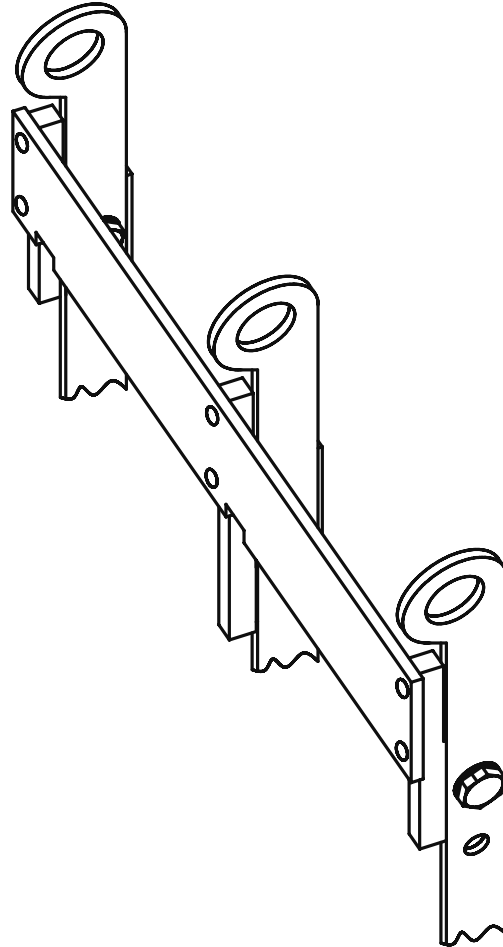


Type VFI fault interrupter with tri-phase control single-phase trip to three-phase trip conversion kits KPA-114-1, KPA-114-11, KPA-114-21, and KPA-114-31 installation instructions



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Contents

DISCLAIMER OF WARRANTIES AND LIMITATION OF LIABILITY I

SAFETY FOR LIFE III

SAFETY INFORMATION III

 Hazard statement definitions iii

 Safety instructions iii

PRODUCT INFORMATION 1

 Introduction 1

 Acceptance and initial inspection 1

 Handling and storage 1

 Quality standards 1

 Description 1

INSTALLATION PROCEDURES 2

 Kits KPA-114-1 and KPA-114-11 2

 (and for kits for switchgear with a S/N above 3Q9317000 or beginning with CP57)

 Kits KPA-114-21 and KPA-114-31 4

 (only for switchgear with a S/N that precedes 3Q9317000)

OPERATION 6

 Manual reset operation 6



Safety for life



Eaton's Cooper Power series 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 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 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

Type VFI fault interrupter with tri-phase control single-phase trip to three-phase trip conversion kits

Table 1. Ordering information

Kit Description	Catalog No.
For use with welded steel operating handles located on the right-hand side of the handle box. Applicable to units manufactured Aug 2010 or later.	KPA-114-1
For use with welded operating handles located on the left-hand side of the handle box. Applicable to units manufactured Aug 2010 or later.	KPA-114-11
For use with cast aluminum operating handles located on the right-hand side of the handle box. Applicable to units manufactured prior to Aug 2010.	KPA-114-21
For use with cast aluminum operating handles located on the left-hand side of the handle box. Applicable to units manufactured prior to Aug 2010.	KPA-114-31

Product information

Introduction

Service Information MN285019EN, Type VFI Fault Interrupter with Tri-Phase Control Single-Phase Trip to Three-Phase Trip Conversion Kit KPA114-1, KPA-114-11, KPA-114-21 and KPA-114-31 Installation Instructions provides installation and operation instructions for kits used to convert VFI pad-mounted switchgear equipped with a Tri-Phase electronic trip control from single-phase operation to three-phase operation.

For additional information, refer to the following applicable service information bulletins:

- *MN285006EN Type VFI, Oil-Insulated, Vacuum Fault Interrupter; Installation, Operation, and Maintenance Instructions*
- *MN285004EN Type VFI, SF6-Insulated, Vacuum Fault Interrupter; Installation, Operation, and Maintenance Instructions*
- *MN285013EN Type Shrubline VFI, Vacuum Fault Interrupter; Installation, Operation, and Maintenance Instructions*
- *MN285008EN Tri-Phase, TPG, and TPG with SCADA Electronic Control Installation and Operation Instructions*

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.

Acceptance and initial inspection

Each conversion kit is in good condition at the factory and when accepted by the carrier for shipment.

Upon receipt, inspect the carton for signs of damage. Unpack the kit(s) and inspect thoroughly for damage incurred during shipment. If damage is discovered, file a claim with the carrier immediately.

