Type **ESD63**

Aluminum Grounding Switch

38 kV – 245 kV

200 kV – 900 kV BIL

INSTALLATION &

INSTRUCTION

MANUAL

Safety Information

⚠ WARNING

IMPROPER HANDLING, INSTALLATION, OPERATION OR MAINTENANCE OF THIS EQUIPMENT MAY CAUSE IMMEDIATE HAZARDS WHICH WILL LIKELY RESULT IN SERIOUS PERSONNEL INJURY OR DEATH.

⚠ WARNING

The equipment covered by this publication must be handled, installed, operated and maintained by qualified persons who have direct knowledge and experience dealing with the hazards involved and are thoroughly trained in the handling, installation, operation and maintenance of high voltage transmission and distribution equipment. These instructions are meant for only such **Qualified Persons**. They are not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment.
A **Qualified Person** is one who is trained in and has skills necessary:

- to read and comprehend this instruction book – understanding that these instructions are general in nature
- to accept personal responsibility to prepare and maintain an intrinsically safe work environment and maintain control of the work site to safeguard all persons present
- to develop and implement a proper rigging, lifting, and installation plan along with all safety precautions required to insure safe and proper lifting and installation of the equipment.
- to distinguish between energized and non energized parts
- to determine proper approach distances to energized parts
- to properly work with and around energized or de-energized equipment that may be pressurized with gas
- for proper use of personal protective equipment, insulating and shielding materials, insulated tools for working near energized and /or pressurized electrical equipment
- to recognize and take necessary precautions for the unique and dynamic conditions of site and specialized equipment to maintain a safe work environment during handling, installation, operation, and maintenance of high voltage switching equipment

The instructions in this manual are general guidelines for this type of equipment and not specific to the equipment supplied. Portions of it may not be applicable or may not have complete instructions for your specific equipment.

If you do not understand any part of these instructions or need assistance, contact Southern States Service Division at 770-946-4562 during normal business hours (8:00am – 4:30pm EST, M-F) or 770-946-4565 after normal business hours.

Southern States, LLC

Equipment Receipt, Installation, Use, Operation and Maintenance Terms

("Terms of Use")

The purchaser ("Purchaser") of certain Equipment (the "Equipment") identified in the Instruction Manual accompanying these Terms of Use sold by Southern States, LLC ("Southern States"), by Purchaser's acceptance or Use of Equipment in any way, agrees to the Terms of Use set forth below (the word "Use" herein means receipt, testing, inspection, installation, operation, maintenance and otherwise handling the Equipment):

- Purchaser represents and warrants that it is fully qualified to Use the Equipment, and that it is a sophisticated user of the Equipment with a high level of expertise in the Use of the Equipment and Purchaser knows that Southern States is relying on Purchaser's sophistication and expertise with respect to the Equipment.

- The Purchaser will, within seven (7) days after receipt of the Equipment, inspect the Equipment and identify and notify Southern States in writing of any missing parts, damage or defects observed in the Equipment.

- The Purchaser will Use the Equipment, only in conformity with all manuals, data sheets and instructions provided by Southern States, and in keeping with sound engineering, utility and safety practice. Purchaser will at its own expense, provide all necessary labor, supplies, and facilities required to Use the Equipment.

    - The Purchaser may use its own personnel or engage a third party to Use the Equipment. The Purchaser shall insure that it only utilizes personnel who are fully qualified or certified by a reputable certification agency to Use the Equipment. In the event that Purchaser cannot find such qualified personnel, the Purchaser will notify Southern States and seek its advice to determine a mutually agreeable solution.

    - By separate agreement, Southern States may provide such services and the personnel to conduct such services in connection with the installation of the Equipment. In the event Southern States agrees to provide personnel to install, maintain, and operate the Equipment, such personnel will function only in an advisory capacity and shall have no responsibility for the supervision, or the quality or workmanship of such installation, maintenance, or operation of the Equipment.

- The Purchaser shall not install and operate the Equipment in a way such that a single point of Equipment failure leads to a cascading event or consequential damage to any person or property. Purchaser shall ensure redundancy in its system at all times. Purchaser acknowledges and agrees that electric service is by nature subject to interruptions due to Equipment failures and shall not agree to provide service free from the effects of Equipment failures.

- The Equipment will be maintained and inspected as provided by this instruction manual and in compliance with best industry practices, but in no event will the Equipment be inspected and tested less frequently than once in every 6 months.

- The Purchaser shall not repair, dismantle, or alter any of the Equipment without Southern States' written consent.

- Any failure of Equipment either in service, testing or inspection will be promptly reported in writing to Southern States within 24 hours of the failure so that adequate evidence can be collected, appropriate diagnostic tests can be conducted, and analysis of the failure can be determined.

- Southern States will have no liability for any direct, indirect, consequential or remote damage or injury, whether or not foreseen or foreseeable, to the Purchaser or any third party or person for any damages or injury to person or property caused by Purchaser's or any third party's actions, whether or not negligent, in the Use of the Equipment. Purchaser shall indemnify and hold Southern States and its employees, officers and directors against any damage or injury caused in whole or part by Purchaser's or any third party's action whether or not negligent, resulting from the Use of the Equipment. Southern States expressly rejects any liability to third parties. The Purchaser expressly waives any claim against Southern States, its employees, officers, directors and affiliates, for injury or damage to person or property resulting from Use of the Equipment not directly and solely caused by Southern States' negligence. For the purposes of clarity, Southern States shall not be liable, and be fully indemnified by the Purchaser, for the following related to the Equipment: normal wear and tear, excessive use and loading, improper interference or maintenance on the part of the Purchaser or third parties, incomplete or false information given by the Purchaser, inappropriate or improper Use, faulty operation, installation or start-up, faulty or careless handling, improper maintenance, use of unsuitable operating materials/substitute materials, defective construction work, hazardous ambient conditions unknown to the Purchaser, chemical, electro-chemical or electrical influences, changes to the subject of delivery made without Southern States consent.

