



Type HRU

High Speed Grounding Switch

INSTALLATION &

INSTRUCTION

MANUAL

Safety Information

DANGER

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 (EST) or 770-946-4565 after normal business hours.



LIMITED WARRANTY

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) 12 months from the date of installation, (2) 18 months from the date of invoice by SSLLC, or (3) as otherwise specified on the Southern States Proposal. “Installation” shall be defined as the Product being assembled in the intended service location and does not require energization to be complete. 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.

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 State 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.

INSTALLATION AND MAINTENANCE INSTRUCTIONS — TYPE "HRU" HIGH SPEED GROUNDING SWITCH

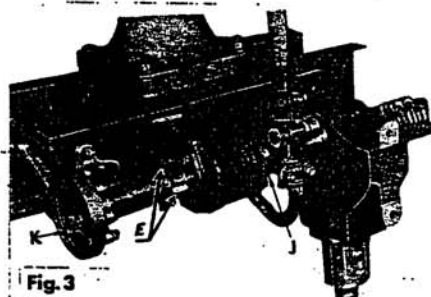
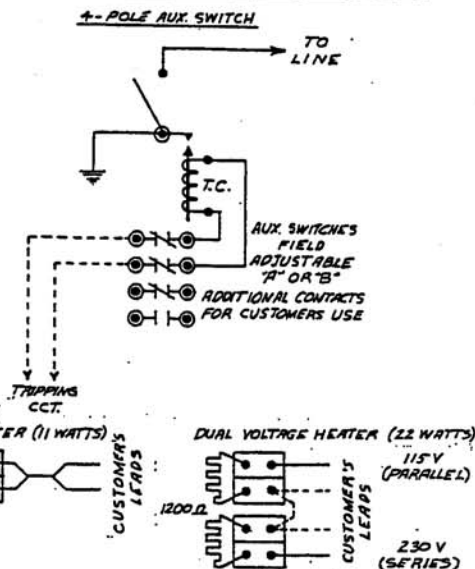
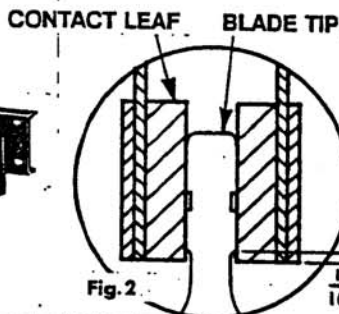
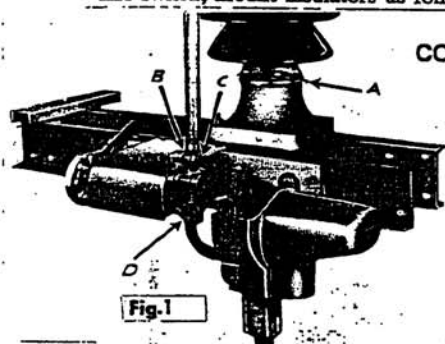
UNPACKING AND INSPECTION

Uncrate unit and inspect for possible damage in transit. If damaged, file claim with carrier immediately and notify factory. Switch units through 46 kv are shipped assembled and adjusted. Ratings of 69 kv and above are shipped less insulators. See Bulletin 400 for general description of switch.

MOUNTING

Mount switch in accordance with instructions on operating mechanism and switch assembly drawing.

Units rated 69 kv and above require mounting of insulators. If unit is to be mounted on a line switch, see line switch instruction sheet for insulator mounting instructions. If not mounted on a line switch, mount insulators as follows:



1. If 69 kv switches use tilting rings, mount insulators on top of tilting rings, making certain that the tabs ("A", Fig. 1) of the tilting rings are opposite each other. Use tilting rings to plumb insulator stack. For all horizontal upright mounted switch above 69 kv, jackscrews are used. Mount cap and pin insulators on adapter or mount post insulators on adjusting plate as shown on switch assembly drawing. Use jackscrews to plumb insulator stack.

Mount jaw assembly to top of insulator stack. The center of the jaw should be in line with the center of the blade. It may be necessary to rotate the stack to obtain alignment.

2. It is not necessary to adjust the operating spring as this has been set at the factory to close the switch within 30 cycles. Any attempt to operate the switch with a spring setting other than that set by the factory could result in slow closing, an overstressed spring, or other serious trouble. The maximum preload that the spring will withstand without permanent set is 90°, which is three notches on the spring retaining plate ("J", Fig. 3).

BLADE ADJUSTMENT — 69 KV AND ABOVE

Place blade in socket and close switch. With the blade in the contacts and parallel to the insulator stack, adjust so that bottom contact area of blade tip is 1/16" above bottom of contact leaf by raising or lowering the blade as required (see Fig. 2). When the proper distance has been obtained, tighten the clamp bolt ("B", Fig. 1) on the socket. Center-punch blade through tapped hole ("C", Fig. 1) in the socket to mark spot for hole and open switch. Remove blade from socket and drill a 3/8" diameter hole through blade wall at center punch. Assemble blade in socket, lining up hole in blade with tapped hole in socket. Install 3/8-16 x 1" galvanized bolt and L. W. and tighten. Socket clamping bolt may now be tightened securely. Connect shunt to blade using U-bolt and clamp ("D", Fig. 1).