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. When additional information is desired to satisfy a problem not covered sufficiently for the user's purpose, contact your Eaton representative.

Handling and storage

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

Quality standards

ISO 9001 Certified Quality Management System

Description

The kits described in this manual are used to convert Eaton Cooper Power series VFI pad-mounted switchgear, equipped with a Tri-phase/TPG electronic trip control, from single-phase operation to three-phase operation.

The conversion from single- to three-phase trip functionality requires that the P20029667B or P20029669B series handles be attached to the VFI handles. The VFI handle provides mechanical, external ganging for manual close, open, and reset operations.

Service Information MN285019EN includes instructions for the four variations of this single- to three-phase conversion kit.

KPA-114-1 is for use on applications having welded steel operating handles located on the right-hand side of the handle box for units manufactured Aug 2010 or later. (Figure 3, Table 2).

KPA-114-11 is for use on applications having welded steel operating handles located on the left-hand side of the handle box for units manufactured Aug 2010 or later. (Figure 4, Table 3).

KPA-114-21 is for use on applications having cast aluminum operating handles located on the right-hand side of the handle box for units manufactured prior to Aug 2010. (Figure 6, Table 4).

KPA-114-31 is for use on applications having cast aluminum operating handles located on the left-hand side of the handle box for units manufactured prior to Aug 2010. (Figure 7, Table 5).

Switchgear with serial numbers below 3Q9317000 utilize an early generation of Tri-Phase control and require installation of a jumper connector (SEC0113) upon the P2 connector of the Tri-Phase control board (Figure 2). This jumper parallels the trip circuits of each phase so that when a trip command is executed for the flux shift tripper of any one phase, all three phases trip concurrently.

Type VFI fault interrupter with tri-phase control single-phase trip to three-phase trip conversion kits

Switchgear with serial numbers above 3Q9317000 utilize a newer generation of Tri-Phase Control and do not require installation of a jumper connector for ganged, three-phase operation of the flux-shift trippers. Instead, three-Phase operation of the flux-shift trippers is selected by placing switch SW5, located on the Tri-Phase board (Figure 5), into the GANGED position.

Installation procedure KITS kpa-114-1/kpa-114-11

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. 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

WARNING

Hazardous Voltage. This device is not a substitute for a visible disconnect. Follow all locally approved safety practices. Failure to follow proper safety practices can result in contact with high voltage, which will cause death or severe personal injury.

G112.1

Remove unit from service

De-energize the switchgear according to locally approved procedures before servicing.

Assembly procedure

The following kits, KPA-114-1 and KPA-114-11, are applicable to VFI Switchgear manufactured Aug 2010 or later.

Tri-phase control modifications

1. Open the access door of the Tri-Phase/TPG control. The VFI operating handles may be in any position since this will not affect installation.
2. Locate the SW5 DIP switch, which is in the lower right corner of the control panel; Refer to Figure 5. Switch the position of the DIP switch from INDEPENDENT to GANGED position.
3. Close the access door.

Note: To convert from three-phase trip back to single-phase trip, reverse the procedure above.

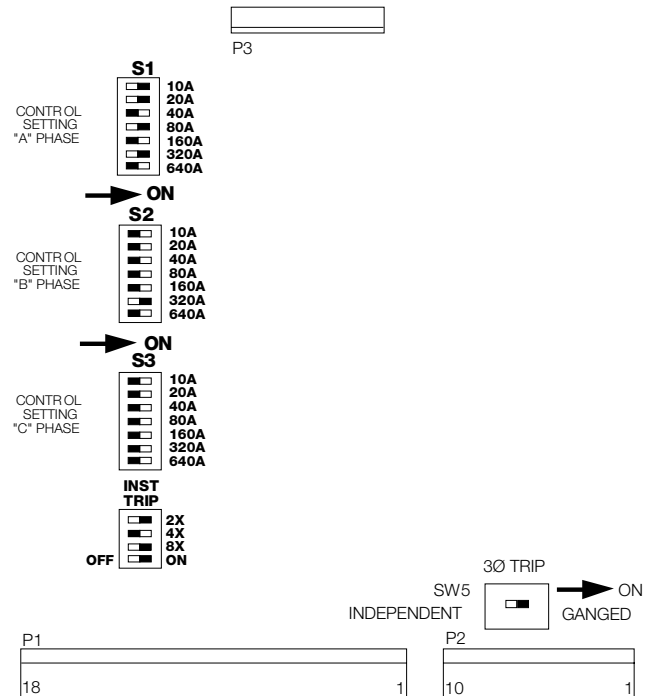


Figure 1. Setting of the 3-phase trip switch (SW5) to the ganged position

Attachment of the single-phase to three-phase VFI conversion handle

Refer to Figures 3 and 4 for steps 1 and 2.

