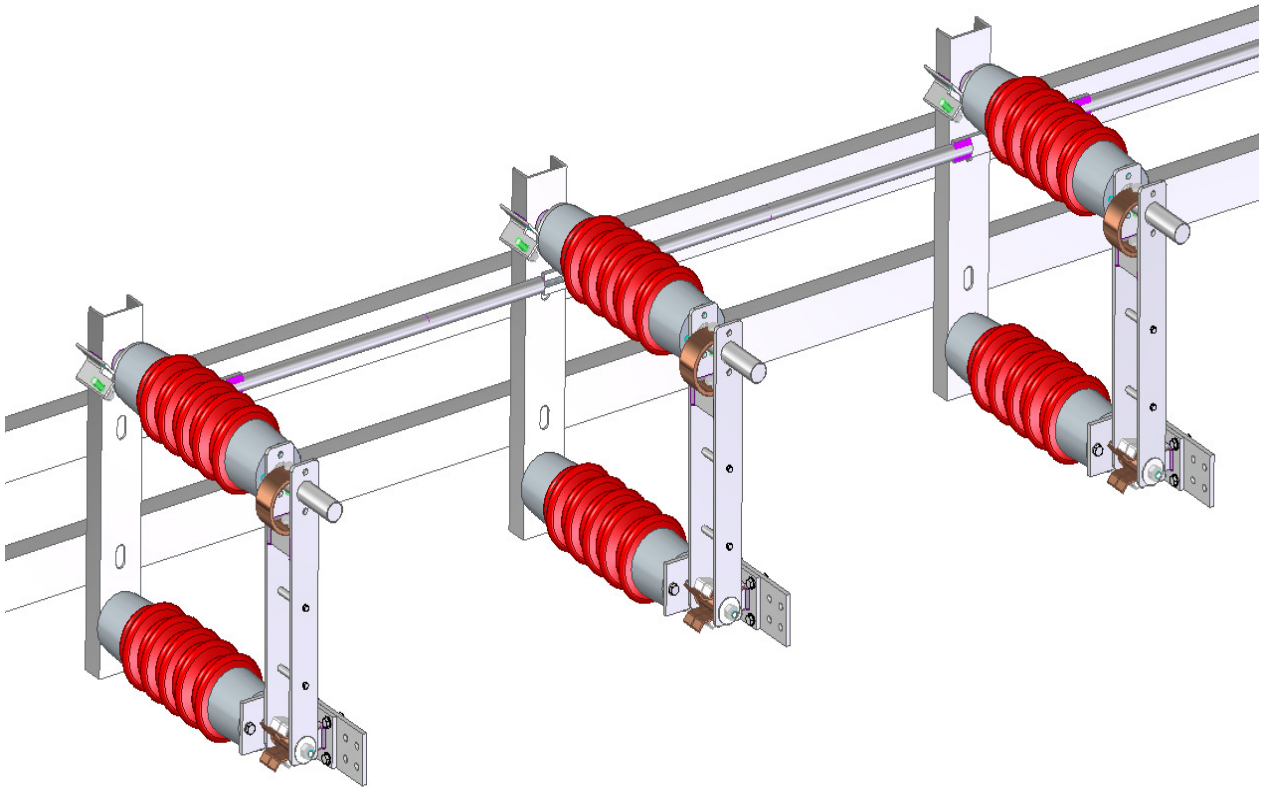
S & S POWER SWITCHGEAR EQUIPMENT LIMITED

UNLOADING, STORAGE, ERECTION, INSTALLATION & MAINTENANCE MANUAL



SIDE BREAK DISCONNECTOR
(TYPE: RS 36)

Dear customer!

Thank sincerely for purchasing our product. We are glad to deliver you an outdoor disconnector, which has been designed in order to meet your usable needs. The instruction is intended for outdoor disconnectors type RS 36. The instruction has been issued with an intention to help in proper installation, servicing and operation of the disconnectors. Follow carefully requirements specified in this instruction ensures trouble free service of disconnectors and determines the validity of manufacturer's guarantee. Carefully read and understand this instruction sheet before installation, operation and maintenance of disconnectors. Would you have any questions, please contact ***sales@sspower.com*** *&* ***customercare@sspower.com***

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Disconnectors are remarkable pieces of equipment. They can stay in the same position for years before they have to switch. But, then at the critical moment they have to work perfectly. No matter what the conditions are, whether they are in the freezing cold or in the extreme heat.

INDEX

1.0 PREAMBLE:

The Disconnector described in this publication is designed, manufactured and tested with care and will give satisfactory service if it is installed, operated and maintained in accordance with the instructions, by fully skilled personnel duly authorized to carryout this work.

Efforts are constantly being made to improve design and manufacturing. Hence the equipment supplied may differ in minor detail from the data given in this publication.

2.0 GENERAL DESCRIPTION OF THE DISCONNECTOR:

- Disconnectors are primarily off- load mechanical switching device used to isolate equipments and lines in electrical network. They are able to make or break the magnetizing Current and line charging current of 0.7Amps at 0.15 power factors.

- Side Break Disconnector is designed for independent single pole operation or three poles operation. Disconnectors can be supplied with or without earth switches. Where earth switch is required, single or double earth switch can be provided. Disconnector and earth switches can be operated either manually or by motor.

- Side Break Disconnector is checked for satisfactory operation at the works. They are supplied in knock down condition ready for assembly at site. The relevant standards for disconnectors are IEC: 62271-102/62271-1 and for insulators IEC: 60273 / 60168.

