



S&S POWER SWITCHGEAR LIMITED



The Front View of the Company.

THE COMPANY

S&S POWER was established as a small switchgear manufacturing unit way back in 1975 in Madras (now Chennai) India. In 1978 the company entered into collaboration with South Wales Switchgear and introduced High Voltage Disconnecting Switches and the company is one of the major players in the world in this field today. It acquired a license from M/s. Hawker Siddley group of companies, U.K. and achieved two break throughs in quick succession.

The revolutionary introduction of Vacuum Circuit Breakers in the year 1981 and the launch of its patented Outdoor Porcelain Clad Vacuum Circuit Breakers soon after.

Both the products were instant successes with customers and eventually became benchmark for the industry. S&S POWER is the first company in India to introduce these high technology equipment in Indian market. Since then there was no looking back and the company maintained its leading position in technology, manufacturing, productivity, quality and sales exceeding Rs. 1000 Million a year. The company

became the Industry leader in the country in sales and market share in Medium Voltage Switchgear and High Voltage Disconnector Industry.

In 1992, a fresh phase of activity was charted out for the company as S&S POWER decided to test its ability outside the protected domestic market.

So began a fresh round of initiatives. A joint venture company in Malaysia was incorporated in 1992 for assembly of Switchgear. Agents have been commissioned in many countries to give desired thrust to the export market.

To boost the performance further, S&S POWER acquired Acrastyle Ltd. in Ulverston, U.K. in 1997. This company manufactures Control and Relay Panels and has a turnover exceeding Rs. 750 Million with a high profile customer clientele all over the world.

The company's factory in Chennai has state-of-the-art manufacturing facilities to produce high quality equipment. A world class factory in Pondicherry houses all third generation equipment and provides low cost high quality

manufacturing facilities for Disconnectors.

S&S POWER Products have been tested in International Laboratories - KEMA in Holland and CESI in Italy. The company continuously works with well laid systems and procedures and has been Certified for ISO 9001 quality systems by RWTUV.

S&S Power's forey in to the world market was, needless to say, most successful. By 1996-97, export sales were contributing to 25% of the company's turnover.

The successes of the company is backed by more than a 100 strong team of qualified engineers and a fully equipped in-house Research and Development Department.

S&S POWER is now reorganising to consolidate and to face the emerging challenges of the world economy. The company is also restructuring itself to speed up customer response and deliveries and to handle the enhanced volume of business with a view to delight the customer.

INDOOR VACUUM SWITCHGEAR TYPE HHV-12 RANGE

INTRODUCTION :

