S&S POWER SWITCHGEAR EQUIPMENT LIMITED

S&S PSE

PROTECTING POWER SYSTEMS FOR OVER

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DECADES

EXCELLENCE IN SWITCHING &

PROTECTION ENGINEERING

WORLD LEADER IN
DESIGN & MANUFACTURING
DISCONNECTORS
FOR CRITICAL APPLICATIONS

- Rated Voltage 12kV to 550 kV
- Current Rating Upto 4000 A
- Short Circuit Rating Upto 63 kA

COMPANY HISTORY

S&S Power Switchgear Ltd (S&S) was established in 1975 in Technical collaboration with Brush Fusegear, UK for manufacture of Fuses. S&S introduced High Voltage Disconnecting Switches in 1978 collaborating with Southwales, UK.

S&S indigenously developed Outdoor Porcelain Clad Vacuum Circuit Breaker and introduced for the first time in Indian market. S&S became the industry leader in the country in sales and market shares in Medium Voltage and High Voltage Disconnector Industry.The factory has state-of-the-art manufacturing facilities to produce high quality equipment. A world class Factory in Puducherry houses all third generation equipment and provides low cost high quality manufacturing facility for Disconnectors.

The products of S&S have been tested in internationally renowned Laboratories- Kema Holland and CESI-Italy. The type test conducted include Ice Breaking test for High Altitude installation of these Disconnectors. S&S continues its success march backed by a strong team of quality Engineers and a fully equipped in house Research and Development department.

S&S is the only company in India to have sold more than 18,000 nos of Circuit Breakers and more than 35,000 nos of Disconnectors to all major Utilities in India and Worldwide. Repeated orders from esteemed customers prove their confidence reposed on S&S products and timely delivery. S&S continues its thrust and introduced wide range of products to meet the customer's changing needs which are their core strength in staying ahead successfully in the competitive market.

Careful selection of automatic and semi-automatic machines enables S&S to manufacture quality products to meet the stringent customer requirements.

WHY S&S

- Quality products
- Detailed application study
- Dedicated team of engineering experts
- Timely execution of projects
- Complete after sales services
- Large Production Capacity
- Provide Customized Solutions
- Flexibility to adopt to Customer needs
- Long term experience in Disconnectors

CORE VALUES

- Committed to achieve success focussing on customer satisfaction
- Delivering value
- Excellence in operations
- Provision of suitable platform for best electrical deals
- Quality Focused Team

GLOBAL DISTRIBUTION CLASS DISCONNECTORS

S&S Power Switchgear offers outdoor distribution class disconnector from 12kV to 40.5kV complying Indian and International standards.