SECTION-A

UNLOADING AND STROAGE INSTRUCTIONS

3.0 UNLOADING:

- Unload the crates / boxes using crane / fork lift truck, as appropriate.
- **Do not roll the crates. Do not drop the crates over tiers / rubber mats. Etc.**
- Use proper lifting tools / tackles like nylon belts / ropes etc.
- Count the number of crates / boxes and tally them against the shipping document.
- Inspect thoroughly all the crates / boxes for damages.
- In case of damage, identify the crate / box and keep it separately.
- Take adequate photos of the damage.
- Kindly report the damage to the transporter in writing.
- Also mail the damage report (along with the photographs) to **S&S Power Switchgear Equipment Limited**. Email: sales@sspower.com.

3.1 STORAGE:

"Failure to properly store and protect disconnectors / parts may cause damage to equipment. Such damage could cause hard operation, mal-operation and contact resistance issue when equipment is installed / tested and mal-function in service."

- Storage shall be made in an area that is well ventilated and provided with drains to prevent water stagnation.
- It is advisable to leave all crates / boxes in packed condition until the start of erection.
- All crates / boxes shall be properly stored / stacked with proper covers.
- Disconnector and operating mechanism crates / boxes should always be stored in elevated position (at least two feet above ground) to prevent water entry.
- In case of longer storage period / damp atmosphere, the operating mechanism boxes shall be removed from packing and electrical space heating is to be provided.
- Space heating should continue till complete removal of moisture / condensation.
- Adequate care to be taken to prevent entry / ingress of dirt, moisture, cement, sand and other corrosive material.

3.2 LONG TERM STORAGE INSTRUCTIONS:

General instruction (for all materials):
Ground clearance:

All materials, including operating mechanisms, should be kept at a minimum of 600 mm (two feet) height from the ground level using pallets or cement concrete bed, to avoid water entry during rainy season. However, the water level rise at the respective site / storage locations shall be considered for fixing the ground clearance (but shall not be less than 600 mm).

Other contacts and steel materials:

- Clean all the contact surfaces thoroughly with a lint-free cloth.
- Protect all contact surfaces with a thin layer of petroleum gel.
- Cover all Copper flats and Aluminium flats with polythene sheets / covers.
- Ensure that the inside surfaces of the polythene coverings are pasted with foam based adhesive strip.
- Provide volatile corrosion inhibitors sheets and paste them along the inner surfaces.
- Kindly repeat the above steps once in every three months.

Galvanized steel items:

These are to be wrapped / covered with waterproof / dust proof covering and sufficient bags of silica gels to be placed in various places inside the covering. Once in 3 months all materials to be cleaned and replaced with silica gel bags.

SECTION – B

CONSTRUCTION

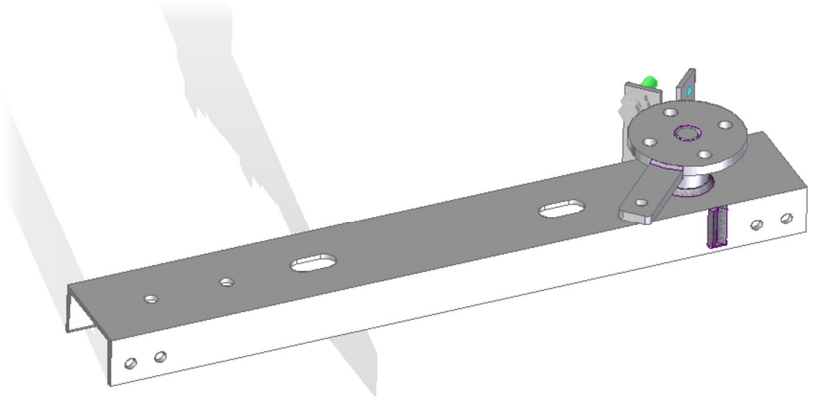
4.0 SCOPE OF SUPPLY

Our Vertical Break Disconnector consists of the following components:
Disconnector:

- Base assembly.
- Moving blade assembly.
- Fixed contact assembly.
- Tandem pipe assembly (phase to phase coupling pipes) in case of three pole arrangement
- Down operating pipe.
- Operating drive.
- Support insulators
- Support structure (Optional).
- Terminal connectors (Optional).

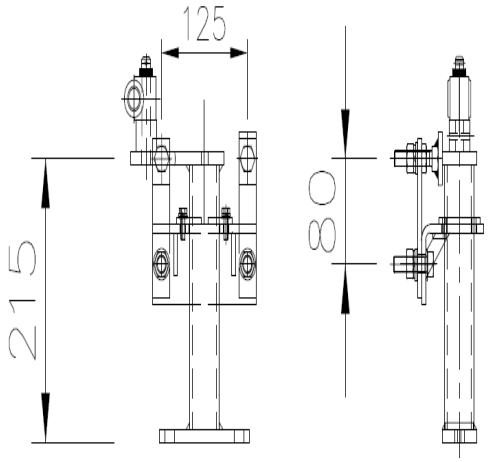
5.0 BASE ASSEMBLY:

- Each 3 pole disconnector (R, Y, and B) is supplied with same type of base assemblies for without earth vertical mounting.
- The base assembly manufactured with hot-dip-galvanized finish.
- All ferrous parts in base assembly are hot-dip galvanized.
- Base assemblies are supplied with:
  a. Lever and hinges with pins, Friction washer, Brass washers and Split pins.
  b. Two slots in base channel for fixing the base channel to the supporting structure.
- Each base is provided with two holes for M12 grounding bolts for earthing purpose.

