600 A U-OP visible break connector system operation instructions

Powering Business Worldwide

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Safety for life

Eaton meets or exceeds all applicable industry standards relating to product safety in its Cooper Power™ series products. 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 Eaton 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 arc flash clothing, safety glasses, face shield, hard hat, rubber gloves, clampstick, 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 can 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

⚠ CAUTION

The 600 A U-OP connector is designed to be operated in accordance with normal safe operating procedures. These instructions are not intended to supersede or replace existing safety and operating procedures. Connectors must be de-energized during operation or maintenance. Visible break and adequate grounding must be provided before cable work proceeds.

U-OP connectors should be installed and serviced only by personnel familiar with good safety practice and the handling of high-voltage electrical equipment.

Product information

Introduction

These instructions are applicable for Eaton's Cooper Power™ series U-OP connector configurations shown in Figure 1. Other configurations are possible with the U-OP connector. For other configurations, other or additional steps may be needed to operate the U-OP connector.

Read this manual first

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

Acceptance and initial inspection

Each U-OP connector is in good condition when accepted by the carrier for shipment. Upon receipt, inspect the shipping container for signs of damage. Unpack the U-OP connector and inspect it thoroughly for damage incurred during shipment. If damage is discovered, file a claim with the carrier immediately.

Handling and storage

Be careful during handling and storage of the U-OP connector to minimize the possibility of damage. If the U-OP connector is to be stored for any length of time prior to installation, provide a clean, dry storage area.

Standards

ISO 9001 Certified Quality Management System

Figure 1. 600 A U-OP connector.

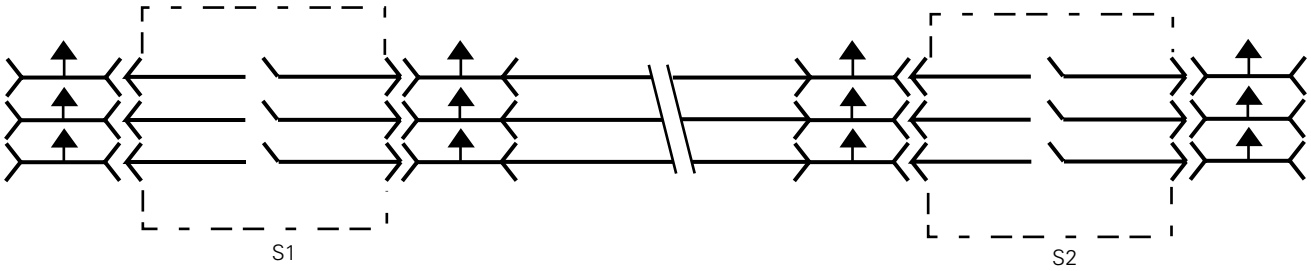

Figure 2. One-line diagram of a three-phase cable connected to a three-phase switch on either end.