1. Position the conversion handle across the three VFI handles using the correct left/right orientation required of your installation.
2. Fasten the conversion handle to each of the three VFI handles using one 3/8" x 1" hex-head capscrew, two 3/8" plain washers, and one elastomer stop-nut per handle. Locate the hex-head capscrews and accompanying hardware through the upper holes of the two outboard VFI operating levers. Locate the third hex-head bolt and accompanying hardware through the lower hole of the center VFI operating handle.

Note: The fastening hardware must be routed through the lower hole of the center VFI operating handle to allow an open hole in the handle for padlocking, when required.

Note: For proper operation of the ganged VFI handles, the conversion handle anchor bolts must not be fully tightened. Tighten hardware, then loosen all three nuts one half turn. The anchor bolts must turn freely within the bores of the VFI handles.

Type VFI fault interrupter with tri-phase control single-phase trip to three-phase trip conversion kits

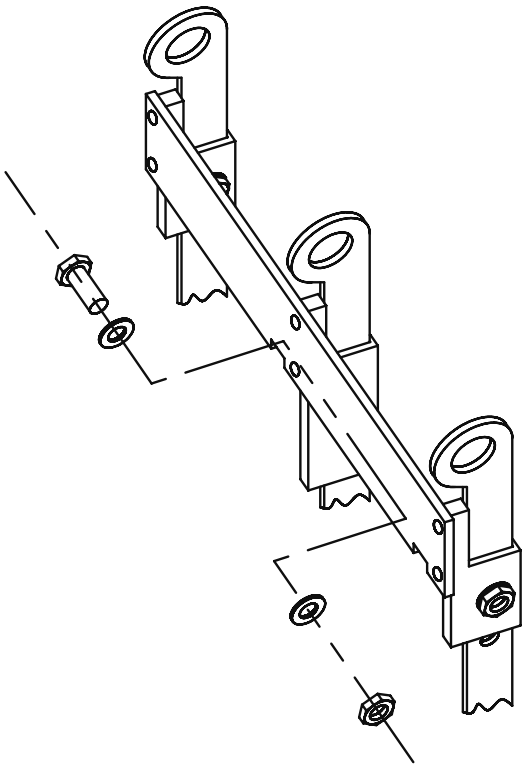


Figure 2. Conversion handle #P20029667B0002
(For use with welded steel operating handles located on the right-hand side of the handle box; reference Table 2.)

Table 2. Conversion kit KPA-114-1* contents

Qty.	Part No.	Description
1	P20029667B0002	Conversion Handle
3	730115137100A	Hex-head Capscrews
3	KA2020025	Locknuts
6	900115043100A	Washers

* For use with welded steel operating handles located on the right-hand side of the handle box. Applicable to units manufactured Aug 2010 or later

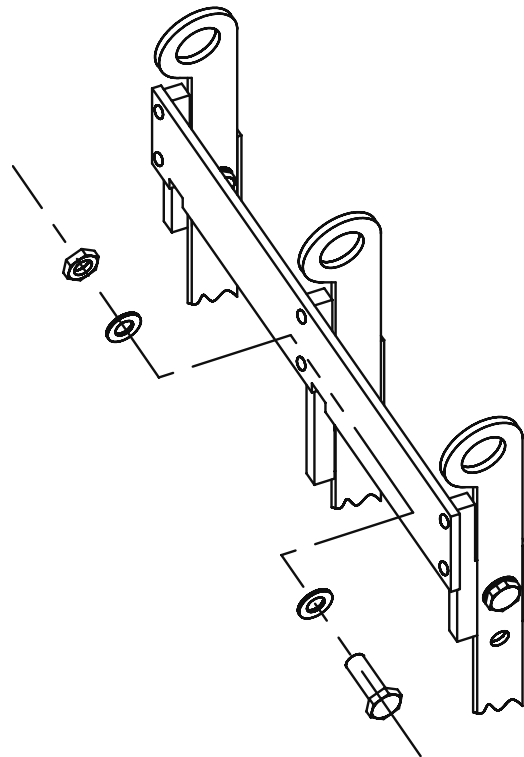


Figure 3. Conversion handle P20029669B0002
(For use with welded steel operating handles located on the left-hand side of the handle box; reference Table 3.)