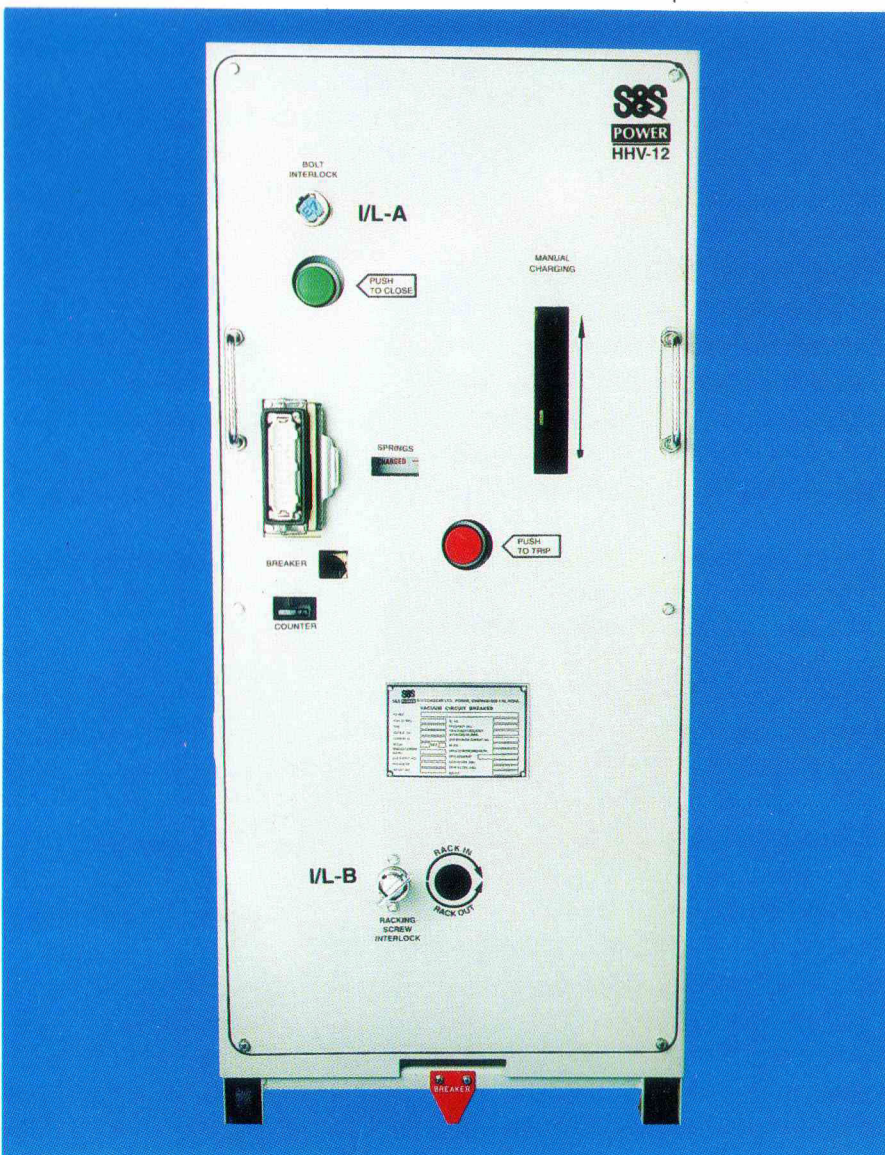
S&S Power was one of the first company's in India to introduce horizontal isolated, horizontal draw out type Vacuum Circuit Breaker in this country way back in early 90s. Pioneering zeal of S&S Power together with the innovative skill of its R&D team made this circuit breaker meet highly demanding needs for performance from all quarters including Consultants, Contractors, Industries

and Utilities. Large number of this circuit breakers are today in operation in India, South East Asia, and other parts of the world, This 12kV horizontal isolated, horizontal draw out vacuum circuit breaker type HHV12 is highly effective and easy to operate and maintain equipment for distribution at 12kV. This specially designed equipment offers following concepts

- Customer friendly
- High degree of safety
- High operational reliability



Side rear view of draw out truck.



Front view of draw out truck.

- Rugged design
- Simple in construction
- Modular and compact
- Easy maneuverability of truck
- Extensible with high degree of customisation.

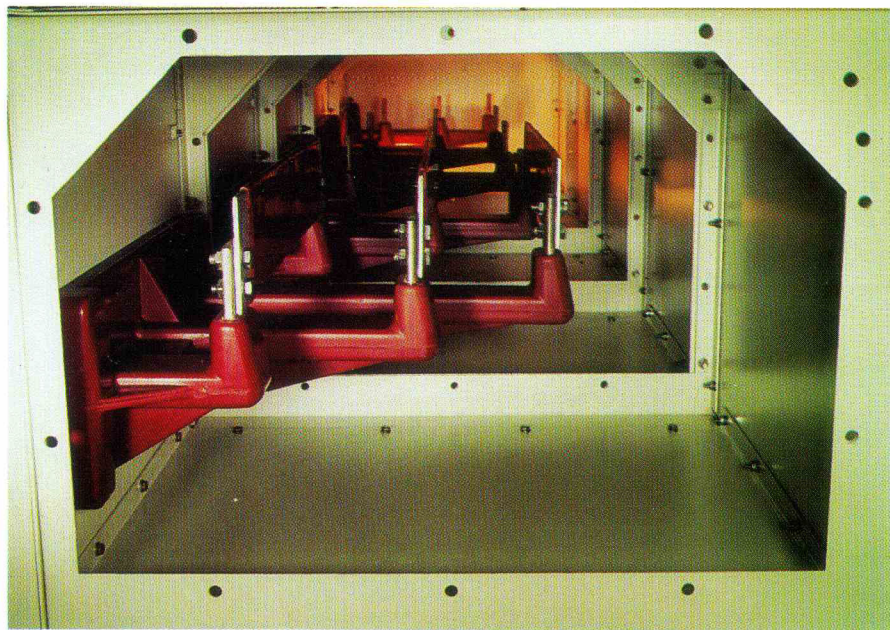
This circuit breaker has been developed after extensive consultation with clients, and consultants in various parts of the world keeping primarily in mind their requirements.

