

The construction of the switchgear is modular by design. It is custom built to meet your project specific application parameters and has a broad set of features that can be tailored to meet your performance, reliability and safety requirements. The design draws on Eaton's extensive experience in insulation technologies, combining cast resin insulation and fully insulated busbar systems.

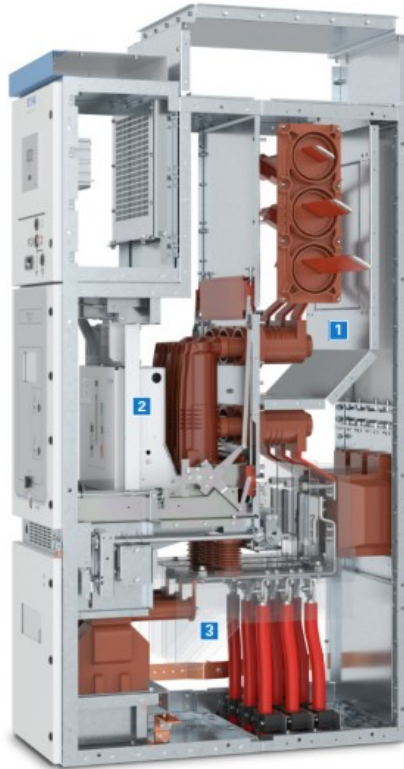
The Switchgear platform has three high-voltage compartments separated by earthed metal barriers, providing the highest loss of service continuity classification LSC2B and partition class PM:

**1. The busbar compartment**

- Pressure relief for venting into the arc channel
- Busbars are fully insulated along their entire length
- Segregation of busbars per panel or number of panels

**2. The switching device compartment**

- Pressure relief for venting into the arc channel
- Test position included for full functional testing of the switching device without connection to primary power
- Includes all the safety interlocking mechanisms required for safe and reliable operation
- Houses SF6 free switching devices using cast resin solid insulation technologies to ensure complete segregation and isolation between phases and between phases and earth
- Optional remote racking and operation of the withdrawable switching devices



**3. The cable compartment**

- Pressure relief for venting into the arc channel
- Connection for up to 9 cables per phase
- Provision for connection of primary cables from the front side
- Multiple sets of current transformers per phase
- Fixed/removable or fully withdrawable voltage transformers
- Houses the fixed integral fault making earthing switch, manually operated from the front side
- Optional remote operation of the earthing switch

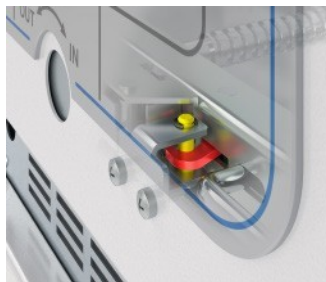
Pressure relief solutions are available for venting gases either inside or outside of the electrical switch room and can be configured with full or low height arc channels to match your switch room parameters.

The Switchgear is designed for maximum flexibility with switchboards capable of being positioned back to wall, front to front or back to back.

**Safety and reliability through accessibility of compartments**

Ensuring safety of personnel whether through operation or under maintenance is essential. Restricting access to high-voltage compartments is achieved through design. The Switchgear has the following accessibility definitions according to IEC62271-200:

- Busbar compartment:
- Tool-based/non accessible
- Switching device compartment: Interlock controlled
- Cable compartment: Tool-based or option for interlock controlled



Interlock controlled access to the switching device compartment.



Interlock controlled access to the cable compartment.



# xGear, Power Xpert UX

## MV Switchgear

### Internal arc classification (IAC) AFLR up to 50kA for 1 second

#### Arc free zones

Fully insulated and isolated current paths reduce the potential for internal faults through the creation of arc free zones.



#### Features

##### Highest loss of service continuity classification (LSC2B)

Safety of personnel is critical, including during installation and maintenance. The ability to work on an installation without switching off the power to maximize uptime is defined as "Loss of Service Continuity" (LSC). It describes the extent to which the switchgear and control gear are allowed to remain operational in case access to a main circuit compartment is necessary. The Switchgear has the highest classification, LSC2B, as standard. This rating indicates that it is safe to open the switching device compartment when the cables and busbars are energized.

##### Fully insulated and isolated design

The Switchgear utilizes insulating medium throughout the high-voltage current path to create and ensure arc free zones. This increases the lifetime reliability of the system as well as to ensure a safer environment under maintenance.

##### SF<sub>6</sub>-free design

The combination of vacuum interrupters for switching, cast-resin technology and clean air as the isolation medium ensures that the Switchgear is an environmental friendly system. Without SF<sub>6</sub> The combination of vacuum interrupters for switching, cast-resin technology and clean air as the isolation medium ensures that the Switchgear is an environmental friendly system.

In the unlikely event of an Internal arc fault, the metal enclosed design and robust construction enables the The Switchgear system to successfully pass internal arcing tests in accordance with IEC 62271-200. This standard defines the required level of protection in the event of an internal arc fault, in all three primary compartments up to 50kA for 1 second.

