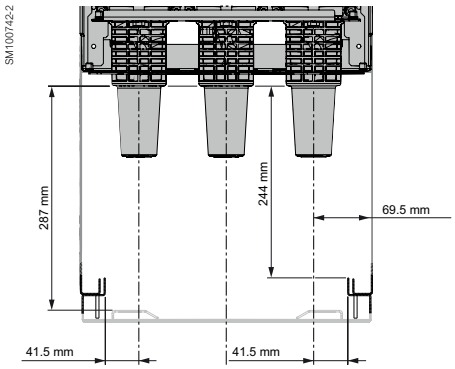


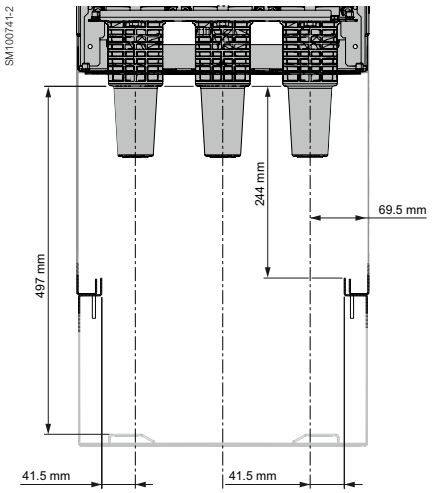
2 cables/bushing



Standard version 1

IAe 100 A
for natural earthing network

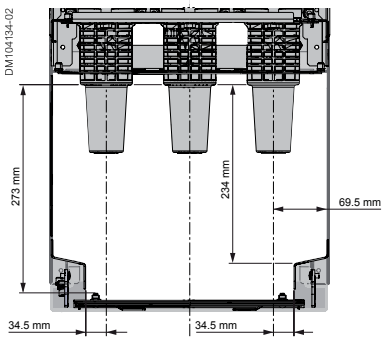


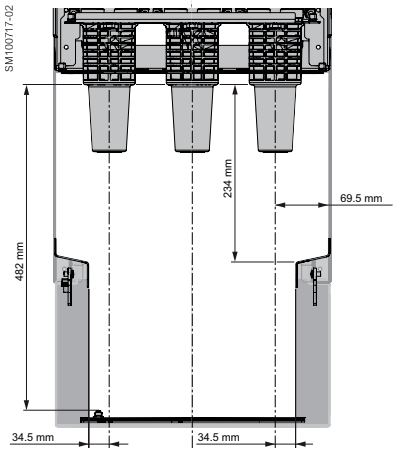


Arc control version

AFLR 16 ~25kA 1s

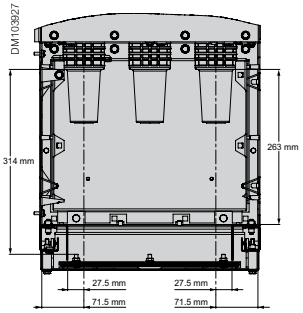
Front cable connections



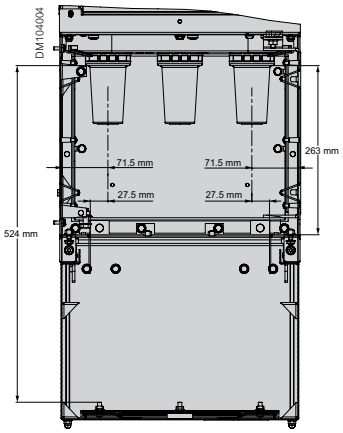


Rear cable connections 2

For door height/depth: 290 mm



For door height/depth: 500 mm



Cable in/out incoming cable door refer to 1 / Cable in/out outgoing cable door refer to 2

Network cable testing and diagnostics device

PremSet offers an original primary circuit arrangement allowing direct access to cable conductors without operating the main switches or dismantling the cables connections.

Combined with a dedicated cable testing device, it provides operators protection during cable testing and diagnosis.

Cable testing and cable diagnosis

Medium voltage cable testing is a demanding task that leaves no room for error

- Work is carried out on the main circuit with a high-voltage test bench
- Earthing is removed during testing
- Access to the main circuit for test connections may require access to the cable box and dismantling of cable termination insulation
- Procedures must be followed strictly to ensure the protection of personnel
- Cable connections must be properly reassembled to restore full insulation

PM102715

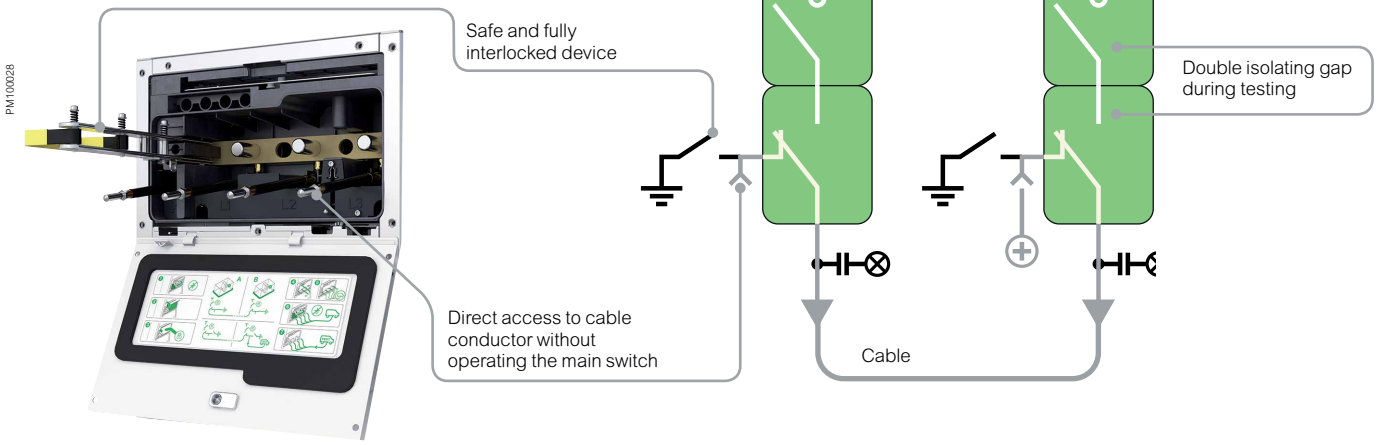
Intuitive and easy cable access with PremSet

PremSet switchboards can be equipped with a dedicated cable testing device that enhances the protection of personnel during cable testing

- Cable testing can be carried out without accessing the cable box (cables remain connected) and without touching the cable terminations.
- The test device can be connected from the front of the switchboard, prior to removing the earth link.
- Earth link removal is the last operation to be carried out, using a special earthing bar disconnection system, without any operation of the main switching device or main earthing switch.
- Earth link removal featuring interlocking, i.e. the earth link can be opened only if the main earthing switch is closed (cable earthed) and the main earthing switch can be opened only if the earthing link is closed.
- Test bench connections are delivered separately. They can also be adapted locally to any specific test set.

Network cable testing and diagnostics device

The cable testing device can be used on both ends of the cable to be tested, in order to completely isolate the cable section from the network.