Circuit breaker is fully short circuit tested in the international testing laboratory of CESI, Italy to relevant IEC specification and caters to all types of climatic conditions.

THE CIRCUIT BREAKER :

The basic enclosure houses circuit breaker compartment, bus bar chamber, cable chamber, CT / PT chambers, relay and instrument panels and earthing facilities. The construction

- Very low arcing time
- Quick recovery of dielectric strength
- Small contact gap
- Trouble free service
- Low energy mechanism



View of busbar chamber.

is of metal clad type and uses high-grade CRCA steel of adequate thickness ensuring safety and security.

The circuit breaker trolley comprising of Vacuum Interrupter, Mechanism, etc engages to the enclosure facilitating horizontal isolation and horizontal draw out. The trolley has distinct service position, and test position with latching and locking facility as needed. Inter locking facility is also available through limit switches.

VACUUM INTERRUPTERS :

HHV12 employs rated Vacuum Interrupters for arc extinction. These interrupters are procured from most renowned and the best quality manufacturers of the world. The interrupters are suitable for large number of full short circuit operations and mechanical operations. Special characteristics of Vacuum Interrupters are :

OPERATING MECHANISM

The mechanism is of conventional design and is very simple in operation and construction. Mechanism is designed for operation of very short stroke required in Vacuum Interrupter and is normally charged by motor. Standby manual charging facility is also provided for the operation in case of necessity. Quick O-CO operation is possible.

When charged, the closing spring is held by a latch which can be released either by manual means or by a solenoid to close the circuit breaker. Where motor charging is provided, the spring gets automatically recharged immediately after a closing operation. The mechanism is retained in the "ON" position (circuit breaker closed) by an over toggle linkage and trip solenoid to open circuit breaker.

The energy required for opening is provided by the springs, incorporated in the drive assembly which are

compressed during the closing stroke.

A hinged door is provided for easy access to the above components. The closing mechanism includes the following indications :

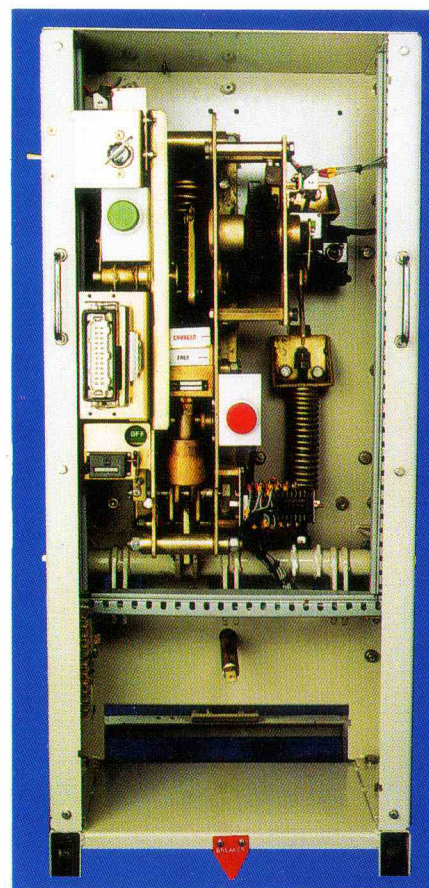
- Breaker On/Off.
- Springs charged or discharged.

The following features are also provided on the switchgear.

- Operation counter.
- Local on/off switch.
- Local/remote switch.
- Anti pumping relay.
- All necessary fuses and wiring.

CUBICLE :

Cubicle is compartmentalised design in various segregations and bus bar are fully insulated for specified power frequency withstand voltage through use of shrinkable sleeves. Joints are



Operating Mechanism.

also fully encapsulated. Bus bar support is rigid enough for all thermal and electrodynamic stresses arising out of 3 sec. Short time current.

Duplicate busbar arrangement is also available with the breaker trolley being racked into the upper or lower bus.

CABLE CHAMBER :

Cable chamber is located at the rear of the panel and can accommodate 6 nos. single core 1000 sq. mm cable or equivalent. This can be accessed through removable rear cover.

The cable box is designed for cable entry from top or bottom and sufficient head room is provided for cable termination. Multicore cables are accommodated in separate compartments at the rear and individual course lead from the terminal compartment to the control / relay panels mounted at the front of the housing within metal earthed conduit. All glands and earthing facilities are provided to terminate the main and multi core cables and need to be specified by the customer.