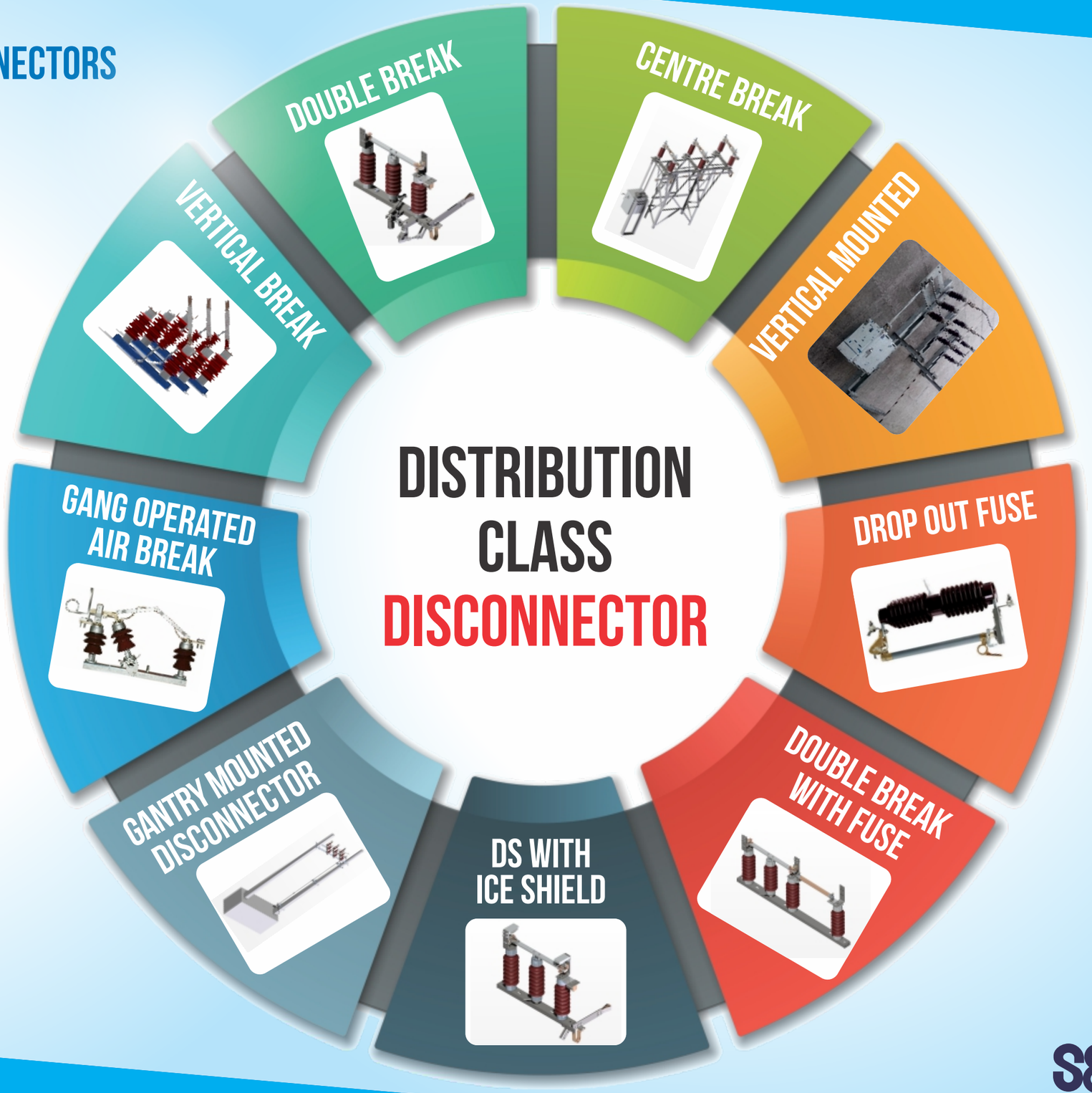
TYPES OF DISCONNECTING SWITCH

S&S Power Switchgear manufactures different types of Disconnecting Switches for different applications.

1. Double Break Disconnector
2. Center Break Disconnector
3. Vertical Break Disconnector
4. GOAB switch
5. Load Break Switches
6. Drop Out Fuse
7. Double Break Disconnector with Fuse (HT HRC Fuse / DO Fuse)
8. Center Break Disconnector with Fuse (HT HRC Fuse / DO Fuse)
9. Vertical Break Disconnector with Fuse (HT HRC Fuse / DO Fuse)
10. GOAB switch with DO Fuse
11. Earthing Switches

The above disconnecting switches will be manufactured based on Customer requirement. We offer Disconnectors suitable for the following geographical and substation layout requirements:

1. High level mounting (Gantry / Beam)
2. Vertical / Horizontal mounting
3. Very heavily polluted environment
4. Ice breaking applications
5. Frequent switching applications
6. For Tropicalized climates



DRIVE BOX

Primary function of a Drive Box is to provide reliable local / manual / remote operation of disconnector by means of a torsion pipe and adaptation to specific requirements. Our range of manual operating mechanism is designed to ensure the best performances and reliability, which are the result of our 40-year old experience. Over 30,000 disconnectors are installed in many countries worldwide are the guarantee of best-buys.

The Drive box comes with various options.

1. MANUAL OPERATING MECHANISM (MOM)

MOM mechanism consist of a robust corrosion-free, sand and water proof IP55 mechanism containing; interlock facilities for safe operation, and the lever for manual closing/opening operation.

The auxiliary contact assembly on the mechanism can be easily inspected and wired by removing the sealing protection.

