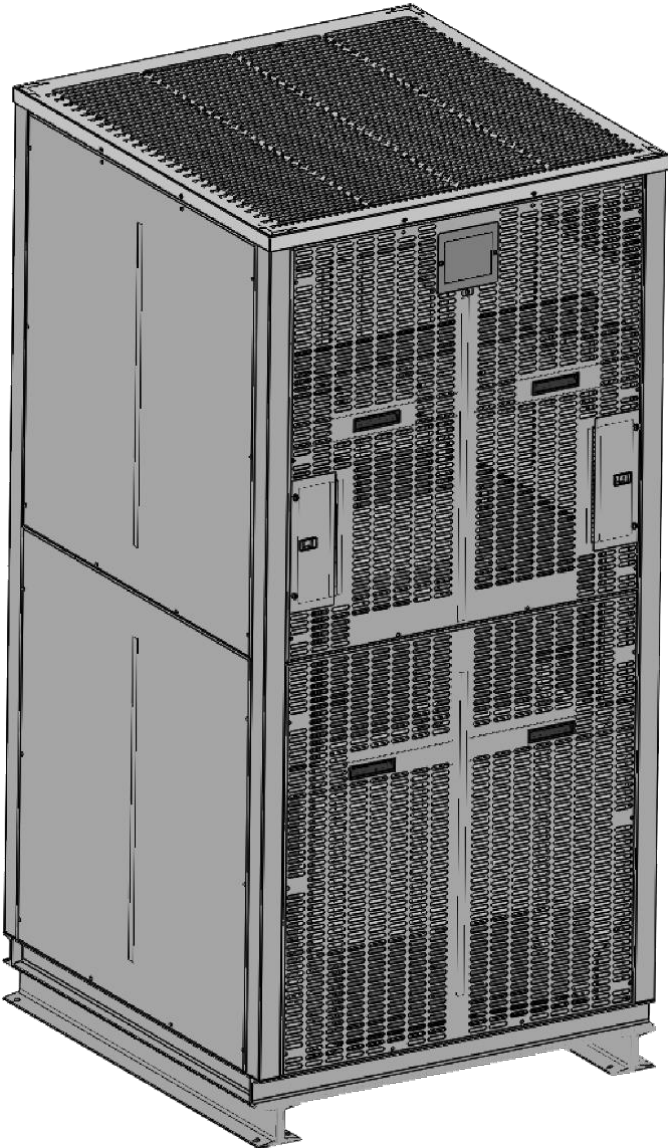


Eaton® Current-limiting Reactor (5000A)

Installation Manual



IMPORTANT SAFETY INSTRUCTIONS - SAVE THESE INSTRUCTIONS

This manual contains important instructions that you should follow during installation and maintenance of the equipment. Please read all instructions before operating the equipment and save this manual for future reference.

CONSIGNES DE SÉCURITÉ IMPORTANTES – CONSERVER CES INSTRUCTIONS

Ce manuel contient des instructions importantes que vous devez suivre lors de l'installation et de la maintenance de l'équipement. Veuillez consulter entièrement ces instructions avant de faire fonctionner l'équipement et conserver ce manuel afin de pouvoir vous y reporter ultérieurement.

WARNING

This is a product for restricted sales distribution to informed partners (EN/IEC 62040-2). Installation restrictions or additional measures may be needed to prevent electromagnetic disturbances.

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Dear Customer,

On behalf of everyone at Eaton, we thank you for partnering with us, for trusting us to maintain your business continuity and for preventing downtime at your facility.

Our suite of backup power, power distribution and power management products are designed to protect you from a host of threats including power outages, surges, and lightning strikes, and enable you to monitor and control your power infrastructure.

We trust that our products will deliver high quality, reliable power for your business, and we are committed to your success.

Please read this manual, which details the installation and operation processes for your new Eaton product.

Thank you for choosing Eaton!

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Chapter 1 Introduction

1.1 Intended Use

The Current-limiting Reactor (5000A) (hereafter “the Reactor”) is a power conditioning system that limits fault current under short-circuit conditions, helping to support overall NFPA-70E and NFPA-75 safety.

The Reactor is to be installed between a switchboard and switchgear and will be electrically connected to them with flexible busbar connectors.

1.2 Description

The Reactor is a stand-alone unit with no operational controls.

