Pad-Mounted Switchgear

COOPER Power Systems

Service Information

Edison Modular Switchgear (EMS) Installation, Operation, and Maintenance Instructions

S285-90-1

Figure 1.
Edison Modular Switchgear.

Contents

SAFETY FOR LIFE

Cooper Power Systems products meet or exceed all applicable industry standards relating to product safety. We actively promote safe practices in the use and maintenance of our products through our service literature, instructional training programs, and the continuous efforts of all Cooper Power Systems employees involved in product design, manufacture, marketing, and service.

We strongly urge that you always follow all locally approved safety procedures and safety instructions when working around high-voltage lines and equipment and support our “Safety For Life” mission.

SAFETY INFORMATION

The instructions in this manual are not intended as a substitute for proper training or adequate experience in the safe operation of the equipment described. Only competent technicians who are familiar with this equipment should install, operate, and service it.

A competent technician has these qualifications:

- *Is thoroughly familiar with these instructions.*
- *Is trained in industry-accepted high- and low-voltage safe operating practices and procedures.*
- *Is trained and authorized to energize, de-energize, clear, and ground power distribution equipment.*
- *Is trained in the care and use of protective equipment such as flash clothing, safety glasses, face shield, hard hat, rubber gloves, hotstick, etc.*

Following is important safety information. For safe installation and operation of this equipment, be sure to read and understand all cautions and warnings.

Hazard Statement Definitions

This manual may contain four types of hazard statements:

DANGER: Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in equipment damage only.

Safety Instructions

Following are general caution and warning statements that apply to this equipment. Additional statements, related to specific tasks and procedures, are located throughout the manual.

DANGER: Hazardous voltage. Contact with hazardous voltage will cause death or severe personal injury. Follow all locally approved safety procedures when working around high- and low-voltage lines and equipment. G103.3

WARNING: Before installing, operating, maintaining, or testing this equipment, carefully read and understand the contents of this manual. Improper operation, handling, or maintenance can result in death, severe personal injury, and equipment damage. G101.0

WARNING: This equipment is not intended to protect human life. Follow all locally approved procedures and safety practices when installing or operating this equipment. Failure to comply may result in death, severe personal injury, and equipment damage. G102.1

WARNING: Power distribution and transmission equipment must be properly selected for the intended application. It must be installed and serviced by competent personnel who have been trained and understand proper safety procedures. These instructions are written for such personnel and are not a substitute for adequate training and experience in safety procedures. Failure to properly select, install, or maintain power distribution and transmission equipment can result in death, severe personal injury, and equipment damage. G122.3

PRODUCT INFORMATION

Introduction

Service Information S285-90-1 provides the installation, operation, maintenance, and testing instructions for EPDM rubber-insulated, pad-mounted or vault-style, Edison Modular Switchgear.

Read This Manual First

Read and understand the contents of this manual and follow all locally approved procedures and safety practices before installing, operating, or maintaining this equipment.

Additional Information

These instructions cannot cover all details or variations in the equipment, procedures, or process described nor provide directions for meeting every possible contingency during installation, operation, or maintenance. For additional information, contact your Cooper Power Systems representative.

Acceptance and Initial Inspection

Edison Modular Switchgear is completely assembled, tested, and inspected at the factory. It is in good condition when accepted by the carrier for shipment. Upon receipt, inspect the switchgear thoroughly for damage and loss of parts incurred during shipment. If damage is discovered, file a claim with the carrier immediately. Check for and tighten any bolts that may have loosened during shipment.

Handling and Storage

Be careful during handling and storage of the switchgear to minimize the possibility of damage. The switchgear should remain on its shipping pallet until it is installed. When handling the switchgear, always use a fork truck that has adequate lifting capacity and forks that extend the entire length of the pallet. Improper handling can cause damage to the switchgear.