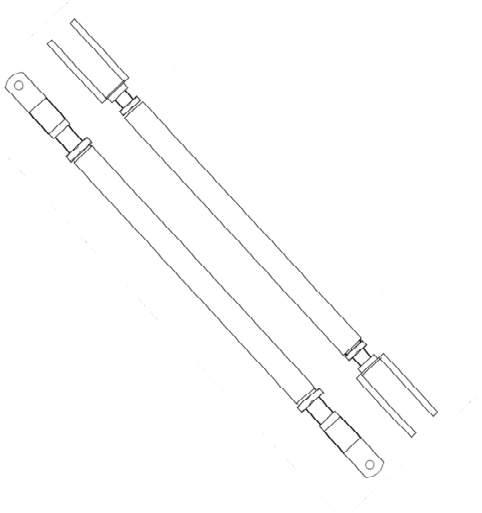


Sl. No.	Item Description	Qty / Switch	Remarks
1	Base	3	One Galvanized Steel ISMC CHANNEL Section having provision for rotating shaft, Drive coupling arrangement for main.
2	Base fixing slots	2 per base	For fixing the base angle to the supporting structure.
3	Torque Bearing	1	Torque bearing assembly in per-set condition
4 & 5	Mechanical limit stop	1	The mechanical limit stop of the disconnector in "closed" position and another limit stop in "open" position for disconnectors
6	Support Insulator	6	Solidcore
7	Moving blade assembly	3	Aluminium Busbar one end connected with silver plater copper male contact. Other end contacts provided with copper flexible for rotating function and current transferring.
8	Fixed Contact Assembly	3	Spring loaded Silver plated Copper fingers bolted to The Aluminum extruded block.
9	DOP – Main	WOE – 1	Galvanized Steel Pipe (Optional for elevated structures).
10	DOP Guide	1	Galvanized Steel Plate.
11	Operating Drive	1	Manual operating Aluminum shell
12	Main Push Pipe	1	Galvanized

Torque Bearing Fixing



Main Push Pipe

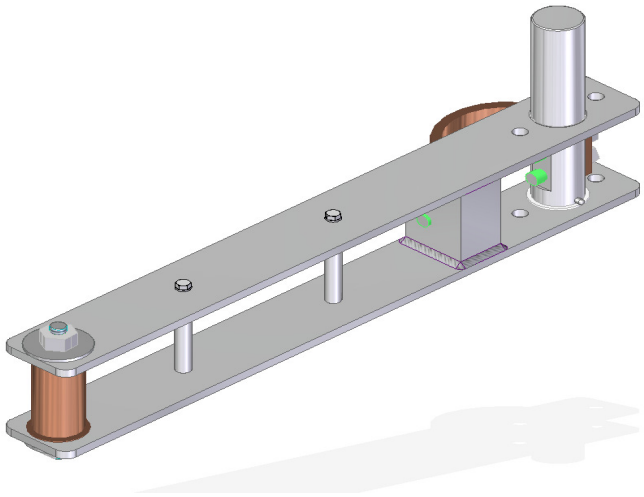


Note:

- **Suitable arrangement should be provide in your structure for item:3**
- **Push is used to connect the torque bearing with drive end base.**

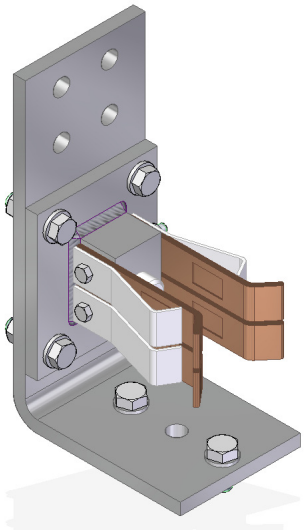
6.0 MOVING BLADE ASSEMBLY & FIXED CONTACT:

The current carrying moving blade is made of Aluminum. At the one end flats, silver plated male contact is bolted which is made of copper. The terminal stem is fixed to the other end of the Aluminum busbars.



7.0 FIXED CONTACT ASSEMBLY:

The Aluminum support has provision to fix the contact block made of Aluminum block. The fixed contacts are of the multi-finger. Contact pressure is applied to each individual finger by stainless steel spring leaf. Contact fingers are silver plated and bolted.



8.0 TANDEM PIPE:

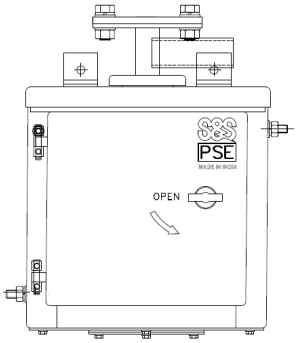
- The tandem pipe assembly is used to connect adjacent poles for gang operation of all the three poles with one drive mechanism.
- These parts are hot-dip galvanized and assembled with necessary screws & washers etc.

9.0 DOWN OPERATING PIPE(DOP):

- This assembly is used to connect the operating drive in the base assembly
- The above assemblies are made out of steel pipe with one plain end and T-bar plate welded at other end.
- The above welded assembly is hot dip galvanized.
- Excess length of DOP to be cut at site depending upon the requirement.

10.0 OPERATING DRIVE:

- This assembly is used to open and close the main disconnector**.**
- This aluminium box contain operating mechanism.
- This operating mechanism is provided with padlock provision for open & closed position.
- Open and close indicators are provided for identification.
- This drive is operated manually.