Technical characteristics

Cable testing device can be used for various testing and diagnosis purposes:

- DC tests up to 36 kV DC x 15 min
- Very low frequency testing from 0.1 Hz up to 20 kV x 30 min (sinusoidal signal), and 28 kV x 30 min for cos2 signal
- 50/60 Hz dielectric tests up to 14 kV x 1 min
- Tan Delta diagnosis: power dissipation 18 kV
- Performance characteristics have been validated in accordance with standard IEC 62271-200, Edition 2

Dimensions

Unit type	Height (mm)	Width (mm)	Depth (1) (mm)	Weight (2) (kg)	Weight with packaging (kg)
I06T	1550	375	910	200	275
I06H	1550	375	910	200	275
D02N	1550	375	910	200	275
D06N	1550	375	910	200	275
D06H	1550	375	910	200	275
E-SB	1550	375	910	200	275
G06	1550	375	910	100	175
M06S	1550	375	910	250	275
M06A	1550	750	910	350	425
VTM	1550	375	910	150	225
VTP	1550	375	910	150	225
VTM-D	1550	375	910	250	325
VTP-D	1550	375	910	250	325
VTM-C	1550	375	910	150	225
VTM-F	1550	375	910	150	225
VTF	1550	375	910	150	225
I12H	1550	750	910	500	650
D12H	1995	750	910	500	650
M12S	1550	375	910	250	275
M12A	1550	750	910	450	425
G12	1550	375	910	100	175

(1) With arc control design, the depth is 1146 mm for front cable connection and 1262 mm for rear cable connection.

(2) With arc control design, the weight increases by 20 kg for front cable connection and by 50 kg for rear cable connection.

Floor preparation

Units may be installed on ordinary concrete floors, with or without trenches depending on the type and cross-section of the cables. Required civil engineering works are identical for all units.

Fixing of units

With each other

The units are simply bolted together to form the MV switchboard (bolts supplied).

To the floor

- For switchboards comprising up to three units, the four corners of the switchboard must be fixed to the floor using:
  - bolts (not supplied) screwed into nuts set into the floor using a sealing pistol
  - threaded rods grouted into the ground
- For switchboards comprising more than three units, the number and position of fixing points depends on local criteria (earthquake withstand capacities).

Dimensions

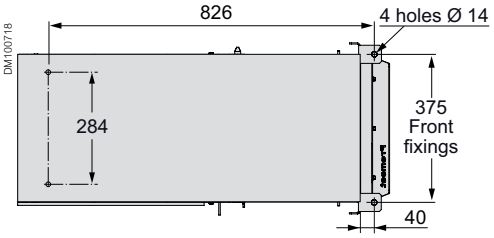
Fixing the switchboard to the floor

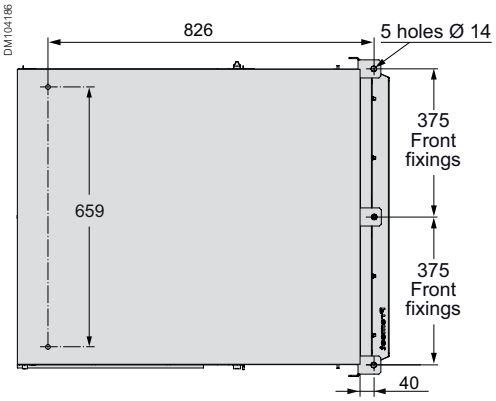
- Use Spit drills to fix the cubicles to the floor
- Fix each cubicle using the two holes at the bottom rear corners and the two ground fixing brackets at the front

Note: The rear brackets are not required except for seismic constraints

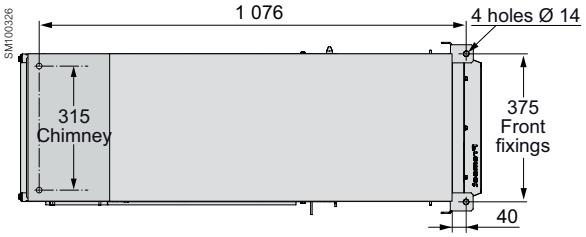
Front cable connection

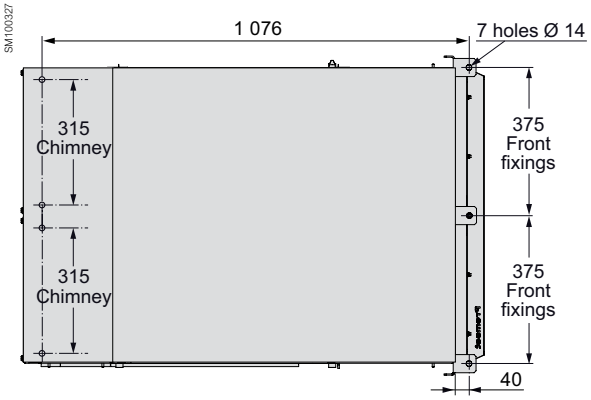
Fixing standard version





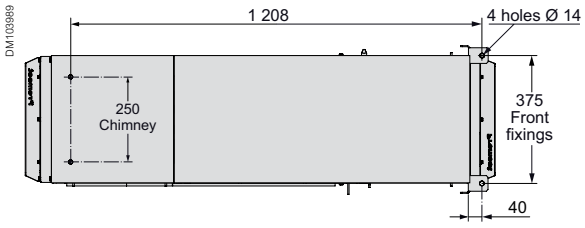
Fixing with arc control version

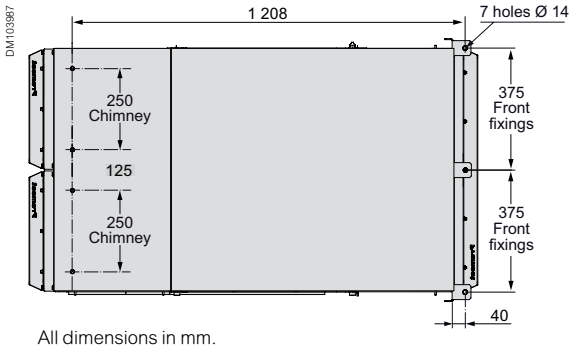




All dimensions in mm.

Rear cable connection





All dimensions in mm.

Dimensions

Standard version

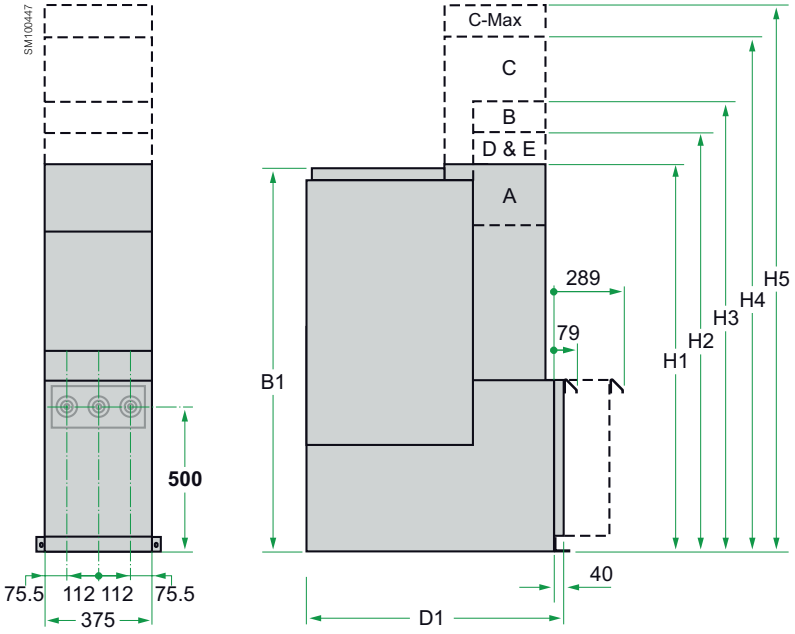
Front cable connection

375 mm wide cubicle, 630 A
Cable termination height: 500 mm

All dimensions in mm.

