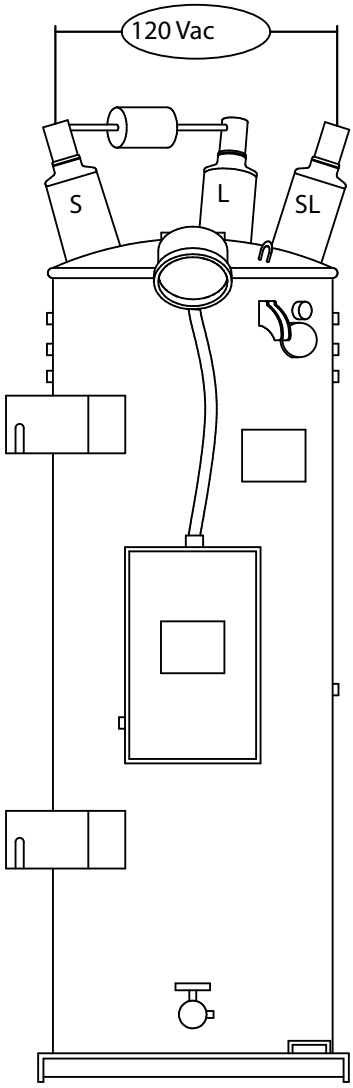
Potential transformer ratio test



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Contents

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, 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 a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

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

CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

CAUTION

Indicates a hazardous situation which, if not avoided, could 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 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.

Product information

Introduction

Service Information *MN225061EN* provides test procedure steps to verify proper potential transformer ratio.

Refer to *MN225003EN, CL-7 voltage regulator control installation, operation, and maintenance instructions and MN225008EN VR-32 voltage regulator with Quik-Drive™ tap changer installation, operation, and maintenance instructions* or the documentation appropriate for your equipment for detailed service information on Eaton's Cooper Power series voltage regulators and controls.

⚠ 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 processes described nor provide directions for meeting every possible contingency during installation, operation, or maintenance. For additional information, contact your Eaton representative.

Standards

ISO 9001 Certified Quality Management System

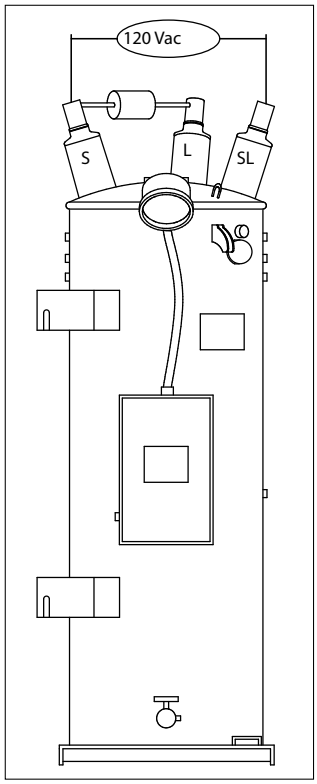

Figure 1. Potential transformer ratio test connections.

$$\frac{\text{Input Voltage (120 Vac)}}{\text{PT Ratio}} = \text{V1 to Ground Voltage}$$

Figure 2. Ratio test output voltage calculation.

Required equipment

The following equipment is required to perform this test procedure.

- Voltmeter
- 120 Vac variable power supply
- Appropriate cable leads
- Calculator

Procedure instructions

1. To perform this procedure, the voltage regulator must be removed from service. If the voltage regulator is in service, refer to document MN225008EN for procedures on removing a voltage regulator from service.
2. Insure that the voltage regulator is in the neutral position. If it is not in the neutral position, refer document MN225003EN for information on externally powering a voltage regulator control. Once the control is powered, operate the tap changer to return the voltage regulator to the neutral position.
3. On the panel behind the control, open the knife switch marked V1.
4. Connect 120 Vac between the source (S) and the source-load (SL) bushings as shown in Figure 1.
5. Measure and record the voltage between the top of the V1 knife switch and ground. The entire back panel is at ground potential.
6. Note the PT ratio as given on the nameplate in the Internal PT Ratio column for the pinned Load Voltage. The measured voltage at top of the V1 switch should be approximately the same as 120 volts divided by the PT primary (see Figure 2). For example, 120 volts applied to the bushings with a 60:1 PT ratio would give 2 volts at the V1 switch.
7. If the measured voltage at the V1 switch is not as expected, verify the internal PT tap connection by inspecting the tap changer terminal board located under the regulator cover hand-hole. The wire marked with E will be connected to a terminal marked E1, E2, or E3. This should match with the connection displayed in the Control Winding Tap column for the pinned system voltage on the nameplate. If the PT connection is not correct, take steps to correct the connection and repeat the test.

Questions about this procedure may be directed to your Eaton Representative.

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