EcoStruxure™
Innovation At Every Level

PacT series

EvoPacT™

Medium Voltage Distribution

Catalog 2023

Vacuum Circuit Breaker up to 15kV
The next generation digital MV Vacuum Circuit Breaker



se.com/us/evopact

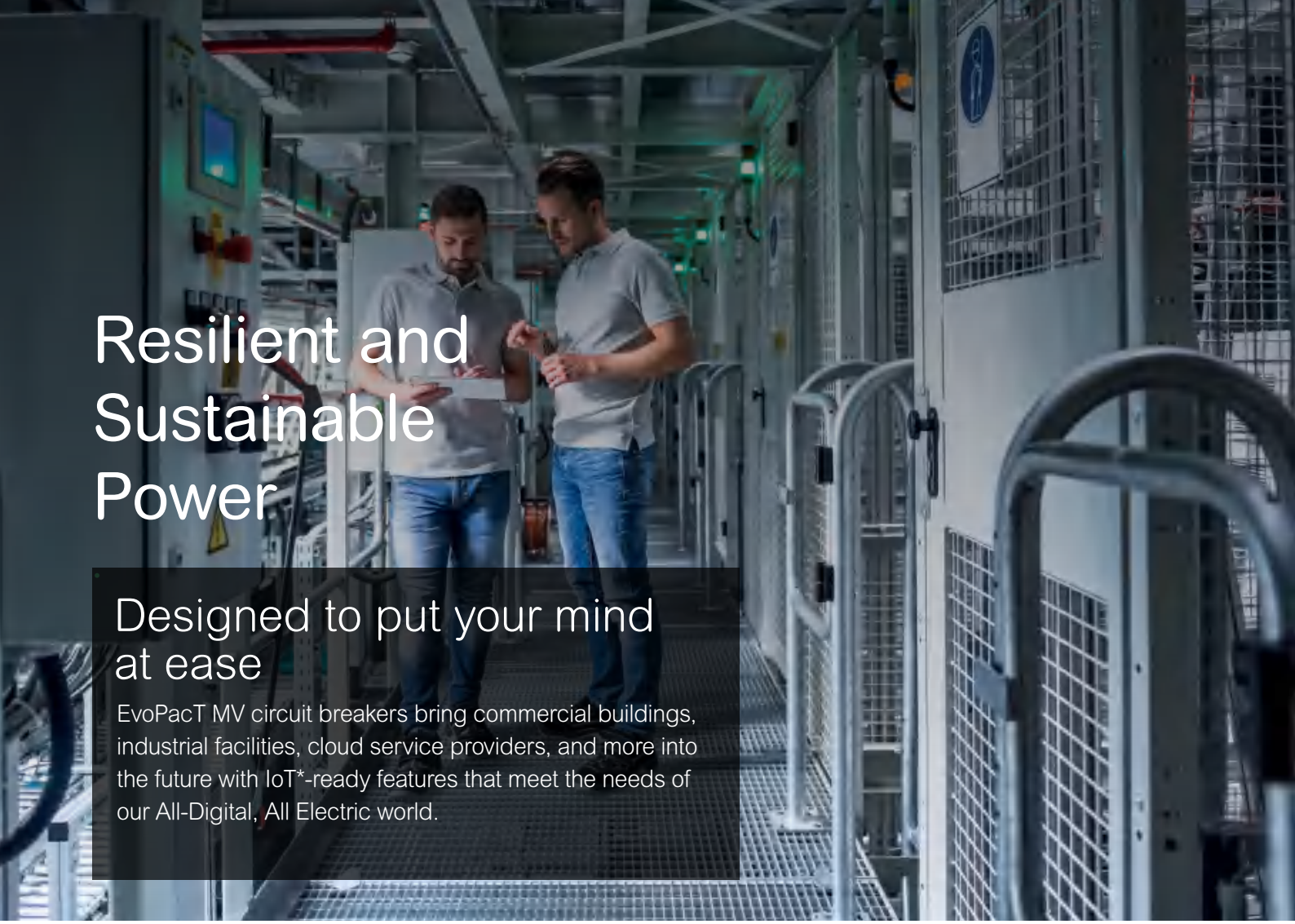
Life Is On | Schneider Electric

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Evo**PacT**



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Resilient and Sustainable Power

Designed to put your mind at ease

EvoPacT MV circuit breakers bring commercial buildings, industrial facilities, cloud service providers, and more into the future with IoT*-ready features that meet the needs of our All-Digital, All Electric world.

Digital Ready

• First of its kind, integrated MV Circuit Breaker Health Monitoring sensors to provide end users with real time information and can be accessed remotely through a Wi-Fi connected device or the cloud to alert end users of potential hazards or maintenance needs.
• End users can tailor EvoPacT to fit their needs with three different levels of digital features, as well as easily upgrade as their needs expand.

More Robust Power Availability

• Built to withstand up to 30,000 open/close mechanical operations, three times longer than the industry standard for MV circuit breakers, making it unmatched in durability.

Unmatched Efficiency

• EvoPacT digital monitoring and operation features are designed to be used outside of the arc flash zone through a Wi-Fi connected device, reducing risk to on-site personnel.

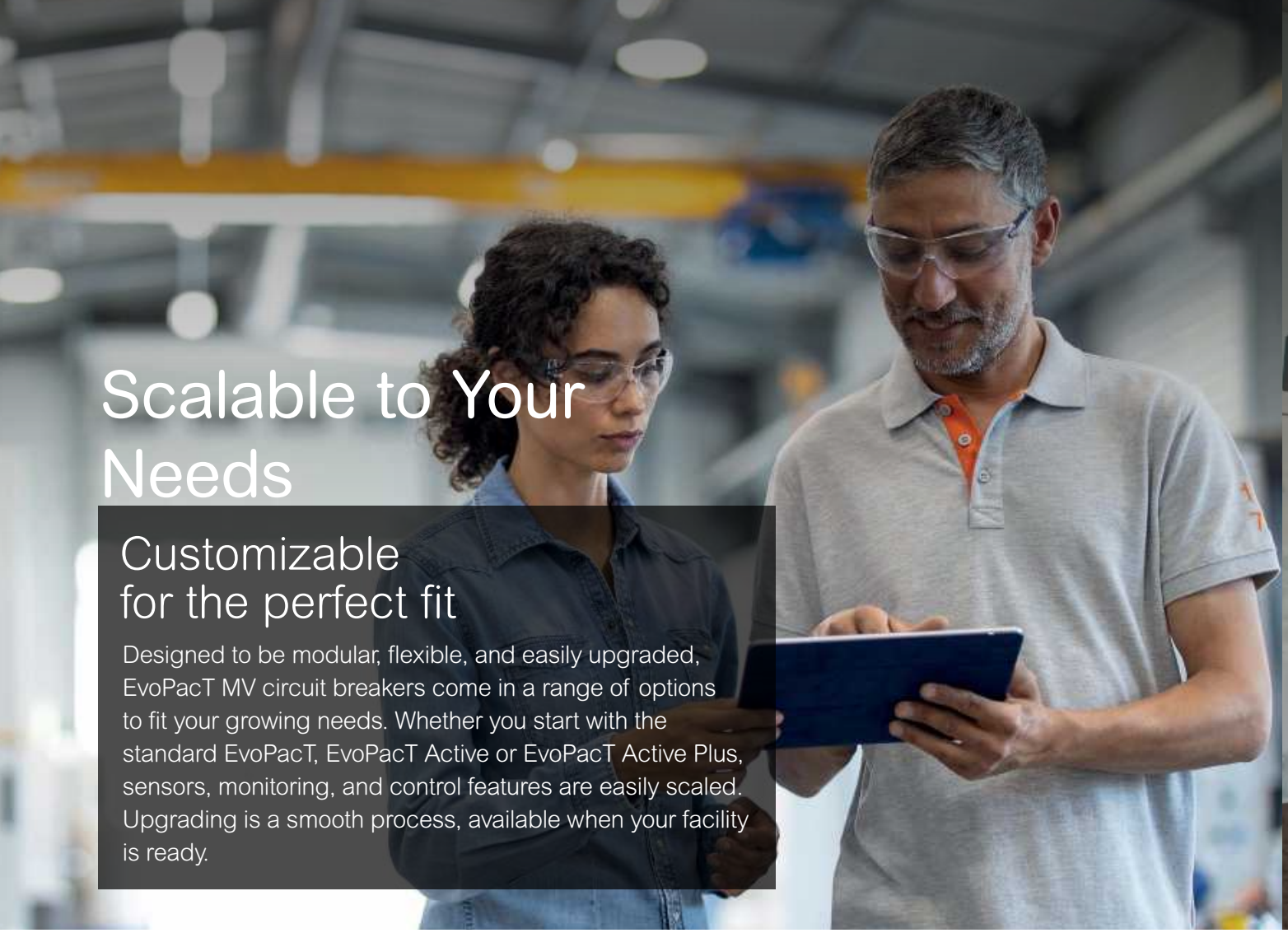
Built-in sustainability

Green Premium™

EvoPacT digital MV circuit breakers are Green Premium certified, part of our commitment to deliver sustainable performance for our customers.