H1	LV cabinet A (option to have cable testing device)	1350
H2	LV cabinet D & E	1461
H3	LV cabinet B	1573
H4	LV cabinet C	1795
H5	LV cabinet C-Max	2045
B1	Non internal arc	1336
D1	Without internal arc exhausting	910

Note:
Dimensions are the same for bar-connected cubicles.

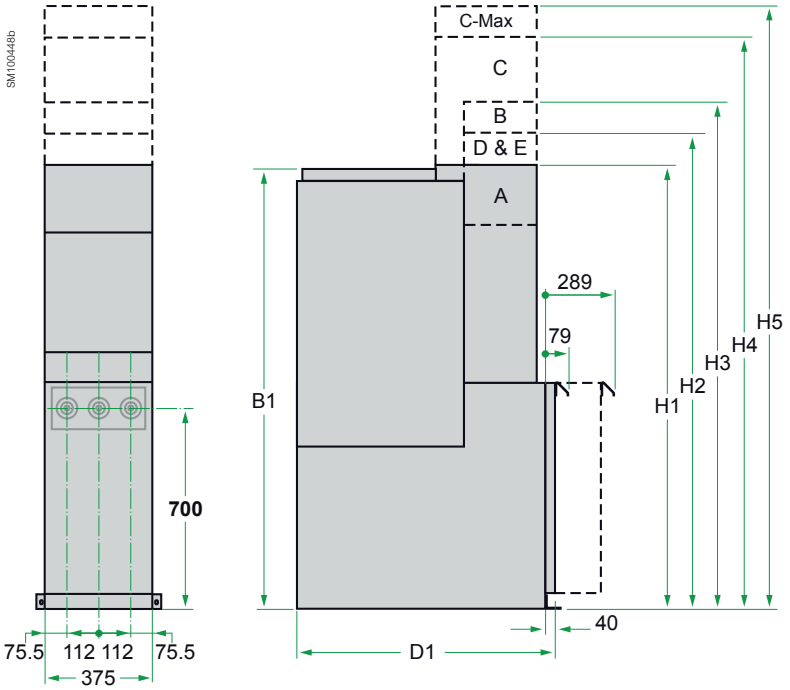


375 mm wide cubicle, 630 A
Cable termination height: 700 mm
(For I12H and D12H: 750 mm wide cubicle)

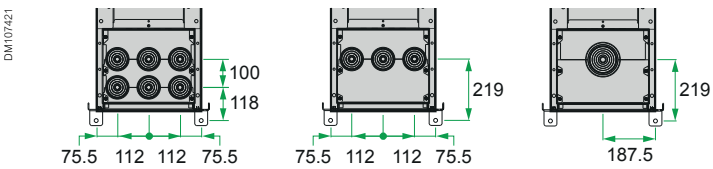
All dimensions in mm.

H1	LV cabinet A (option to have cable testing device)	1550
H2	LV cabinet D & E	1661
H3	LV cabinet B	1773
H4	LV cabinet C	1995
H5	LV cabinet C-Max	2245
B1	Non internal arc	1536
D1	Standard version exhausting	910

Note:
Dimensions are the same for bar-connected cubicles.



Diagrams and dimensions for cable entry



Dimensions

Arc control design

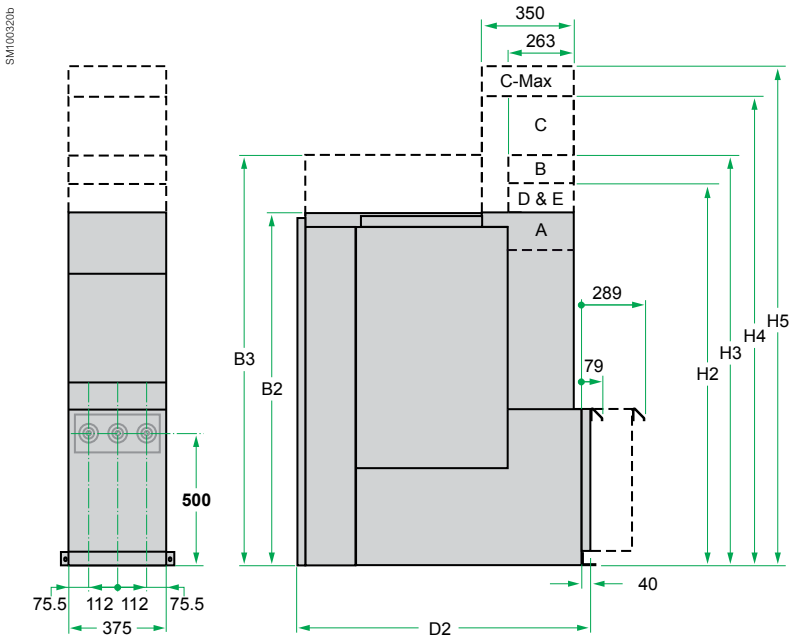
Front cable connection

375 mm wide cubicle, 630 A
Cable termination height: 500 mm

All dimensions in mm.

H1	LV cabinet A (option to have cable testing device)	1350
H2	LV cabinet D & E	1461
H3	LV cabinet B	1573
H4	LV cabinet C	1795
H5	LV cabinet C-Max	2045
B2	Internal arc bottom exhaust outside the room	1349
B3	Internal arc top exhaust	1664
D2	With internal arc exhausting	1146

Note:
Dimensions are the same for bar-connected cubicles.

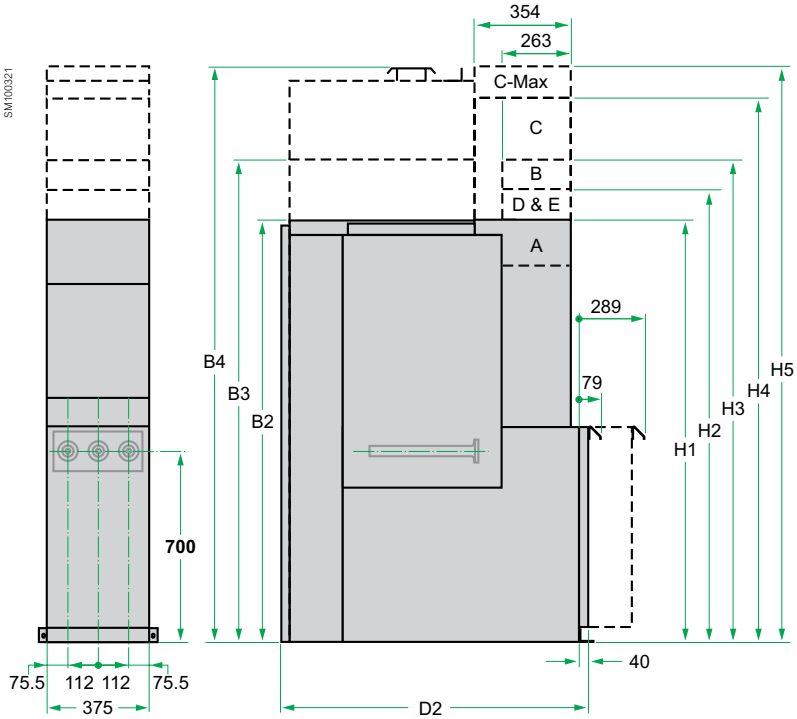


375 mm wide cubicle, 630 A
Cable termination height: 700 mm
(For I12H and D12H: 750 mm wide cubicle)