11.0 INSULATOR ASSEMBLY:

- Insulators are selected to meet the basic insulation level, minimum creepage and minimum bending load to suit the Customer / Design requirement.

SECTION – C

INSTALLATION & SETTING INSTRUCTION

12.0 ERECTION SEQUENCE:

- Structure
- Bases
- Insulators
- Fixed contact assembly
- Moving blade assembly
- Operating drive
- Down Operating pipes
- Tandem pipe
- Terminal connectors

13.0 BASE ASSEMBLY:

- Identify the base R, Y&B.
- Remove the base fixing hardware from bases and keep it in proper place.
- Identify the drive end base and place in the proper position on top of the structure. Fix the hardware; do not tighten fully.
- Place the other two bases on top of the structure in the proper position. Fix the hardware; do not tighten fully.
- Check with sprit level on top of bearing shaft and give shims if required on the leg of the bases.
- Check the diagonal distances.
- Tighten all the bolts. After complete tightening once again check with sprit level.

Note:

- Ensure the correctness of centre line of same pole and centre line of other phases.

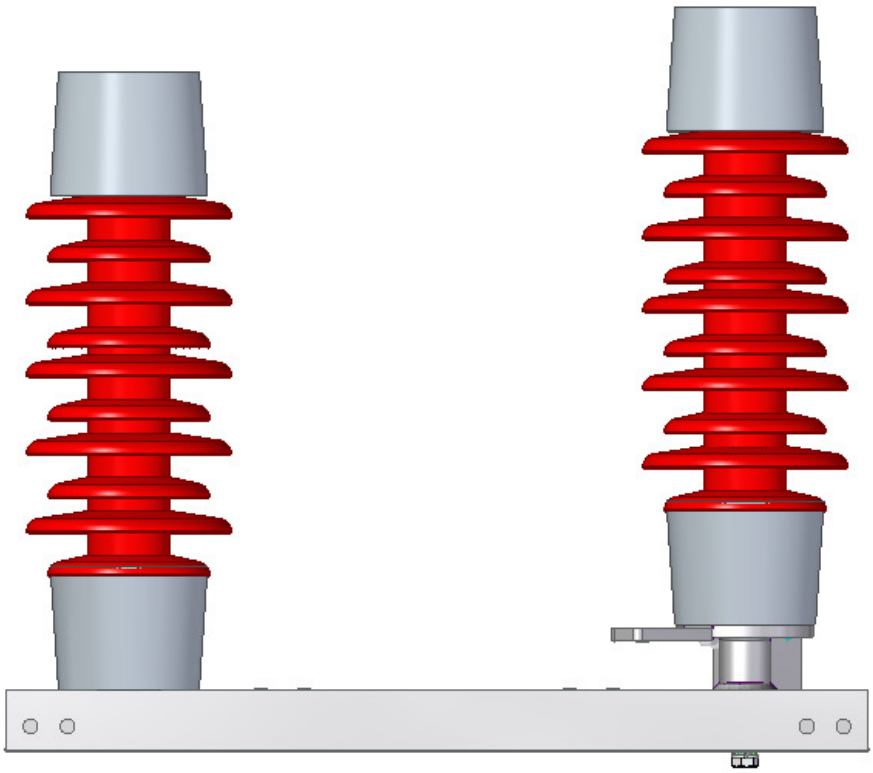
14.0 INSULATORS:

Before Start of erection

- Clean the insulator thoroughly.
- Keep the fixing hardware in respective places.
- Identify the Insulator and keep them in respective position.

ERECTION

- Clean the insulator with cloth, Lift the insulator and place it over the base assembly (both the ends).
- Fix mounting hardware with base and maintain half tight in base safely.
- Check for level of the top surface of insulator by sprit level / plumb**.**
- If necessary add shims below the bottom flange of the insulator for alignment.
- Repeat the same for other stacks also.