In addition to meeting Green Premium qualifications, EvoPacT MV circuit breakers are:
• Designed to be modular and easily upgraded, whether you need additional monitoring, control components, sensors, or replacement coils, so your MV circuit breaker can quickly and smoothly evolve with your business
• Tested for long-lasting performance and durability, up to 30,000 operations, so you replace your MV circuit breaker less often, to increase the lifespan of the circuit breaker, lowering environmental impact, reducing overall maintenance, and improving costs
• Built using vacuum technology to improve reduce risk and avoid environmental pollutants.

* Internet of Things (IoT)



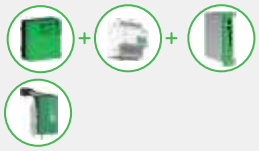
Scalable to Your Needs

Customizable for the perfect fit

Designed to be modular, flexible, and easily upgraded, EvoPacT MV circuit breakers come in a range of options to fit your growing needs. Whether you start with the standard EvoPacT, EvoPacT Active or EvoPacT Active Plus, sensors, monitoring, and control features are easily scaled. Upgrading is a smooth process, available when your facility is ready.

EvoPacT Active

Enhanced power availability



Continuous thermal monitoring

EvoPacT Active Plus

Most complete power availability



Continuous thermal monitoring +
spring charging motor +
VI monitoring + mechanism and coils

Digital Tools

Digital Logbook

Software and Services

Edge control

- Designed for power-critical and energy-intensive facilities to maximize uptime and operational efficiency.
- Energy supply management software for electro-intensive sites.

EcoStruxure Power Monitoring Expert

EcoStruxure Power Operation

Services

- Reduce downtime by monitoring and optimizing your critical connected products.
- A set of tailored service contracts that combine the power of our EcoStruxure™ platform with dynamic maintenance.

EcoStruxure Asset Advisor

EcoStruxure Service Plans



Connected and Flexible for Greater Efficiency

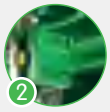
Discover powerful connectivity

When used with SureSeT MV Switchgear, EvoPacT also boasts other powerful digital capabilities extending beyond local visibility and maintenance.



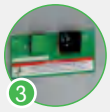
Switchgear Control

Local or Remote Operations. EvoPacT is designed to be electrically opened or closed and racked in or out via the locally mounted HMI screen or through a personal device through Wi-Fi or the Cloud for reduced risks and increased efficiency.



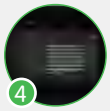
Thermal monitoring

Wireless thermal sensors help detect temperature anomalies, prompting diagnosis of potential faults, reducing downtime and fire risks.



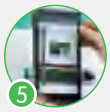
Environmental monitoring

Wireless humidity sensors monitor environmental impacts, helping detect accelerated aging and optimizing maintenance costs.



MV Circuit breaker monitoring

Monitoring MV circuit breakers wear and tear to allow for condition-based maintenance.



Digital Logbook

Quickly connect with SureSeT by QR code to access its dedicated digital logbook, manuals, support and more; designed to save operational time and effort.



Overview

Overview

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Applications

EvoPacT is a range of Vacuum Circuit Breakers (VCB), available up to 15kV, 40kA, 2000A.

Designed for medium voltage applications for commercial buildings, industrial facilities, cloud service providers, and more.

GI_115230921



GI_539948780



GI_115759449



Commercial and Industrial Applications

Industrial facilities

- Manufacturing facilities
- Large warehouses
- Water and Waste Water
- Hospitals

Commercial buildings

- Hospitals
- University campuses

Transportation

- Airports
- Railways

Data Centers

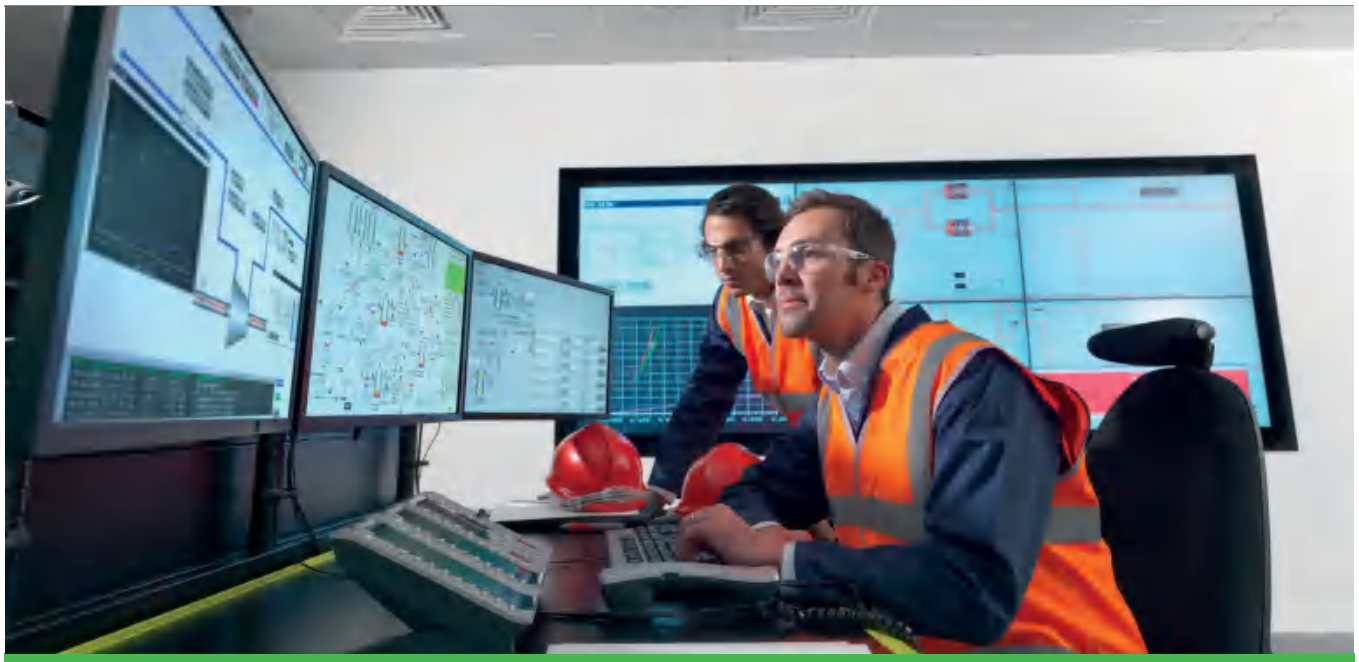
- Airports
- Railways

Infrastructure

- Water and Waste Water
- Airports
- Railways

Smarter with Integrated Digital Features

GI_110052270



EvoPacT is designed to be Smarter with integrated digital monitoring and operation. Combined with SureSeT, our new MV switchgear, EvoPacT helps reduce risk and increase efficiency for our end users.

Digital Operation from a Personal Device

- With integrated digital features, EvoPacT allows users to operate and monitor outside the arc flash zone to increase efficiency and reduce risk

Selectable 24/7 MV Circuit Breaker Health Monitoring

- When used with SureSeT MV Switchgear, end users can monitor critical components such as electrical connections, opening, closing, and spring charging mechanisms, circuit breaker electronic coils, and circuit breaker vacuum interrupters.
- Move towards condition-based maintenance with alerts based on the real-time status of equipment.

A single Digital Logbook

- Simple asset management through our unique Digital Logbook. Reduce wasted time and effort searching for product documents with our Digital Logbook, accessible from anywhere through the QR code or the MySE app.

PM109379





EvoPacT HMI

Digital Logbook

Quickly access your EvoPacT MV circuit breaker dedicated files to review manuals, drawings, support documents, and more.



Stronger Power Availability

GL_9647636B4



Reliable Design Experience

- High quality standards
- Long experience in CB design
- Key components designed and manufactured in-house

45 years
Design and manufacture for Medium Voltage

2,500,000
Medium Voltage circuit breakers installed worldwide

Build to Last

- The most durable MV circuit breaker we have ever made
- Tested three the industry standard for open/close operations, and two the industry standard for rack in/rack out operations

30,000
mechanical operations (three the industry standard)

Certified
ANSI/IEEE and cULus listed

Sustainability

Green Premium™ Program

PM108239



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 # of PEP's*
- Circularity instructions

DM107341

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 assets 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)

Sustainability

Environmental and Quality Performance

PM108293



Long-term environmental approach

Based on our Green Premium program, EvoPacT supports two additional improvements to strengthen sustainability and reduce the impact on the planet:

Upgradeability : With a modular design, EvoPacT can be upgraded easily with replacement coils or and control components.