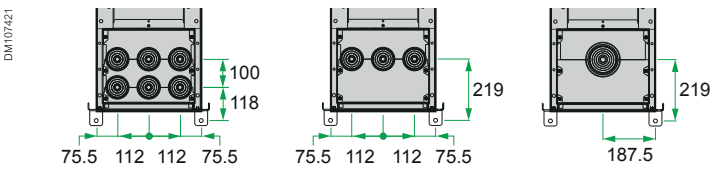
All dimensions in mm.

H1	LV cabinet A (option to have cable testing device)	1550
H2	LV cabinet D & E	1661
H3	LV cabinet B	1773
H4	LV cabinet C	1995
H5	LV cabinet C-Max	2245
B2	Internal arc bottom exhaust outside the room	1549
B3	Internal arc top exhaust	1864
B4	Internal arc exhaust inside the room	2230
D2	With internal arc exhausting	1146

Note:
Dimensions are the same for bar-connected cubicles.



Diagrams and dimensions for cable entry



Dimensions

Arc control design

Rear cable connection
(rear bottom entry)

375 mm wide cubicle, 630 A

Cable termination height: 700 mm

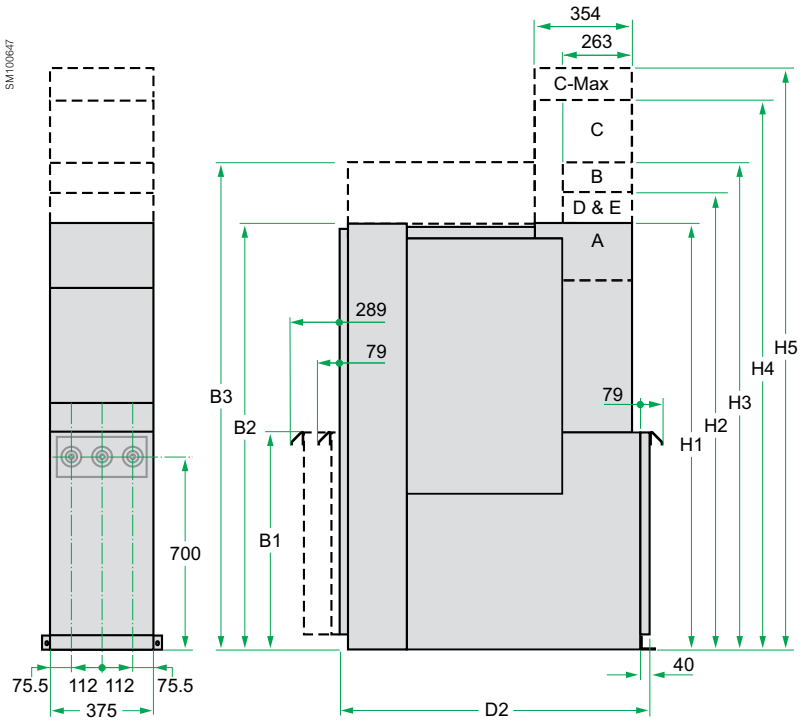
(For I12H and D12H: 750 mm wide cubicle)

All dimensions in mm.

H1	LV cabinet A (option to have cable testing device)	1550
H2	LV cabinet D & E	1661
H3	LV cabinet B	1773
H4	LV cabinet C	1995
H5	LV cabinet C-Max	2245
B1	Door bottom entry	792
B2	Internal arc bottom exhaust	1549
B3	Internal arc top exhaust outside the room (1)	1864
D2	With internal arc exhausting	1262

(1) For top exhaust inside the room, please contact our Customer care center.

Note:
Dimensions are the same for bar-connected cubicles.



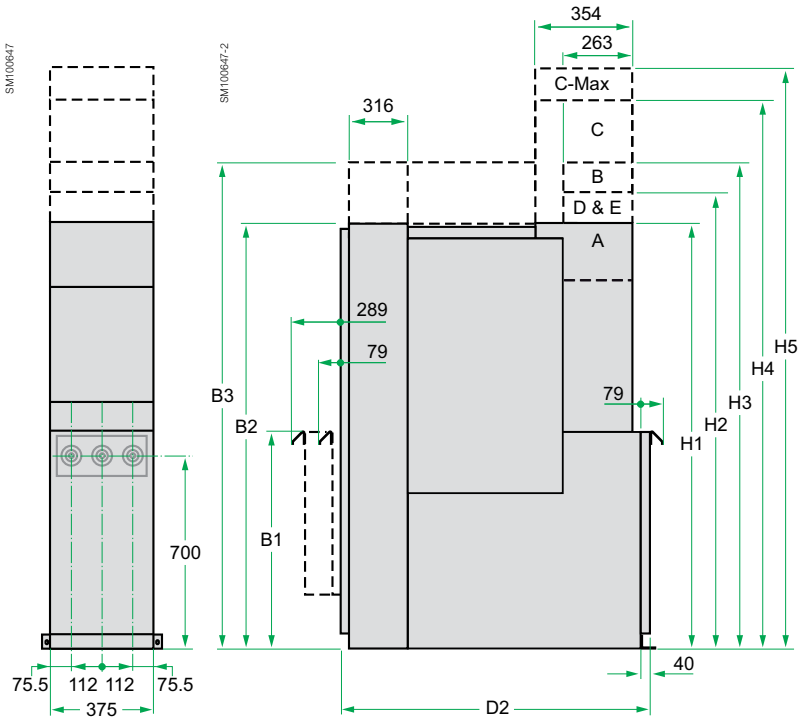
Rear cable connection
(rear top entry)

All dimensions in mm.

H1	LV cabinet A (option to have cable testing device)	1550
H2	LV cabinet D & E	1661
H3	LV cabinet B	1773
H4	LV cabinet C	1995
H5	LV cabinet C-Max	2245
B1	Door bottom entry	792
B2	Internal arc bottom exhaust	1549
B3	Internal arc top exhaust outside the room (1)	1864
D2	With internal arc exhausting	1262

(1) For top exhaust inside the room, please contact our Customer care center.

Note:
Dimensions are the same for bar-connected cubicles.