- In the event that Southern States is found by a court of competent jurisdiction or a properly empaneled arbitral body to be liable to the Purchaser for any reason, Southern States shall be entitled to a reduction in the liability by taking into account the exceptions provided by statute, law, and any counterclaims Southern States may have against Purchaser.

- The failure of Purchaser to comply with these Terms of Use herein shall void any and all warranties related to the Equipment. These Terms of Use shall be deemed to be part of the binding contractual agreements between Purchaser and Southern States related to the Equipment and shall govern over any inconsistent term or provision in such other contractual agreements

LIMITED WARRANTY

Southern States, LLC ("SSLLC") warrants only to the Warranty Holder (hereinafter defined as the "End User" or the "Immediate Purchaser", as applicable, pursuant to the terms and conditions of this Limited Warranty as set forth below), that the Product identified below will, upon shipment, be free of defects in workmanship and material for the applicable Warranty Period. The "Warranty Period" is that period of time during which this Limited Warranty is effective, and such period begins on the invoice date issued by SSLLC for the Product, and continues until the earlier to occur of (1) the expiration of the Warranty Duration period, or (2) the Number of Operations, both as specified in the table below. If the Product is both purchased and installed within the United States or Canada, this Limited Warranty is granted to each end user of the Product who acquired the Product for its own use during the Warranty Period ("End User"). In all other situations, this Limited Warranty is granted only to the first purchaser of the Product ("Immediate Purchaser") from SSLLC. No primary or remote purchaser or owner of the Product who is not a Warranty Holder may claim any benefit under this Limited Warranty, or any remedial promise included in this Limited Warranty. SSLLC shall, upon prompt written notice from the Warranty Holder, correct a nonconforming Product by repair or replacement at the sole discretion of SSLLC of the nonconforming Product or any part or component of a nonconforming Product necessary in SSLLC's discretion to make such Product conforming. Any transportation charges, labor for removing, reinstalling the Product or part, and/or costs related to providing access to the Product shall be the responsibility of the Warranty Holder. Correction in this manner will constitute the Warranty Holder's exclusive remedy and fulfillment of all SSLLC's liabilities and responsibilities hereunder. SSLLC's duty to perform under this limited warranty may be delayed, at SSLLC's sole option, until SSLLC has been paid in full for all products purchased by the Warranty Holder. No such delay will extend the Warranty Period. If SSLLC does not make such repair or replacement, SSLLC's liability for damages on account of any claimed nonconformity will in no event exceed the purchase price of the Product in question. This Limited Warranty does not apply to any Product that has been disassembled, repaired, or altered by anyone other than SSLLC. This Limited Warranty will not apply to any Product that has been subjected to improper or abnormal use of the Product. SSLLC has no responsibility to repair or replace any Product or component thereof manufactured by another party, but SSLLC will assign, to the extent assignable, to the Warranty Holder any manufacturers' warranty that applies to products and components not manufactured by SSLLC.

THIS LIMITED WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES. THERE ARE NO OTHER EXPRESS, IMPLIED, OR STATUTORY WARRANTIES. ALL IMPLIED WARRANTIES WHICH MAY ARISE BY IMPLICATION OF LAW, OR APPLICATION OF COURSE OF DEALING OR USAGE OF TRADE, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT OR OTHERWISE ARE EXPRESSLY EXCLUDED. SSLLC SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY CONSEQUENTIAL, INCIDENTAL, INDIRECT, EXEMPLARY, SPECIAL, OR PUNITIVE DAMAGES, EVEN IF SSLLC HAS BEEN ADVISED OF THE POSSIBILITY OF SAME. THE WARRANTY HOLDER IS SOLELY RESPONSIBLE FOR THE SUITABILITY OF THE PRODUCT FOR ANY PARTICULAR APPLICATION.

Product Purchased Region	Product Installed Region	Warranty Holder	Warranty Duration
U.S and Canada	U.S and Canada	End User	Five (5) Years
All Other Conditions		Immediate Purchaser	Earlier of 1 year from installation or 18 months from shipment

Type ESD63

Aluminum Maintenance Ground Switch

38 kV – 245 kV

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Summary & Introduction

Important

The information contained herein is general in nature and not intended for specific application purposes. It does not relieve the user of responsibility to use sound practices in application, installation, operation, and maintenance of the equipment purchased. Southern States reserves the right to make changes in the specifications shown herein or to make improvements at any time without notice or obligation. Should a conflict arise between the general information contained in this publication and the contents of drawings or supplementary material, or both, the latter shall take precedence.

Summary

These instructions do not purport to cover all details or variations in equipment, or provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the local Southern States Representative.

The contents of this instruction manual should not become part of or modify any prior or existing agreement, commitment, or relationship. The sales contract contains the entire obligation of Southern States. The Warranty contained in the contract between the parties is the sole warranty of Southern States. Any statements contained herein do not create new warranties or modify the existing warranty.

Introduction

Southern States type ESD63 ground switch is typically shipped mounted and adjusted on line switch whenever line switch is assembled with its insulators. Depending upon shipping constraints, sometimes this will not be the case and some assembly and adjustment will be required.

This switch can be used on either the jaw or hinge end of line switch, or both. On center break switches they are arranged so that their jaw is attached to either (or both) line switch blades. They can also be mounted on station post columns, and not attached to line switch.

Operation can be either three-pole, group operated, or single pole, by manual crank, swing handle or motor drive. And finally, they may be arranged so that the blades open parallel to the base, or perpendicular to it.

The installation procedures for all mounting and operating schemes are very similar. Regardless of the configuration, they all use a system of pipes, bearings, and adjustable length arms to open and close the switch from the ground. Interlocks (mechanical and/or electrical) can be added to prevent the line switch and the grounding switch from being closed at the same time. When these are applied make sure all accessory items are installed on the vertical pipe as order of operations is important.