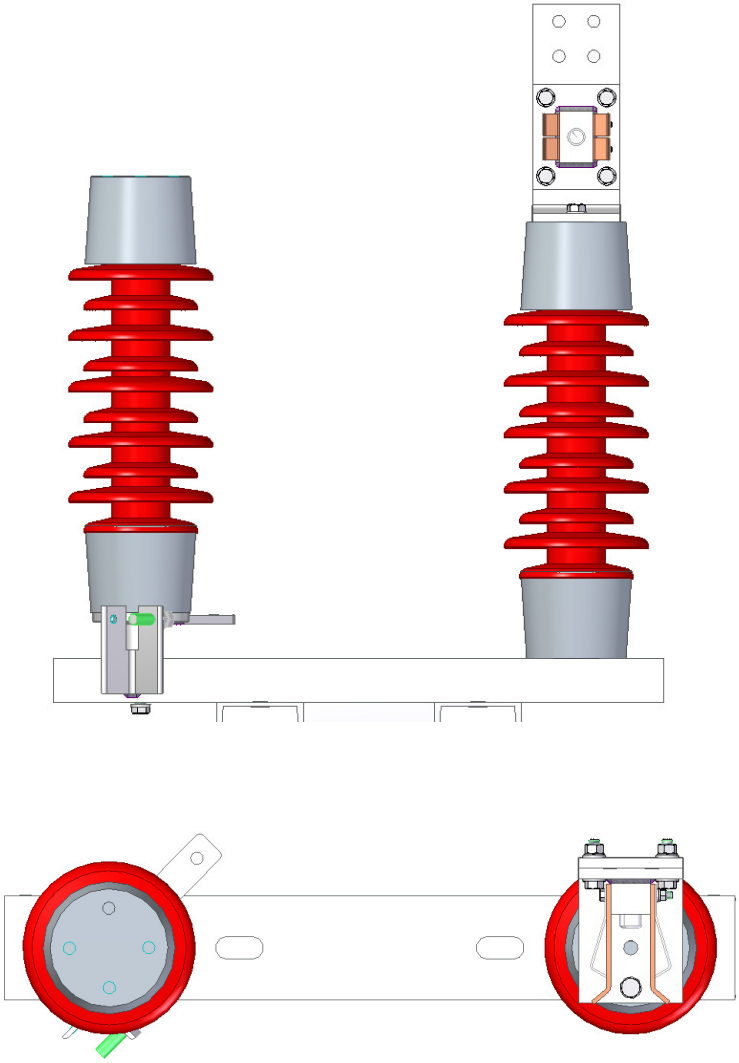
15.0 FIXED CONTACT ASSEMBLY

Before Erection

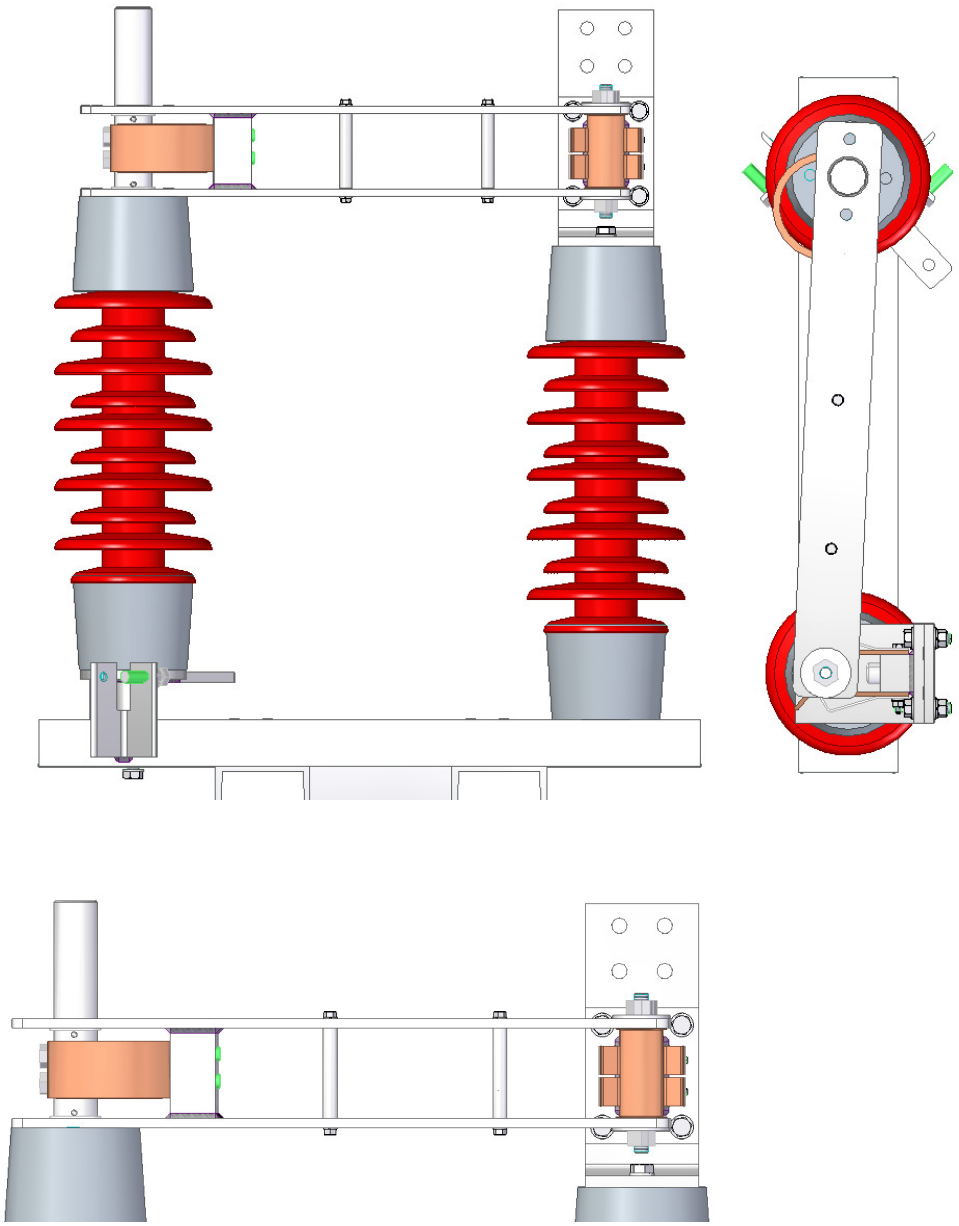
- Identify the Moving blades & fixed contacts.
- Keep the fixing hardware.

ERECTION

- Take the fixed contact and place over an insulator as per below image. And put two M12 screws with necessary washers on two holes. Repeat the same for the three poles also.