Civil engineering

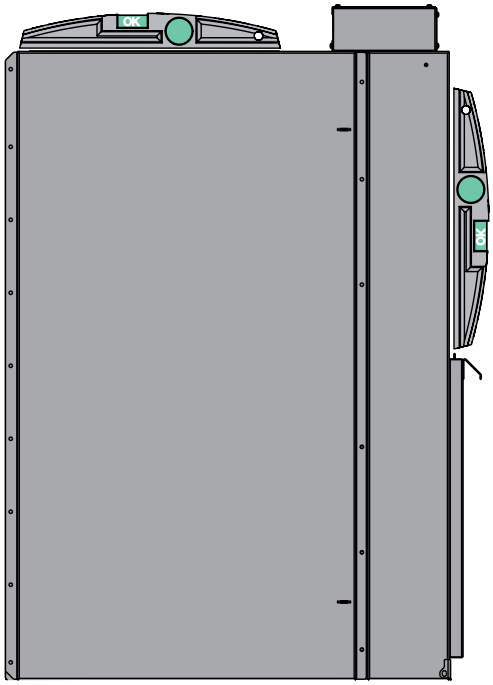
Ground preparation

To ensure the internal arc performance, the ground on which the switchgear is to be installed must comply with the ollowing requirements:

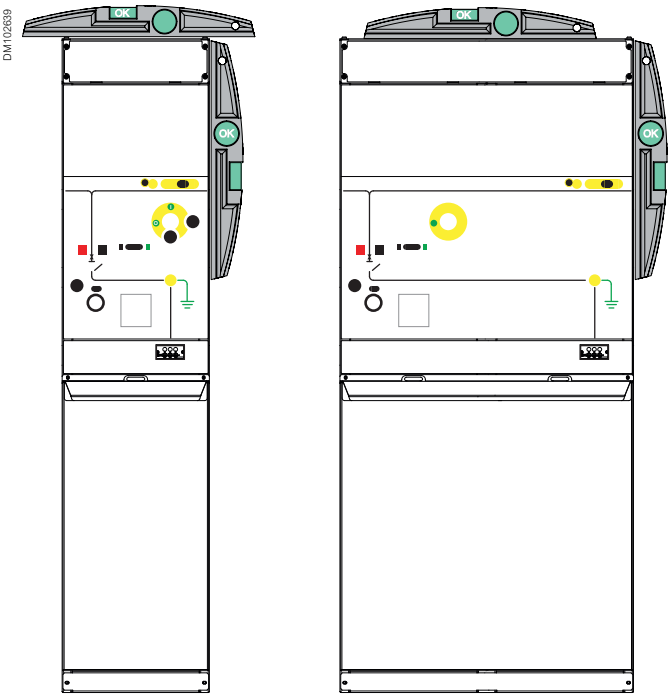
- Floor flatness tolerance is within 7 mm per 2 m

Failure to follow these instructions can result in equipment damage, and may adversely affect the internal arc performance.

SM100375



DM102639

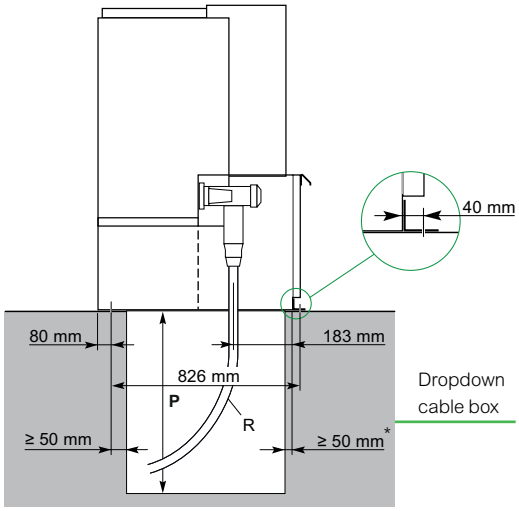


Civil engineering

Standard version

Trench dimensions for MV cables

DM100049



Trench depth **P** for PremSet without plinth.
* 50 mm when 2 cables/bushing

Cable connection and cable trench

Dimensions for MV cables

Cable insulation	Cable	Cross-section [1] (mm²)	Bending radius: R [2] (mm)	Depth: P [2] (mm)	Depth: with deep Pan 500 [2] [3] (mm)
Dry insulation	Single-core	≤150	500	400	-
		185 to 300	600	520	-
	Three-core	≤150	550	660	1 190
		185	650	770	1 300
Paper impregnated with non-draining material	Single-core	≤150	500	580	-
		185 to 300	675	800	-
	Three-core	≤95	635	750	1 280
		150 to 300	835	970	1 500

[1] For other cross-sections, please contact our Customer Care Center.

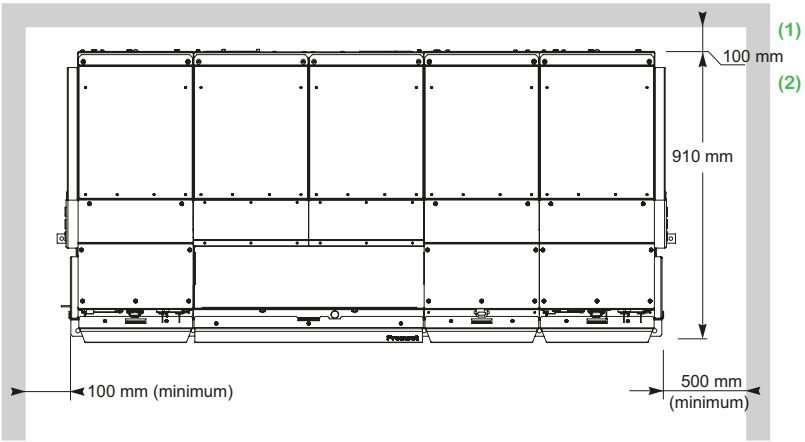
[2] These values are for indication only;, please refer to the cable supplier's technical documentation.

[3] Dropdown cable box is for 1x3c cable with ARC6.

Position of cubicles in a substation

Installation of a switchboard with standard design

DE58658



(1) 500 mm is recommended for ease of installation and maintenance.

(2) 500 mm is requested if there is an M06A, M12A, D12H, or I12H.

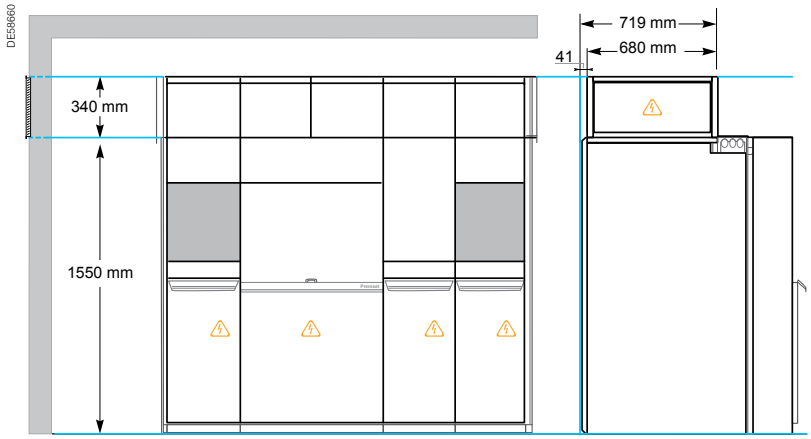
Civil engineering

Arc control design (upwards exhaust)

Gas exhaust outside the room

Installation of a switchboard

With arc control design: A-FLR with upwards exhaust left side (ceiling height ≥ 2 500 mm)