Durability : EvoPacT durable design is tested in real-life (not simulated) to 30,000 operations, proving its long lasting performance.

EcoStruxure Solutions
What is EcoStruxure?

500 000

EcoStruxure has been deployed in almost 500 000 sites with the support of some 20 000 developers, 650 000 service providers and partners, and 3 000 utilities, and connects over 2 million assets under management.

EcoStruxure ready



Efficient asset management

Greater efficiency with **condition-based** maintenance helping to reduce downtime.



24/7 connectivity

Real-time data **everywhere anytime** to make better informed decisions.



Increased protection

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

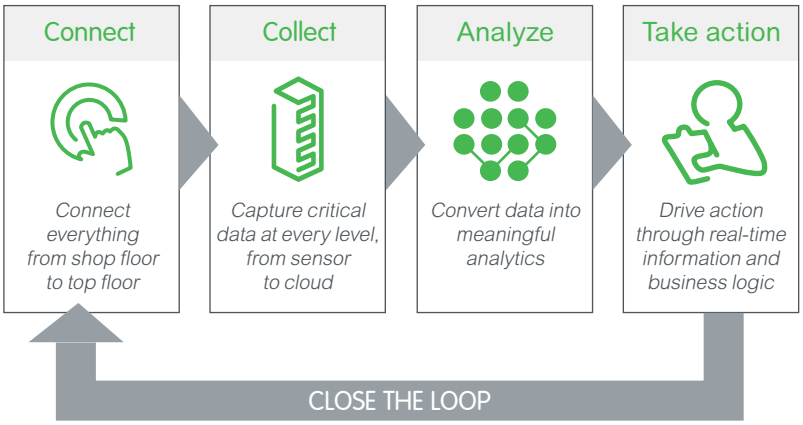
EcoStruxure is our open, interoperable, IoT-enabled system architecture and platform. EcoStruxure delivers enhanced value around reliability, efficiency, sustainability, and connectivity for our customers. EcoStruxure leverages advancements in IoT, mobility, sensing, cloud, analytics, and cybersecurity to deliver Innovation at Every Level. This includes Connected Products, Edge Control, and Apps, Analytics & Services, which are supported by Customer Lifecycle Software.

Turn data into action

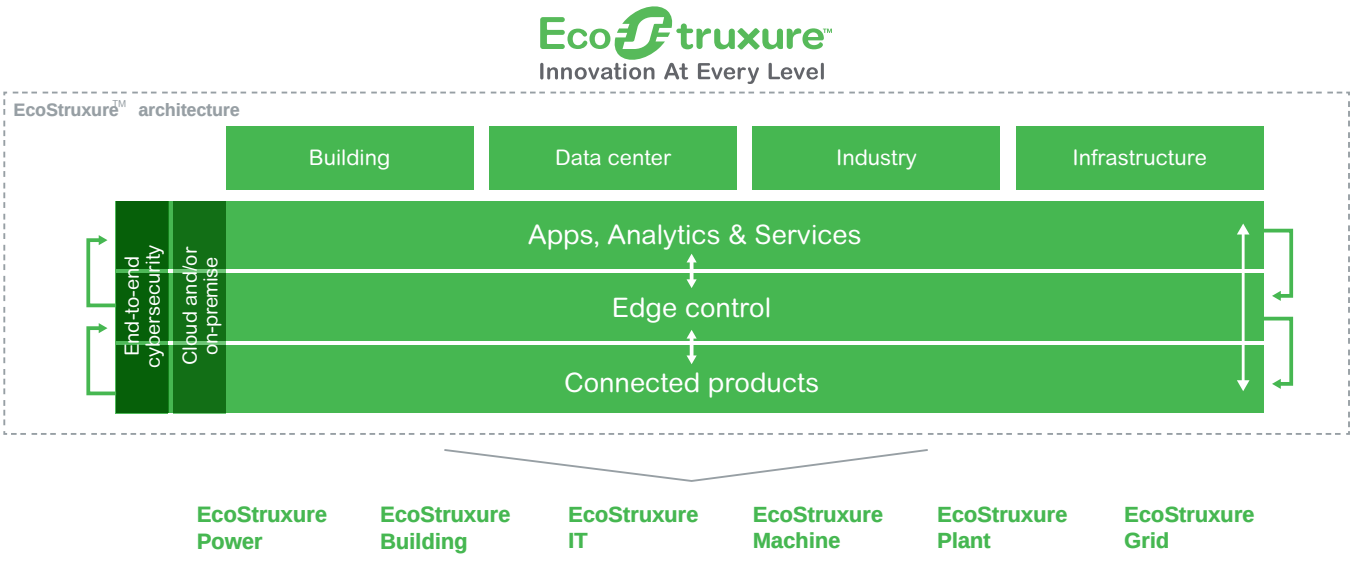
EcoStruxure architecture lets customers maximize the value of data.

Specifically, it helps them:

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

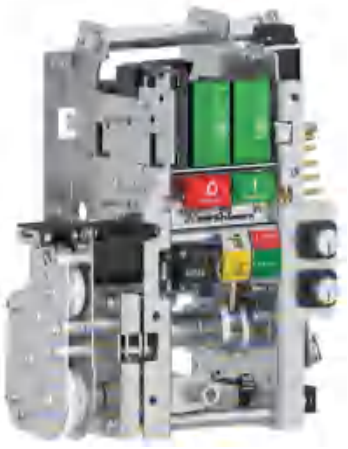


DM107233



EcoStruxure Connected Product
Offer Structure





PM110076

Digital Ready

Digitization provides an opportunity to take real benefits of data, cloud and analytics with power system equipment. Schneider Electric offers extensive digital benefits and connectivity with EvoPacT.

- Available with integrated digital sensors to provide data to monitor critical components and connections, and the installation environment. Upgradeable with Schneider Electric Field Services, so your monitoring capabilities can as grow as your needs do.
- Essential data can be easily shared via on-premises or on-cloud architectures, connected to various applications to help users benefit from data.
- Nearby or remote connectivity allows users to monitor or control power system equipment from a safer distance, without even visiting the substation.
- 24/7 data helps maintenance teams improve efficiency and reliability. Respond to problems faster, and be better prepared for site visits.

IoT data enables optional digital services, like EcoStruxure Asset Advisor. These services can give you smart alarms or data analytics that help you start your journey to condition-based maintenance, efficient asset management, and much more.

Find more information Here

Our customer needs are diverse and raise different expectations and for this reason, we have introduced three scalable tiers of monitoring to better meet your needs. In addition to the three tiers of monitoring, digital control can be added as needed, giving our customers a truly tailored fit.

EvoPacT

With easy upgrade capability, our standard MV circuit breaker has fast access to documentation through the Digital Logbook, via QR code

EvoPacT Active

React faster to help prevent unplanned downtime with 24/7 cloud connectivity and essential condition monitoring using scalable features and smart alerts

Thermal monitoring - 24/7 connected

EvoPacT Active Plus

Comprehensive monitoring with complete circuit breaker health diagnosis and alerts from anywhere, as well as operation and racking through your local HMI or connected device

Thermal monitoring - 24/7 connected +
Auxiliary circuit monitoring + Racking compatibility monitoring +
Operating mechanism condition monitoring + Vacuum interrupter and endurance monitoring

Digital Controls with Integrated Racking Capabilities

Digital Logbook

Optional

Edge and cloud connectivity (1)

(1) Edge and cloud connectivity comprise the optional software offers:
- EcoStruxure Power Monitoring Expert
- EcoStruxure Power SCADA
- EcoStruxure Asset Advisor

EcoStruxure Connected Product
Selection List

		EvoPacT	EvoPacT Active	EvoPacT Active Plus
Digital Control Please contact Schneider Electric for availability				
CB motorized truck and control	Motorized CB truck control and protection	○	○	○
Digital LogBook	Stay connected with all project documentation and records	●	●	●
Thermal monitoring	CB power connections arms thermal monitoring		●	●
	Ambient temperature and relative humidity monitoring		●	●
	Busbar and cables connections thermal monitoring		●	●
	Temperature rise alarm according to temperature and current measuring		●	●
Auxiliary circuit monitoring	Shunt release condition monitoring			●
	Spring charging motor condition monitoring			●
Operating mechanism condition monitoring	MV Circuit breaker Closing/Opening time			●
	MV Circuit breaker bouncing time on closing			●
	MV Circuit breaker rebounding detection on opening			●
	MV Circuit breaker closing/opening speed			●
	Vacuum Interrupter contacts gap monitoring			●
Vacuum Interrupter condition monitoring	Vacuum Interrupter contacts condition monitoring			●
	Poles closing/opening synchronization			●
	Vacuum Interrupter contacts pressure monitoring			●
MV Circuit Breaker endurance monitoring	Electrical endurance assessment			●

● As standard, available when purchased with SureSeT ○ Optional

EcoStruxure Connected Product
Offer Structure

PM119826



EcoStruxure Operation Server for Circuit Breaker Monitoring BM100

This electronic device assesses the health status & proper function of MV circuit breaker by monitoring several critical parameters of MV circuit breaker during its lifetime. It gets information from various components inside the MV circuit breaker. This intelligent device then computes the inputs to provide meaningful MV circuit breaker health information including:

- Health of MV circuit breaker mechanism
- Health of vacuum interrupters
- Health of opening / closing release
- Health of charging motor

In case of abnormality, it provides alarms to users to take necessary actions to help prevent unwanted shutdown.