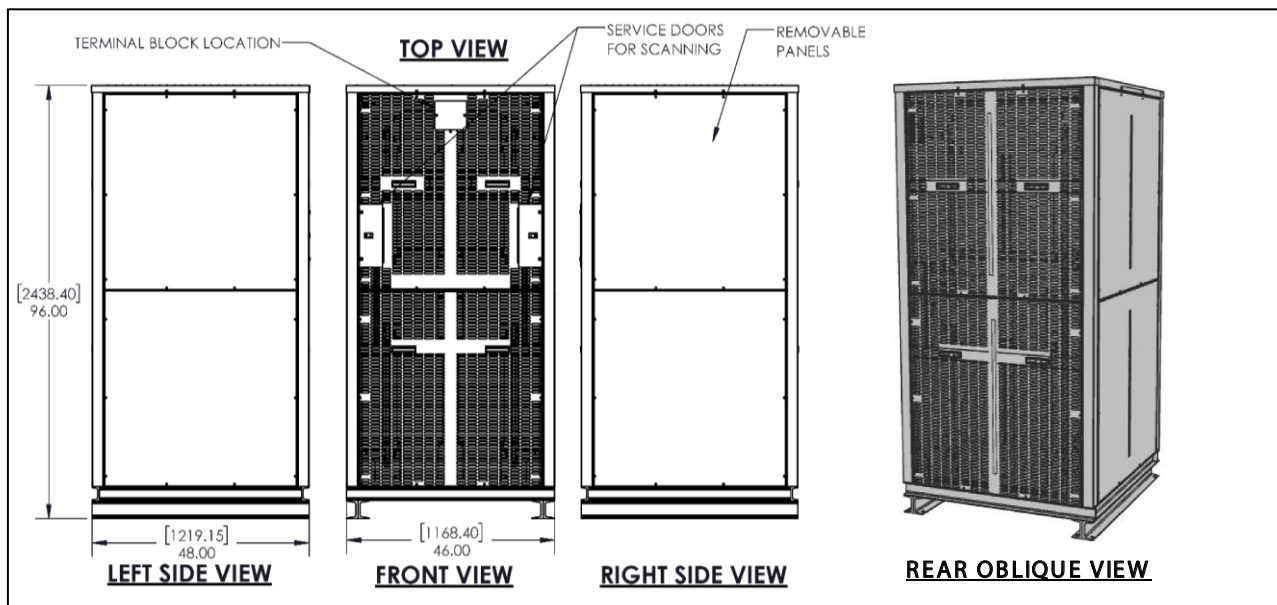
The Reactor is connected to adjacent switchgear and switchboard with flexible busbar connectors. See section [Chapter 4 Power Connections](#).

Panels on all four sides lift off. Side panels are removed and discarded for connection to the adjacent switchgear or switchboard.

The Reactor has the following dimensions:

- 46" [1168.4 mm] W x 96" [2438.4 mm] H x 48" [1219.15 mm] D.

Figure 1. Eaton Current-limiting Reactor (5000A)



Front, back, top, and bottom panels are ventilated. When side panels are removed for connection to the adjacent switchgear and switchboard, additional side ventilation is provided through these units.

Routine maintenance can be performed from the front of the unit. The front of the unit has service doors on the left and right side for viewing and infrared scanning of busbar connections. The lower front panel can be removed to adjust or re-torque connections.

1.3 Using This Manual

Read this manual thoroughly and make sure you understand the procedures before you attempt to install, set up, operate or carry out any maintenance work on this Eaton product.

Read through each procedure before beginning the procedure. Perform only those procedures that apply to the unit being installed or operated.

1.4 Conventions Used in This Manual

This manual uses these type conventions:



NOTE Some conventions only apply to display screens (if installed).

- **Bold type** highlights important concepts in discussions, key terms in procedures, and menu options, or represents a command or option that you type or enter at a prompt.
- *Italic type* highlights notes and new terms where they are defined.
- `Screen type` represents information that appears on the screen or LCD.

Icon	Description
	Information notes call attention to important features or instructions.
[Keys]	Brackets are used when referring to a specific key, such as [Enter] or [Ctrl].

1.5 Symbols, Controls, and Indicators

The following are examples of symbols used on the reactor or accessories to alert you to important information:



RISK OF ELECTRIC SHOCK - Observe the warning associated with the risk of electric shock symbol.