If the switchgear is to be stored for any length of time prior to installation, provide a clean, dry storage area. Do not stack other material on the switchgear cabinet. For vault-style gear, verify that the protective wrapping that the unit was shipped with is intact. This will help insure that the internal components are kept clean and ready for installation.

Standards

Edison Modular Switchgear is designed and tested in accordance with IEEE Std 386™-2006, IEEE Std C37.74™-2003, and IEEE Std C57.12.28™-2005 standards.

Vacuum fault interrupter switchgear is designed and tested in accordance with IEEE Std C37.60™-2003 standard.

Quality Standards

ISO 9001:2000 Certified Quality Management System

Product Description

Edison Modular Switchgear provides convenient load switching and overcurrent protection for 15 kV and 25 kV underground systems. Edison Modular Switchgear's sealed construction is designed for outdoor mounting on a concrete pad or also for vault or subsurface installation. For pad-mounted installation, power is fed to and from the switchgear underground through openings in the pad. For vault installations, power to and from the switchgear can be routed from any direction.

Dead-front construction minimizes the high-voltage safety hazards for both the operator and the general public.

Edison Modular Switchgear employs EPDM rubber as the solid dielectric insulation medium to provide a compact, low-profile installation.

Edison Modular Switchgear can be specified with overcurrent/fault protection. Protection is provided by using digital electronic controls and vacuum interruption.

Modular Components

Edison Modular Switchgear accomplishes source and tap switching and protection using a combination of two types of solid-dielectric-encapsulated modules: an encapsulated vacuum switch that utilizes three-pole, ganged operation and a resettable vacuum fault interrupter which also utilizes three-pole, ganged operation. Any combination of these modules is available to obtain a variety of protection options.

Load-Break Switch Operation

Edison Modular Switchgear utilizes vacuum load-make/break switches. Shotgun-stick-operable, switch-operating handles are located on the top of the mechanism box. The ganged three-phase switching operation uses a single operating handle. A position indicator provides indication of Open and Close positions. Provisions are included to lock the operating handle in the open position.

Vacuum Fault Interrupter Operation

Encapsulated vacuum fault interrupter modules utilize vacuum interrupters to provide fault current interruption and load-make/break switching capabilities. Shotgun-stick-operable handles are located on top on the mechanism box. Vacuum fault interrupter operating mechanisms are configured for ganged three-phase operation. A position indicator provides indications of Open, Tripped, and Close positions. Provisions are included to lock the operating handle in the open position.

Encapsulated current-sensing transformers, located inside an encapsulated digital electronic control, provide line current information to the control. When line current exceeds the minimum trip setting, the control initiates a signal that causes the vacuum fault interrupter to interrupt the circuit. Interruption is three-phase.

Figure 2.
Vacuum interrupter.

Vacuum Interrupters

Load and fault interruption takes place within sealed vacuum interrupters (Figure 2). Vacuum interrupters provide fast, low-energy arc interruption and produce no arcing by-products to contaminate the insulating medium.

EMS Digital Control

The encapsulated, bushing-mounted control employs current-sensing transformers to sense line current and provide control power. When current in excess of the minimum trip value is detected, the control initiates a signal that trips all three phases. No external power is needed to power the control.

The digital control settings are PC programmable using the EMS Digital Control Interface Software via a USB connection. Refer to *S285-35-1 EMS Digital Control Installation and Operation Instructions* for detailed installation instructions.

Bushings

The bushings for the customer connection to switch and interrupter modules incorporate Cooper Power Systems 600 A dead-break aluminum bushings or 200 A load-break bushings. All bushings conform to the ANSI/IEEE Std 386™-1995 standard. Optional dead-break copper bushings can also be specified.

Bushings are mounted in-line and located a minimum of 610 mm (24 in) above the pad for switches and interrupters. Alternate bushing heights can also be specified to meet specific application requirements; the bushing heights would still be in-line.