OPERATING MECHANISM

Install operating mechanism in accordance with operating mechanism drawing. With the HRU blade fully closed, position the switch arm to the dimension shown on the operating mechanism drawing. Check to see that there is a gap of 1/8-1/4 inch between operating lugs ("E", Fig. 3). If necessary, the HRU arm may be adjusted in 5° increments by removing the four bolts ("K", Fig. 3) holding it to the hub and repositioning. With the switch arm in this position and the operating arm in the "normal" position install the vertical operating rod. Tighten bolts in clevises and check all dimensions to see that they are in accordance with those shown on the operating mechanism drawing. Improper adjustment could cause binding, overstressing of parts, or other serious trouble.

Check by opening the switch and manually tripping several times. Manual tripping may be accomplished by removing the inspection cover and manually actuating the trip latch ("F", Fig. 4) with a screwdriver. **CAUTION**—Keep fingers clear of latch linkage when operating manually.

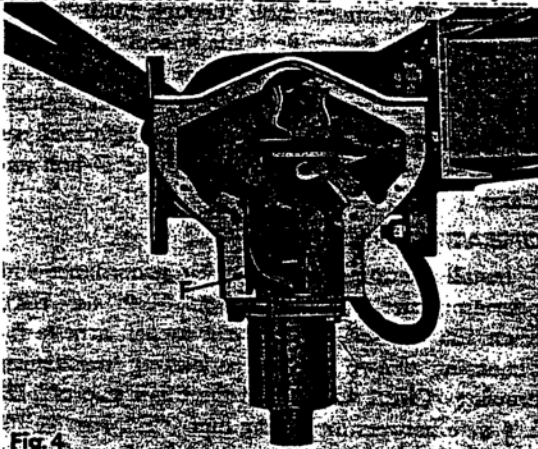


Fig. 4

When resetting, never attempt to move the operating arm beyond approximately 160° (or as shown on the operating mechanism drawing) as this is the latch point of the trip mechanism. Travel beyond this point could result in damage to the switch. Upon opening, resistance can be felt through the operating arm when the trip mechanism latches. When this is felt, ease off on the operating arm to see if the trip mechanism is latched. If it is latched, return operating arm to the "normal" position. If it is not latched, continue as above.

ELECTRICAL OPERATION

Make electrical connections in accordance with the wiring diagram. Operate electrically and check all adjustments. Voltage at coil terminals should not be less than that shown in NEMA Standard SG 6-7.01 for tripping mechanism or tripping may

not be accomplished. Be sure that all electrical connections are tight.

Auxiliary switches have been adjusted at the factory, however they may be adjusted in the field if necessary. To field adjust, remove cotter pin, nut and washer ("G", Fig. 5) on auxiliary switch shaft. Spacers and contacts ("H", Fig. 5) are easily slipped off square shaft. Contacts are adjustable in 22½° increments. Adjust as required, replacing contacts and spacers in the order in which they were removed. Replace washer, nut and cotter pin.

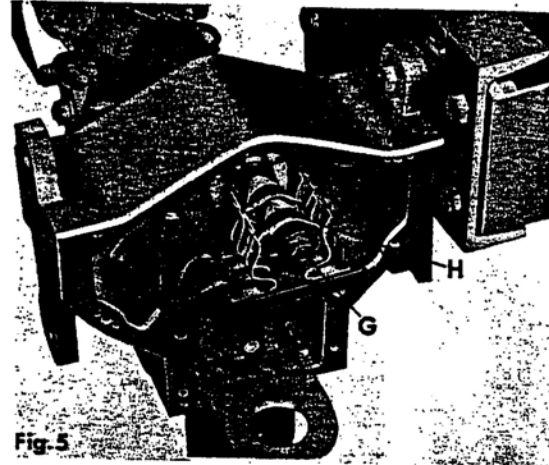


Fig. 5

GENERAL MAINTENANCE

The trip mechanism should be inspected at least once a year. Remove trip mechanism cover by turning quick release fasteners ¼ turn. Inspect auxiliary-switch contacts and clean if necessary. It is recommended that the switch be isolated and exercised by operating several times manually and electrically. Check to see that all connector bolts and all terminal nuts on the auxiliary switch are tight. None of the switch parts require lubrication. Do not attempt to change any spring settings.

Make certain that trip mechanism cover is replaced and that quick release fasteners are secure.

Inspect all parts of the operating mechanism to see that clevis bolts are tight and that no parts have slipped.

LONG TERM STORAGE

As the hinge mechanism contains electrical components, it is imperative they remain dry during long term storage. If stored before installation for longer than one month steps should be taken to prevent moisture from accumulating inside the hinge mechanism.



The Quality Name in High Voltage Switching

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