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Numerous applications.**

SINGLE SOLUTIONS.

MV Switchgear Range from the leaders in LV Switchgear



Switchgear Factory, Navi Mumbai



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Switchgear Factory, Vadodara

L&T Electrical & Automation (E&A) is a market leader for electrical distribution, monitoring and control solutions in the low voltage category.

Popular among customers as L&T Switchgear, E&A offers a wide range of low and medium voltage switchgear, motor starters, electrical systems, industrial automation, building electrical solutions, energy management solutions, electrical modernization solutions and metering solutions. Its products and solutions cater to key sectors of economy like industries, utilities, infrastructure, building and agriculture.

E&A's manufacturing operations at Navi Mumbai, Ahmednagar, Vadodara, Coimbatore and Mysuru in India adhere to global practices of excellence and receive support from well-equipped in-house design and development centres as well as tooling facilities that contribute to precision in manufacturing.

Air Insulated Switchgear (AIS) is used for control and protection of electrical power distribution system. In our AIS, Vacuum Circuit Breaker (VCB) is used as the switching device with air as the insulating medium in a metal clad enclosure. The protection and control is offered by numerical relays.

The VCB is type tested as per IEC 62271-100 and the metal clad enclosure is type tested as per IEC 62271-200, at reputed international laboratories viz. CPRI, ERDA, CESI, KEMA, ASTA to assure highest quality standards.

The AIS panel is available for the system voltage of 3.3kV, 6.6kV, 11kV, 22kV, & 33kV and for current ratings upto 3150A with natural cooling. The short circuit ratings are available upto 50kA for 3 sec for 11kV & 31.5kA for 3 sec for 33kV. To prove its suitability for use in severe climatic conditions, the switchgear has been subjected to climatic aging tests according to IEC 60932, and proven to Design Class 2 (the highest class). The switchgear has been designed and tested as per IEC 62271-200 to ensure the safety of the operator in the event of an internal-arc fault. Arc vents are provided in the busbar, cable and VCB compartments.

The switchgear has also been successfully tested to withstand seismic forces of 5-7 on the Richter scale, in accordance with IEC 60068-3-3.

Ahmednagar MV Manufacturing Facility



OFFERINGS



11kV, 800A, 40kA VCB



33kV, 800A, 31.5kA VCB

Fault Level (kA)		26.3				40/50			
Current Rating(A)									
Rated Voltage	Type of Panel	630A	800A	1250A	2000A	800A	1250A	2000A	3150A
upto 12kV	Full panel	✓	✓	✓	✓	✓	✓	✓	✓
	Sub-cubicle	✓	✓	✓					
	Half-panel	✓	✓	✓	✓	✓	✓	✓	✓

Fault Level (kA)		31.5		
Current Rating(A)				
Rated Voltage	Type of Panel	800A	1250A	2000A
24kV*	Full panel	✓	✓	✓
	Half-panel	✓	✓	✓

Fault Level (kA)		31.5		
Current Rating(A)				
Rated Voltage	Type of Panel	800A	1250A	2000A
36kV	Full panel	✓	✓	✓
	Half-panel	✓	✓	✓

* 36kV VCB will be given for 24kV requirements.

- Full Panel: Complete panel having all components as per specification / BOM
- Subcubicle: VCB compartment, i.e. VCB in an enclosure with door and safety interlocks
- Half Panel: Consist of VCB and fabrication of VCB compartment, Busbar compartment, LV compartment and Cable compartment. LV components, Control wiring, Busbar, Busbar links & supports, CTs and PTs are not included

GENERAL

- Complies with IEC 62271-100, 62271-102 and 62271-200
- Metal clad, fully compartmentalized panel
- Horizontal isolation, horizontal draw-out & floor rolling trolley type VCB
- Panel readily extensible on both sides
- Panel is designed to meet temperature rise limits as per standards
- Fully type tested at renowned STL laboratories
- Partition class is PM
- Mechanical endurance class is M2
- Electrical endurance class is E2
- Loss of service continuity category is LSC2B
- Indoor type panel with ingress protection rating IP4X (Higher IP on request)

SAFETY

- True close door operation as per IEC standard
- Rack in / Rack out, breaker closing / tripping are behind closed door
- Automatic independent safety shutters to prevent accidental contact with live parts
- Pad lockable door to ensure operator safety

USER FRIENDLY

- Compact, light weight & hence easy to maneuver
- Generous space for cable termination
- Safety Shutters with individual padlocking facility are available.
Both the shutters can be independently kept in open or close position during maintenance
- Draw out and fixed type PT available

UNIQUE

- Current rating upto 3150A with natural cooling
- Internal arc classification AFLR upto 40kA for 1 second and 50kA for 0.5 second
- Compact and safe
- Single latch door closing & optional rear door interlock