PM109836



EvoPacT Mechanism Sensor MC110

This sensor is mounted on the mechanism shaft. This sensor measures the speed of the mechanism, and detects contacts rebound and incomplete opening conditions.

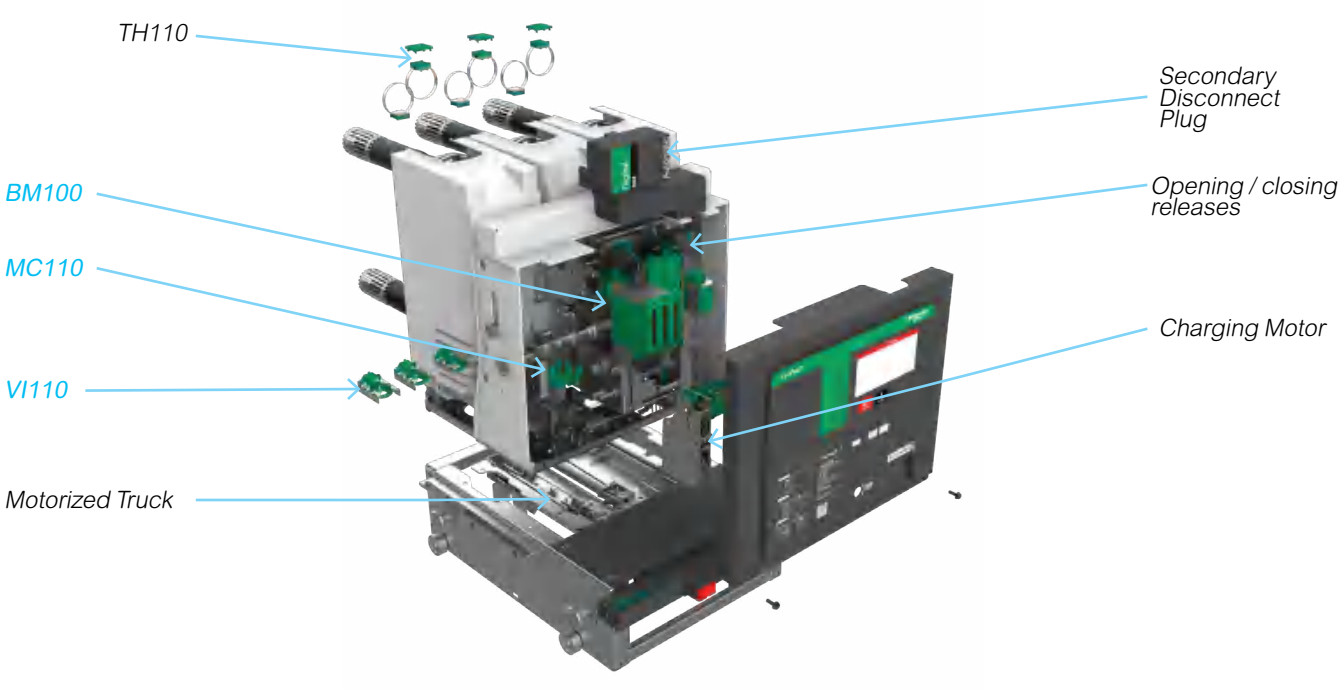
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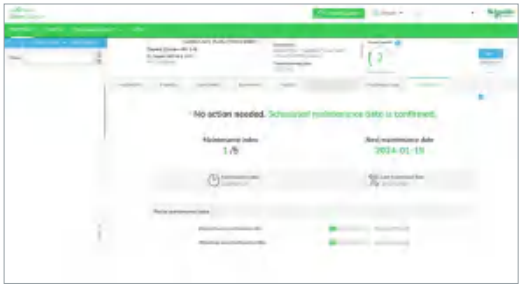
EvoPacT Vacuum Interrupter Sensor VI110

This sensor is mounted under the vacuum interrupter. They measure the vacuum interrupters contact wear and detect occurrences of asynchronism of the vacuum interrupters.

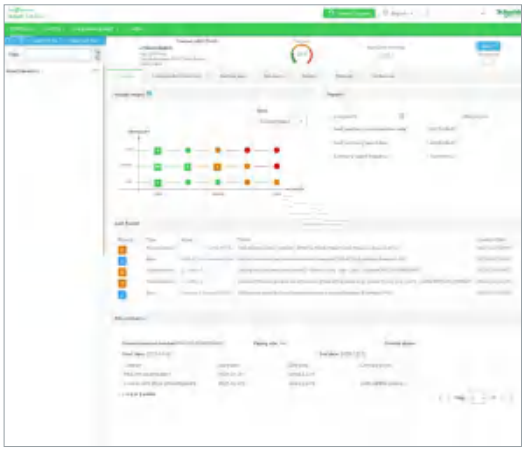
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EcoStruxure Ready Solutions
EcoStruxure Asset Advisor



Maintenance Index



Site view with Health matrix

Mitigate and anticipate potential electrical disruption

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

That is what you get with EcoStruxure Asset Advisor from the Schneider Electric Connected Services Hub.

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

Move from reactive to condition-based maintenance

- Breakthroughs in connectivity, sensor technology, and advanced analytics create an opportunity for you to improve your maintenance strategy on new circuit breaker.
- Discover new ways to optimize your critical electrical assets performance and secure your overall equipment efficiency.

Our EcoStruxure Asset Advisor solution

Connect your new MV circuit breaker to leverage Schneider Electric expertise and analytics to assess the health of your cubicles, natively equipped with a dedicated monitoring network:

- Cloud based monitoring with timely analysis of raw data sampled on field
- 24/7 support from Connected Service Hub experts
- Unlock value of data by smart alarming, indicators and status insights
- Users empowered to schedule the right maintenance at the right time
- Friendly user interface with customizable widgets and smartphone app
- Complaint with strong cybersecurity guidelines than Schneider has implemented to secure product development lifecycle

Cybersecurity best practices include:

- Manage risk with 24/7 asset health remote monitoring
- Secure operational excellence by reducing downtime risk and by optimizing your asset's lifetime
- Increase employee protection by detecting early abnormal conditions
- Achieve financial efficiency by minimizing unplanned shutdown, by monitoring your energy consumption, and by optimizing your maintenance budget

Click here to download the free version of
EcoStruxure Asset Advisor

Operational performance

- Fewer unscheduled downtimes
- Increased asset useful life
- Shorter time to fix
- Better compliance with regulations

Financial efficiency

- Lower total cost of ownership (TCO)
- Decreased disruption cost
- Decreased average maintenance cost/fix

Reduce risk

- Helping reduce personal risk through:
  - Maintenance expertise and continuity in high turnover environment
  - Early warning of impending equipment disruption

Peace of mind

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

EcoStruxure Ready Solutions
EcoStruxure Facility expert

Asset Management

> Improve efficiencies and expand your offerings

> Stay connected to maximize your operations

Energy Management

> Enhance your energy efficiency services

Introducing EcoStruxure Facility Expert

Use your digital logbook to create QR codes and track your assets for long-term maintenance schedules and task reminders. In one scan, you can not only log and access asset history, documentation, and collaborative information, but also generate inspection and activity reports.

Collect information from your connected panels and receive alerts with actionable data directly onto your mobile device allowing you to monitor energy consumption and equipment of one or more buildings.

Designed to be a highly secure, robust and resilient managed service is distributed across data centers in multiple locations. Schneider Electric is continuously monitoring the changing security landscape of cryptography and cybersecurity to help ensure that we offer the protection to our customers and their sensitive data.

Introducing the Digital Logbook

The digital logbook is an easy to use collaborative tool that keeps record of important documentation and maintenance schedules.

With EcoStruxure Power from Schneider Electric, you can offer your customers the cutting-edge, end-to-end digital solutions they are looking for to make their buildings more efficient and reliable. And now, with the addition of the Digital Logbook, EcoStruxure Power is an even stronger asset in all phases of a buildings lifecycle – from design and installation to operation and maintenance.