Table 3. Conversion kit KPA-114-11* contents

Qty.	Part No.	Description
1	P20029669B0002	Conversion Handle
3	730115137100A	Hex-head Capscrews
3	KA2020025	Locknuts
6	900115043100A	Washers

* For use with welded steel operating handles located on the left-hand side of the handle box). Applicable to units manufactured Aug 2010 or later.

Installation procedure kits KPA-114-21/KPA-114-31

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. 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

WARNING

Hazardous Voltage. This device is not a substitute for a visible disconnect. Follow all locally approved safety practices. Failure to follow proper safety practices can result in contact with high voltage, which will cause death or severe personal injury.

G112.1

Remove unit from service

De-energize the switchgear according to locally approved procedures before servicing.

Assembly procedure

The following kits (KPA-114-21 and KPA-114-31) are applicable to VFI Switchgear manufactured prior to Aug 2010.

If the unit has S/N 3Q9317000 or lower, follow the instructions below. If the unit has a S/N above 3Q9317000 or starts with CP57, follow the assembly procedure on page 2.

Tri-phase control modifications

1. Open the access door of the Tri-Phase/TPG control. The VFI operating handles may be in any position since this will not affect installation.
2. Locate pin connector P2, which is in the lower right corner of the control panel; refer to Figure 2. Install jumper connector SECO113 on P2 as shown. The jumper parallels the trip circuits of each phase so that when a trip is enabled for the flux shift tripper on one phase, all three phases are then automatically tripped. The jumper connector is keyed (one side notched) to allow it to lock in place with P2 when properly installed. Do not force it into place.
3. Close the access door.

Note: To convert from three-phase trip back to single-phase trip, reverse the procedure above. Remove the jumper connector from P2 and store in a safe place. Do not apply excessive force to the plastic retainer on P2 when removing the jumper connector. Disengage the connector by grasping both ends of the connector with thumb and index finger and carefully rocking the ends free.

Attachment of the single-phase to three-phase VFI conversion handle

Refer to Figures 6 and 7 for steps 1 and 2.

1. Position the conversion handle across the three VFI handles using the correct left/right orientation required of your installation.

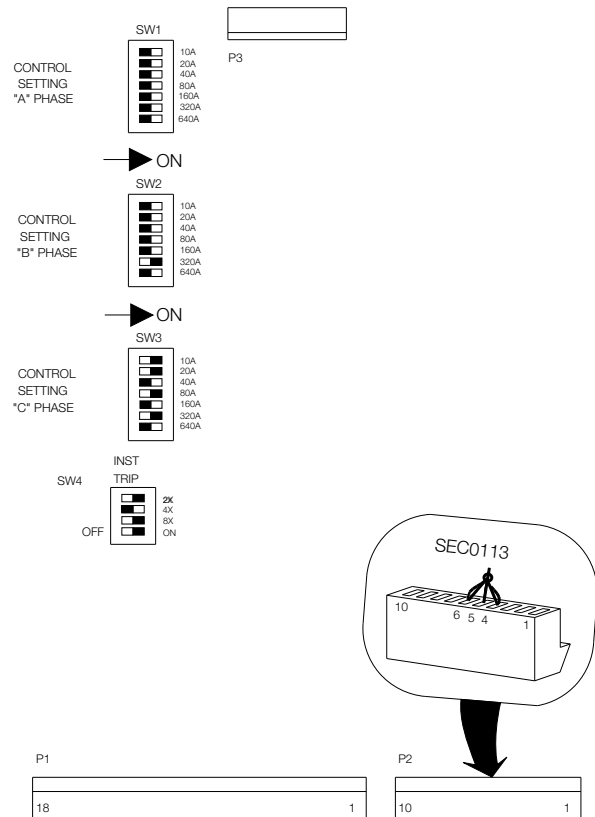


Figure 4. Installation of the jumper connector on the Tri-phase/TPG control board

2. Fasten the conversion handle to each of the three VFI handles using one 3/8" x 1" hex-head capscrews, two 3/8" plain washers, and one elastomer stop-nut per handle. Locate the hex-head capscrews and accompanying hardware through the upper holes of the two outboard VFI operating levers. Locate the third hex-head capscrew and accompanying hardware through the lower hole of the center VFI operating handle.

Note: The fastening hardware must be routed through the lower hole of the center VFI operating handle to allow an open hole in the handle for padlocking, when required.

Note: For proper operation of the ganged VFI handles, the conversion handle anchor bolts must not be fully tightened. Tighten hardware, then loosen all three nuts one half turn. The anchor bolts must turn freely within the bores of the VFI handles.