2. MOTORIZED GEARED BOX (MGB)

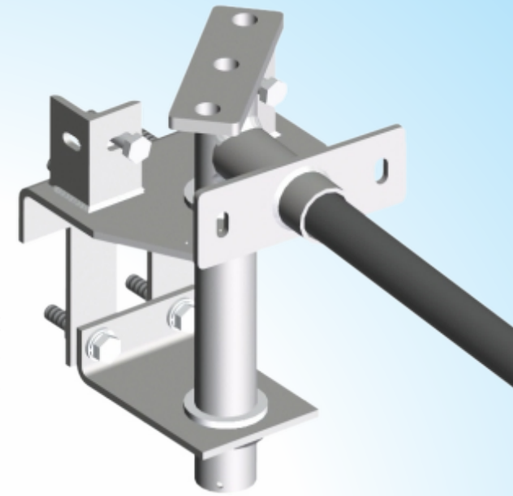
MGB mechanism consist of corrosion-free, sand and water proof IP55 cabinet containing; DC or AC motor, local remote selector switch, closing/opening push button, motor protection, auxiliary contacts device, easy assembly terminal board, hand crank for manual operation, mechanical and electrical interlocking facilities for safe operation.

A robust lubricated for life, two stage irreversible reduction gear system provide smooth and fast operation.

3. MANUAL HAND LEVER OPERATED

This assembly is used to open and close the main disconnector/earth switch. The assemblies are made of steel material and hot dip galvanized. Bushes are provided in friction area to ensure the free rotation of shaft.

This operating mechanism consists of padlocking facility at both open and close condition. Open and close indicators (Metal stickers) are provided for identification. This drive is operated by one-metersteel pipe (insulated with sleeve).



4. INTELLIGENT DRIVE BOX

Intelligent drive box is a smart controller that monitors the voltage, current, power, torque and environmental variables (temperature and humidity) as a function of time and position.

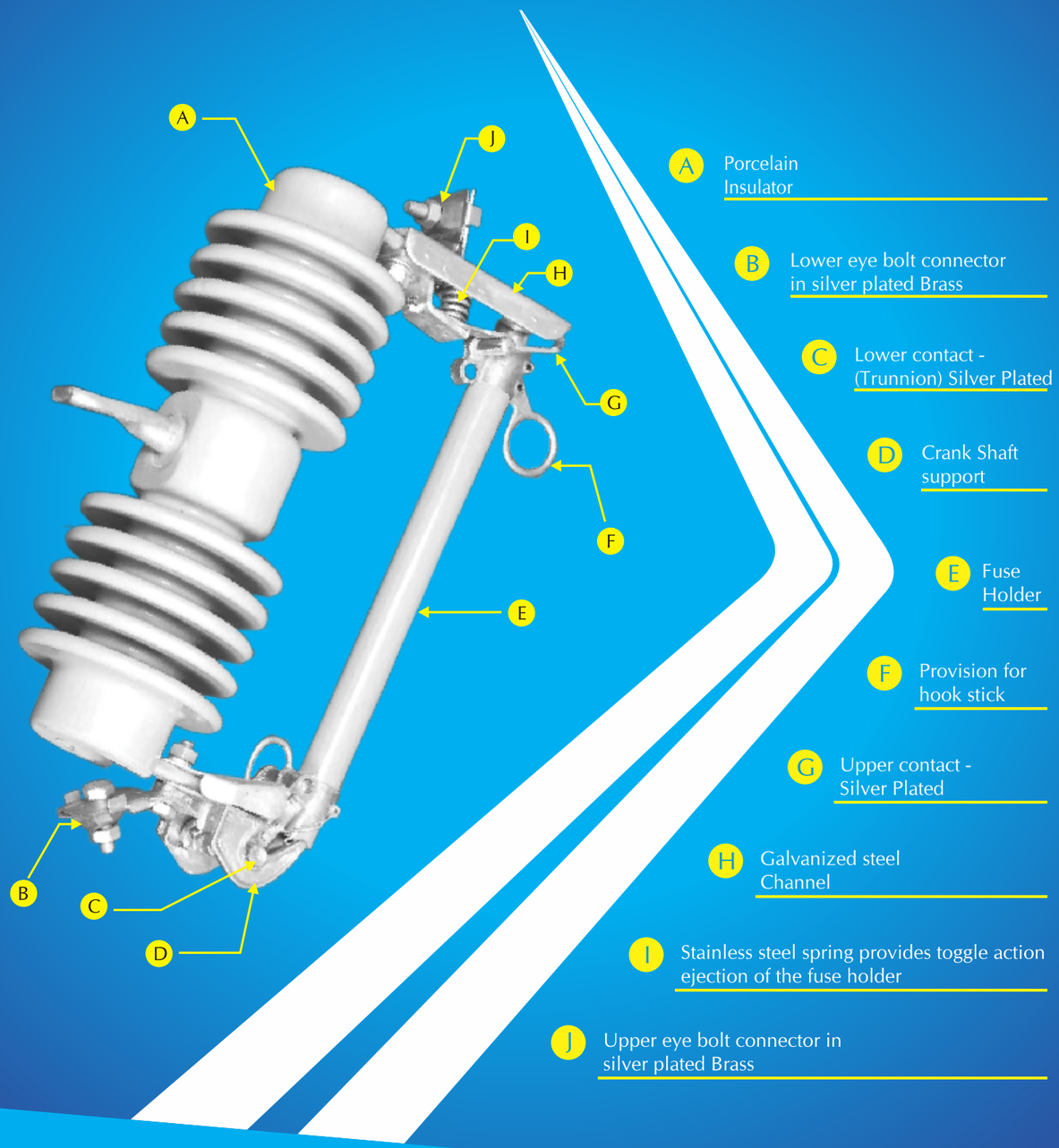
Based on a reference operating curve recorded at the time of commissioning, it also makes real-time comparative analysis to detect fault, breakages and major misalignments of the disconnector.