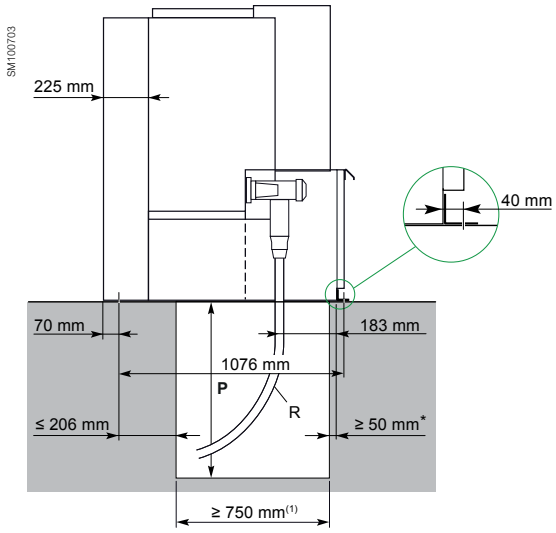


(1) Only required for internal arc withstand with downwards exhaust

(*) 50 mm when there are 2 cables per bushing

Note: For cable connection and cable trench request, please refer to the "Standard version" (p. 42)

Trench dimensions for MV cables

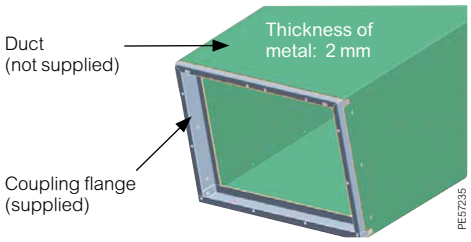


Gas exhaust duct

To enable the evacuation of gases by the top, users must install a duct fixed to the coupling flange on the right or left of the switchboard. For IP3X protection, a flap must be installed with this coupling flange on the lateral of the cubicle duct.

The end of the duct must block water, dust, moisture, and animals from entering and at the same time enable the evacuation of gases into a dedicated area through a device situated at the outer end of the duct (not supplied).

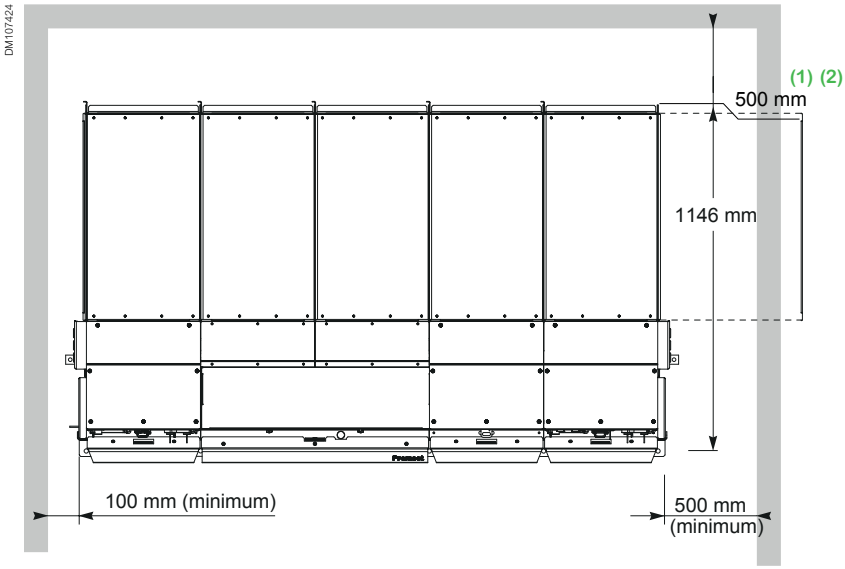
Gas exhaust duct example:
The exhaust duct must be made of metal sheet of sufficient thickness to withstand pressure and hot gases.



Note: For more detailed information, refer to the Installation Manual (P7M18012)

Position of cubicles in a substation

Installation of a switchboard with arc control design: A-FLR with downwards exhaust



(1) 500 mm is recommended for ease of installation and maintenance.

(2) 500 mm is requested if there is an M06A, M12A, D12H, or I12H.

Note: The gas exhaust duct must be manufactured in accordance with the architecture of the building from the switchboard to the outside.

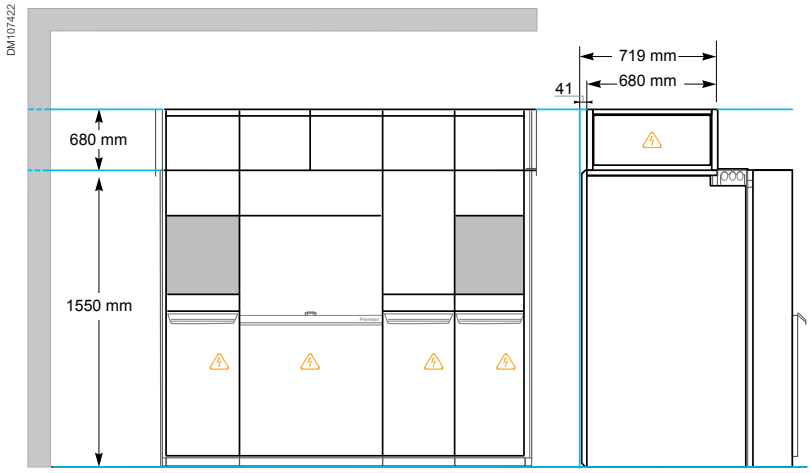
Civil engineering

Arc control design (upwards exhaust)

Gas exhaust inside the room

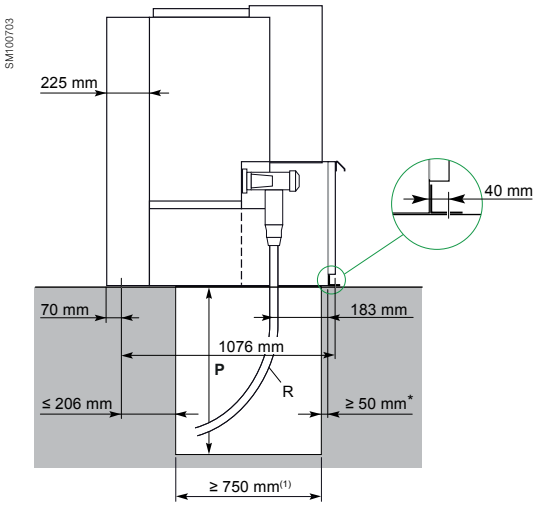
Installation of a switchboard

With arc control design: A-FLR with upwards exhaust left side (ceiling height ≥2 800 mm)



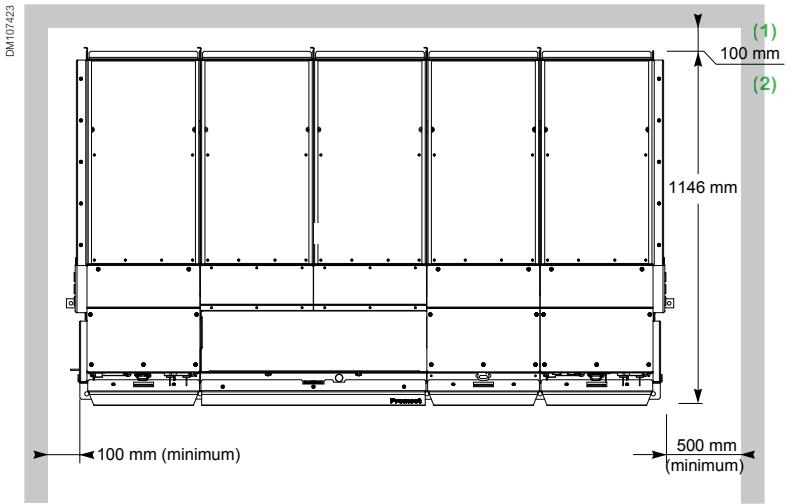
(1) Only required for internal arc withstand with downwards exhaust
(*) 50 mm when there are 2 cables per bushing
Note: For cable connection and cable trench request, please refer to the "Standard version"

Trench depth for MV cables



Position of cubicle in a substation

With arc control design: A-FLR with upwards exhaust



(1) 500 mm is recommended for ease of installation and maintenance.
(2) 500 mm is requested if there is an M06A, M12A, D12H, or I12H.