It is important to remember that leveling adjustments to these switches are made to the hardware that supports the grounding switch - not to the hardware that supports the insulator. This is so as not to disturb the adjustments already made to the line switch, which should be installed and operating satisfactorily first.

It may be necessary to make adjustments not described in this manual. If any question should arise during installation or adjustment of this equipment, call your local Southern States representative, or the factory.

Southern States After Sales and Service Department is available for field installation assistance along with providing parts support for all Southern States products.

Contact After Sales and Service at 770-946-4562
7:30am-4:00pm EST Monday-Friday. After Hours: 770-946-4565

Distinctive signal words are used to indicate the degree of hazard that may be encountered by the user. Identification of the signal words and their definition follow:

⚠ DANGER	Indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.
⚠ WARNING	Indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.

Recommended Tools & Values

Table 1: Recommended Tools and Torque Values

Recommended Tools	
Type	**Sizes**
Hand Wrenches and/or Sockets	15/16”, 3/4", 5/8”, 9/16”
Drill Bit	1/4”
Slotted Screwdriver	
SAE Hex Key Set	

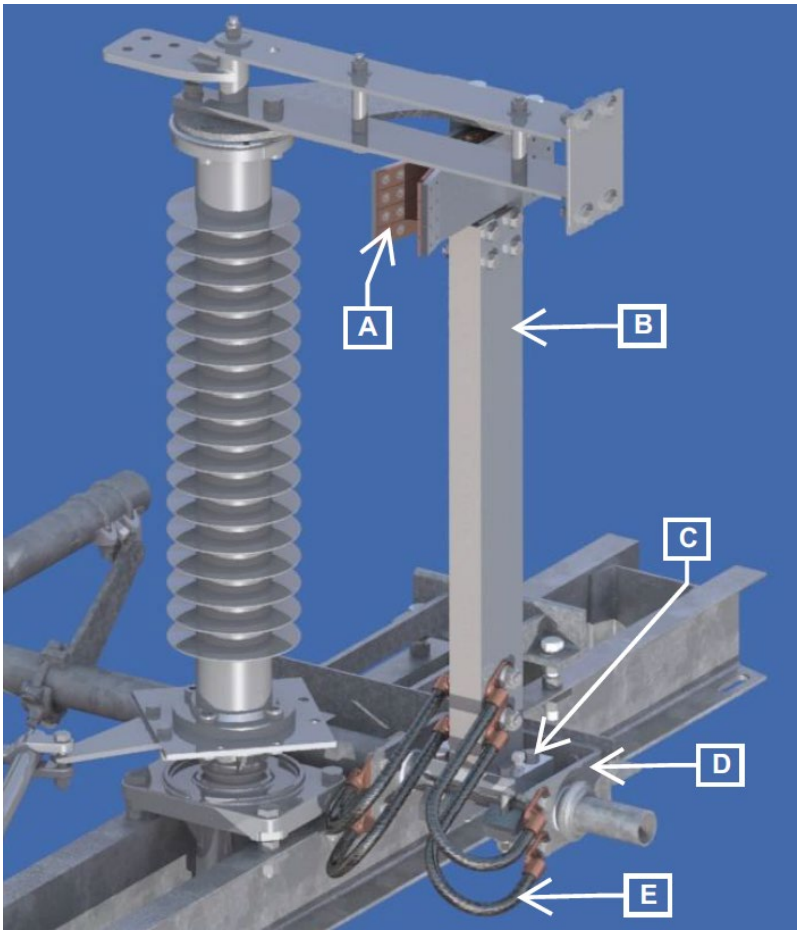
Recommended Torque Values	
Bolt/Nut size	**Torque (Ft-lb)**
1/2”	40
5/8”	92
3/4"	127
1”	286

Product Description

Typical Disconnect Switch

In general, installing a disconnect switch consists of the following:

- Mounting the insulators to the switch base
- Mounting the live parts to the insulators
- Mounting the switch base to the structure
- Installing operating components
- Final adjustment or tuning is then completed.



A – Jaw
B – Blade
C – Hinge
D – Hinge Support
E – Hinge Shunts

Figure 1: Typical ESD63 Disconnect Switch & Common Terminology

Receiving, Handling & Storage

Receiving & Unpacking

Unpack the equipment and check for damages or material shortages immediately. The bill-of-material from the Unit Assembly (switch) and Operating Mechanism drawings should be used for this purpose. If damage or a shortage is noted, file a claim immediately with the carrier and contact the factory.

Storage

All components of the ESD63 maintenance ground switch are suitable for outdoor use and do not have any special storage requirements. If a motor operator is furnished be sure to connect the heater circuit, using the provided external wiring, while the unit is in storage. Discard the wiring upon installation.

Typical crating is intended for storage less than 1 year. If long term storage is required, please notify factory at time of order placement so that special crating can be used.

General Information

All photographs and sketches in this manual are for illustration purposes only and may not be to scale. Refer to the Unit Assembly drawing and the Operating Mechanism drawing provided with each disconnect switch for specific details. During installation, it may be necessary to make adjustments other than those described in this manual. Contact your local representative or the factory if questions should arise.

Installation & Adjustment Procedures

Assembly

1. Preferred Switch Assembly Method

1.1. If the disconnect is shipped assembled on insulators with ground switch support bracket and jaw installed do not remove the shipping supporting straps or stops and install the switch on the structure. Adjust it satisfactorily before proceeding with ground switch installation and adjustment. Skip to Section 2.

1.2. If not shipped assembled, Install the disconnect switch and then install the ground switch.

1.3. **DO NOT** attach any of the op-mech linkage to the ground switches until Section 3.

1.4. Mount the base mounting bracket to the switch base.

1.5. If not installed, install the jaw.

1.6. Parallel to base installations:

1.6.1. Slide each ground support saddle on to the interphase pipe making sure to also slide the pipe collars on as well. Refer to drawing for location and quantity of pipe collars. Interphase pipe may be provided with couplings so sequence of installation is important.