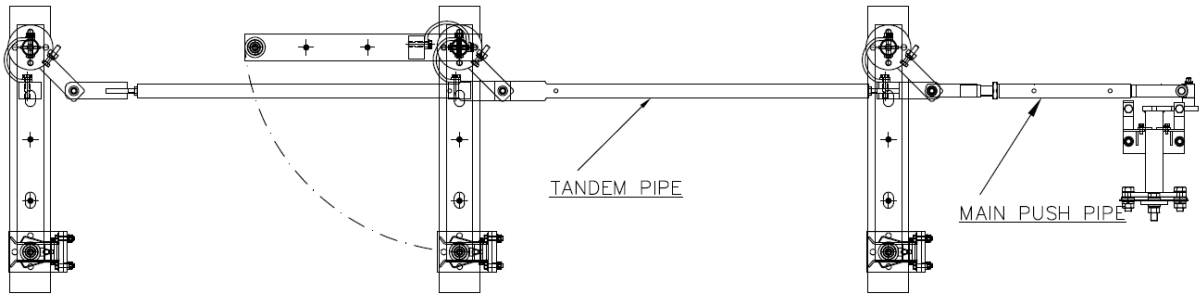
16.0 MOVING BLADE ASSEMBLY:



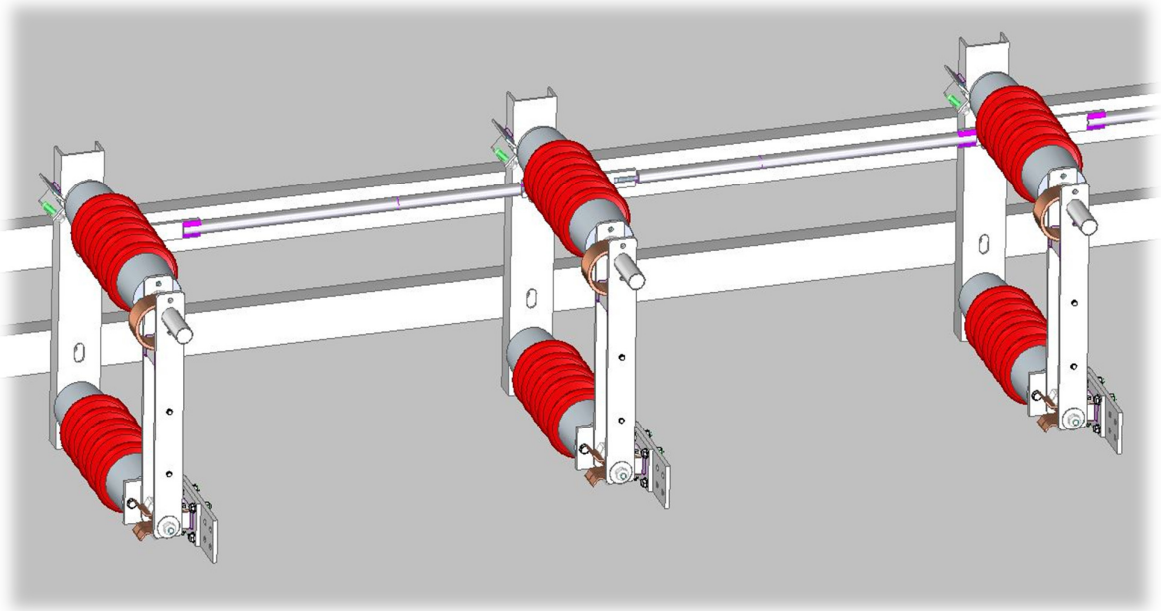
- Lift the Moving blade with proper and position it in the respective place as per the approved General Arrangement drawing.
- Fix the hardware; do not tighten fully. - Ensure earth adaptor (in case of Disconnector with earth) is in the respective side as per the approved drawing. - As shown in the image bring the moving blade to close position and check free entry of Male contact into the fixed contact. - Check the male contact position with respect to fingers (refer image); if required, align either moving blade or fixed contact with shims.

17.0 THREE POLE CONNECTION & PUSH PIPE CONNECTION WITH TORQUE BEARING.

- Keep the three pole in open condition and connect the tandem pipes . After three pole connection , connect push pipe lever with base level(R Phase)as shown in below image.