##### Vacuum circuit breaker technology

By designing a simple and efficient low energy spring- charged mechanism with the minimum possible number of parts, the maintenance requirements normally associated with this type of mechanism are minimized. The W-VACi breaker is virtually maintenance-free.

##### Vacuum contactor technology

Developed with cutting-edge technologies, Eaton's withdrawable type vacuum contactor switching devices are world- leading in terms of performance, safety and functionality. With a mechanical life up to 1,000,000 operations contactor switching devices are used in frequently operated loads and harsh environments.

The system has been proven by independent 3rd-party testing to provide an internal arc classification (IAC) of AFLR.

A = Protection for personnel

F = Protection at the front

L = Protection at the sides

R = Protection at the rear

##### Fully withdrawable voltage transformers

Fully withdrawable voltage transformers with shutters are available for safe operation under live conditions.

##### Busbar system

The The Switchgear busbar system is fully insulated along its entire length with molded supports providing segregation of the busbar chambers to adjacent panels. This ensures maximum integrity and provides a virtually maintenance-free busbar system.

##### Harsh environment protection

In areas where high-voltage switchgear can be exposed to harsh environments, solutions are available to avoid or minimize the impact to electrical current carrying components.



Eaton's newest range of IEC W-VACi vacuum circuit breakers are virtually maintenance-free.



Independently operated and lockable shutters allow for safe cable or busbar testing while adjacent compartments remain live.



A fully insulated busbar system provides a virtually maintenance-free system.



Fully withdrawable voltage transformers with shutters allow safe operation under live conditions with the cable compartment door closed.

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## MV Switchgear

### Optional panel and switchgear solutions

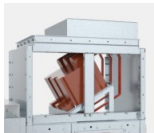
- Fused load-break switch panels up to 24kV as an alternative for withdrawable switching devices
- 400mm wide Slimline vacuum contactor panels up to 7.2kV
- 600mm wide vacuum contactor panels up to 12kV
- Single width panel solutions with cables in/out (top/bottom, top/top)
- Back to wall installation
- Back to back, front to front and 'U' shaped configurations
- Top entry solutions for primary and secondary cables
- Bus-duct connections



Single width panel solution with cable in/out (top/bottom).

### Space saving solutions

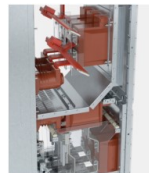
- Current and voltage transformers located in the bus riser
- Voltage transformer and integral fault-making busbar earthing combined in the bus coupler
- Top mounted voltage transformers
- Top mounted integral fault making busbar earthing
- Multiple sets of current transformers per phase
- Fixed/removable and withdrawable voltage transformers
- On board control power transformer (contactor)



Top mounted voltage



Top mounted integral fault-making busbar earthing.



Multiple sets of current transformers per phase.



Current and voltage transformers located in the bus riser.

### Primary Component



Vacuum circuit breakers  
Type W-VACi

- Type tested in accordance with IEC62271-100
- 12/17.5kV up to 4000A 50kA/3sec.
- 24kV up to 2500A 31.5kA/3sec.
- Wide range of AC or DC auxiliary control voltages
- Full range of accessories
- Optional remote racking capability
- Electrical or mechanical key interlocking options



Vacuum contactors  
Type W-SLC

- Tested in accordance with IEC 62271-106
- Mid-mount type
- 3.6/7.2/12kV ratings
- Contactor switching up to 400A
- Maximum fuse/contactor combination: 200A
- Breaking capacity with fuse up to 50kA
- Optional remote racking capability



Earthing Switch

- Type tested in accordance with IEC62271-102
- 12/17.5kV up to 50kA/3sec. 130kA peak
- 24kV up to 31.5kA/3sec. 80kA peak
- Optional remote operating capability



Protection relay can be provide as client request , as follows :

- EATON
- GE Multilin
- SEL
- PNC
- Etc.