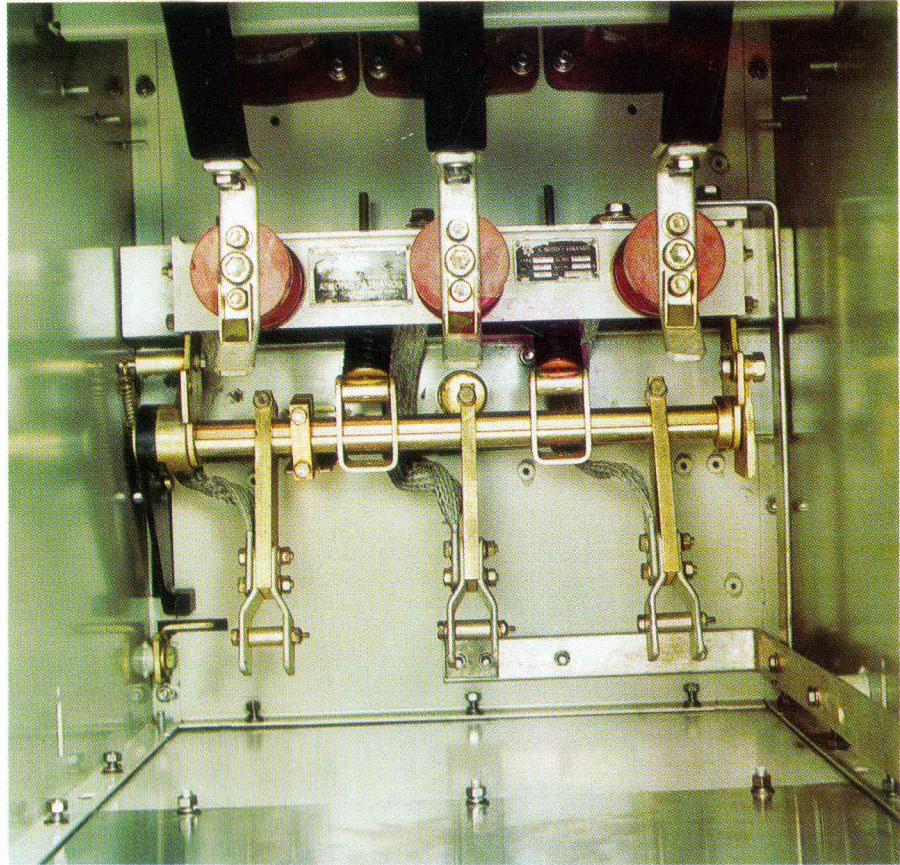
CT / PT CHAMBERS :

While the current transformers are housed in the chamber within the cubicle, the potential transformers (Voltage Transformer) are mounted on top of the cubicle. Range of current transformers can be provided to meet individual customer protection and metering scheme. Current transformers are easily removed for any future modification or replacement in protection or metering requirements.

Provision for feeder connection for 3 phase voltage transformers are provided by means of isolatable high voltage fuse chamber mounted on top position on the circuit breaker metal clad housing.

INSTRUMENT CHAMBER :

Relays, indicating instruments and measuring instruments are mounted on a separate chamber. This is a LT



View of panel rear with cover removed showing earth switch arrangement.

chamber and is fully segregated from the other chambers. The relays and meters are mounted on a hinged door and are located at a comfortable height for ease of viewing and maintenance. There is a provision to increase the height depending on the number of instruments / relays to be fitted as needed by the customer.

EARTH SWITCH :

Where required, earth switches can be provided as an integral part of the equipment. The earth switches are independent in operation to the main closing mechanism, and are interlocked to prevent use when the VCB is connected into its service position.

This prevents the vacuum circuit breaker being racked onto a circuit that has been earthed.

Operator indicators are provided to warn if the earth switch is in the ON or OFF position, with the additional security that the design has been tested against a

full fault make of 3 seconds. Busbar earthing trucks are provided when required.

SPECIAL APPLICATION

In addition to regular distribution function HHV-12 is ideally suited for capacitor switching application and auto reclosing duty.