1.6.2. Lift the interphase pipe, ground support saddle, pipe collars as one unit and bolt into place on the base mounting bracket.

1.6.2.1. If the interphase pipe goes through the switch base, each section will be installed individually

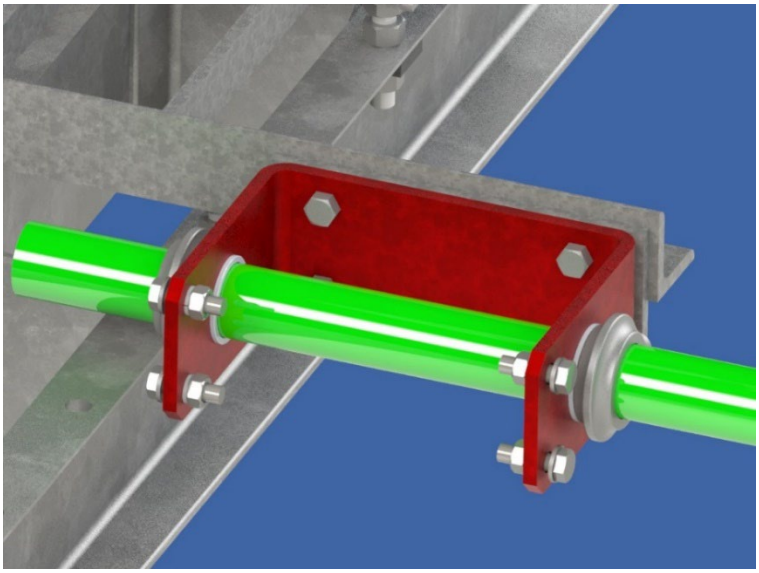


Figure 2: Ground Support Saddle

1.7. Perpendicular to base installations
1.7.1. Attach the ground support saddle to the base mounting bracket.

1.7.2. Slide the pipe through the support saddle and pipe collars on both sides.

1.8. In the open position install the ground blade with the tapered end of the blade tip toward the jaw. Loosely attach the blade clamps on the pipe.

1.9. Install each phase in the same manner.

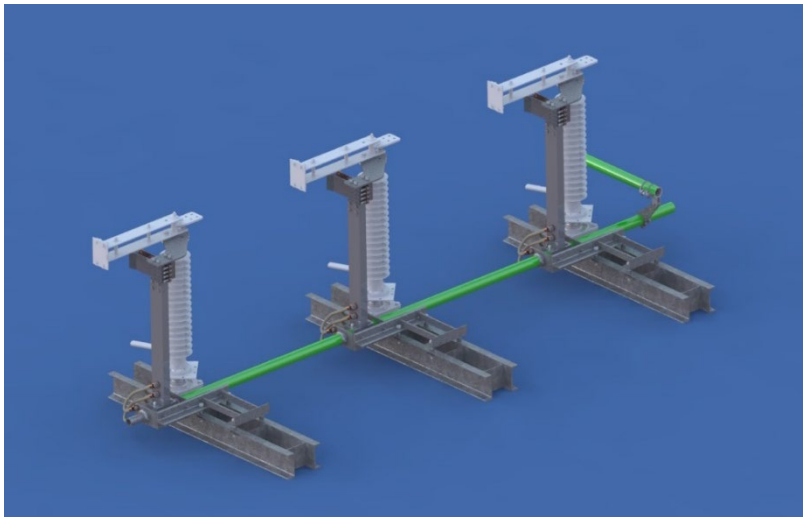


Figure 3: Perpendicular to Base

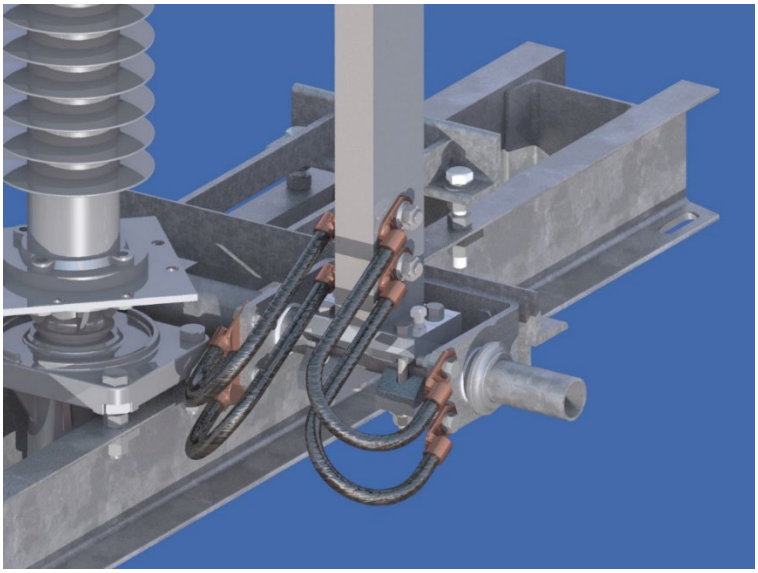


Figure 4: Ground Braids / Hinge

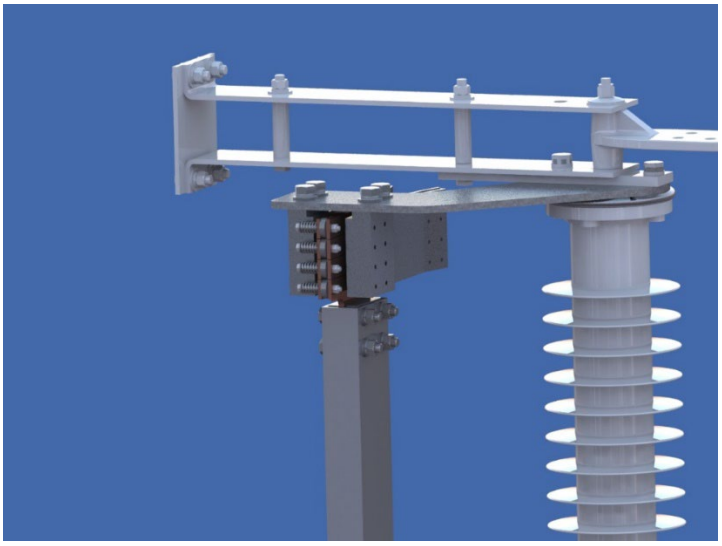


Figure 5: Jaw Contact

2. Contact Alignment

2.1. Carefully, lift the blade manually by hand confirming the blade tip is centered in the jaw (**Figure 5**) and the leading tapered edge is vertically in line with the jaw opening. If correct tighten the blade clamps and any loose hardware on the jaw mounting, proceed to the next phase until all are complete.