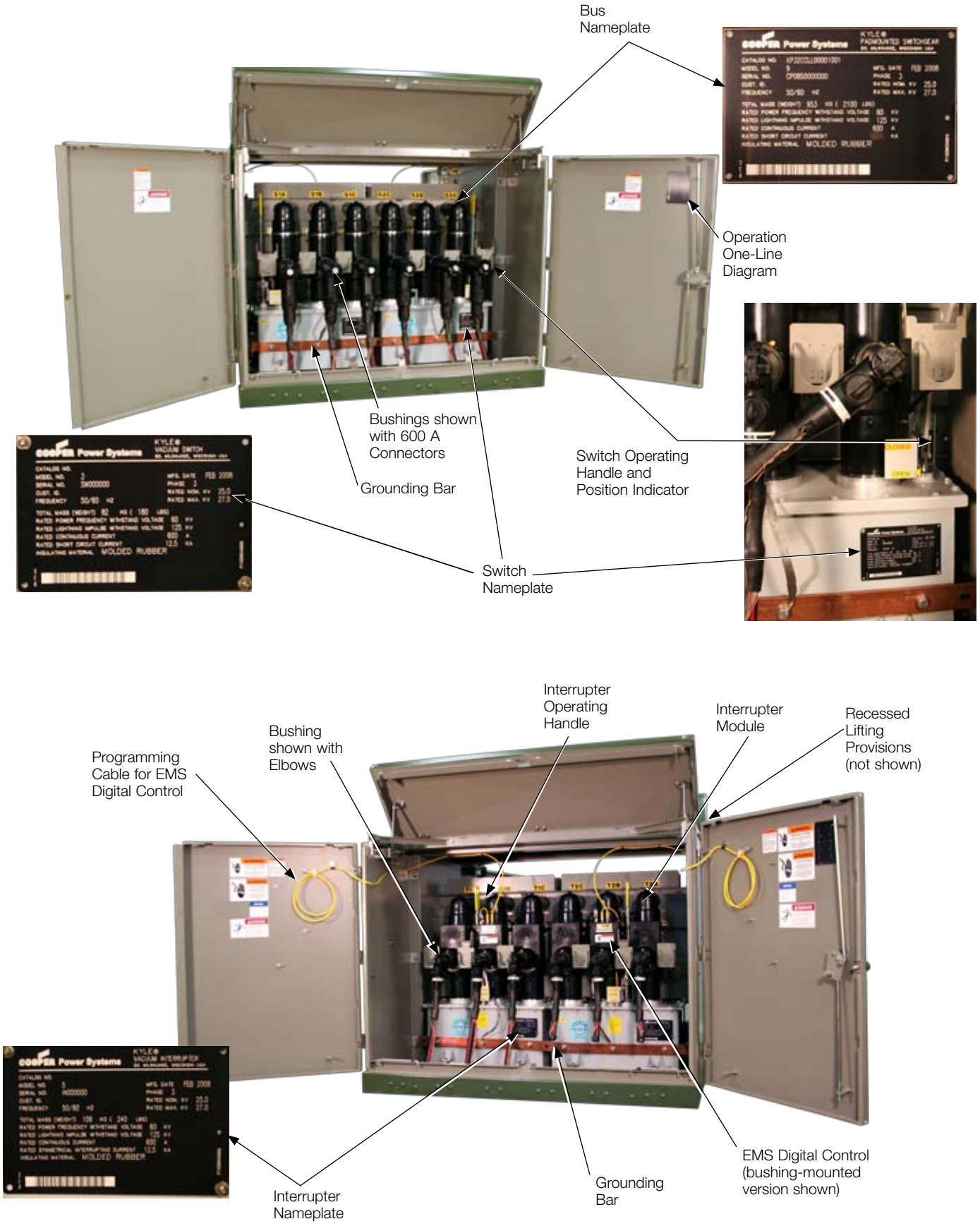

Figure 3.
Edison Modular Switchgear.

Cabinet Construction

Edison Modular Switchgear features dead-front, low-profile tamper-resistant construction. Its sealed construction is suitable for operation in areas subject to excessive moisture and blowing snow. Cabinets meet the enclosure security requirements of the IEEE Std C57.12.28™-2005 standard.