ASSURED QUALITY AND SAFETY

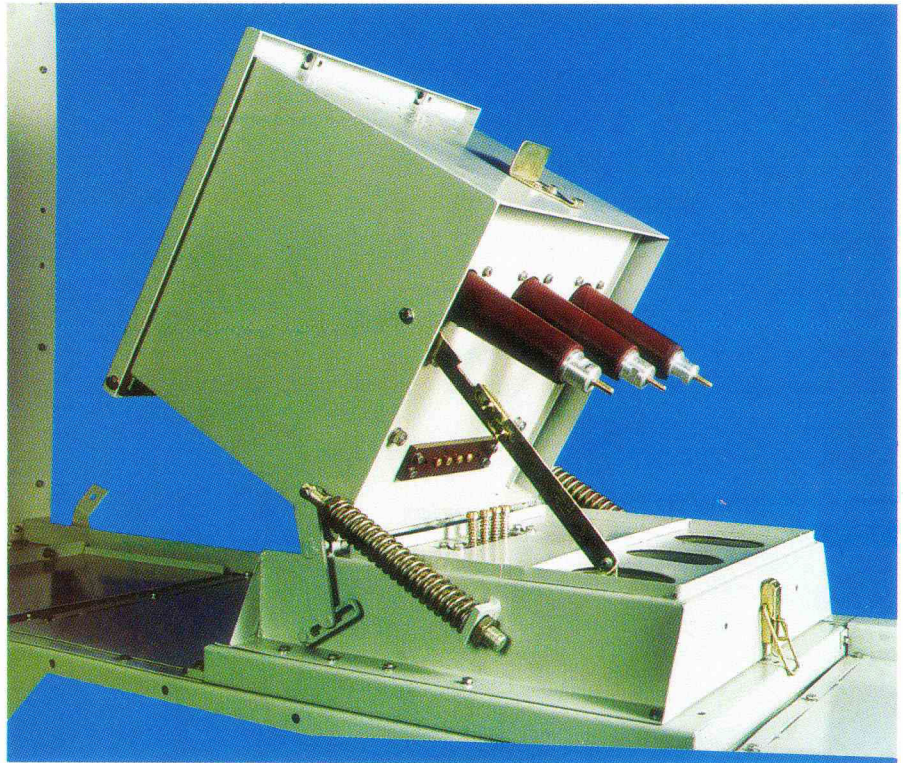
HHV-12 is manufactured strictly under technology standards set by the company with the components and subsystems selected through strict quality control procedures as per ISO 9001 certification guide lines.

Separate front door has been provided for circuit breaker to ensure double safety.

HHV-12 is the only equipment successfully tested for internal arc for 20kA for 0.1 Sec.