The digital logbook can be initiated by a panel builder using EcoStruxure Power Commission during switchboard construction. Then during the project handover, this “digital twin” can be shared to the contractor or the Facility Manager on EcoStruxure Facility Expert. The “Digital Twin” allows people to keep record of important construction documentations, user guide and maintenance schedules, collaborating better and delivering with greater insights and cost savings. And once a building is operational, facility managers or service providers have easy access to key information and maintenance plan which is critical for electrical facility upkeep.

- **Enjoy convenient digital access** to user manuals, single-line drawings, photos, factory and site acceptance tests, spare parts lists, and more
- **Share information** with your professional partners
- **Get things organized** and achieve a common goal
- **Create clear and consistent** documentation
- **Identify key responsibilities** and points of contact at different project stages
- **Help eliminate conflicting** or missing information

Range Description

Range Description

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Withdrawable MV Circuit Breaker Dimensions 25

General Characteristics

General characteristics for EvoPacT withdrawable MV circuit breakers

Designation			
Rated voltage	U_r	kV	5/15
Rated frequency	fr	Hz	50/60
Rated power frequency withstand voltage	U_d	kV	19/36
Rated short-circuit breaking current	Isc	kA	25/40
Rated duration of short circuit	tK	s	2
Rated continuous current	Ir	A	1200/2000
Rated operating sequences			O - 0.3s - CO - 15s - CO
			O - 0.3s - CO - 3min - CO
			O - 3min - CO - 3min - CO
No load mechanical endurance	Number of operations		30,000



Standard electrical characteristics according to IEEE C37.09, NEMA C37.54 CLASS S1 M2

Common Characteristics						
Rated voltage	U_r	kV	5		15	
Rated frequency	fr	Hz	60		60	
Rated power frequency withstand voltage (1 min) Phase-phase & Phase-ground	U_d	kV	19		36	
Rated impulse bil withstand voltage Phase-phase & Phase-ground	U_p	kV	60		95	
Rated operating sequence			O - 0.3s - CO - 15s - CO		O - 0.3s - CO - 15s - CO	
Rated continuous current		A	1200/2000		1200/2000	
Rated short circuit and short time breaking current		kA Sym	25	40	25	40
Rated duration of short circuit		s	2	2	2	2
Rated peak withstand current		kA	65	104	65	104
Percentage DC component			47%			
Interrupting time		ms	50ms, 3.00 cycles, 60Hz			

Electrical characteristics for capacitor rated circuit breakers

Capacitor Switching Rated Circuit Breakers (C2)			
		Ir 1200A	Ir 2000A
Rated capacitor back-to-back bank current	A	630	400, 1000
Rated cable-charging breaking current	A	25	25, 31.5
Rated line-charging breaking current	A	2-10	2-10
Rated capacitor bank inrush making current	kApk	20	20
No load mechanical endurance	cycles	30,000	
Classification		C2-M2	

General Characteristics

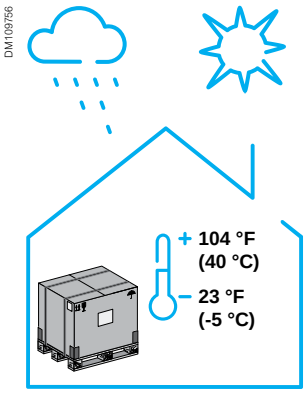
Electrical characteristics for generator rated circuit breakers according to IEC/IEEE 62271-37-013

Generator Rated Circuit Breakers			
Rated continuous current	A	1200/2000	
Rated short circuit and short time breaking current	kA Sym	25	25
Rated duration of short circuit	kA	2	2
Close-and-latch current	kApk	68.5	68.5
Interrupting time		3 cycles	
Classification		G2-M3	
Rated operating sequence		CO - 30min - CO	
Rated voltage		5kV	15kV
Rated power frequency withstand voltage		20kV	38kV

Operating Conditions

According to ANSI/IEEE
Designed to operate in the following conditions:

Operating Conditions		Indoor Switchgear
Ambient air temperature	Minimum	23 °F (-5 °C)
	Maximum	104 °F(40 °C)
Altitude (maximum without derating)	Stand alone circuit breaker	Less than or equal to 3300 ft (1000m)
Atmosphere	No dust, smoke, salt corrosive or flammable gas nor vapor	
Humidity	Average relative humidity over 1 month	≤ 90%



Other service conditions

If operated beyond the normal service conditions, the MV circuit breaker is submitted to accelerated aging.

The MV circuit breaker may only be used under conditions other than the normal service conditions with express written permission from Schneider Electric.

Storage

In order to preserve all of the devices characteristics when stored for prolonged periods, we recommend storing the device in its original packaging, in dry conditions, and sheltered from the sun and rain at a temperature of 70 °F (21 °C).

The maximum storage period is 12 months.

If the device was stored:

- Between 6 and 12 months: perform basic preventive maintenance to help ensure a correct device operation
- Beyond 12 months: contact your Schneider Electric Service local representative for device check-up.

Vacuum Interrupters

PVM110058



The heart of the MV circuit breaker

Vacuum interrupters are the heart of a MV circuit breaker: its electrical performances highly depend upon the vacuum interrupters characteristics and quality. They must convey and break the rated normal current as well as the rated short circuit one for a number of times specified by the manufacturer.

Brand new design

Schneider Electric has been designing and producing its own vacuum interrupters for 45 years and carries a unique knowledge in this field.

For the EvoPacT MV circuit breaker, Schneider Electric has designed a brand new range of vacuum Interrupter, following the very robust process of development: "Model based system engineering". Specific and innovative solutions have been implemented: the VI shape, the contacts shape, the specific barriers to help protect ceramic, the petal shape of the radial magnetic field.

Designed to serve high performances and energy continuity

The result is a range of vacuum interrupters with high electrical performances, long life expectancy, high endurance, in a compact volume.

Available up to 2000A, 40kA and endurance tested up to 30,000 operations, three the industry standard. Also enhanced with C2 class capacitive switching.

Our compact volume of the new VI allows to increase the insulation distance within the circuit breaker, enhancing reducing risk and smooth operation.

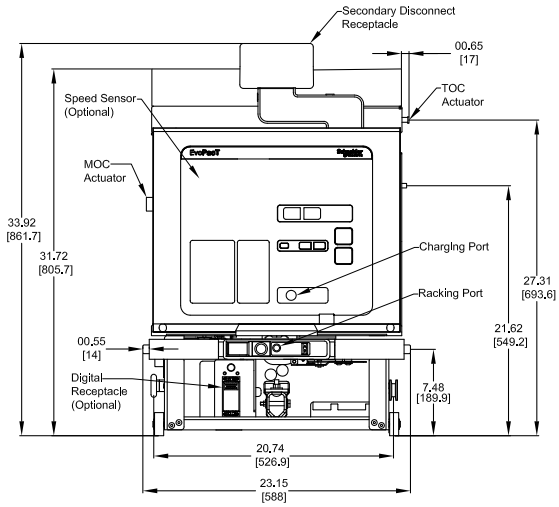
The capacitive switching is also enhanced with C2 class for back to back capacitors installation.

Withdrawable MV Circuit Breaker Dimensions

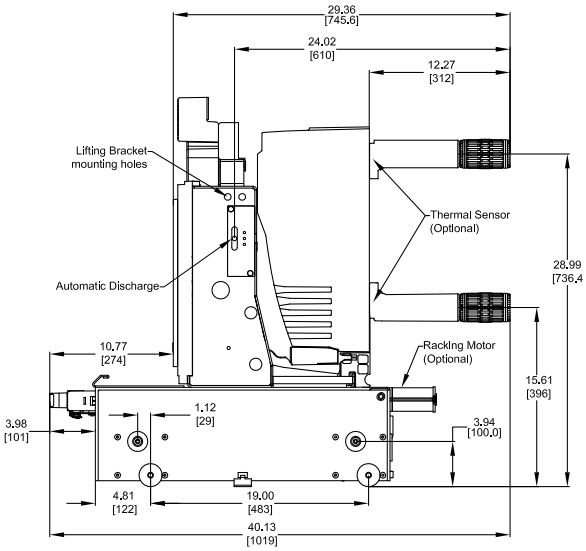
5, 15kV, less than/equal to 2000A, less than/equal to 40 kA

GEX67119.02

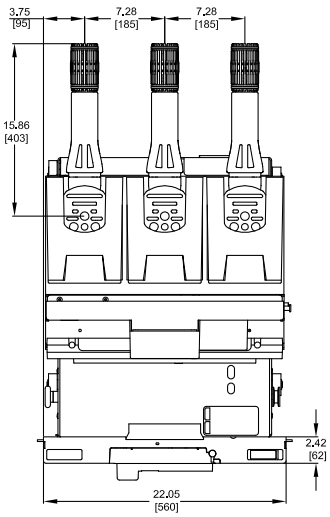
FRONT VIEW



RIGHT SIDE VIEW



TOP VIEW



Note 1: Keylock is optional.