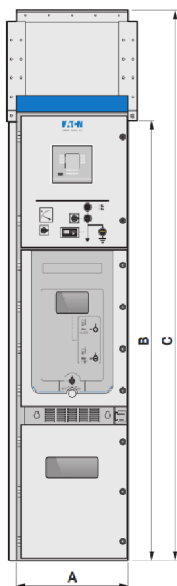
### Protection and Control

# xGear, Power Xpert UX

## MV Switchgear

### Electrical data

System		3.6 kV	7.2 kV	12 kV	17.5 kV	24 kV
Rated voltage	kV	3.6	7.2	12	17.5	24
Impulse withstand voltage	kV	40	60	75	95	125
Power frequency withstand voltage	kV	10	20	28	38	50
Rated frequency	Hz	50/60	50/60	50/60	50/60	50/60
<b>Busbar system</b>						
Rated normal current	A	630 ... 4000				630 ... 2500
Rated short time withstand current	kA/s	25 ... 50/3				20 ... 31.5/3
Rated peak withstand current	kA	63 ... 125				50 ... 80
<b>Circuit-breaker type W-VACi</b>						
Rated nominal current	A	630 ... 4000 (FC)				630 ... 2500
Rated breaking current	kA	25 ... 50/3				20 ... 31.5/3
Rated short-circuit making current	kA	63 ... 125				50 ... 80
Rated short time withstand current	kA/s	25 ... 50/3				20 ... 31.5/3
<b>Contactors type W-SLC</b>						
Rated nominal current	A	400			-	-
Rated current contactor / fuse combination	A	Max. 200			-	-
Rated breaking current	kA	50 (limited by the fuse)			-	-
Rated short time withstand current	kA/s	6/1			-	-
Rated peak withstand current	kA	15.6			-	-
<b>Earthing switch</b>						
Rated short-circuit making current	kA	63 ... 130				50 ... 80
Rated short time withstand current	kA/s	25 ... 50/3				20 ... 31.5/3
<b>Contactors type W-SLN (Slimline)</b>						
Rated nominal current	A	400			-	-
Rated current contactor / fuse combination	A	Max. 400 (double fuse)			-	-
Rated breaking current	kA	50 (limited by the fuse)			-	-
Rated short time withstand current	kA/s	6/1			-	-
Rated peak withstand current	kA	15.6			-	-
<b>Earthing switch</b>						
Rated short-circuit making current	kA	15.6			-	-
Rated short time withstand current	kA/s	6/1			-	-
<b>Internal arc</b>						
Internal arc classification AFLR	kA/s	Up to 50/1				Up to 31.5/1
<b>Enclosure data</b>						
Degree of protection		IP4X (IP41, IP42 or IP44 as an option)				
Loss of service continuity category		LSC2B				
Partition class		PM				
Standard color		RAL7035				



### Main dimensions

System	Width A (mm)	Height B (mm)	Height C <sup>1)</sup> (mm)	Depth D (mm)
<b>3.6/7.2kV</b>				
Slimline contactor	400	2200	2760	1770
<b>3.6/7.2/12kV</b>				
Mid-mount contactor panel	600	2200	2760	1320
<b>3.6/7.2/12/17.5kV</b>				
630A - 25kA	600	2200	2760	1320
1250A - 25/31.5kA	600	2200	2760	1320
2000A - 25/31.5kA	800	2200	2760	1320
2500A - 25/31.5kA	800	2200	2760	1320
1250A - 40/50kA	800	2200	2760	1500
2000A - 40/50kA	800	2200	2760	1500
3150A - 25/31.5/40/50kA	1000	2200	2760	1500
<b>24kV</b>				
1250A - 20/25/31.5kA	800	2320	2880	1570
2000A - 20/25/31.5kA	1000	2320	2880	1570
2500A - 20/25/31.5kA	1000	2320	2880	1570

<sup>1)</sup> Total height with standard arc channel for venting gases outside the switch room.  
For the availability of low height arc channels and integral arc absorber solutions, please contact Eaton.



# xGear, Power Xpert UX MV Switchgear

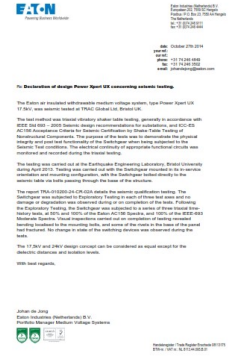
## Certificate



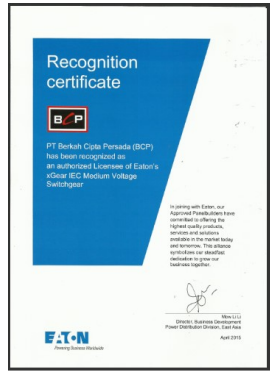
Type Test Certificate by CESI



Local Content Certificate by  
MINISTRY OF INDUSTRY



Type Test Certificate by seismic



License Certificate of xGear  
By EATON

## Success Story

NO	Project Name	Customer	Market Application
1	PLTGU Tanjung Batu	PT. PLN (Persero)	Power Plant
2	PLTP Lahendong Unit 5 & 6	PT. ReKayasa Industri	Power Plant
3	Pertamina Sungai Gelam	PT. Bukaka	Oil & Gas
4	Pertamina Ketalang	PT. Bukaka	Oil & Gas
5	Terminal LPG Refrigerated Tanjung Sekong	PT. Wijaya Karya	Oil & Gas
6	New Effluent Water Treatment Plant (EWTP) Pertamina RU VI Balongan	PT. Recon Sarana Utama	Oil & Gas
7	Pembanguna Pipa CY III Lomanis	PT. Nindya Karya	Oil & Gas
8	Pertamina EP Tanjung	PT. Nindya Karya	Oil & Gas
9	Grati Add ON	PT. PP	Utility
10	PLN Paya Pasir	PT. ETI	Utility
11	Paya Pasir Bridging	PT. ETI	Utility
12	Ciberut Aggregated Biomass Gasification Power Plant	PT. Inti Karya Persada Teknik	Utility
13	ADD ON Grati Block 2	PT. PP (Persero) Tbk	Utility
14	Kupang	PT. Indo Fuji Energi	Utility
15	Gunung Madu Plantations	PT. Mahardika Wisnu Karya	Utility
16	PT. Polycemindo	PT. Polycemindo	Industrial