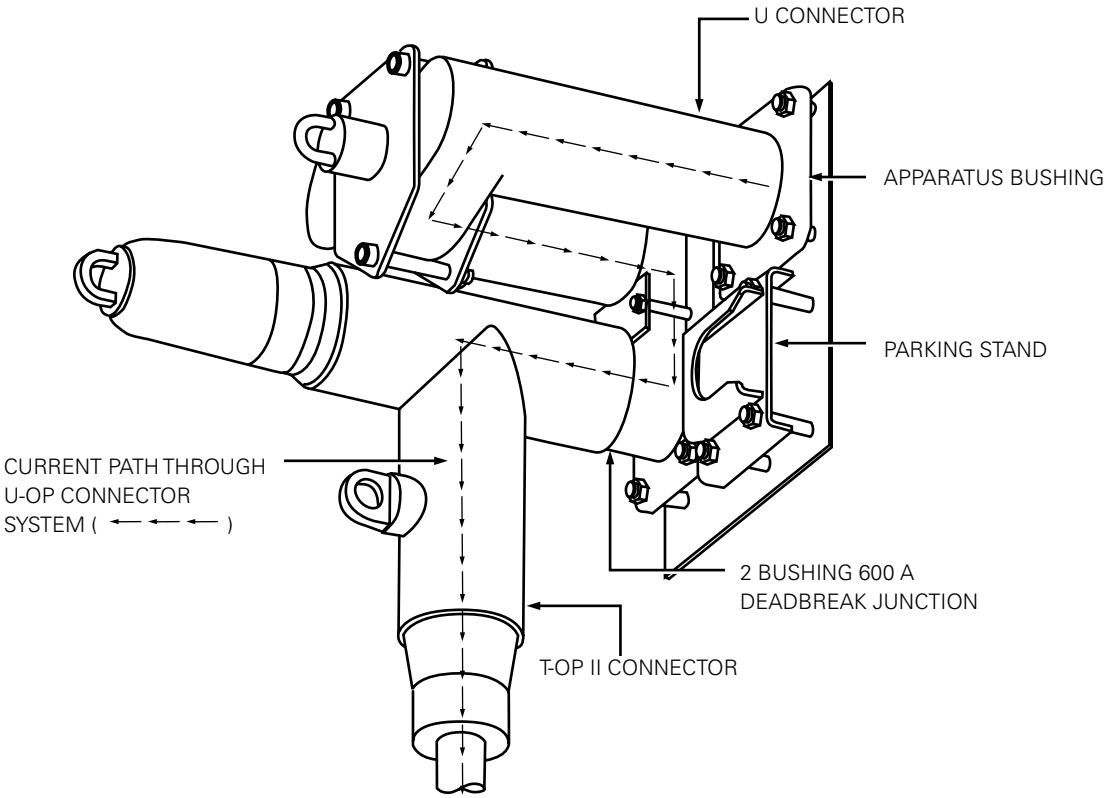

Figure 3. The U-OP connector system in a typical pad-mounted switchgear application.

Installation procedure

Equipment required

- (3) 200 A Grounding Elbows
- (3) 600 A Grounded Standoff Bushings with U-OP Studs
- (3) U-OP/T-OP™ II Protective Caps
- (1) O & T Tool
- (1) Voltage Detector
- (1) Clampstick

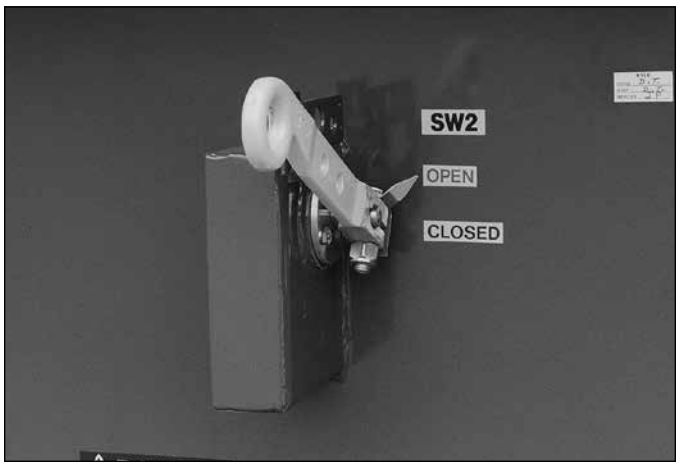

Figure 4. Open switch at both ends of cable.

Isolating and grounding a cable requiring repair

1. De-energize cables
   A. Open switches at both ends of cable to be isolated. Refer to Figure 4.
   B. Determine that there is adequate working room around the terminators for parking the grounded standoff bushings.
   C. Determine that there is adequate working room for handling clampstick around apparatus cabinet.
   D. Place insulating rubber blanket on the ground directly in front of terminators.
   E. Inspect and test all operating equipment for serviceability.
   F. Connect grounding elbows to system ground.
   G. Connect ground leads of protective caps to system ground.
   H. Connect ground leads of grounded standoff bushings to system ground.
2. Determine that cables are de-energized
   A. Remove 200 A protective cap or arrester from T-OP II terminators using clampstick and set aside in a clean, protected area.
   B. Insert test probe into 200 A interfaces using clampstick.
   C. Test for voltage by using voltage detector designed for terminators. Remove probe after testing.

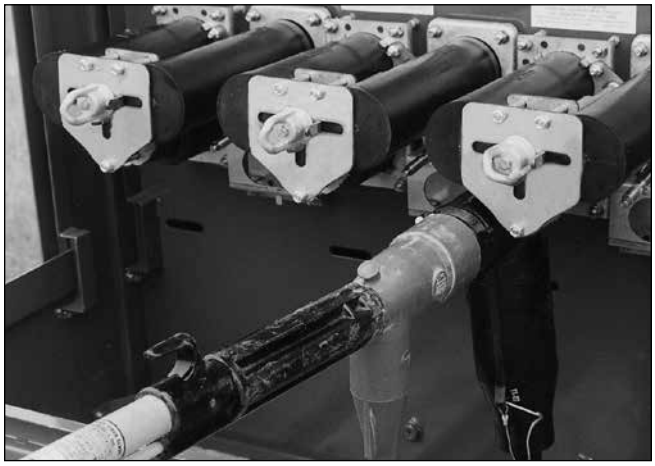

Figure 5. Close grounding elbows.

⚠ WARNING

High Voltage. Do not proceed until cable is de-energized. Failure to company may result in death, serious personal injury and equipment damage.

3. Provide a visible ground
   A. Close grounding elbows into T-OP II 200 A interface using a clampstick. Refer to Figure 5.

⚠ CAUTION

High Voltage. Ground all three phases (Steps 2 and 3) before proceeding. Failure to comply may result in serouis personal injury and equipment damage.

Figure 6. Mount grounded standoff bushing.