5-15kV Circuit Breaker Rating	Weight
1200A, 25kA and 40kA	340 lb. (155 kg)
2000A, 25kA and 40kA	410 lb. (186 kg)

Function and Modules Description

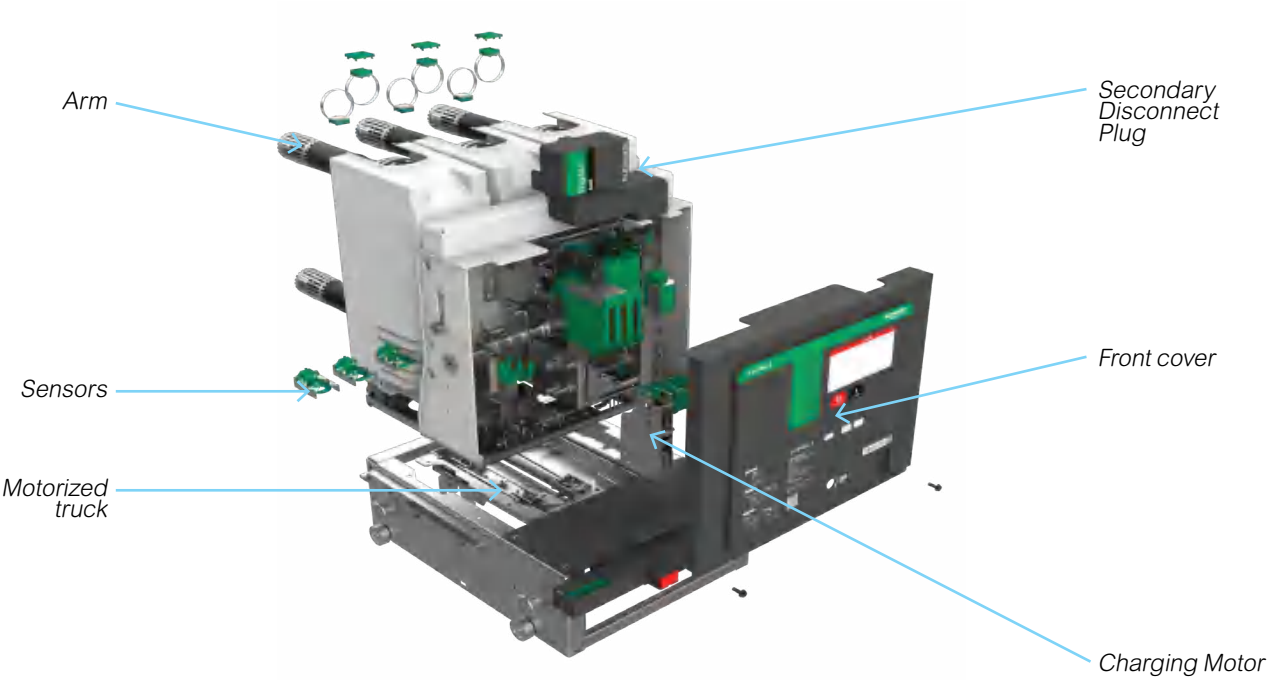
Function and Modules Description

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Overview

MV Circuit Breaker

PM109558



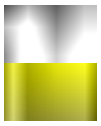
Pushbuttons and indicators



Opening pushbutton



Closing pushbutton



Spring charged and ready-to-close indicator

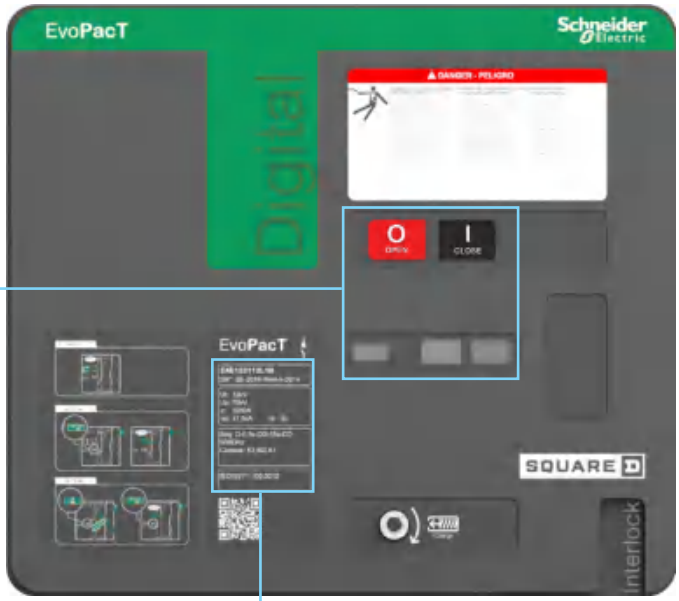


Main contact position indicator



Operating counter

EvoPacT nameplate



Nameplate

Opening and Closing Functions

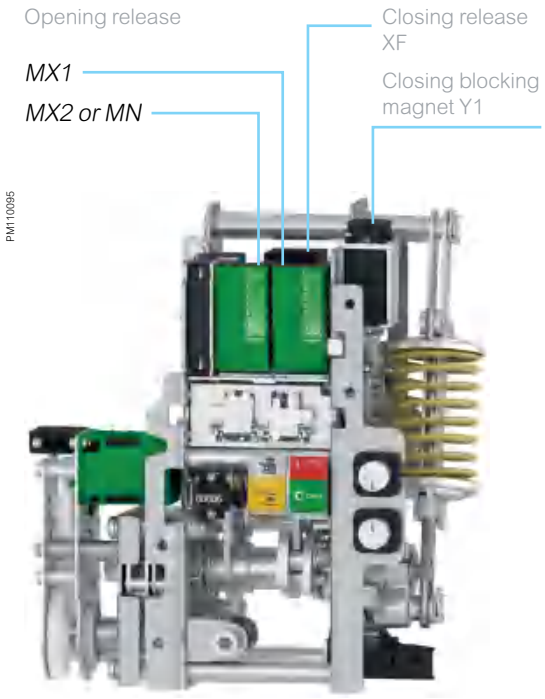


Image intended for reference only



Electronic release for MX1/MX2 and XF

Operating Mechanism

Opening release MX

The MX1/MX2 release is used to open the MV circuit breaker. The release coil is actuated by the auxiliary power supply.
The coil is an electronic device rated for latched operations; circuit breaker auxiliary contacts shall not be wired in series to the coil.
The coil also features a monitoring output connected to the BM100 when circuit breaker health monitoring features are required.

Characteristics		
Rated nominal voltage	V AC	120V - 240V
	V DC	24 - 48 - 125 -250
Operating range	V AC	104V to 127V - 208V to 254V
	V DC	14V to 28V - 28V to 56V - 70V to 140V - 140V to 280V
Consumption	Inrush Power	250 W/VA
	Continuous Power	5W/WA

MX1/MX2 coils are suitable for use with a capacitor trip unit in case the trip circuit is powered with an AC source. Switchgear manufacturer to select a capacitor trip unit that features sufficient energy storage to satisfy the application requirements.

Shunt closing release XF

The XF release is used to close the MV circuit breaker. The release coil is actuated by the auxiliary power supply.
The coil is an electronic device rated for latched operations; circuit breaker auxiliary contacts shall not be wired in series to the coil.
The coil also features a monitoring output connected to the BM100 when circuit breaker health monitoring features are required.

Characteristics		
Power supply	V AC	120V - 240V
	V DC	24 - 48 - 125 -250
Operating range	V AC	104V to 127V - 208V to 254V
	V DC	21V to 28V - 36V to 56V - 90V to 140V - 180V to 280V
Consumption	Inrush Power	250 W/VA
	Continuous Power	5W/WA

Opening and Closing Functions

PM110087



Undervoltage release MN

Undervoltage release MN

The undervoltage release operates to open the MV circuit breaker when the voltage at the terminals of the release falls below 70% of its rated voltage, the trip signal is continuously applied to the MV circuit breaker until the release resets.
As the supply voltage increases, the undervoltage release resets between the 70% and 85% of its rated voltage.
The closing of the MV circuit breaker is always possible when the voltage at the terminals of the release is equal to or exceeds 85% of its rated voltage.

Characteristics					
Power supply	V AC	120			240
	V DC	24	48	125	250V
Operating range	Opening	<70% of Rated Voltage			
Inrush consumption (W/VA)	V AC	250			
	V DC				
Latching consumption (W/VA)	V AC	5			
	V DC				

Charging Functions

MV Circuit breaker charging motor and auxiliary contacts



Charging motor

Operating mechanism

Charging motor

The electric motor charges the spring of the operating mechanism automatically as soon as it is discharged.