THREE POLE ASSEMBLY CLOSED CONDITION



18.0 OPERATING DRIVE AND DOWN OPERATING PIPE (MAIN):

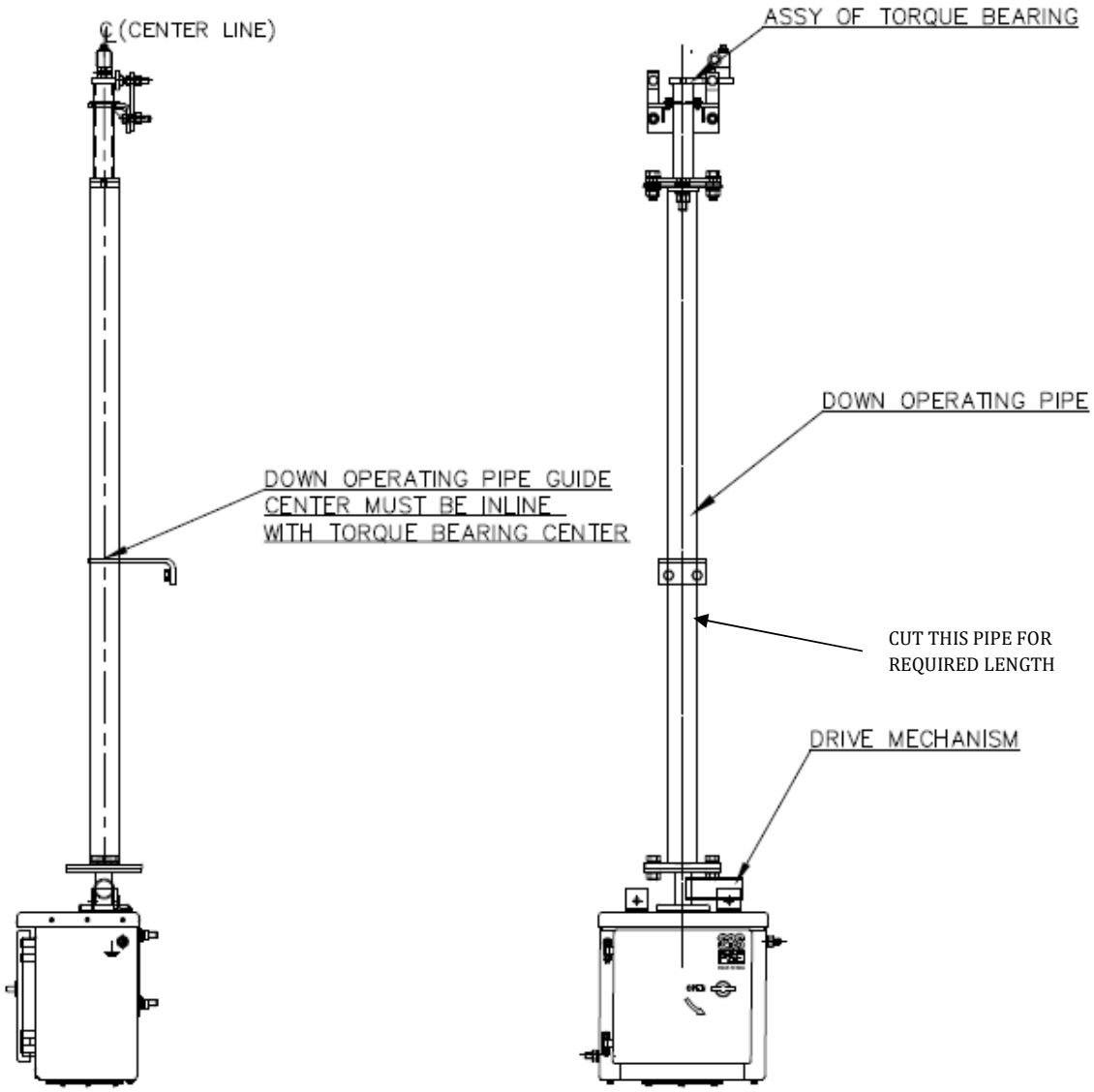
Identify the drive with the help of drawing and packinglist and open the case carefully.

MOUNTING:

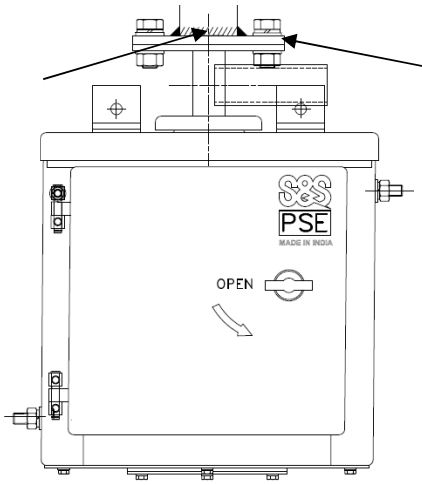
Do not attempt to lift mechanism by drive coupling flange. Lift the drive position and fix with structure. At this stage fixing bolts should only be hand tightened.

CONNECTING DOWN OPERATING PIPE (DOP):

- Check center line and vertical line between torque bearing flange and drive flange with a plumb.
- Fix the tee bar end of the down operating pipe to the tee bar of the torque bearing assembly
- Now fix the other down operating pipe tee bar to the tee bar of operating drive. Cut the down operating pipe to required length.
- Insert down operating pipe guide in to down operating pipe before welding it bottom flange in the drive box and isolator open condition.
- Keep the isolator in open position and also keep the drive box in open position then fix the down operating pipe with box.
- Tighten all bolts.
- Operate the pole manually and ensure open/close label is in proper position.