VCB Compartment



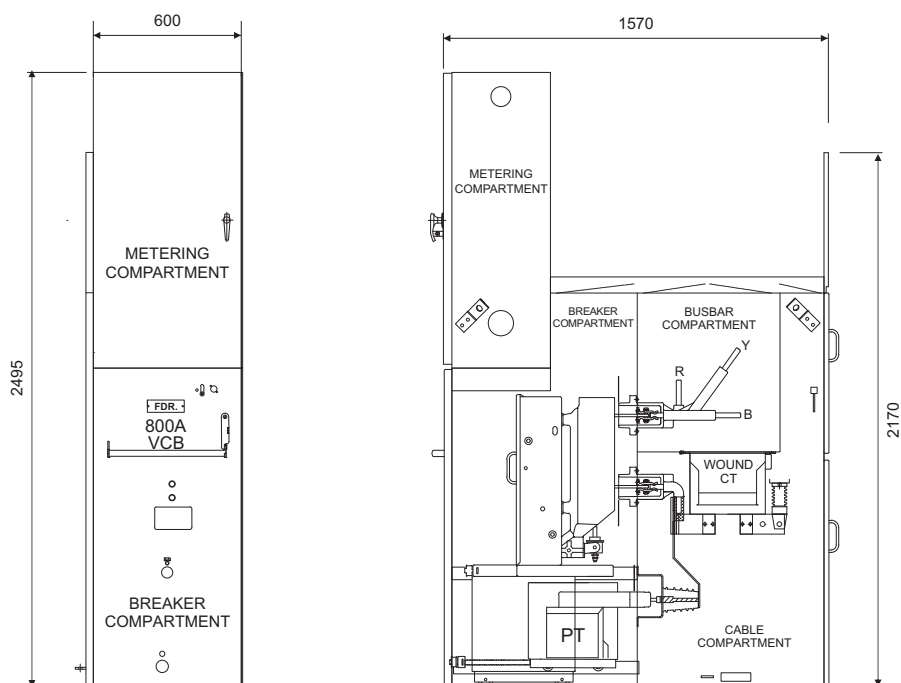
Busbar Compartment

Standards	IEC 62271-100, IEC 62271-102, IEC 62271-200				
Voltage	12kV			24kV	36kV
Frequency	50 Hz				
Normal current (A)	630, 800 1250, 2000	800, 1250 2000, 3150	800, 1250 2000, 3150	800, 1250 2000	800, 1250 2000
Short time current rating	26.3kA	40kA	50kA	31.5kA	31.5kA
Duration of short circuit withstand	3 sec				
Making Capacity	65.75kA	100kA	125kA	79kA	79kA
Impulse withstand voltage	75kVp			125kVp	170kVp
One minute power frequency withstand	28kV (rms)			50kV (rms)	70kV (rms)
Suitable for operating sequence	O-0.3 sec-CO-3 min-CO				
Break time	<3 Cycles				
Mechanical life	>10,000 operations				
Degree of protection	IP4X (Higher IP on request)				
Closing and tripping coil voltage	24V, 30V, 110V, 220V DC **				
Spring charging motor voltage	110V, 220V DC/ 110V, 230V AC				
Auxiliary contacts*	6NO + 6NC *				

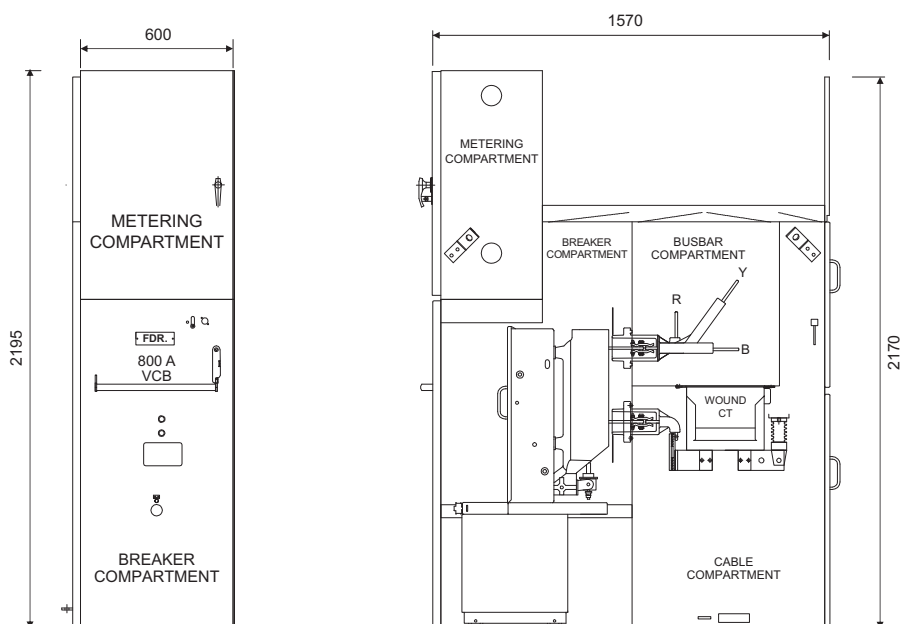
* 12NO + 12NC auxiliary contacts can be given on request for 26.3kA, 40kA & 50kA VCBs.