Characteristics		
Power supply	V AC	120 - 240
	V DC	24 - 48 - 125 - 250
Operating range	V AC	0.85 to 1.1 Ua
	V DC	0.85 to 1.1 Ua
Consumption	V AC	approx. 180 VA
	V DC	approx. 180 W

Operating time of motor	
Motor charging time	≤12 s

Circuit breaker On/Off status auxiliary switch S11

The auxiliary switch S11 is linked to the circuit breaker shaft and may be used to provide electrical indication of the circuit breaker status (open vs closed).
The number of available auxiliary contacts varies according to the selection of Contact+ features. Five normally open contacts (52/a) and four normally closed contacts (52/b) are provided as a standard. In case Contact+ features are selected, ten normally open contacts (52/a) and nine normally closed contacts (52/b) are provided.

PM110023



Auxiliary switch S11

Characteristics								
Rated operating voltage (Ue)	V AC/ DC	250						
Rated thermal current (Ic)	A	10						
Rated short-time withstand current (Icw)	A	250 (during 3s)						
Rated breaking capacity with inductive charge		**L/R=10 ms**				**L/R=20 ms**		
Voltage		24 VDC	48 VDC	125 VDC	250 VDC	120 VAC	240 VAC	
Switching current	A	10	8	3	2	8	4	
Max capacity (W)		440						

PM110089



Auxiliary switch in charging position S2

Spring charging status auxiliary switch S2

The auxiliary switch is used to control the charging motor and to indicate the charging status..

When contact S2 is closed, the motor is powered on and charges the spring of the operating mechanism. When charging is complete, it breaks the electrical charging circuit.

Micro switch for charging	5 A / 250 V DC	16 A / 250 V AC
Micro switch for control	16 A / 250 V AC	

Low Voltage Connection

EvoPacT Product Image

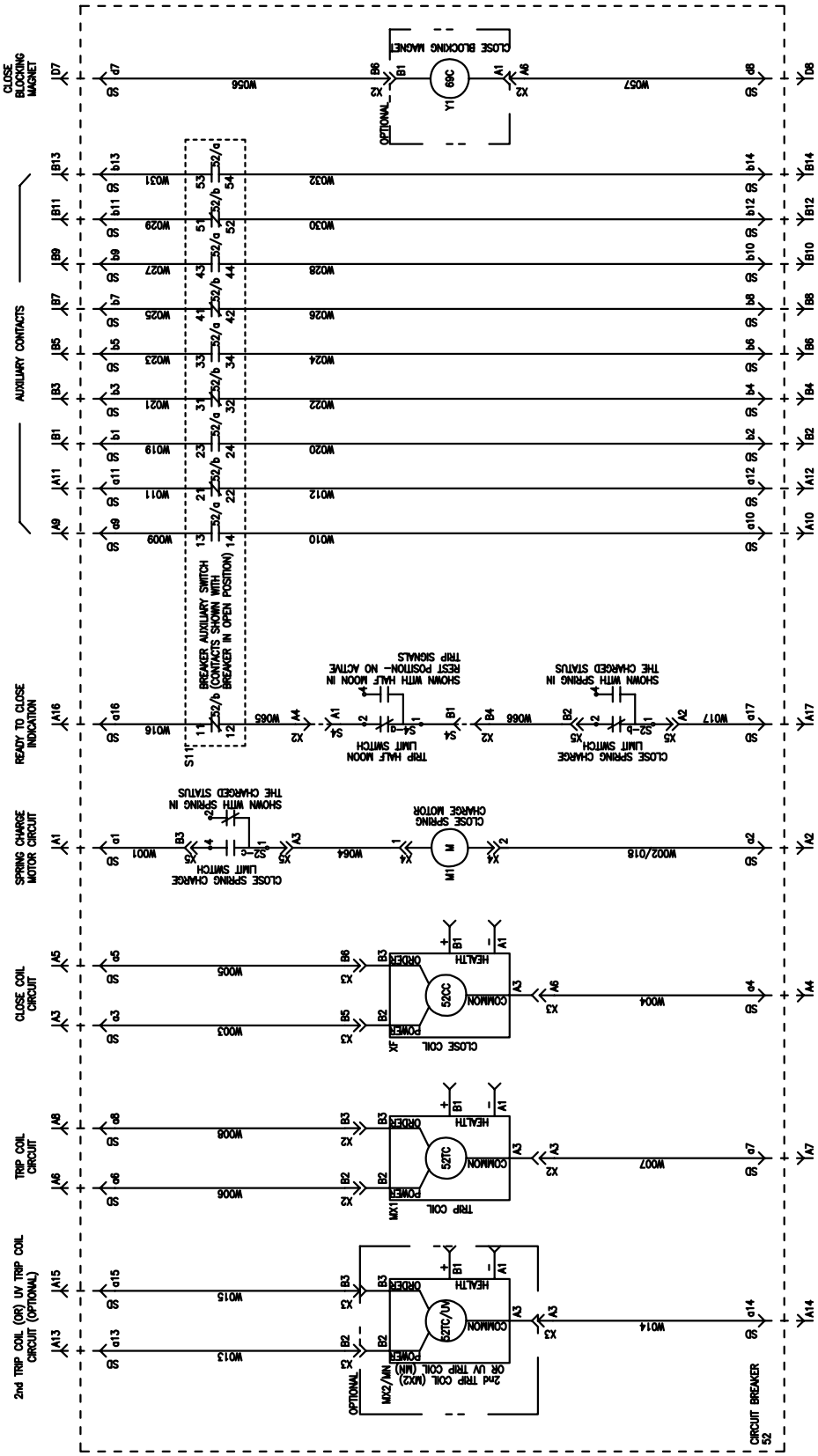


Secondary Disconnect Plug for Power and Control

Located at the top center of the circuit breaker, the secondary disconnect plug automatically connects with the secondary disconnect receptacle in the MV circuit breaker compartment when the MV circuit breaker is racked in. It also allows connection to the secondary receptacle to test the MV circuit breaker electrical control when in the test position.

Typical Circuit Breaker Electrical Schematic

Always refer to the specific circuit breaker schematic diagram in the customer order drawings.



Typical Circuit Breaker Electrical Schematic

Note: Information on the operation of the circuit breaker:

• Operation of coils MX1, MX2, and MN causes the circuit breaker to open.

• Operation of coil XF causes the circuit breaker to close provided that the ready to close conditions are met. Refer to “Ready to Close” Indication, page 43 in this user guide, for further information.

• Coils XF, MX1, MX2 are actuated when:

A. Rated voltage is applied across the “power” terminal and the “common” terminal, and

B. Rated voltage is applied across the “order” terminal and the “common” terminal

When voltage is applied exclusively across the “power” terminal and the “common” terminal, only the electronic board of the coil is powered up allowing monitoring functions (if equipped) to run, but the coil plunger is not actuated.

• Coils MX2 and MN are optional and may not be provided.