2.2. If adjustment is necessary, have a helper make adjustments to the jaw mounting bracket, base mounting bracket, and/or blade clamp, correcting the issue. Refer to **Figure 5**.

3. Operating Mechanism Installation:

3.1. Refer to the operating mechanism drawing and lay out all parts and check them against the bill of material.

3.1.1. Depending on configuration, either parallel to the base or perpendicular to the base, use the sketch in **Figure 10** or **Figure 11** as a reference, and the operating mechanism drawing for specifics and dimensions. Install mounting brackets, bearings, bushings, clevises, operating device, adjustable arm, vertical pipe and reach pipe, etc. Be sure to install any encircling member (such as key interlock, pipe guide, etc.) on the vertical pipe at this time. REFER TO SECTION 4.1 for note on interphase pipe installation.

3.1.1.1. **Important**: The pipe collar must support the entire weight of the vertical pipe. Do not allow the housing of the manual or motor operator to bear any of the weight of the vertical pipe. See **Figure 7**.

3.1.1.2. **Important**: Prior to installation confirm the adjustable arm has the correct trial dimension shown in the operating mechanism drawing, measure from the centerline of vertical pipe rotation to the centerline of the pinned attachment point. If not loosen and adjust as necessary.

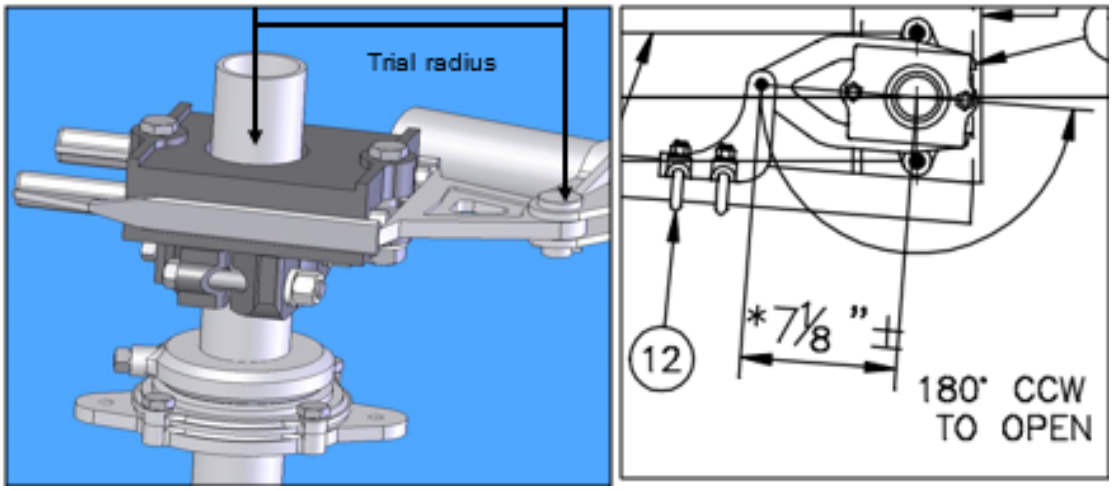


Figure 6: Vertical Pipe Rotation

3.1.1.3. If provided, pay close attention to the dimensions shown on the drawings for the initial setup of the lever drive arm shown on the drawings (marked with an “A” in the **Figure 11**).

3.1.1.4. Tighten all set screws to grip the pipe securely, but do not drive any set screws through the wall of the pipe at this time. Match mark all move able joints like clevis connections, adjustable arm, and operator attachments to check for slippage during trial operations. Especially the coupling to the vertical pipe.

3.1.1.5. If motor operator is used, it shall be used in manual mode only during setup.

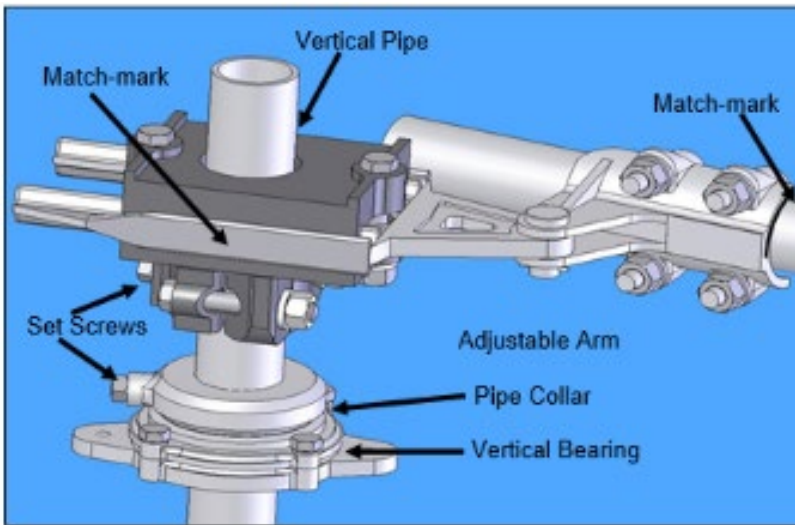


Figure 7: Typical Operating Arrangement

4. Switch Adjustments (Tuning)

4.1. The operating mechanism is intended to fully open and fully close the disconnect switch by rotating the vertical operating pipe 180°± using an operator (manual or electrical). The interphase pipe controls the individual operation of each switch pole, using a push/pull control. The reach rod translates the motion of the vertical operating pipe to the interphase linkage. The adjustable arm (**Figure 7)** controls the total amount of switch operation available.