** For 33 kV VCB Closing & tripping coil voltage available for 110V & 220V DC.

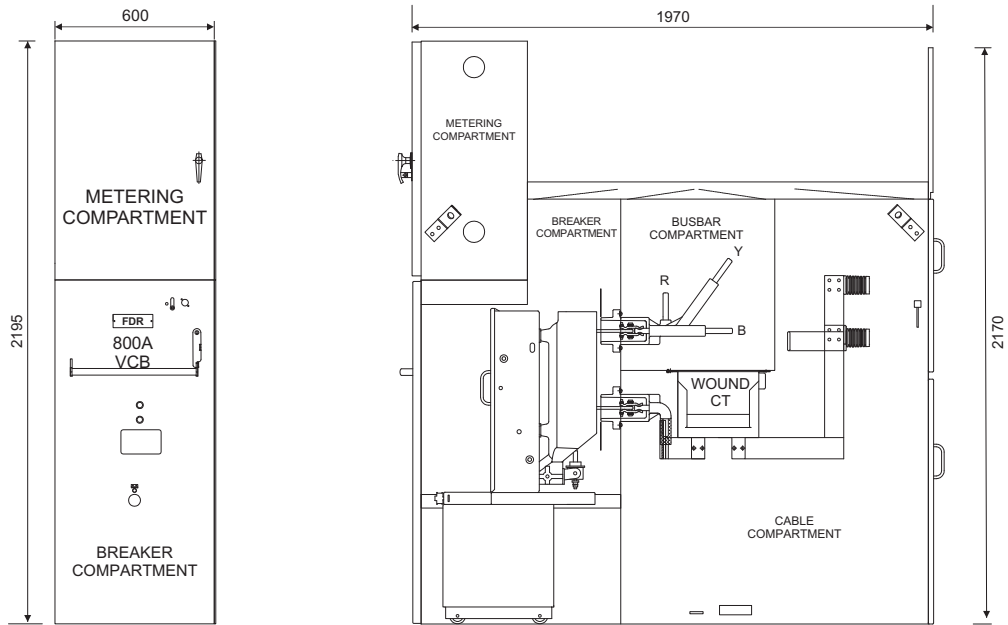
12kV, 800A, 26.3kA Full Panel with PT



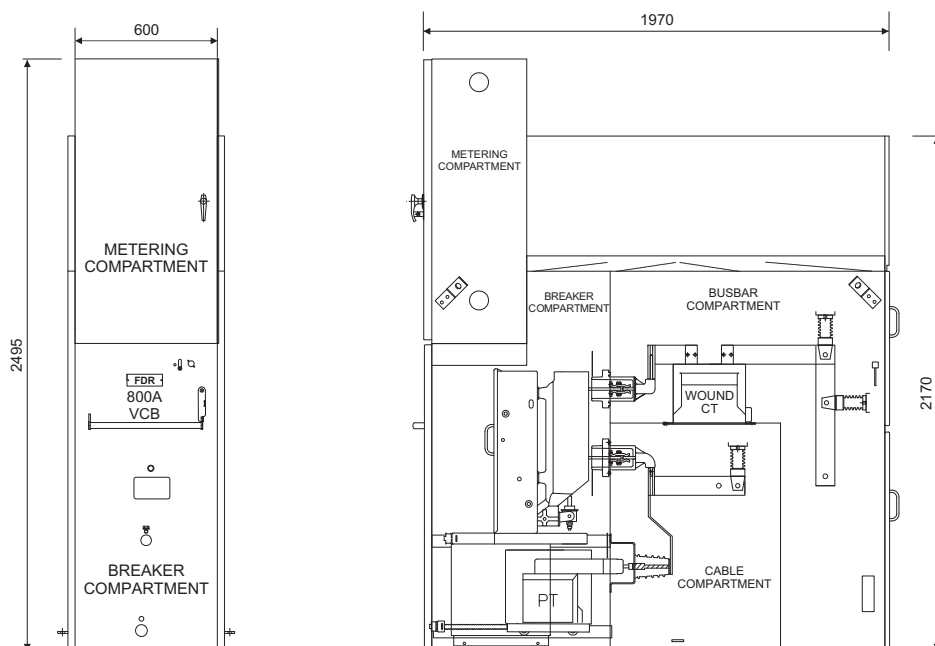
12kV, 800A, 26.3kA Full Panel without PT



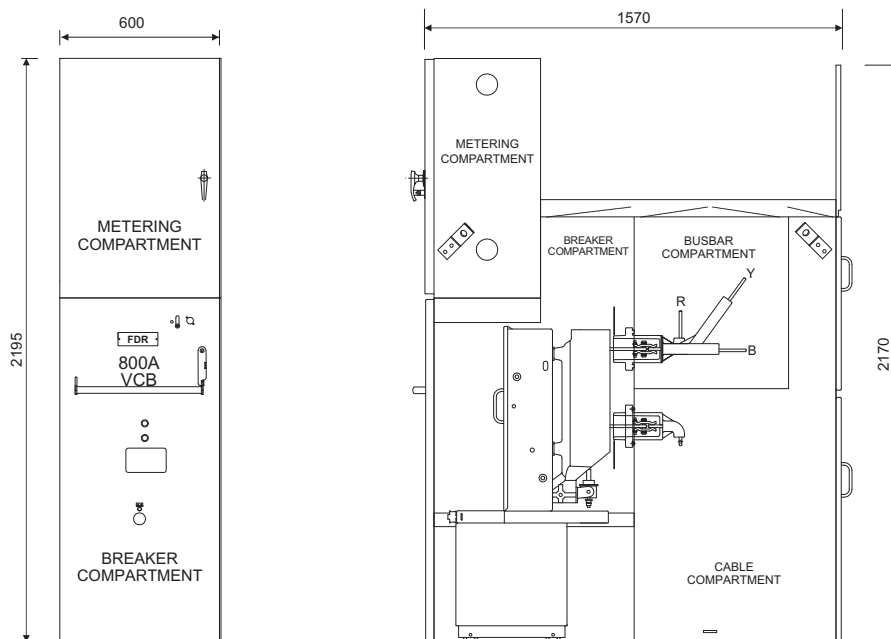
12kV, 800A, 26.3kA Bus Sectionalizer Panel