Side-hinged doors are provided with door stays and fitted with stainless steel hinges. On units wider than 1168 mm (46 inches), split doors are provided to allow easy operation by one person. Both source and tap doors can be fully open at the same time. Each door has a floating lock pocket with padlock provisions and pentahead door bolt.

Switchgear frame construction is of 10-gauge steel and enclosure construction is of minimum 14-gauge steel. Recessed lifting provisions are provided at each corner of the switchgear housing for a balanced lift.

Padlocking Provisions

Provisions are included for padlocking the cabinet doors to prevent unauthorized access. The cabinet must be locked at all times to prevent accidental contact with hazardous voltage.

Standard Features

Standard features (Figure 3) include operation one-line diagrams on the doors and standoff brackets for each bushing. Standard ground provisions include a 6.4 mm x 50.8 mm (1/4 in x 2 in) flat copper ground bar.

Interrupter Duty Cycle

The vacuum fault interrupter mechanism conforms to the duty cycle requirements of the IEEE Std C37.60™-2003 standard.

Switch Test Sequence

The load-break switch mechanism conforms to the switch test sequence requirements of the IEEE Std C37.74™-2003 and IEEE Std 1247™-2005 standards.

Finish

Edison Modular Switchgear is finished in a green color which conforms to Munsell 7GY 3.29/1.5 Green.

The coating conforms to the IEEE Std C57.12.28™-2005 standard.

Nameplate(s)

Prior to installation, be sure to check the bus, switch, and interrupter nameplates, as appropriate, to verify that the voltage and current ratings are correct for the system on which the switchgear is to be installed. Refer to Figure 3.

Weight

CAUTION: Load Imbalance Hazard. The Center of Gravity may be shifted off the physical center based on unit configuration. Use caution when lifting the unit as the load may not be balanced. Failure to comply may result in personal injury. T353.0

The weight of the switchgear is shown on the bus nameplate. Make sure to use lifting equipment that is rated sufficiently to safely handle the switchgear.

Operating Handles

WARNING: Hazardous Voltage. Never rely on the open position of the operating handle or the contact position indicator; it does not ensure that the line is de-energized. Follow all locally approved safety practices. Failure to comply can result in contact with high voltage, which will cause death or severe personal injury. G123.1

WARNING: Hazardous Voltage. Always use a shotgun stick when working with this equipment. Failure to do so could result in contact with high voltage, which will cause death or severe personal injury. G108A.0

Edison Modular Switchgear is equipped with shotgun-stick-operable load-break switch handles that are located on the mechanism boxes of the unit. The load-break switch is configured for ganged three-phase operation: all three phases operate simultaneously with a single handle. The switch operating handle (shown in Figure 4) provides convenient push-to-close and pull-to-open operation. The handle can be padlocked in the open position.

The vacuum fault interrupter modules are equipped with shotgun-stick-operable handles that are located on the mechanism boxes of the unit. The vacuum fault interrupter is configured for ganged three-phase operation (all three phases operate simultaneously with a single handle). The operating handles (shown in Figure 5) provide convenient push-to-close and pull-to-open operation. The operating handles may be padlocked in the open position.

If a fault is present when the vacuum fault interrupter mechanism is closed, the mechanism will trip open. The trip-free feature allows the mechanism to open even if the handle is held in the closed position with a shotgun stick.

Figure 4.
Three-phase ganged operation, load-break switch module.

Figure 5.
Three-phase ganged operation, vacuum interrupter module.