HINT: For easiest adjustment start with the reach rod connected to the drive phase and the interphase pipe disconnected from the other two phases. Once the drive phase is properly adjusted, connect the interphase pipe and continue tuning the other two phases. Care should be taken to ensure that the operating mechanism only exerts enough force to toggle the blade tip perpendicular to the jaw contacts. Excess downward force on the blade could result in damage to the switch that will render it inoperable.

4.2. Switch Operating Devices:

4.2.1. Worm gear operator (HOGO – High Output Geared Operator)

4.2.1.1. The operator handle is factory set to rotate either clockwise or counterclockwise to open the switch.

4.2.1.2. When the switch is properly adjusted the operator handle should hang vertically and free in both the open and closed positions to permit the use of a customer supplied padlock. Refer to **Figure 8**.

⚠ CAUTION Be aware that there is an adjustable stop on the operator. **Do not over operate as damage will occur to the operator.**

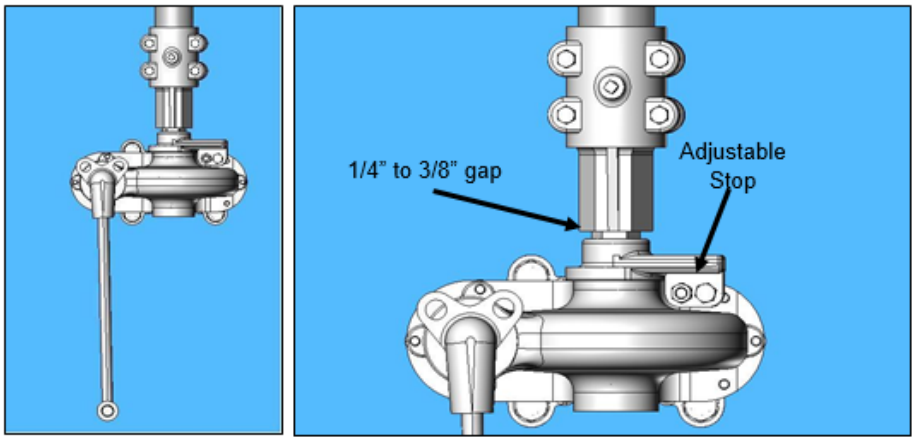


Figure 8: Type HOGO (High Output Geared Operator) Front View

4.2.2. Worm gear operator (SEGO – Safety Enhanced Gear Operator) (Optional)

4.2.2.1. The weight of the vertical operating pipe should be supported by pipe collar by maintaining the 1/4”-3/8” gap.

4.2.2.2. When the switch is properly adjusted the operator handle should hang freely in both the open and closed positions to permit the use of the customer supplied padlock.

⚠ CAUTION	Be aware that there is an adjustable stop on the operator. **Do not over operate as damage will occur to the operator.**

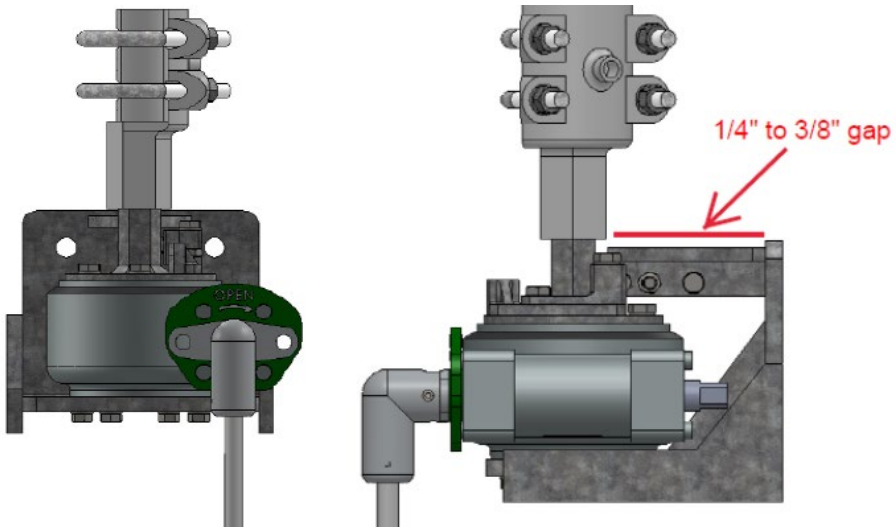


Figure 9: Type SEGO (Safety Enhanced Gear Operator)

4.2.3. Swing handle operator

4.2.3.1. Adjust stops on handle mount after adjusting switch.

4.2.3.2. When the switch is properly adjusted the handle should hang vertically and free in both the open and closed positions to permit the use of a customer supplied padlock.

4.2.4. Electrical motor operator

4.2.4.1. Please refer to motor operator instruction manual for proper installation and setup.

4.2.4.2. Use manual operation while completing switch setup.

4.2.4.3. **Do not** electrically operate until all switch adjustments are complete. **ALWAYS** operate the motor operator decoupled first to ensure proper setup.