4. Provide a visible break
   A. Clean and lubricate grounded standoff bushing.
   B. Mount grounded standoff bushing in the apparatus parking pocket using a clampstick. Do not tighten eyebolt–leave grounded standoff bushing loose in parking stand. Refer to Figure 6.
   C. Grasp U-OP operating handle with clampstick, but do not pull handle completely into clampstick.

D. Rotate the clampstick counterclockwise until U-OP operating shaft is completely disengaged from the mating stud. Refer to Figure 7.

Figure 7. Disengage U-OP operating shaft.

E. Once U-OP operating shaft is completely unthreaded but is still positioned on the stud, pull clampstick completely onto handle and engage anti-rotational tabs.

F. Reorient the U connector so that the short leg of the "U" is over the grounded standoff bushing, the long leg of the "U" is over the apparatus bushing, and the operating shaft slides over the mating stud mounted on the parking stand. Disengage the anti-rotational tabs from the clampstick. Refer to Figure 8.

Figure 8. Reorient the U connector.

G. Rotate the clampstick clockwise until the operating shaft is completely seated on the mating stud.

H. Verify that the U connector is completely seated by ensuring that the operating shaft is on far enough to cover the indentation in the mating stud. See Figure 10.

I. Install U-OP protective cap over the exposed bushing of the 600 A deadbreak junction by rotating clockwise until the cap is completely seated. Refer to Figure 9.

Figure 9. Install U-OP protective cap on exposed bushing.

J. Attach U-OP protective cap's drain wire to system ground.

K. Repeat steps A to I for the remaining two phases.

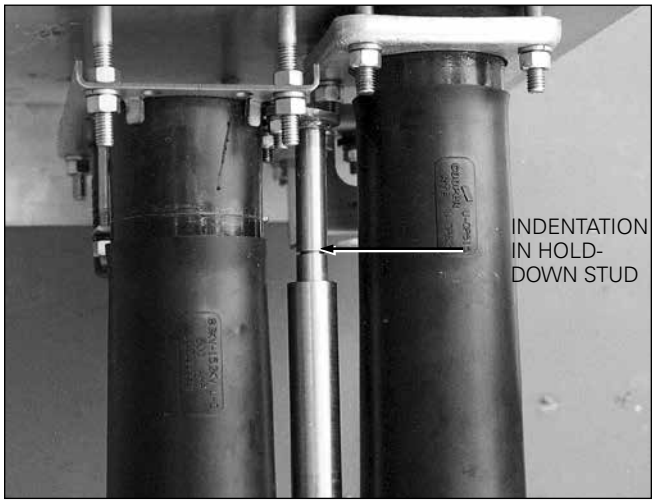

Figure 10. Checking if the U connector is fully seated.

Reconnecting the circuit from the cable to the apparatus bushing

A. Remove U-OP protective cap's drain wire from system ground.

B. Grasp the operating eye of the U-OP protective cap, but do not pull it into the clampstick. Rotate it counterclockwise until the cap's threads are completely disengaged from the U-OP stud and remove the protective cap.

C. Lubricate the exposed bushing, if necessary.

D. Grasp the operating handle of the "U" but do not pull it into the hotstick. Rotate counter-clockwise until the operating shaft is completely disengaged from its mating stud. Refer to Figure 11.

Figure 11. Disengage operating shaft from mating stud.

Figure 12. Reorient the U connector.

E. Reorient the "U" as shown in Figure 12, with the long leg over the apparatus bushing, the short leg over the exposed deadbreak junction interface, and the operating shaft over the mating stud.

F. Rotate the handle clockwise until the operating shaft is completely threaded onto its mating stud.

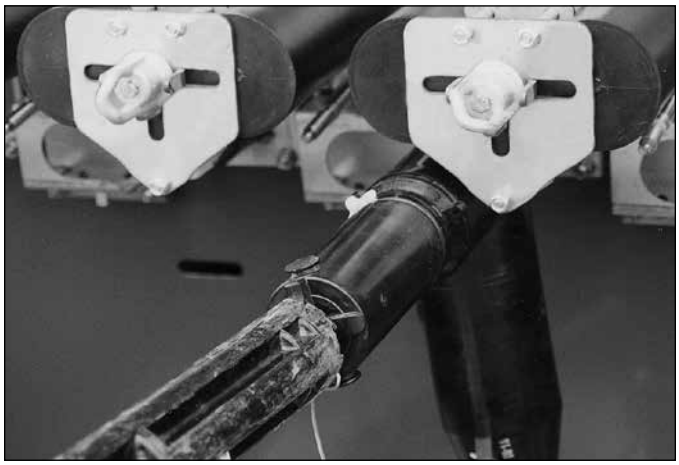

Figure 13. Install protective cap or arrester.

G. Verify that the U connector is fully installed by ensuring that the operating shaft is on far enough to cover the indentation in the mating stud. See Figure 10.

H. Remove the grounded standoff bushing from the parking stand.

I. Remove the grounding elbow from the T-OP II.

J. Install a protective cap or elbow arrester on the 200 A interface of the T-OP II. (Refer to Figure 13.)

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