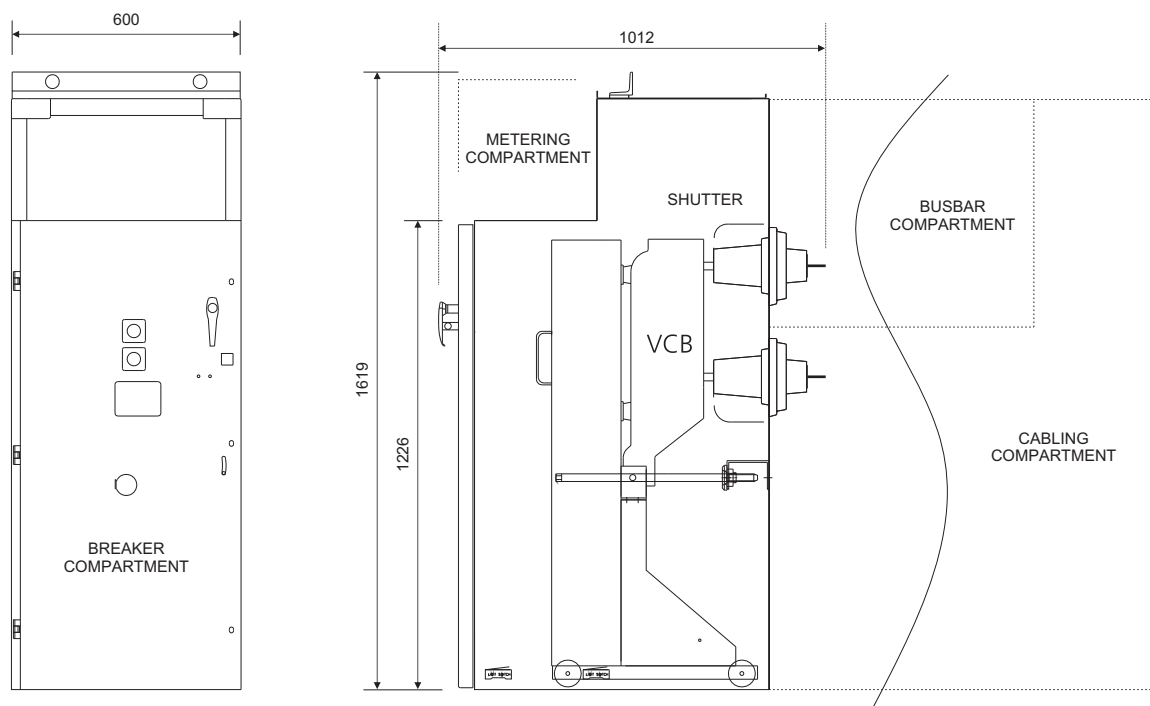
12kV, 800A, 26.3kA ICOG Full Panel with PT



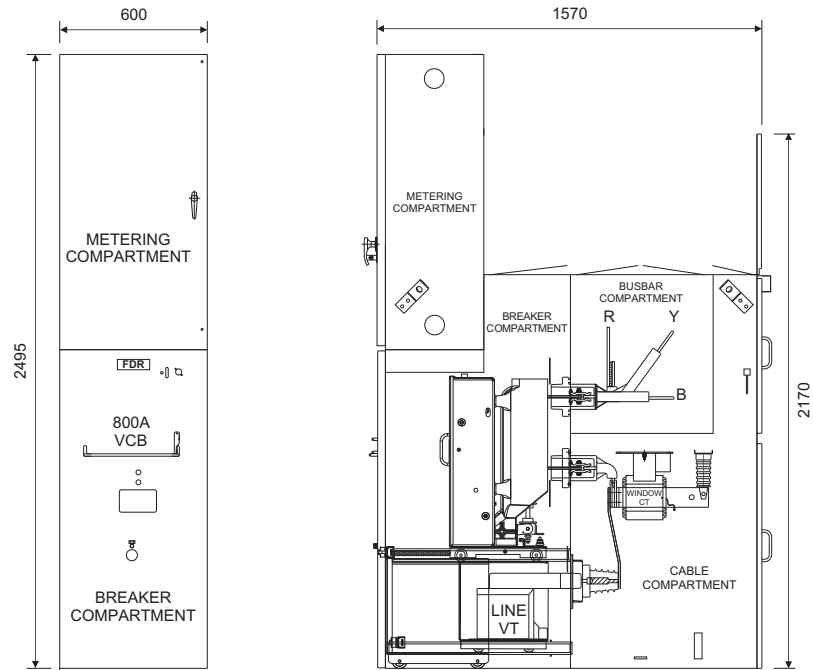
12kV, 800A, 26.3kA Half Panel without CT, PT