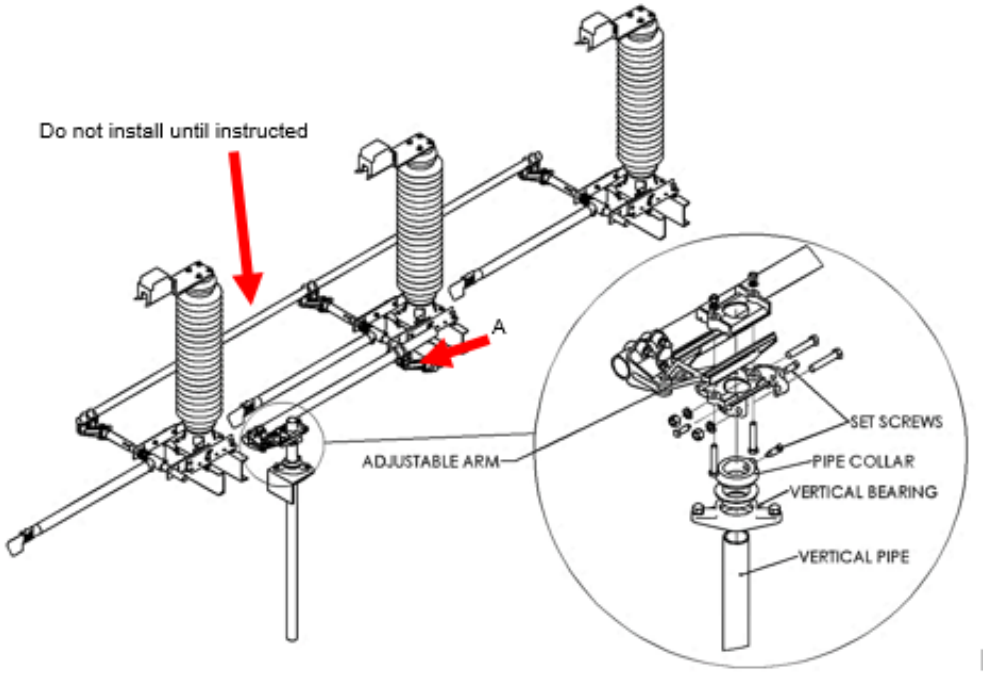


Figure 10: Perpendicular to the Base

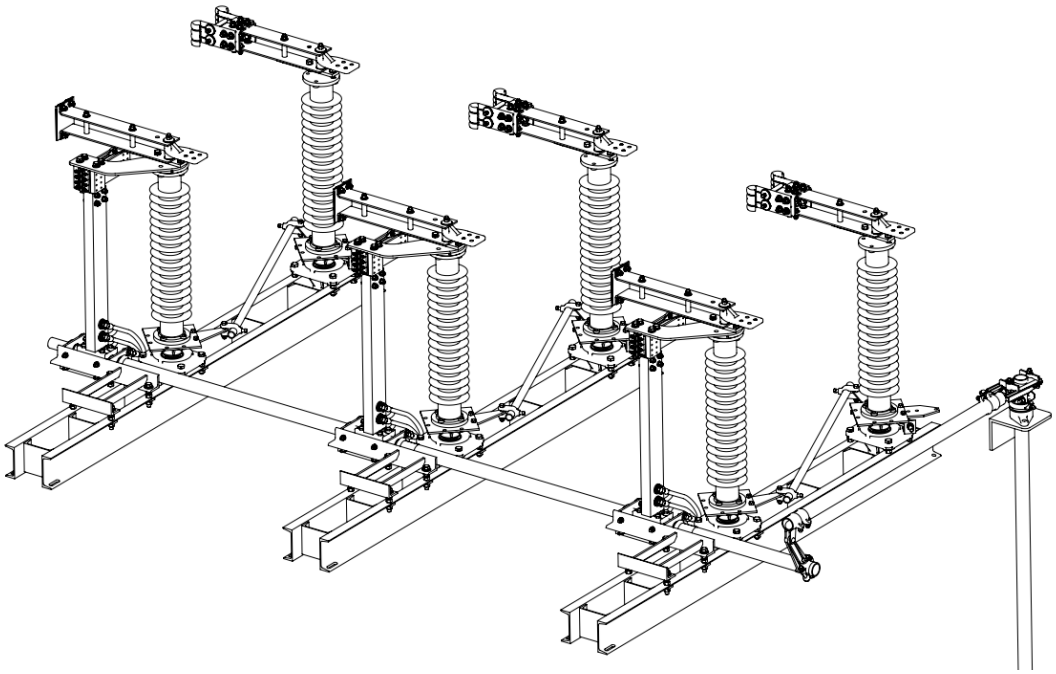


Figure 11: Parallel to the Base

5. Operating Mechanism Adjustment:

5.1. All grounding switch poles should be open as well as the line switch.

5.2. When adjusting the ground switch, it is best to adjust the driven phase only if possible.

5.2.1. For perpendicular arrangements similar to the one shown in **Figure 10** this is achieved by connecting the operating pipes to the center phase only. Once adjusted, open the switch and connect the interphase pipe between all phases. Operate the switch and make adjustments if necessary.

5.2.2. For parallel arrangements similar to the one shown in **Figure 11** this you must install the interphase before adjusting the switch. When adjusting focus on adjusting the phase closest to the operating reach rod and then the next two phases.

5.3. Open/Close criteria defined:

5.3.1. Full open, the ground blade is at or near parallel to the switch base **(Figure 12**).

5.3.1.1. If necessary, it is acceptable to be above parallel but not above the switch base as long as no physical interference is created.