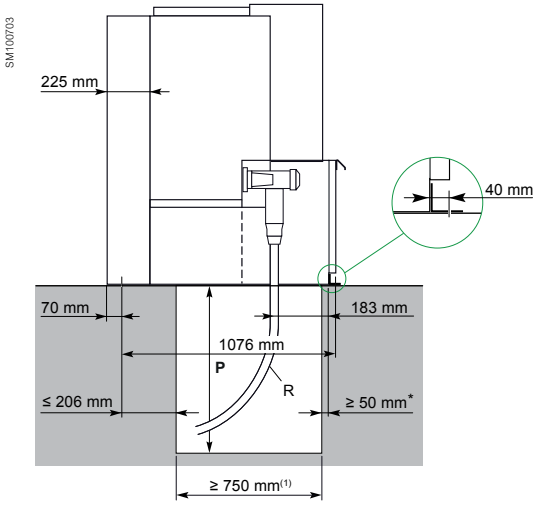
Note: The gas exhaust duct must be manufactured in accordance with the architecture of the building from the switchboard to the outside.

Civil engineering

Arc control design (downwards exhaust)

Front cable connection

Trench depth for MV cables



(1) Only required for internal arc withstand with downwards exhaust
(*) 50 mm when there are 2 cables per bushing

Dimensions for MV cables

Cable insulation	Cable	Cross-section (1) (mm²)	Bending radius: R (2) (mm)	Depth: P (2) (mm)	Depth: with deep pan 500 (2) (3) (mm)
Dry insulation	Single-core	≤150	500	550	-
		185 to 300	600		-
	Three-core	≤150	550	660	R + 530
		185	650	770	R + 530
Paper impregnated with non-draining material	Single-core	≤150	500	580	-
		185 to 300	675	800	-
	Three-core	≤95	635	750	R + 530
		150 to 300	835	970	R + 530

(1) For other cross-sections, please contact our Customer Care Center.

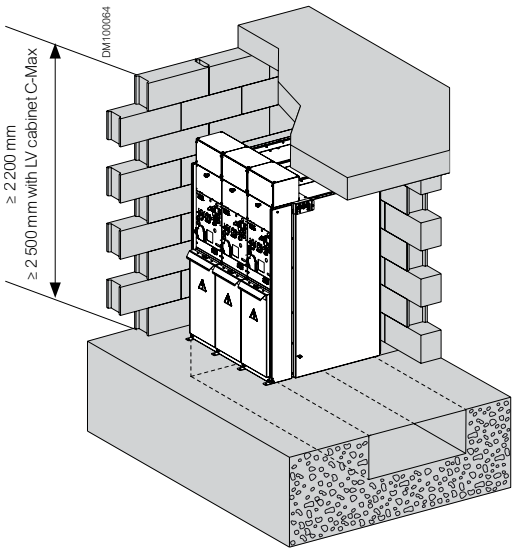
(2) These values are indication only; please refer to the cable supplier's technical documentation.

(3) Dropdown cable box is for 1x3c cable with ARC6.

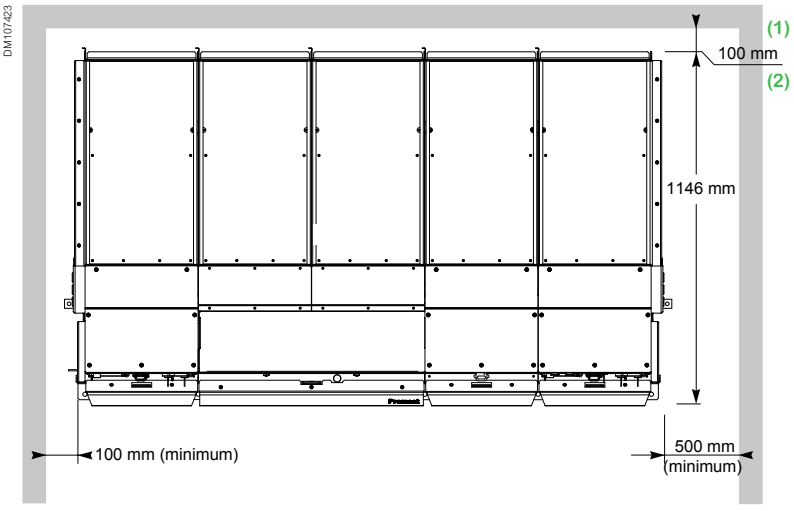
Note: For cable connection and cable trench request, please refer to the "Standard version"

Position of cubicle in a substation

Layout of a downwards exhaust internal arc switchboard



Installation of a switchboard with arc control design: A-FLR with downwards exhaust



(1) 500 mm is recommended for ease of installation and maintenance.
(2) 500 mm is requested if there is an M06A, M12A, D12H, or I12H.