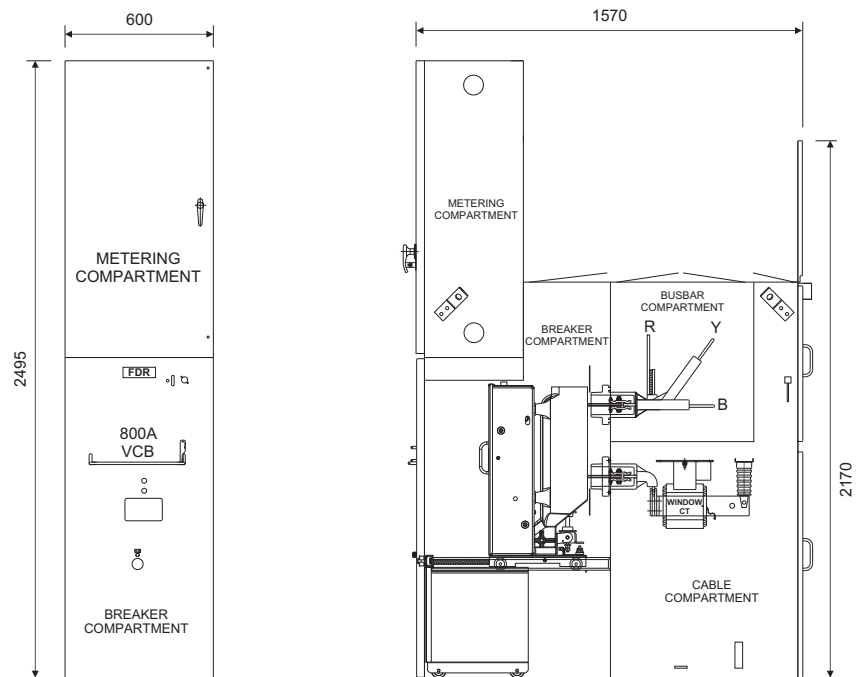
12kV, 630A, 26.3kA Subcubicle



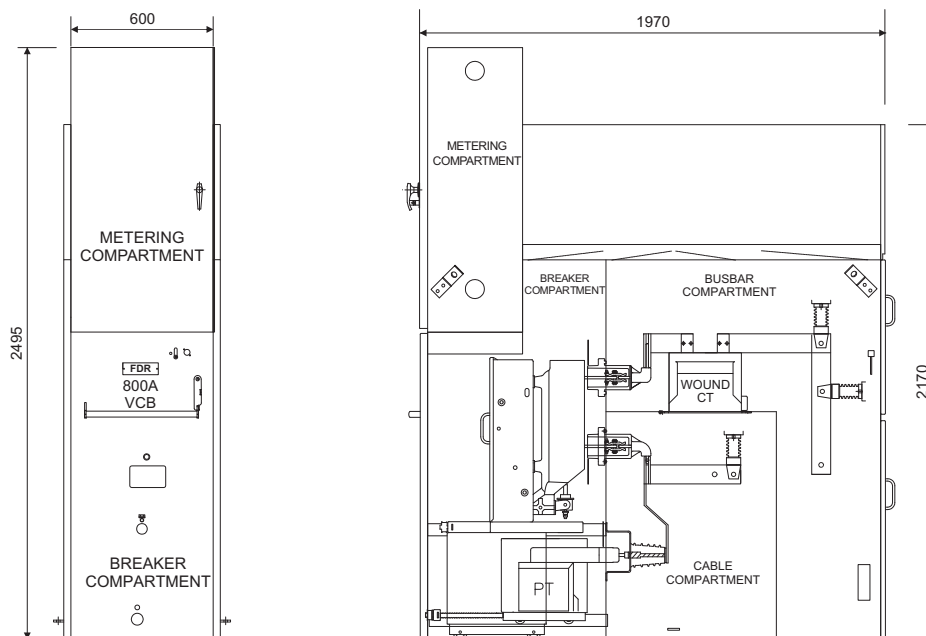
12kV, 800A, 40kA Full Panel with PT



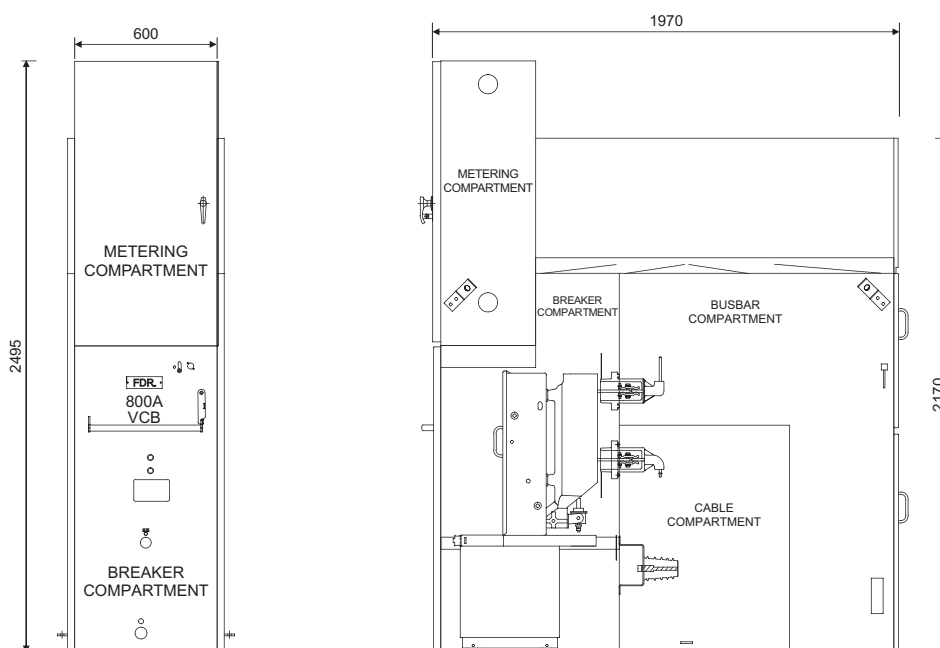