RATINGS

Table 1
Switch Ratings

Voltage Class	15 kV	25 kV
Maximum Design Voltage, kV	15.5	27
Lightning Impulse Withstand Voltage, kV	95	125
Power Frequency Withstand (60 Hz) Switch and Terminators, kV	35	60
Continuous Current (max), A	600	600
Load Switching, A	600	600
Momentary Current 10 cycles (asym.), kA	25	25
1 Second (sym.), kA	12.5 or 16	12.5
3 Shot Make and Latch (sym.), kA	12.5 or 16	12.5
Transformer Magnetizing Interrupting Current, A	21	21
Cable Charging Interrupting Current, A	10	15

Table 2
Interrupter Ratings

Voltage Class	15 kV	25 kV
Maximum Design Voltage, kV	15.5	27
Lightning Impulse Withstand Voltage, kV	95	125
Power Frequency Withstand (60 Hz) Interrupter and Terminators, kV	35	60
Continuous Current (max), A	600	600
Interrupting Current (sym./asym.), kA	12.5/20 or 16/25.8	12.5/20
Cable Charging Interrupting Current, A	10	25
Line Charging Interrupting Current, A	2	5

INSTALLATION PROCEDURE

WARNING: This equipment is not intended to protect human life. Follow all locally approved procedures and safety practices when installing or operating this equipment. Failure to comply can result in death, severe personal injury and equipment damage. G102.1

1. Check the nameplate ratings. Make sure the ratings on the switchgear nameplate are correct for the planned installation.

CAUTION: Equipment Damage. Follow all locally approved safety practices when lifting and mounting the equipment. Use the lifting lugs provided. Lift the unit smoothly and do not allow the unit to shift. Improper lifting can result in equipment damage. G106.2

CAUTION: Equipment Damage. Never place jacks, tackle, or other attachments under the unit for the purpose of lifting. Failure to comply will result in damage to the equipment. T240.0

2. Mount the switchgear on the concrete pad or structure.

A. The switchgear must be installed on a horizontally flat concrete pad or structure that has been designed to support the size and weight of the unit.

CAUTION: Load Imbalance Hazard. The Center of Gravity may be shifted off the physical center based on unit configuration. Use caution when lifting the unit as the load may not be balanced. Failure to comply may result in personal injury. T353.0

B. The switchgear must be hoisted only by the recessed lifting provisions provided at the four corners of the switchgear housing. Suitable lifting straps must be used to prevent damage to the switchgear. Make sure to use lifting equipment that is rated sufficiently to safely handle the switchgear.

C. The switchgear must be anchored to the concrete pad. Anchor the switchgear using the mounting cleats provided or other suitable mounting hardware.

WARNING: Hazardous Voltage. Solidly ground all equipment. Failure to comply can result in death, severe personal injury, and equipment damage. T223.2

3. Ground the switchgear. Switchgear must be adequately grounded. Install a permanent, low-resistance ground connection to the switchgear assembly. Grounding provisions are provided near the bottom of the switchgear assembly. Verify the ground system is intact during and after equipment servicing or maintenance.

4. Make the high-voltage line connections.

A. Prior to making connections, make sure that the source-side and tap-side cable elbows are correctly identified and that the switchgear unit is oriented correctly for the installation. The source leads must connect to the source bushings of the unit, and the tap leads must connect to the tap bushings of the unit.

WARNING: Hazardous Voltage. Remove any connection to programming cable and do not touch programming cable while working on or handling high-voltage cable. Accidental contact of high-voltage cable to the control or programming cable could result in electric shock via the programming cable causing death or serious injury. T333.0

B. Refer to the operation one-line diagram located inside the doors of the switchgear, and make only those elbow connections shown. The voltage and current ratings shown on the nameplate(s) must be correct for the planned installation.

C. All cables not in use must be properly isolated from all other leads. Unused leads must be parked on standoff insulators or properly grounded using an elbow grounding kit.

WARNING: Hazardous Voltage. Do not energize switchgear with the plastic shipping caps installed. Energizing equipment with plastic shipping caps installed can cause carbon build-up, leading to line-to-ground faults. Failure to comply can result in death, severe personal injury and equipment damage. T341.0

D. All bushings not in use must be insulated with a properly rated insulated load-break, dead-break, or Energized Break protective cap.