KEY FEATURES

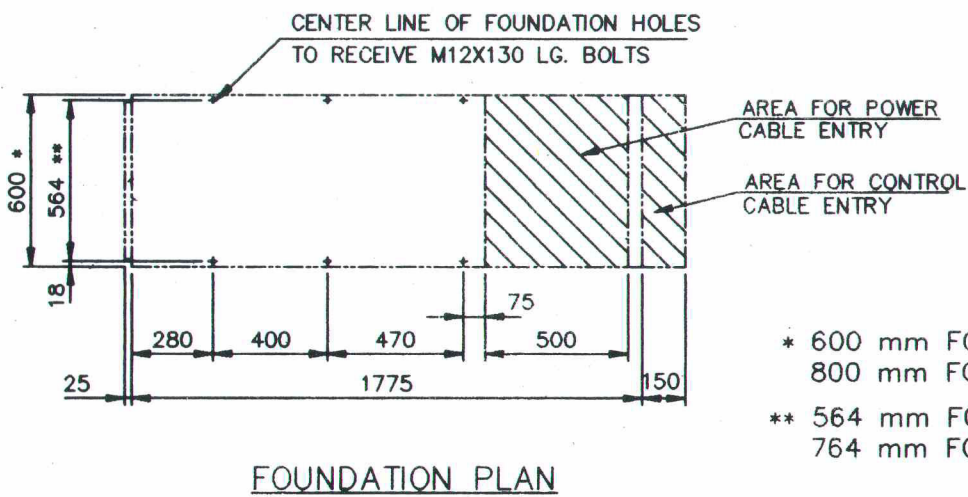
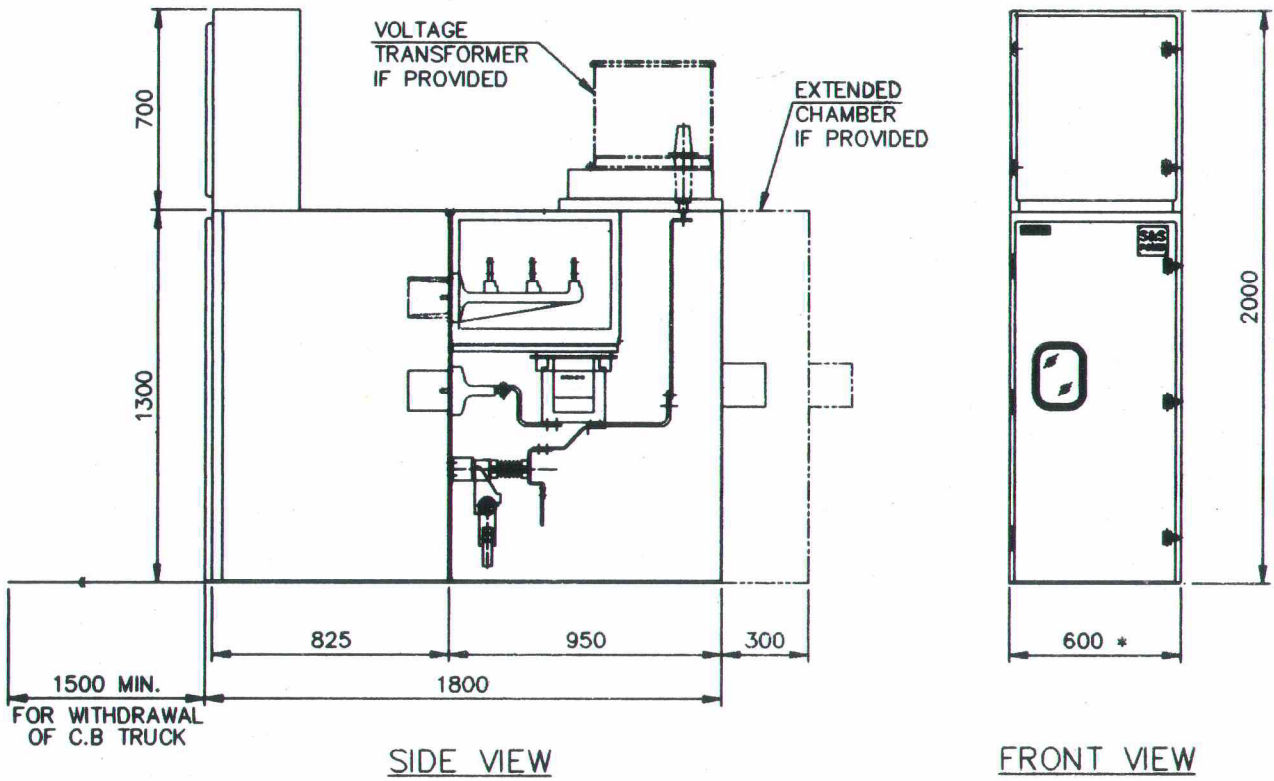
- Long maintenance free operation
- Fully metalclad design
- Horizontal isolation
- Busbar system fully insulated
- Manual or motor charged main closing mechanism
- Fully rated earth switches
- Complete set of interlocks and padlocking facilities
- Isolatable voltage transformer
- Ample current transformer accommodation
- Extensive use in tropical environments
- Safety interlocks.



Tilt away type potential transformer.

TECHNICAL PARTICULARS

Applicable standard	:	IEC 56
Type designation	:	HHV 12
Normal Voltage	:	11kV
Rated voltage	:	12kV
Frequency	:	50Hz/60Hz
Normal rated current	:	upto 2000 Amps
Short Circuit Breaking Capacity	:	25 kA/31.5 kA
Rated 1 minute power frequency withstand Voltage	:	28 kV rms
Rated impulse withstand voltage	:	75 kV peak
Duty Cycle — full breaking capacity		
Normal	:	0 - 3 MIN - CO - 3 MIN - CO
Auto reclose	:	0 - 0.3 SEC - CO - 3 MIN - CO



- * 600 mm FOR 630A/1250A
800 mm FOR ABOVE 1600A
- ** 564 mm FOR 630A/1250A
764 mm FOR ABOVE 1600A

NOTE:—FOR ALL RATINGS ABOVE 25KA PANEL WIDTH WILL BE 800mm.IRRESPECTIVE OF CURRENT RATING.

12kV INDOOR VCB PANEL