12kV, 800A, 40kA Full Panel without PT



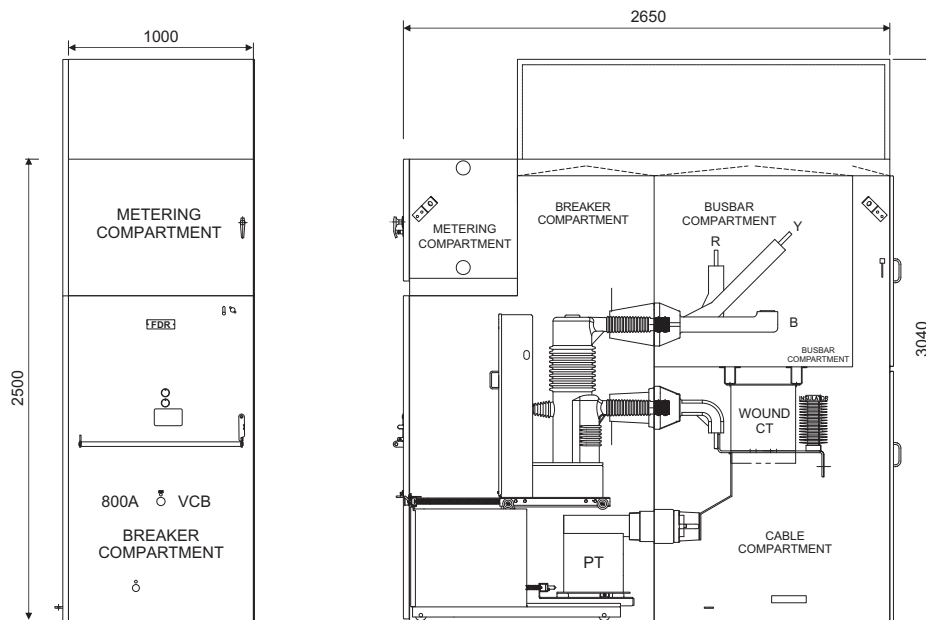
12kV, 800A, 40kA ICOG Full Panel with PT



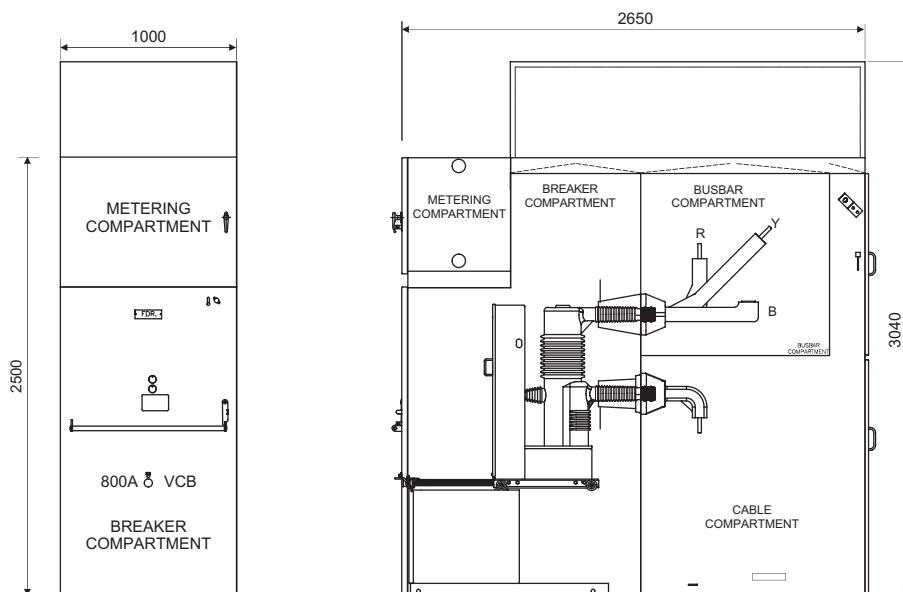
12kV, 800A, 40kA ICOG Half Panel without CT, PT