E. Refer to the connector manufacturer's installation instructions for proper assembly of the connections.

F. The switchgear shall be installed such that the static force imposed on the connector system by the cable does not exceed 80 lbs. in any direction. If installing a 600 A connector system onto a 600 A bushing interface, it is recommended that the force on the installing tool be applied opposite the direction of the static weight already on the connection.

5. Close and lock switchgear doors. Switchgear doors must be closed and locked in order to prevent unauthorized access and accidental contact with high voltage.

OPERATION

DANGER: Hazardous Voltage. Contact with hazardous voltage will cause death or severe personal injury. Follow all locally approved safety procedures when working around high- and low-voltage lines and equipment. G103.3

WARNING: Hazardous Voltage. Never rely on the open position of the operating handle or the contact position indicator; it does not ensure that the line is de-energized. Follow all locally approved safety practices. Failure to comply can result in contact with high voltage, which will cause death or severe personal injury. G123.1

WARNING: Hazardous Voltage. Solidly ground all equipment. Failure to comply can result in death, severe personal injury, and equipment damage. T223.2

WARNING: Hazardous Voltage. Verify center CT module is solidly grounded before touching or connecting to programming cable. Failure of high-voltage insulation system could result in electric shock via the programming cable causing death or serious injury. T339.1

Application

This switchgear must only be applied within its specified ratings.

Switch Operation

WARNING: Hazardous Voltage. Always use a shotgun-stick when working with this equipment. Failure to do so could result in contact with high voltage, which will cause death or severe personal injury. G108A.0

Edison Modular Switchgear equipped with vacuum switches utilize shotgun-stick-operable vacuum switch handles. The switch operating handle provides convenient push-to-close and pull-to-open operation. The switch can be padlocked in the open position, and an optional Kirk® key interlock is available for added security.

Interrupter Operation

Vacuum Fault Interrupters

The vacuum fault interrupter push/pull operating handles (shown in Figure 5) located on the mechanism boxes of the unit must be operated by a shotgun stick

Opening Interrupter

The vacuum fault interrupter is opened by firmly pulling the operating handle until it fully reaches the open position. The handle may be padlocked in the open position to prevent accidental closure.

Resetting Interrupter

After the vacuum fault interrupter mechanism has tripped electronically through the control, the mechanism must be reset before it can be closed. To reset the mechanism, firmly pull the operating handle until the latch resets. After the latch has been successfully reset, the vacuum fault interrupter mechanism can be closed normally.

Closing Interrupter

The vacuum fault interrupter is closed by firmly pushing the handle with a swift, unhesitating stroke until it fully reaches the closed position.

MAINTENANCE

WARNING: This equipment is not intended to protect human life. Follow all locally approved procedures and safety practices when installing or operating this equipment. Failure to comply can result in death, severe personal injury, and equipment damage. G102.1

WARNING: Hazardous Voltage. Never rely on the open position of the operating handle or the contact position indicator; it does not ensure that the line is de-energized. Follow all locally approved safety practices. Failure to comply can result in contact with high voltage, which will cause death or severe personal injury. G123.1

WARNING: Hazardous Voltage. This equipment must be de-energized and solidly grounded prior to conducting maintenance. Failure to comply can result in death, severe personal injury, and equipment damage. G152.0

Edison Modular Switchgear is a dead-front design. All live parts are contained within the encapsulated modules. Verify the ground system is intact during and after equipment servicing or maintenance.

Replacement Parts

Use only factory-authorized Edison Modular Switchgear replacement parts. Replacement parts are available through the factory Service Department. To order replacement parts, refer to the nameplate and provide the product type, serial number, catalog number, voltage rating, and a description of the part. Contact your Cooper Power Systems representative for additional information and ordering procedures.