Therefore, Intelligent disconnector drive box can monitor not only the motor operator, but also the disconnector itself.

One essential part of this Intelligent drive box is the optical positioning system (OPS), which provides a precise measurement of the position of the disconnect switch (DS) at all time.

The intelligent driver can vary the motor speed as a function of the position, monitor various parameters based on the positions of the disconnect switch blade. Also, wiring effort is reduced by almost 50 percent.

DROP OUT FUSE



A Porcelain Insulator

B Lower eye bolt connector in silver plated Brass

C Lower contact - (Trunnion) Silver Plated

D Crank Shaft support

E Fuse Holder

F Provision for hook stick

G Upper contact - Silver Plated

H Galvanized steel Channel

I Stainless steel spring provides toggle action ejection of the fuse holder

J Upper eye bolt connector in silver plated Brass

The Drop Out Fuse unit provides safe and reliable protection to the distribution networks. The Do Fuse designed to offer excellent protection solutions against systems overloads and short circuit fault currents. The unique design phenomenon is to enable rapid fault clearance at a faster time. The Drop Out Fuse unit is manufactured suitable for system ratings from 11 kV to 40.5 kV. The main application of the Drop Out Fuse units is for protection of overhead distribution systems and transformer primary protection. The Drop Out Fuse unit will have maximum current carrying capacity up to 200A.

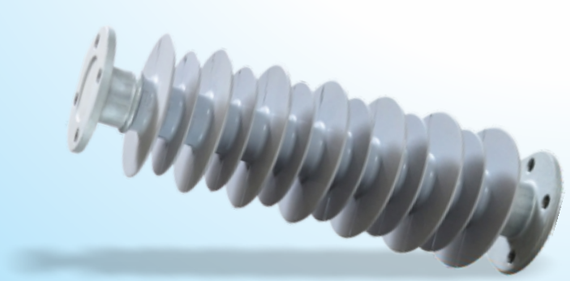
Fuse link will be selected based on the application requirement and the type of equipment required to be protected against overloads and other fault currents. Insulator for Drop Out fuse can be supplied with Porcelain type or Polymeric type. The Drop Out Fuse can be mounted in Horizontal / Vertical based on substation requirement. Hookstick will be supplied on request and it will be used to remove the fuse holder after being operated or to put the fuse holder in place after re-wiring the fuse link. Hookstick will be made from highly insulated FRP tubes for operator's safety.

FUSE LINK

Fuse link will be provided based on load current requirements. Type K fuse link will be supplied for fast blowing K characteristics. Type T fuse link will be supplied for slow blowing T characteristics.

INSULATORS FOR DISCONNECTING SWITCH

We offer Disconnecting switch with Solid Core Insulators and Polymeric Composite Insulators based on customers' requirements. Porcelain and Polymeric Insulators have advantages of its own.