CAUTION: REFER TO OPERATOR'S MANUAL - Refer to your operator's manual for additional information, such as important operating and maintenance instructions.



This symbol indicates that you should not discard waste electrical or electronic equipment (WEEE) in the trash. For proper disposal, contact your local recycling/reuse or hazardous waste center.

1.6 Getting Help

If help is needed with any of the following:

- Scheduling initial startup
- Regional locations and telephone numbers
- A question about any of the information in this manual

- A question this manual does not answer

Please call the Eaton Help Desk at:

United States: **1-800-843-9433** or **1-919-870-3028**

Canada: **1-800-461-9166 ext 260**

All other countries: **Call your local service representative**

Please use the following e-mail for manual comments, suggestions, or to report a technical error in this manual.

E-ESSDocumentation@eaton.com

1.7 Warranty and End User License Agreement

To view the warranty please click on the link or copy the address to download from the Eaton website:

[Eaton Product Warranty](#)

<https://www.eaton.com/content/dam/eaton/products/backup-power-ups-surge-it-power-distribution/backup-power-ups/portfolio/eaton-three-phase-ups-warranty.pdf>

<https://www.eaton.com/content/dam/eaton/products/backup-power-ups-surge-it-power-distribution/backuppower-ups/portfolio/eaton-three-phase-ups-warranty.pdf>

To view the End User License Agreement please click on the link or copy the address to download from the Eaton website:

[Eaton End User License Agreement](#)

<https://www.eaton.com/content/dam/eaton/products/support-systems/software-and-cad-registration-form/eaton-end-user-software-license-agreement.pdf>

Chapter 2 Safety

⚠ WARNING

Follow safe electrical work practices:

- Read, understand, and follow the instructions before installing this product.
- Electrical equipment should be installed, operated, serviced, and maintained only by Eaton qualified personnel and in accordance with all local safety codes. Eaton, Inc. assumes no responsibility for any consequences arising out of the use of this manual. This document should not be viewed as sufficient by otherwise non-qualified personnel to operate, service, or maintain the equipment discussed.
- Reactor units are connected to hazardous line voltages. Severe or fatal injury can result from electrical shock during contact with high voltage conductors, monitoring PCBs, or similar equipment. When installing and servicing reactors, there may be exposed components with housings or protrusions at or above line potential. Extreme care should be taken to protect against shock.
- Disconnect and lock-out all power supplying equipment before working on or installing components. Use a properly rated voltage sensing device to confirm power is OFF.

⚠ DANGER

- Severe or fatal injury can result from electrical shock during contact with high voltage conductors, monitoring PCBs, or similar equipment.
 - Disconnect power before drilling holes, attaching conduit, or connecting power cables or control wiring.
 - Use Lock Out/Tag Out procedures.
 - Wear suitable personal protective clothing and use protective equipment for performing mechanical and electrical installations.
 - Leave ample space for attaching and routing wires.
-

Chapter 3 Installation

3.1 Receiving and Unpacking the Reactor

Reactors are shipped bolted to shipping pallets and protected by two layers of external plastic covering. Units are first covered by a large plastic bag and then shrink-wrapped. Finally, each unit is secured to its pallet with metal retaining bands.

For moving the Reactor on its pallet, Eaton recommends that retaining bands remain intact and connected to the pallet until the unit is moved to a convenient location for removing it from its pallet.

Inspect the shipped unit twice, upon receipt and after removing packaging materials.

1. Upon receiving a Reactor pallet and before removing packaging, inspect the packaging for visible damage. If damage is evident notify the shipping company and Eaton (see below for Eaton contact information)..
2. File any damage claims with the shipping company at time of delivery. Damage must be noted on the bill of lading. Failure to properly document all damage may result in the unit's warranty being voided.
3. Carefully cut the retaining bands, making sure that they do not scrape the exterior of the unit or scratch the paint.

WARNING

- Metal retaining bands are under tension. Exercise caution when cutting them.
 - Wear protective clothing including eye, face, and hand protection when cutting retaining bands.
-
4. Carefully remove the outer layer of protective shrink wrap from the unit and the interior plastic covering bag. Use care to not puncture or scratch the Reactor with cutting tools.
 5. After removing the outer external packaging, inspect the unit's exterior panels and doors for any visible damage such as scratches, dents, or cracks. If you discover any damage, notify the shipping company and Eaton service .

