

# Loadbreak Apparatus

Service Information

## 200 A 15, 25 and 35 kV Class Grounding Elbow Installation Instructions

# KS200-01-1

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**CAUTION:** The Cooper Power Systems 200 A Grounded Elbow 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. The grounding elbow should be installed and serviced only by personnel knowledgeable of good safety practices and fully trained on the installation and application of high voltage electrical equipment.

For product applications that require ratings or characteristics not shown, contact Cooper Power Systems for specific recommendations.

### PRODUCT INFORMATION

The Cooper Power System's 200 A, 15, 25 and 35 kV Class Grounding Elbows/Grounding Kits provide the operating components required for grounding deadfront underground systems. The grounding elbows/grounding kits are tools that can be used to visibly ground cables, transformers and switchgear. Cooper Power Systems' 200 A grounding elbows are designed to mate with 200 A loadbreak bushings and accessories and are manufactured in accordance with IEEE Standard 386. When mated with comparably rated products, they provide a fully-shielded, submersible, separable grounding system.

All grounding elbow sets supplied with a factory installed ferrule and clamp conform to the latest requirements of ASTM F855. When the grounding elbow is ordered without a clamp, it does not meet ASTM F855. It is the user's responsibility to install an approved ferrule and clamp. For all kits not conforming to the latest ASTM F855 Edition, the cable will be terminated with a cable blunt end.

### PRIOR TO INSTALLATION

Visibly inspect grounding elbows, cables, ferrules and clamps prior to installation to insure they are complete and undamaged.

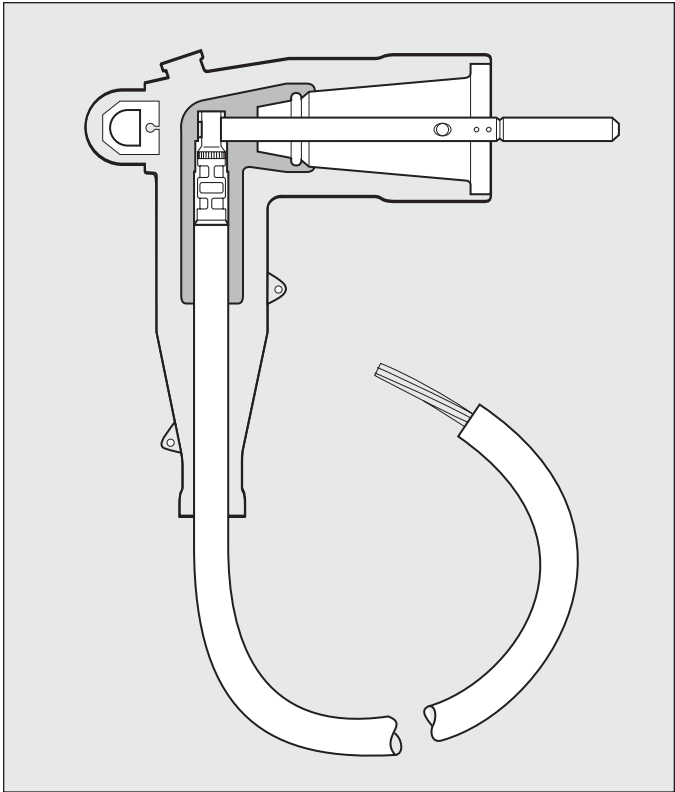


Figure 1.  
25 kV Grounding Elbow.

### STORAGE AND HANDLING

Grounding elbows and accessories should be stored and handled in a manner as to prevent contamination to the interfaces. When not in use, grounding elbows should be stored installed on a mating accessory, such as an insulated standoff bushing. Portable feedthrus should be capped with insulated protective caps.

*These instructions do not claim to cover all details or variations in the equipment, procedure, or process described, nor to provide directions for meeting every contingency during installation, operation, or maintenance. When additional information is desired to satisfy a problem not covered sufficiently for the user's purpose, please contact your Cooper Power Systems sales engineer.*



## 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 high voltage will cause death or severe personal injury. Follow all locally approved safety procedures when working around high- and low-voltage lines and equipment.

 **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.

 **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.

 **WARNING:** Power distribution equipment must be 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 this equipment can result in death, severe personal injury, and equipment damage.



**WARNING:** All associated apparatus must be de-energized during installation or maintenance.

## CABLE ISOLATION AND GROUNDING PROCEDURES

### Equipment Required

- (2) 200 A Grounding Elbows
- (2) 200 A Loadbreak Portable Feedthrus
- (1) Hotstick
- (2) 200 A Insulated Protective Caps
- Silicone Lubricant
- Test Probe\*

### Alternate Equipment

\* **NOTE:** In place of the Test Probe\*, a Fused Test Elbow may be used to determine system status. **See S500-54-1.**

#### STEP 1.

##### Clean and Lubricate Apparatus

- Remove protective caps from portable feedthru.
- Clean and lubricate interfaces of portable feedthru, grounding elbow, and insulated protective cap.
- Use lubricant supplied or CPS approved equivalent.

#### STEP 2.

##### Install Portable Feedthru

- Grasp eyebolt on portable feedthru with hotstick and use the hotstick to position the feedthru in apparatus accessory pocket. Tighten eyebolt to the tank wall.
- Attach #14 AWG copper drain wire from the ground lug on the bracket of the portable feedthru device to system ground.

#### STEP 3.

##### Test Cable

- Grasp pulling eye of loadbreak elbow you intend to ground with hotstick. Disconnect elbow from apparatus bushing and completely close elbow into portable feedthru tap.
- Grasp test probe\* with hotstick and insert probe into open tap of portable feedthru. Test cable status per operating company's standard procedures, tools and methods, verifying the cable is de-energized.
- Use hotstick to remove test probe\* after cable status has been determined.