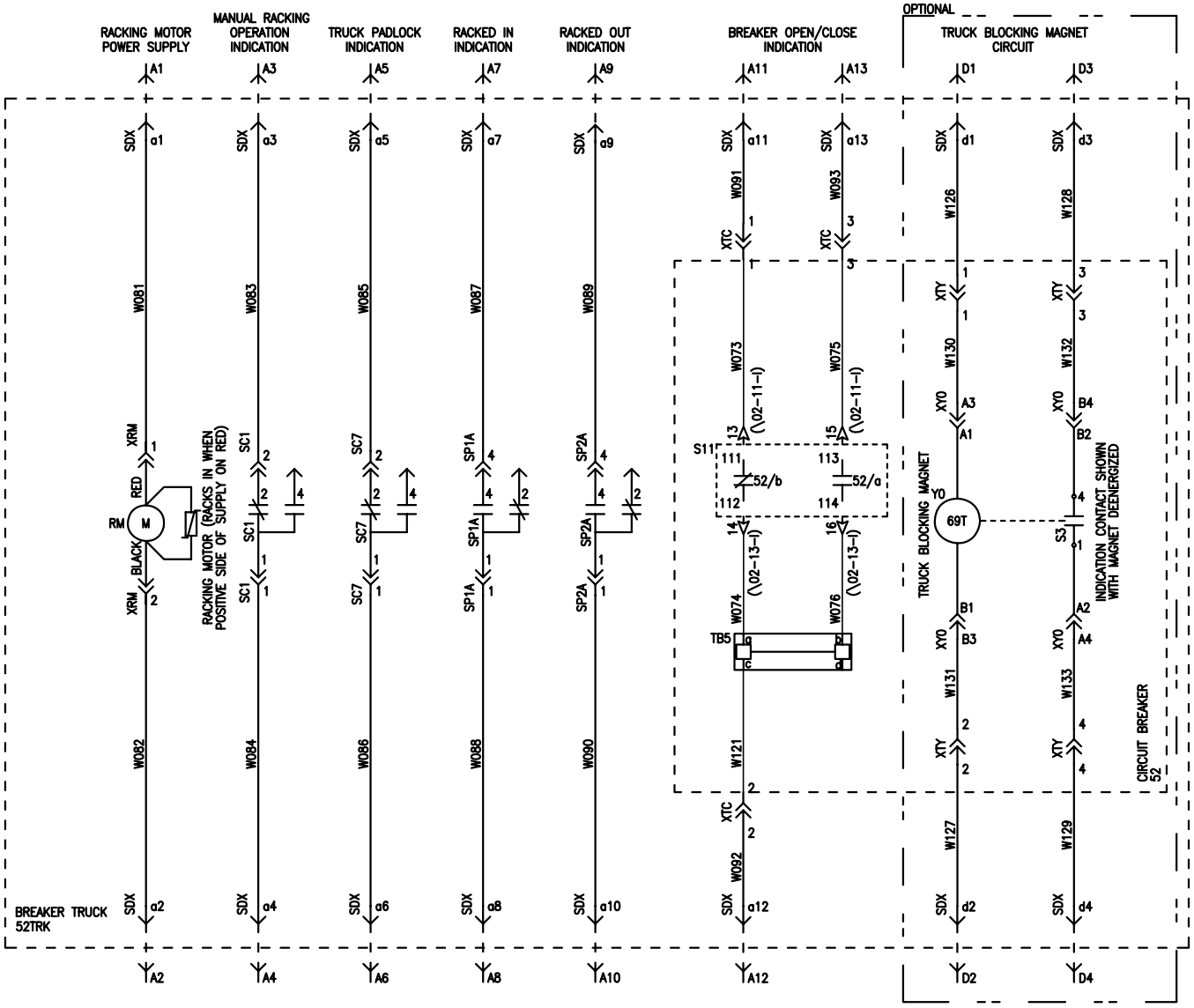
• Coil MN operates when the voltage across its terminals is below 70% of its rated value. The coil may reset when the voltage across its terminals is between 70% and 85% of its rated value and will reset when the voltage across its terminals is above 85% of its rated value. Coil MN is optional and may not be provided.

• When magnet Y1 (if equipped) is energized, the circuit breaker is allowed to close via an electrical (close coil) or mechanical (push button) command. Removing the power supply to the magnet helps prevents any closing operations to be performed. It is recommended to wire a normally closed circuit breaker auxiliary contact in series to Y1 in the equipment instrumentation compartment in order to extend the magnet lifespan and to decrease its energy consumption. Magnet Y1 is optional and may not be provided.

• Anti-pumping function is provided through mechanical features. Wiring circuit breaker auxiliary contacts to the tripping or closing circuit defeats the mechanical anti-pump system.

• Switch S2 is shown with closing spring in the charged position.

Motorized Racking Mechanism Option — Electrical Schematic



Motorized Racking Mechanism Option — Electrical Schematic

Note: Microswitch contacts in schematic are shown with:

• Racking mechanism not under manual operation

• Racking mechanism red racking/emergency trip push button not padlocked

• Racking mechanism in transport position. SP1A and SP1B (when equipped) closed when circuit breaker is fully racked in, SP2A and SP2B (when equipped) closed when the circuit breaker is fully racked out.

Note: When magnet Y0 is energized, the circuit breaker is allowed to be racked in or out (mechanically or electrically). Removing the power supply to the magnet helps prevents from any manual racking operations to be performed. Use limit switch S3 to interlock racking motor in case breaker electrical racking is required.

Racking Truck

Withdrawable type

Our withdrawable EvoPacT is mounted on a racking truck to move the MV circuit breaker between test position and service position .

The EvoPacT racking truck includes:

- A carrier with four wheels for rolling the MV circuit breaker on flat surfaces
- A drive system with a rotating shaft to move the MV circuit breaker from/to the service position when housed inside the switchgear compartment
- An optional motor drive for electrical operation A motor control circuit shall be provided in the control cabinet of the switchgear that houses the circuit breaker)
- A set of mechanical levers to interlock the truck with the operating mechanism
- A system to latch the racking truck to the switchgear frame

The MV circuit breaker is equipped with devices to operate the shutter mechanism.

Characteristics		
Power supply	V DC	125
Operating range	V DC	0.85 to 1.1 Ua
Consumption	V DC	37 W

Interlock Functions

EvoPacT Withdrawable Position Detail

The following table describes the interlocking functions available on withdrawable function of EvoPacT.

How to use the table

Each box describes the possible status of parts interlocked with the MV circuit breaker at a given status.

- Connected: The MV circuit breaker power connections are connected to the switchgear contacts, the LV auxiliary circuits are connected.
- Transport: The MV circuit breaker is moving from the disconnected position to the service position or vice versa
- Test/Disconnected: The MV circuit breaker is inside the switchgear compartment; its power connections are separated from the switchgear contacts by shutters and the LV top auxiliary circuits are disconnected, and the switchgear door can be closed. The top auxiliary circuits can be manually connected with the door open.
- Removed/Withdrawn: The MV circuit breaker with the racking truck is extracted from the switchgear.

MV Circuit breaker status				
	Racking-in ◄------- -------► Racking-out			
Parts	**Connected**	**Transport**	**Test/Disconnected**	**Removed/Withdrawn**
Locking tabs	Locked	Locked	Locked / Unlocked	Unlocked
Secondary disconnect plug for MV circuit breaker power and control	Connected	Connected / Disconnected(1)	Connected / Disconnected	Disconnected
Low voltage plug for additional features	Connected	Connected	Connected	Disconnected
Compartment door(2)	Closed	Closed	Closed / Open(3)	Closed / Open(4)
MV Circuit breaker main vacuum bottle position	Open / Closed	Open	Open / Closed	Open(5)
MV Circuit breaker compartment racking padlock and keylock (optional)	Padlock install / key removal not possible	Padlock install / key removal not possible	Padlock install and / or key removal possible to allow lockout	Padlock install and / or key removal possible to allow lockout
Shutters	Open	Operating(6)	Closed	Closed

(1) In the transport position, the secondary disconnect plug may be in a connected or disconnected state. It is recommended to have the door closed and properly latched when the MV circuit breaker is in the transport position, which requires the secondary disconnect plug to be in the normal disconnected position.

(2) The door is not mechanically interlocked and may be open or closed at any time. It is recommended to have the door closed and properly latched when the MV circuit breaker is in the transport or connected positions. When motorized racking option is selected, the MV circuit breaker compartment door must have a limit switch electrically interlocked with the motor of the racking mechanism that helps prevents electrically racking the MV circuit breaker in or out when the door is open.

(3) In the test / disconnected position, the door may be closed or open. While testing the MV circuit breaker, the MV circuit breaker compartment door must be opened to access the handle for the secondary disconnect receptacle assembly in the MV circuit breaker compartment. The door must remain open if the handle has pulled the receptacle to the test position.

(4) While withdrawing the MV circuit breaker, the MV circuit breaker compartment door will be open, but may be closed and latched after it is fully removed.

(5) After withdrawing the MV circuit breaker, the MV circuit breaker will be open, but may be operated outside the compartment after it is fully removed.

(6) The shutters are not operating the entire time during transport. The shutters perform the open or close operations in a very immediate operation as the MV circuit breaker either moves from connected to test/disconnected position or vice versa.

Other Complementary Devices

PM110008



Operation counter

Operation counter

The operation counter installed on the operating mechanism records the number of opening/closing cycles.

Blocking magnets

PM110093



Blocking magnet on closing Y1

Blocking magnet on closing Y1

If the controlling power supply to operate this magnet is lost, the MV circuit breaker cannot perform the normal closing operation (including manual closing).

Characteristics		
Power supply	V AC	110/120/220/240
	V DC	24/48/60/110/125/220/250
Operating range	V AC	0.85 to 1.1 Ua
	V DC	0.85 to 1.1 Ua
Consumption	V AC	12±1 VA*
	V DC	12±1 W*

PM110018



Blocking magnet on racking truck Y0

Blocking magnet on racking truck Y0

If the secondary controlling power supply is lost, the truck cannot be racked in or out (either manually or by motorization).

Characteristics		
Power supply	V AC	120
	V DC	125
Operating range	V AC	0.85 to 1.1 Ua
	V DC	0.85 to 1.1 Ua
Consumption	V AC	3.6 VA
	V DC	3.6 W

Product References

Please contact your Schneider Electric sales representative for spare parts information.

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Green Premium™ ecolabel product - Sustainable performance, by design

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