5.3.2. Full closed, the blade tip is fully against the rear stop.

5.3.2.1. The blade tip is centered in the jaw contacts.

5.3.2.1.1. It may be required to raise the ground switch mounting bracket slightly.

5.3.2.2. The blade tip enters the jaw without dragging on either side of the contact.

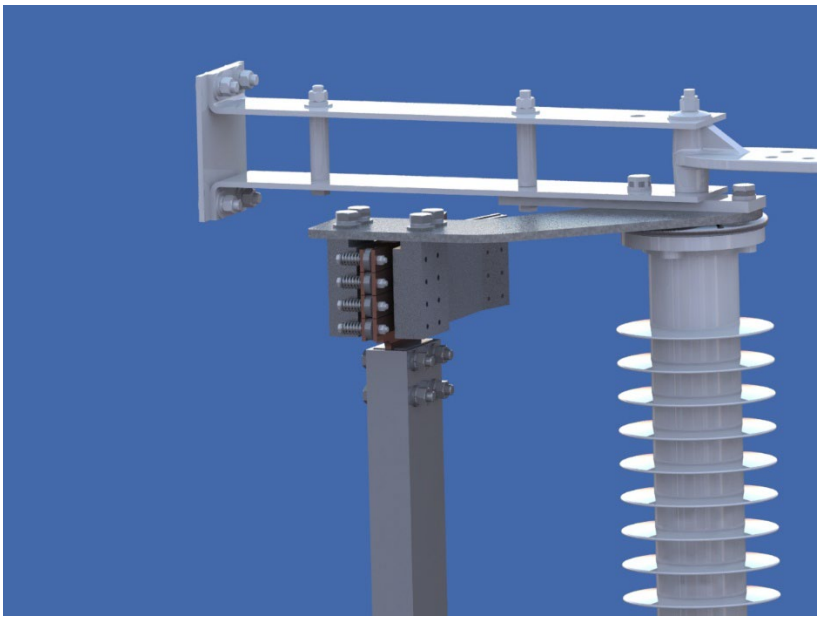


Figure 12: Blade Fully Closed

5.4. Close switch. The adjustable arm should travel 180° from toggle open to toggle closed position.

5.4.1. If the adjustable arm rotates 180° and is not fully closed, the radius of the adjustable arm is too short or something has slipped.

5.4.1.1. Check first to see that nothing has slipped.

5.4.1.2. Return the switch to the open position.

5.4.1.3. Match mark, then loosen adjustable arm and clevis bolts as shown in **Figure 8**.

5.4.1.4. Lengthen the radius of the adjustable arm 1/4 to 1/2 inch and allow the clevis to reposition itself the same distance (lengthening the pipe). Small changes make big differences.

5.4.1.5. Test operate again and repeat as necessary.

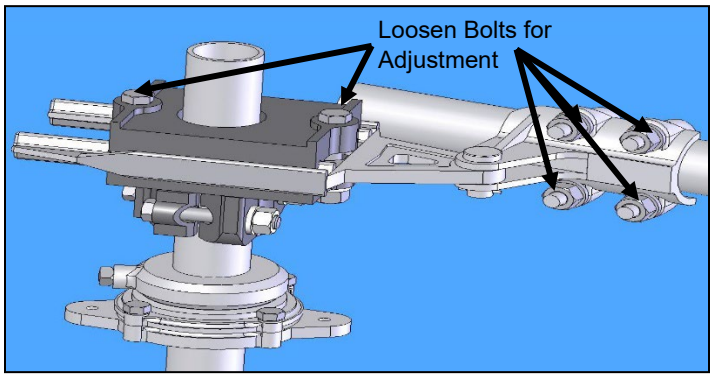


Figure 13: Adjustable Arm Assembly

5.4.2. If the switch is fully closed before the adjustable arm rotates 180°, the radius of the adjustable arm is too long. Be careful not to overdrive the blade into the contacts.

5.4.2.1. Check to see that nothing has slipped.

5.4.2.2. Return the switch to the open position.

5.4.2.3. Loosen the adjustable arm and clevis bolts as shown in **Figure 13**.

5.4.2.4. Shorten the radius of the adjustable arm 1/4 to 1/2 inch and allow the clevis to reposition itself the same distance (shortening the pipe). Small changes make big differences

5.4.2.5. Test operate again and repeat as necessary.

All poles of the fully adjusted switch should operate simultaneously within +/- 5°. The main objective is for all switches to open and close completely. Slight adjustment of the interphase clevises may be necessary to coordinate all three poles. When the switch is completely adjusted, securely tighten all bolts and all set screws until the pipe walls are pierced. (For heavy wall pipe, drill the set screw holes, using the threaded drill guides supplied and a ¼" drill.). **Finish by attaching the ground braids to grounding location.**

Recommended Inspection Maintenance

The ESD63 has been designed to operate with minimal maintenance. Periodic inspection is important for satisfactory operation. Frequency of inspection and maintenance depends on the installation site, weather and atmospheric conditions, experience of operating personnel and special operation requirements.

Table 2: Recommended Installation and Maintenance Table

		Installation Tests	Patrolling Inspection 6 month	Routine 5 Year	Periodic 10 Year
Insulators	Contamination	X	X	X	X
	Damage	X	X	X	X
Cabinet (if motor operator supplied)	Any loose parts on the floor of the cabinet?	X	X	X	X
	Wiring Secure	X	X	X	X
	Links Secure	X	X	X	X
	Inspect Mechanism for loose parts	X	X	X	X
	Heaters Energized	X	X	X	X
	Door Seal	X	X	X	X
Mechanical	Operational Tests	X		X	X
Electrical	Contact Resistance	X		X	X
Liveparts Inspection	Inspect Contacts				X
	Inspect Arcing Horns				X

Patrolling Inspection (6 Months)

The patrolling inspection is a largely visual inspection on an energized unit in service. The frequency of the inspection is determined by the local conditions and policies of the owner of the equipment. Refer to **Table 2** for recommended inspection items.

Routine Inspection & Maintenance (5 year)

Routine inspection is performed on a de-energized unit. The frequency of the inspection is determined by the local conditions and policies of the owner of the equipment. Refer to **Table 2** for recommended inspection items.

Periodic Inspection & Maintenance (10 year)

Periodic inspection is performed on a de-energized unit. The frequency of the inspection is determined by the local conditions and policies of the owner of the equipment. Refer to **Table 2** for recommended inspection items.

ANSI Standard C37.30.1 Annex D is also a recommended guide for maintenance on air disconnect switches.

30 Georgia Avenue
Hampton, Georgia 30228
Phone: 770-946-4562
Fax: 770-946-8106
E-mail: support@southernstatesllc.com
http://www.southernstatesllc.com

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