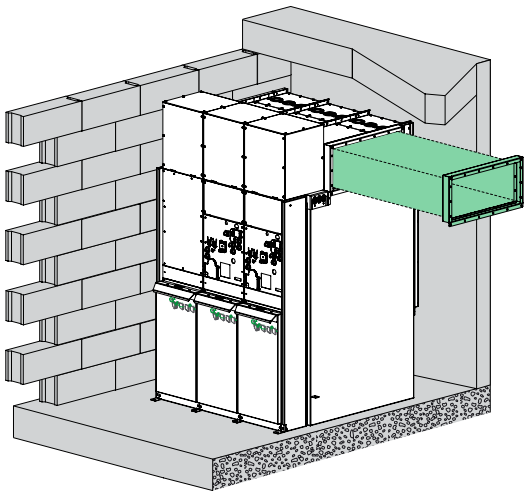
Civil engineering

Arc control design

Rear cable connection

Layout of cable top entry and top exhaust outside room

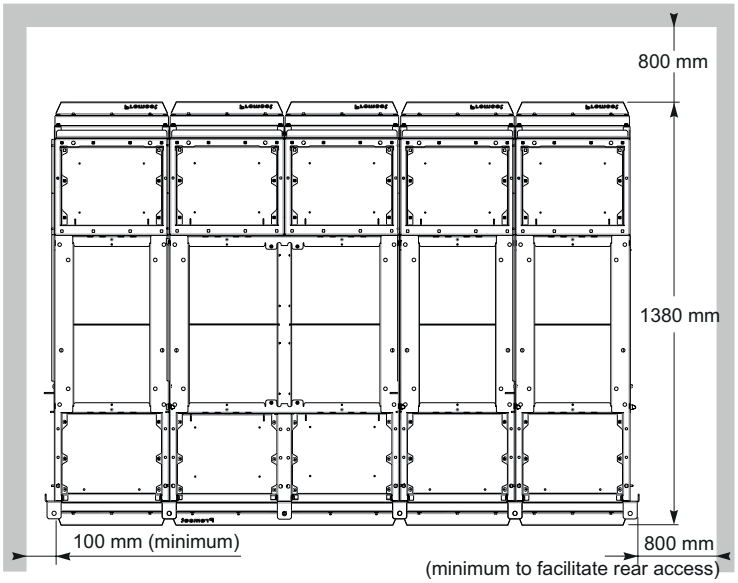
DM103924



Top exhaust

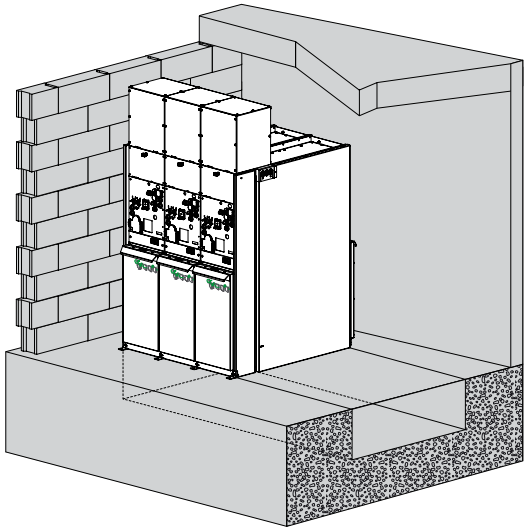
Note: The minimum celling = 1864 mm
Cubicle +P (MV cable bending radius)

DM103968-2



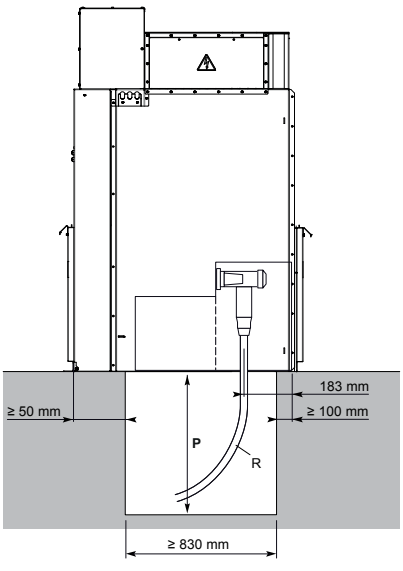
Trench depth for MV cables, rear entry

SM100626



Bottom exhaust

DM103960



Notes:

For IAC upwards exhaust outside the room, cable connection, and cable trench request, please refer to ‘‘Standard version’’

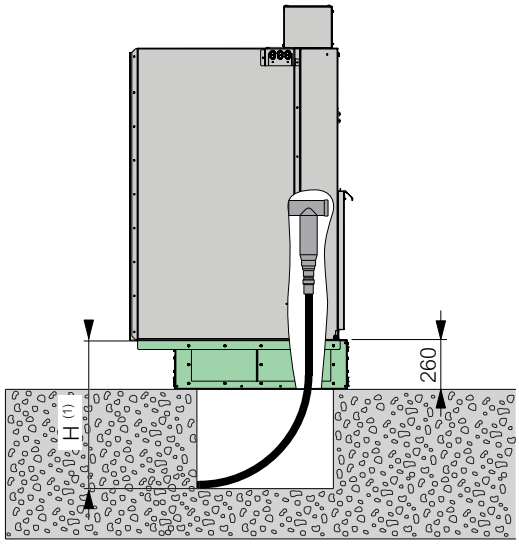
For IAC downwards exhaust, cable connectiond and cable trench request, please refer to ‘‘Arc control design (downwards exhaust)’’

Civil engineering

Raising plinths

Raising plinth 260 mm

DM102567



(1) For downwards exhaust, the minimum distance for the cable trench and raising plinth (H) is 550 mm.

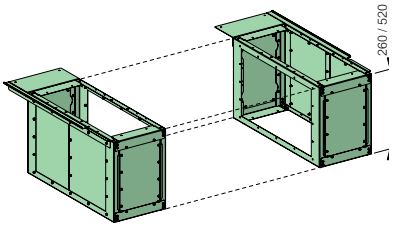
If the trench depth is too small to take into account the proper bending of cables, the switchboard can be fitted with an optional raising plinth.

These plinths exist in two different heights, 260 mm or 520 mm, which can be stacked together in order to reach a total height of 780 mm if required.

The cell is to be assembled on the plinth prior to fix the whole on the floor.

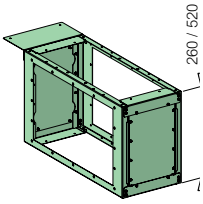
Types of raising plinth

DM102564



Right and left panel raising plinth

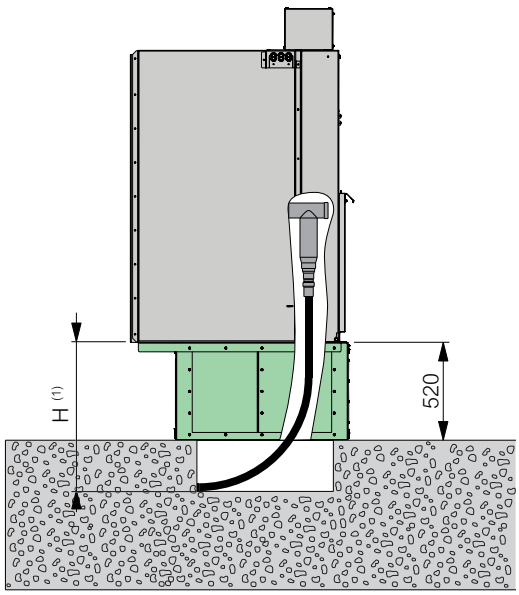
DM102565



Middle panel raising plinth: use 2 plinths for 1 cubicle 1250 A

Raising plinth 520 mm

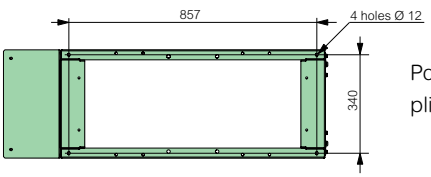
DM102568



(1) For downwards exhaust, the minimum distance for the cable trench and raising plinth (H) is 770 mm.

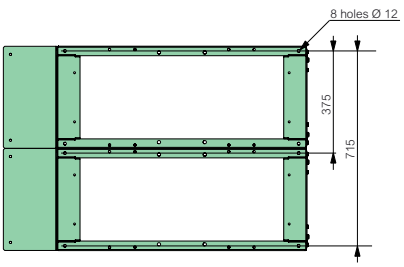
Fixing the raising plinth to the floor

DM102566



Position of holes to fix the raising plinth to the floor

DM104159



Two raising plinths will be used to assemble a 750 mm wide cubicle

Note: For availability of rear connection raising plinths, please contact our Customer Care Center.

Notes

Notes

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