Maintenance Inspection Procedure

1. De-energize and properly ground the switchgear and all source or load cables.
2. Inspect the unit for damage. Check for unusual wear of the paint finish. Check the bushings, elbows, switches, and interrupters. Verify connections are secure. Check for unusual or abnormal indications of wear or abuse. Verify that the cabinet doors will lock securely. Record any unusual conditions.
3. After inspection or repairs are complete, close and lock the doors of the switchgear to prevent unauthorized access and accidental contact with high-voltage connections.

Internal Inspection Procedure

If damage is suspected, the following procedure is recommended. Follow locally approved operating practices.

1. De-energize and properly ground the switchgear.
2. Inspect the unit for damage. Check inside the switchgear for broken or lose parts.
   - **A.** If bushings are damaged, repair or replace as required. Refer to the appropriate section of this manual for repair and replacement instructions.
   - **B.** If internal damage is suspected to the switches, interrupters, or control or if the switchgear must be returned to the factory for service, contact your Cooper Power Systems representative for shipping instructions and a return authorization number.
3. After inspection or repairs are complete, close and lock the doors of the switchgear to prevent unauthorized access and accidental contact with high-voltage connections.

Switch Repair or Replacement

Contact your Cooper Power Systems representative for additional information.

Interrupter Repair or Replacement

Contact your Cooper Power Systems representative for additional information.

Bushing Replacement

Follow locally approved operating practices whenever changing bushings. Contact your CPS representative for information on replacement bushings. The bushings can be changed in the switch and interrupter modules.

1. De-energize and properly ground the switchgear.
2. Disconnect the bushing from the module.
3. Replace any damaged bushings or inserts with new parts.
4. Close and lock the doors of the switchgear, after repairs are complete, to prevent unauthorized access and accidental contact with high-voltage connections.

TESTING

Edison Modular Switchgear is carefully tested and adjusted at the factory to operate according to published data. Well-equipped test facilities, a detailed testing procedure, and thoroughly trained personnel assure accurately calibrated equipment. Each unit leaves the factory ready for installation.

The Edison Modular Switchgear can be tested using a PC and the EMS Digital Control Interface Software to provide verification of correct operation of trip mechanisms and controls.

Refer to *Service Information S285-35-1 EMS Digital Control Installation Programming and Operation Instructions* for complete information on the EMS Digital Control testing procedures, including energized testing.

Minimum Trip Current-Level Test (De-energized Switchgear)

The following test verifies the proper control operation and electrically trips the Edison Modular Switchgear using the EMS control. Refer to *Service Information S285-35-1 EMS Digital Control Installation Programming and Operation Instructions* for complete information on using the EMS Control.

The following equipment is required for this test:

- Variable autotransformer - 120 V, 10 A
- 600:5 BCT - Slip-on type bushing current transformer, set on the 600:5 tap
- Clamp-on ammeter
- 10 AWG or larger cable
- Personal computer with the EMS Digital Control Interface Software
- M12-USB EMS Digital Control programming cable

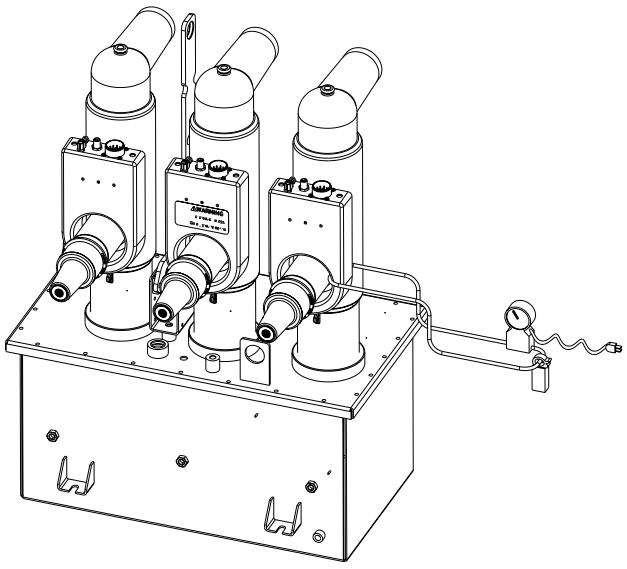

Figure 6.
Test connections.