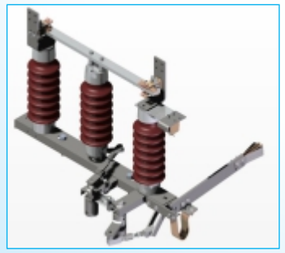


POLYMERIC COMPOSITE INSULATORS	PORCELAIN INSULATORS
EXCELLENT HYDROPHOBICITY The improved pollution and Hydrophobicity properties of Silicon Rubber Provide excellent insulating behavior without the need of washing or greasing even in humid and/or polluted climates including dense fog, heavy rain with high conductivity, sea spray, dense saline fog and industrial pollutions. Hence low failure rate combined with low overall operating and maintenance costs.	**HYDROPHILIC PROPERTIES** Porcelain surface forms a water film on the surface due to its high surface tension (called hydrophilic). As such flashovers and outages in humid and/or polluted climates will be very high.
LOWER LEAKAGE CURRENT Resulting in improved power frequency insulation. 1/10th the energy loss when compared to Porcelain Insulators. Higher di-electric strength.	**HIGHER LEAKAGE CURRENT**
LIGHT WEIGHT	**HEAVY IN WEIGHT**
RESISTANCE TO BREAKAGES Composite Insulators are flexible and therefore, highly resistant to breakages.	**HIGHLY FRAGILE** 10 to 15% breakages are reported during transportation, storage and installation.
SAFETY AGAINST VANDALISM & SHATTER PROOF. Composite Insulators have superior flexibility and strength which provides improved seismic performance and are highly resistant to breakage due to stone throwing, etc. No shattering/explosion.	**SUSCEPTIBLE TO BREAKAGES** Due to very fragile properties, Porcelain Insulators are highly susceptible to breakages due to vandalism such as stone throwing etc. Porcelain Insulators are susceptible to breakages during earthquakes.
COMPACT DESIGN Results in space saving (Right of way) and lower costs.	**BULKY IN DESIGN** Requires Larger and heavier towers for installation and more space.
Composite Insulators have short process time and therefore short delivery periods.	Porcelain Insulators have long manufacturing process requiring long deliveries.
Composite Insulators have many ecological advantages. Manufacturing process is pollution free. Composite Insulators are safe and not health risk.	Process of manufacturing causes pollution and health risk.
Stable long term operating behavior as demonstrated over more than 30 years of outdoor exposure experience abroad against degradation and deterioration of insulating properties.	Porcelain Insulators degrade over period of service and provide reduced insulating properties.

TECHNICAL PARAMETERS OF DISTRIBUTION DISCONNECTORS

Rated Voltage	12kV	24kV	36kV	40.5kV
System Voltage	11kV	22kV	33kV	38kV
Rated Current	1250A	3150A	3150A	3150A
Rated Short-time withstand current	31.5kA/3s	31.5kA/3s	31.5kA/3s	31.5kA/3s
Rated peak withstand current	80kAp	80kAp	80kAp	80kAp
Rated Frequency	50Hz / 60Hz	50Hz / 60Hz	50Hz / 60Hz	50Hz / 60Hz
Lighting Impulse withstand voltage				
- across isolating distance	85kVp	145kVp	195kVp	220kVp
- across phase to earth	75kVp	125kVp	170kVp	200kVp
Power Frequency withstand voltage				
- across isolating distance	32kV (rms)	60kV (rms)	80kV (rms)	95kV (rms)
- across phase to earth	28kV (rms)	50kV (rms)	70kV (rms)	105kV (rms)
Phase to Phase distance	760mm	900mm	900mm	1500mm
Creepage distance	300mm	900mm	900mm	1116mm
Type of Operation	Motor / Manual	Motor / Manual	Motor / Manual	Motor / Manual

EARTH SWITCH



Earth Switches are used in distribution network to discharge the trapped charges. Earth switches are supplied along with Disconnector as integrated Earth Switches also as stand along earth switches. Earth switches can be operated through manual or motor mechanisms.

TERMINAL CONNECTORS

We also supply terminal connectors suitable for various types of Single/Double ACSR conductors and IPS tubes. This is an optional item which will be supplied only on request.

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