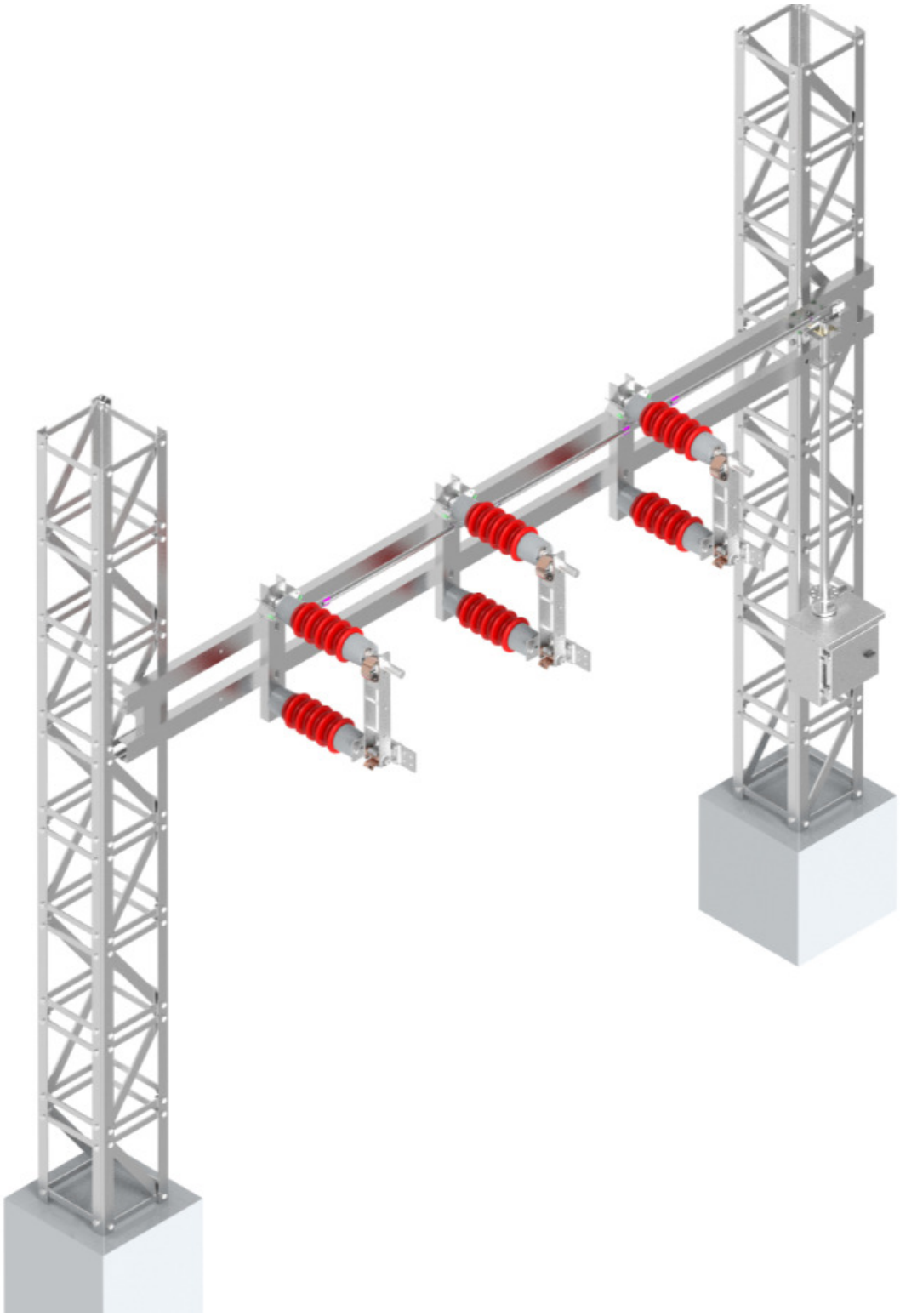


WELD ALL AROUND



Bolted flange for welding with down operating pipe.

DISCONNECTOR ASSEMBLY WITH OPERATING DRIVE MECHANISM



SECTION – D
COMMISIONING AND MAINTENANCE

19.0 COMMISIONING OF DISCONNECTOR:

- Before commissioning take contact resistance value with 100A DC current applying on across the terminal and measure voltage drop. Compare contact resistance value with the factory routine test value. If found value vary more than 20% clean/aligned the contacts and make sure the resistance value are within the limits.
- Carry out test operation manually; ensure satisfactory engagement of contacts for all three poles. If necessary, align the contacts.
- Apply contact grease.

20.0 MAINTENANCE:

Caution:

- **Working on high-voltage is very dangerous; hence follow substation and other standard safety rules.**
- Don't use emery paper for cleaning the contacts.
- Don't try to operate the Earth switch when Disconnector is in closed condition.

Do:

- Ensure disconnection of circuits before doing maintenance activity.
- Do proper earthing of the circuit.
- Stay clear of adjacent live parts; wherever possible, earth the adjacent live parts.
- Use proper tools.

We recommend the following inspection intervals

- Normal ambient condition: After every 5 years or after every 1000 operations (Close/open cycle).
- Extreme ambient conditions i.e. Climate (tropical) and heavy contamination (dust, salt, rust and sulphur): After every 2 years or after every 500 operations (Close/open cycle).

21.0 TOOLS AND TACKLES:

Apart from standard tools, the following are required

- Scotch bite for cleaning of Copper surfaces.
- Scotch bite for cleaning for Aluminum and contact surfaces.
- Contact grease (Petroleum jelly).
- Cold cleaning agent for Silver plated surfaces.
- Lint – free cloth's

22.0 Cleaning:

Bolted or sliding contact surfaces that conduct current have an effect on the electrical resistance of the current path. Dirty or oxidized contact surfaces increase the electrical resistance. This will result in damage to main contacts. Hence the following cleaning procedure shall be strictly adhered to:

Bolted Contact Surfaces: Aluminum

- Grease lightly.
- With Scotch brite, remove oxide film fully (Do not use emery paper).
- Wipe off contaminated grease immediately using lint – free cloth.
- Re-apply grease again (Immediately after cleaning with lint –free cloth).
- Bolt together treated surfaces and grease joints.

Silver plated contact surfaces.

- Clean with cold cleaning agent (do not destroy silver surfaces).
- Clean with cold cleaning agent (do not destroy silver surfaces).

23.0 Inspection checks:

The following operations must be carried out during inspection

Disconnector:

- Clean contact area (Male and Female contacts). Check for any damage; if required, change the contacts.
- Apply grease on contact surfaces.
- Clean the insulators. Check for any damage; if required, change.
- Check all bolted connections.
- Carry out three or four test operations manually.
- Reconnect the power supplies and control voltage.
- Carry our three or four test operations electrically.

24.0 RECOMMENDED SPARES:

Keep adequate quantity of following spares at all times.

- Fixed contacts.
- Moving contacts.
- Headed pins with nylon washers, split pins.

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OUR VISION: TO BECOME A PREFERRED SWITCHGEAR & P&C SOLUTIONS COMPANY TO OUR PARTNERS