Type VFI fault interrupter with tri-phase control single-phase trip to three-phase trip conversion kits

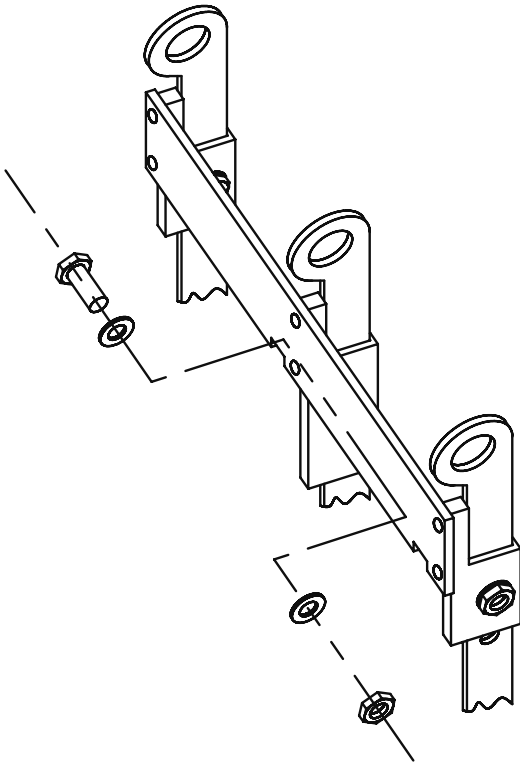


Figure 5. Conversion handle P20029667B0001
(For use with cast aluminum operating handles located on the right hand side of the handle box; reference Table 4.)

Table 4. Conversion kit KPA114-21* contents

Qty.	Part No.	Description
1	SECO113	Jumper Connector
1	P20029667B0001	Conversion Handle
3	730115137125A	Hex-head Capscrews
3	KA2020025	Locknuts
6	900115043100A	Washers

* For use with cast aluminum operating handles located on the right-hand side of the handle box. Applicable to units manufactured prior to Aug 2010.

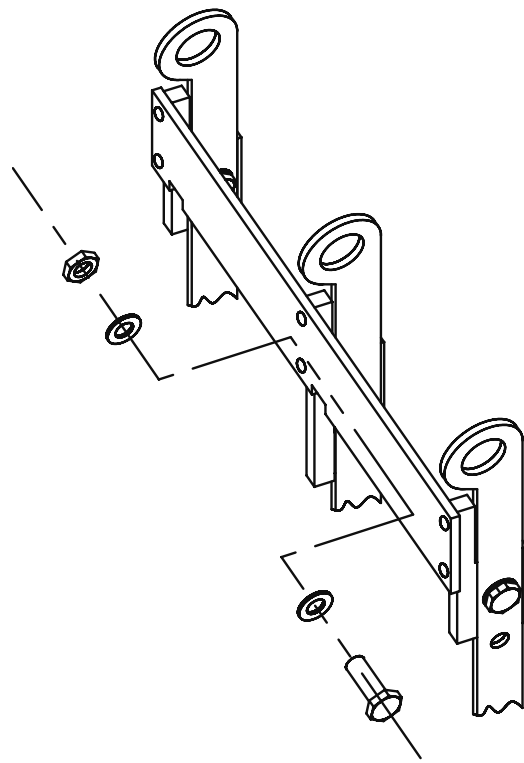


Figure 6. Conversion handle P20029669B0001
(For use with cast aluminum operating handles located on the left hand side of the handle box; reference Table 5.)

Table 5. Conversion kit KPA114-31* contents

Qty.	Part No.	Description
1	SECO113	Jumper Connector
1	P20029669B0001	Conversion Handle
3	730115137125A	Hex-head Capscrews
3	KA2020025	Locknuts
6	900115043100A	Washers

* For use with cast aluminum operating handles located on the left-hand side of the handle box. Applicable to units manufactured prior to Aug 2010.

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

Manual reset operation

1. Pull the center operating handle DOWN, to the OPEN position.
2. Pull DOWN firmly and completely on each individual phase handle to assure positive reset of each of the three phases.
3. Pull UP on center handle, to CLOSE all three phases.

CAUTION

Verify that each phase is closed by testing for presence of line voltage on each phase. The CLOSED position of the ganged yellow operating handle does not assure that each phase is closed.

T257.1

For complete information on the operation of VFI interrupters, refer to the appropriate Service Information referenced within the **PRODUCT INFORMATION** section of this publication.

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