**WARNING:** Do not ground energized cable.

#### STEP 4.

##### Install Grounding Elbow

- Attach grounding elbow cable to system ground.
- Grasp pulling eye on grounding elbow with hotstick and completely close into open tap on feedthru device.
- Attach ground lead from insulated protective cap to system ground.
- Grasp pulling eye on protective cap with hotstick and place on open apparatus bushing.



**CAUTION:** This procedure must be performed on both ends of cable for complete grounding.

#### STEP 5.

##### Repeat Process

- Repeat Steps 1 through 4 on opposite end of cable.



**WARNING:** All associated apparatus must be de-energized during installation or maintenance.

## 200 AMP APPARATUS BUSHING GROUNDING PROCEDURES

### Equipment Required

- Grounding Elbow
- 200 A Insulated Standoff Bushing or Parking Stand Arrester
- Hotstick
- Silicone Lubricant
- Test Probe\*

### Alternate Equipment

\* **NOTE:** In place of the Test Probe\*, a Fused Test Elbow may be used to determine system status. **See S500-54-1.**

#### STEP 1.

##### Clean and Lubricate Apparatus

- Remove protective caps from insulated standoff bushing or parking stand arrester.
- Clean and lubricate interfaces of grounding elbow, insulated standoff, or parking stand arrester.

#### STEP 2.

##### Install Insulated Standoff or Parking Stand Arrester

- Grasp eyebolt on insulated standoff bushing or parking stand arrester with hotstick and use the hotstick to position in apparatus accessory pocket. Tighten eyebolt to tank wall.
- If insulated standoff bushing is used, attach #14 AWG copper drain wire from lug on bracket to system ground.
- If parking stand arrester is used, attach ground lead of arrester (connected to base of arrester with 4 to 8 ft-lb torque) to system ground. Attach #14 AWG drain wire from grounding tab of arrester to system ground.

#### STEP 3.

##### Remove Mating Device

- Using a hotstick, grasp the pulling eye of the loadbreak elbow, protective cap, or other device mounted on the 200 A bushing you intend on grounding. Disconnect elbow, cap or other device to expose the 200 A bushing.
- Install removed device onto insulated standoff bushing or parking stand arrester.

#### STEP 4.

##### Test 200 A Bushing

- Grasp test probe\* with hotstick and insert probe into 200 A bushing. Test bushing status per operating company's standard procedures, tools and methods verifying the bushing is de-energized.
- Use hotstick to remove test probe\* after cable status has been determined.

#### STEP 5.

##### Install Grounding Elbow

- Attach grounding elbow to system ground.
- Grasp pulling eye on grounding elbow with hotstick and completely close onto exposed 200 A bushing.

#### STEP 6.

##### Repeat Process

- Repeat Steps 1 through 5 for all bushings you intend to ground.



**WARNING:** All associated apparatus must be de-energized during installation or maintenance.

## T-OP™ II ISOLATION AND GROUNDING PROCEDURES

### Equipment Required

- 200 A Grounding Elbow
- 600 A Insulated Standoff Bushing
- 600 A Protective Cap
- T-OP II Operating & Test Tool
- Hotstick
- Silicone Lubricant

### Alternate Equipment

\* **NOTE:** In place of an Operating & Test Tool, a Fused Test Elbow may be used to determine system status. See S500-54-1.

#### STEP 1.

##### Clean and Lubricate Apparatus

- Remove protective cap from insulated standoff bushing.
- Clean and lubricate interfaces of grounding elbow, insulated standoff, protective cap and Operating & Test Tool.

#### STEP 2.

##### Install Insulated Standoff

- Grasp eyebolt on insulated standoff bushing with hotstick and use the hotstick to position in apparatus accessory pocket. Tighten eyebolt to tank wall.
- Attach #14 AWG drain wire from lug on standoff bracket to system ground.

#### STEP 3.

##### Remove Mating Device

- Using a hotstick, grasp the pulling eye of the elbow arrester or protective cap mounted on the T-OP II. Disconnect elbow arrester or protective cap to expose the 200 A interface of the loadbreak reducing tap plug.
- Set removed device aside.

#### STEP 4.

##### Test 200 A Loadbreak Reducing Tap Plug

- Grasp Operating & Test Tool\* with hotstick and insert probe into throat of the 200 A bushing portion of the loadbreak reducing tap plug. Test status of the bushing portion of the loadbreak reducing tap plug per operating company's standard procedures, tools and methods, verifying the reducing tap plug is de-energized.
- After system status has been determined, proceed to Step 5.



**WARNING:** All associated apparatus must be de-energized during installation or maintenance.

#### STEP 5.

##### T-OP II Removal

- With the Operating and Test Tool still inserted in the loadbreak reducing tap plug, turn the eye of the O&T tool counterclockwise until the threaded connection and the interface fit of the T-OP II is broken.
- Using the hotstick, lift the T-OP II termination off of the apparatus bushing and place it on the insulated standoff bushing.
- While pushing the T-Body onto the standoff bushing, turn the eye of the O&T tool clockwise to make the threaded connection tight.
- Remove O&T tool.

#### STEP 6.

##### Install Grounding Elbow

- Attach grounding elbow to system ground.
- Grasp pulling eye on grounding elbow with hotstick and completely close onto exposed 200 A interface of the T-OP II.
- Remove hotstick.
- Grasp eye of 600 A protective cap and install on exposed 600 A apparatus bushing.
- Remove hotstick.

#### STEP 7.

##### Repeat Process

- Repeat Steps 1 through 6 for all T-OP II's intended to be isolated and grounded.

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