WARNING: Hazardous Voltage. This equipment must be de-energized and solidly grounded prior to conducting this test. Failure to comply can result in death, severe personal injury, and equipment damage. G153.0

1. Verify that the switchgear is de-energized.
2. Verify that the interrupter is in the closed position.

WARNING: Hazardous Voltage. Remove any connection to programming cable and do not touch programming cable while working on or handling high-voltage cable. Accidental contact of high-voltage cable to the control or programming cable could result in electric shock via the programming cable causing death or serious injury. T333.0

3. Connect a PC to the control as described in *Service Information S285-35-1.*
4. Verify the three LEDs on the connected control are flashing green. This indicates the control passed internal diagnostics. If the control does not pass internal diagnostics, contact your CPS representative.
5. Using the EMS Digital Control Interface Software as described in *Service Information S285-35-1*:
   - **A.** Upload the settings file from the control to the PC and save the file. The settings will be downloaded back to the control after the test.
   - **B.** Set **Ground Trip Block.**
   - **C.** Change the phase minimum trip to 20 A.
6. Assemble and connect the test equipment, running the current-carrying conductor through the hole in the control housing, as shown in Figure 6 to test the right-hand module.
7. Adjust the variable autotransformer so the ammeter reads 10 A.

8. Verify the corresponding LED starts flashing green and the other LEDs are not lit. This indicates current is flowing in the appropriate phase. Refer to Figure 7.
   - **A.** Right LED Right-Hand module
   - **B.** Center LED Center module
   - **C.** Left LED Left-Hand module
9. In the EMS Digital Control Interface Software, click on **Metering > View Metering.**
10. Verify that the software interface displays 10 A of current in that phase. This verifies the metering capability of the control.
11. Slowly increase the variable autotransformer voltage until the interrupter trips. Note the ammeter reading when the interrupter trips.
12. Turn off the autotransformer.
13. Verify that the current level agrees with the programmed minimum trip of 20 A.
14. Verify the appropriate LED is now flashing blue. This indicates a faulted phase.
15. In the EMS Digital Control Interface Software, click on **Status > Control Status.**
16. Select **Reset** to clear the blue LED fault target.
17. Repeat the test for each of the remaining phases.
18. After testing all of the phases, download or change the control settings as appropriate for the application as described in *Service Information S285-35-1*.

Figure 7.
EMS Digital Control LEDs.

High-Potential Withstand Testing of Vacuum Interrupters

High-potential withstand tests can be performed to check the vacuum integrity of the interrupters used in Edison Modular Switchgear. Pre-installation testing is not necessary; however, the vacuum interrupters can be tested prior to installation using the following procedure.

WARNING: Hazardous Voltage. The switchgear and high-voltage transformer must be in a test cage or similar protective device to prevent accidental contact with the high-voltage parts. Solidly ground all equipment. Failure to comply can result in death, severe personal injury, and equipment damage. T221.3

CAUTION: Radiation. At voltages up to the specified test voltages, the radiation emitted by the vacuum interrupter is negligible. However, above these voltages, radiation injurious to personnel can be emitted. See *Service Information S280-90-1 Vacuum Interrupter Withstand Test Voltage Ratings Information* for further information. G109.2

With the vacuum interrupters open (manual operating handles in the Open position), perform a high-potential test for one minute across each open vacuum interrupter assembly at the voltages shown in Table 3. The interrupter should withstand the test voltage and should not load down the source.

TABLE 3
High-Potential Withstand Test Voltages

Edison Modular Switchgear Voltage Rating	High-Potential Test Voltages*
15 kV	26.2 kV ac rms or 37.1 kV dc
25 kV	30.0 kV ac rms or 42.4 kV dc

* 75% of rated low-frequency withstand test voltage.

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