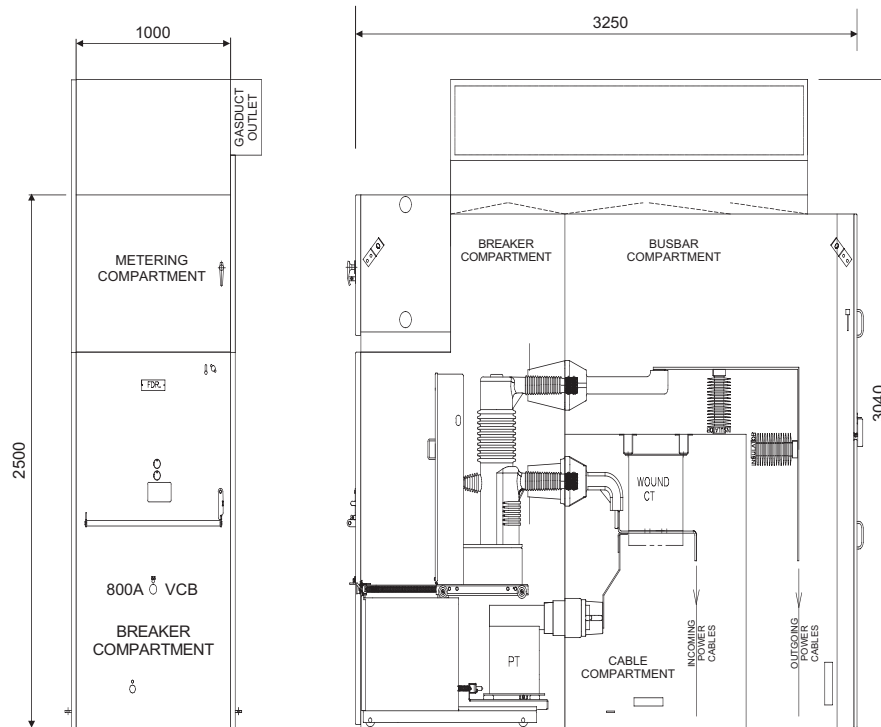
33kV, 800A, 31.5kA Standard Full Panel with PT



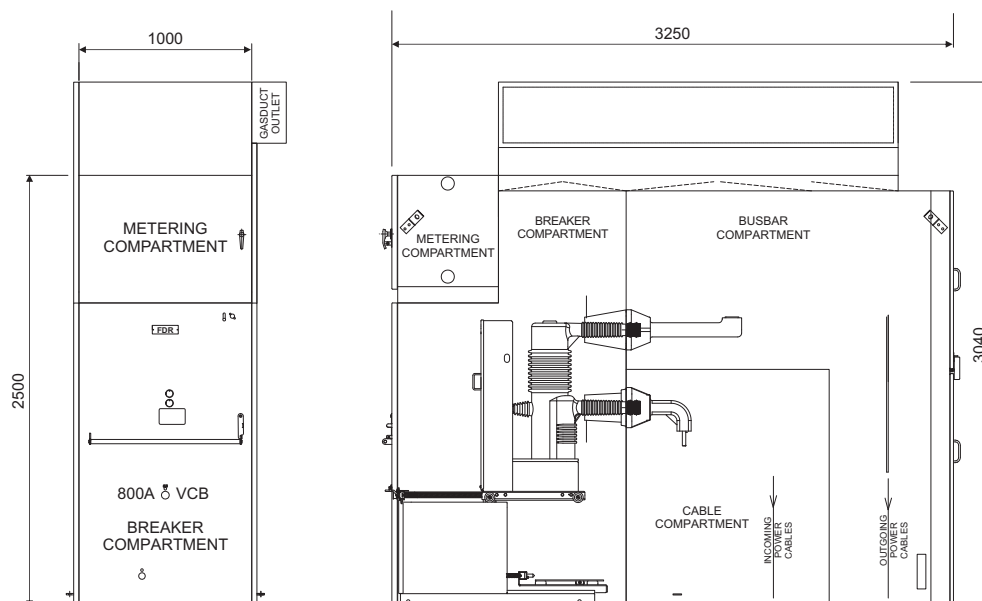
33kV, 800A, 31.5kA Standard Half Panel without PT, CT



33kV, 800A, 31.5kA ICOG Full Panel with PT



33kV, 800A, 31.5kA ICOG Half Panel without PT, CT



* All Dimensions are in mm

Current Rating (A)		800	1250	2000	3150
Rated voltage	Dimensions				
12kV (26.3kA/40kA)	Width (mm)	600	600	800	1000
	Depth (mm)	1570	1570	1970	1970
	Height (mm)	2195	2195	2195	2195
24kV & 36kV* (31.5kA)	Width (mm)	1000	1000	1000	
	Depth (mm)	2650	2650	2650	
	Height (mm)	2500	2500	2500	

• Depth will vary with the no. & size of cable & current transformers.

• Height will change depending on components of LV compartment.

* 36kV VCB will be provided for 24kV VCB requirement.

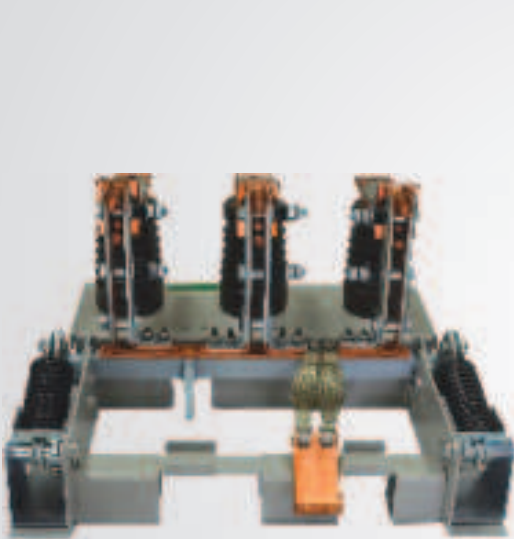
OPTIONAL ACCESSORIES

- **Surge arresters**
- **Annunciator & Hooter**
- **Power pack with inbuilt battery backup**
- **Earthing Truck**

Bus earthing truck & Line/Cable earthing truck are available with safety interlocks

- **Earthing Switch**

Integral earthing switch can be provided for earthing cable/line. Bus earthing switch for busbar side will also provided. Earth switch are provided with full making capacity



Earthing Switch



Earthing Truck



1. SECONDARY DISCONNECTING SWITCH (SDS) INTERLOCKS

- VCB cannot be racked in unless the SDS plug is inserted
- SDS plug cannot be removed when VCB is in service or intermediate position
- SDS plug can be removed only when the VCB is in test or isolated position

2. BREAKER RACK IN/RACK OUT INTERLOCKS

- VCB cannot be racked in/out when it is in closed position and is possible only when it is in open position
- VCB can be closed only when it is either in test or service position
- VCB cannot be closed in the intermediate position

3. EARTHING SWITCH INTERLOCKS

- Earthing switch cannot be closed when VCB is in service position
- VCB cannot be racked in from isolated or test position to service position when earthing switch is closed
- Earthing switch can be closed only when VCB is in isolated or test position

4. OTHER INTERLOCKS

- VCB cannot be closed electrically unless spring is fully charged
- VCB compartment door cannot be opened when VCB is in service & intermediate position & can be opened only when the VCB is in test / isolated position
- Safety shutter opens automatically when the VCB is racked in the service position
- Safety shutter closes automatically when the VCB is racked out from the service position
- Rear door interlock can be provided on request. Rear door cannot be opened when the VCB is in service & intermediate position and can be opened only when the VCB is in test/isolated position or taken out from panel.

ORDERING PARAMETERS

Application	Feeder/Transformer/Motor/Capacitor/Generator Protection/Other			
Voltage	12kV		24kV	36kV
Current Rating (A)	630, 800, 1250, 2000	800, 1250, 2000, 3150	800, 1250, 2000	800, 1250, 2000
Short Circuit Breaking Capacity	26.3kA	40kA / 50kA	31.5kA	31.5kA
Panel Options	Full Panel/Half Panel/ICOG/Subcubicle*			
Panel Version	With PT/Without PT			
Frequency	50 Hz			
Busbar Type	Copper/Aluminium			
CT Details	Ratio/VA rating/Accuracy Class			
PT Details	Ratio/VA rating/Accuracy Class			
Meters	A/V/MFM/TVM/Other			
Control Supply Voltage	24/110/220V DC or 110/230V AC			

* For subcubicle control supply voltage should be mention during ordering.



- VCU available upto current rating 400A & Voltage rating 7.2kV (12kV VCU will be offered on request)
- Fused short circuit protection up to 50kA
- Available in latched & non latched configurations
- Encapsulated current carrying parts for higher safety
- Truck mounted design similar to draw out VCB
- Suitable for motor starters with numerous switching operations
- Two VCUs can be accommodated in single panel for optimum space utilisation
- VCU panels can be coupled with VCB panels owing to similar dimensions



7.2kV AIS with VCU

Panel Details	Standards	IEC 62271-200			
	Type Designation	VH1H			
Voltage Ratings	Voltage	up to 7.2kV*			
	Power Frequency Withstand Voltage	20 kVrms			
	Impulse Withstand Voltage	60 kVp			
	Frequency	50 / 60 Hz			
Current Ratings	Rated Current	200 - 400 A			
	Short Time Withstand Current	up to 8kA			
	Short Time Withstand Current (with Fuse)	25 / 40 / 50kA			
Dimensions	Width#	600 MM			
	Depth#	1570 / 1970 MM			
	Height	2195 / 2495 MM			
Construction	Partition Class	PM			
	Loss of Service continuity	LSC-2B			
	Degree of Protection	IP4X (Higher IP on request)			
	Damage Classification	Type C			
	Internal Arc Classification	A (F, L, R), 40kA, upto 1s			
VCU	IEC Standard	IEC 62271-106			
	VCU Type	Non Latched		Latched	
	Type Designation	VCU7N200	VCU7N400	VCU7L200	VCU7L400
	Opening time	<35 ms			
	Mechanical Endurance	upto 3 Million		upto 0.3 Million	
	Electrical Endurance	upto 0.3 Million (AC-3)			
	Rated Duties (40% on Load Factor)	Class 300			
	Closing/Tripping Coil	110 / 220 V DC			
	Auxiliary Contacts	3NO + 3NC			

2 Tier Panel width & depth starts from 800 mm & 1970 mm respectively

*12kV VCU will be offered on request.

Notes:

Get the Switchgear Training Edge!

Aimed at maximizing productivity, conserving energy, minimizing costs and enhancing safety, our Electrical & Automation training programmes have benefitted over 1.35 Lakh professionals in the last 28 years. These training programmes are highly beneficial as they provide right exposure and impart knowledge on selection, installation, maintenance and testing of Electrical & Automation Products.

So gain the advantage and go the extra mile with:

- 22 courses on contemporary topics
- Courses applicable to all switchgear brands
- Training Centers in Pune, Lucknow, Coonoor, Vadodara, Delhi & Kolkata
- Blend of theory and practical experience

The typical training programmes cover:

- Low Voltage & Medium Voltage Switchgear
- Switchboard Electrical Design
- AC Drives & Building Management Solutions
- Protective Relays & Earthing
- Power Quality Solutions

Please contact any of the training centres for participation and detailed training programme schedule.



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Product photographs shown for representative purpose only.



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