Eaton service phone number: 1-800-225-4838, select option 3

3.2 Moving the Reactor

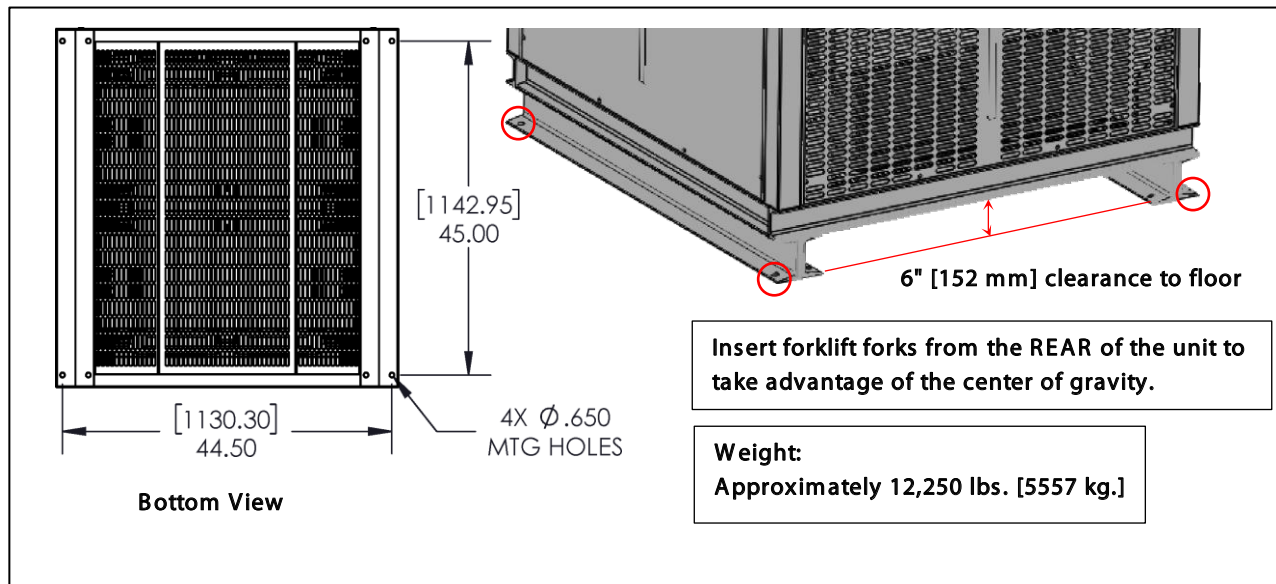
Before moving the Reactor, plan for the following clearances:

- Minimum service clearance, front: 36" [914 mm], which includes front ventilation clearance
- Ventilation openings of the Reactor shall require not less than 6" [152 mm] clearance from wall or other passive partitions and not less than 12" [305 mm] clearance from ventilation openings of adjacent Reactor or of other electrical equipment.

Move the Reactor off its pallet with a forklift or other lifting device as follows:

1. The current-limiting Reactor is bolted to a pallet. With the pallet resting on the floor, remove the bolts.
2. Insert forklift blade under the Reactor cabinet **at the rear of unit** because the rear of unit is heavier than the front. There is 6" [152 mm] clearance from bottom of the enclosure to the floor.
3. Side panels must be removed for electrical connection to adjacent equipment. If adjacent equipment is already installed before the Reactor is placed, then remove the side panels just before placing the Reactor. Panels lift off. Discard the removed side panels.
4. Move the unit to its installation location and withdraw the forklift blades. Units have no casters and should be precisely positioned with the forklift.

Figure 2. Moving and Anchoring the Reactor



3.3 Anchoring the Reactor

The base frame of the Reactor has four (4) x dia. 0.65" [16.5 mm] holes for anchoring the unit to the floor. For securing the unit to the floor ½" dia. hardware is provided by others.

Chapter 4 Power Connections

⚠ CAUTION

- The 5000 A Reactor must be wired by licensed electricians or by Eaton-authorized technicians.
- Installers should use Lock-Out/Tag-Out procedures and observe other precautions listed in the introductory Safety section.
- Power wiring and grounding must comply with NEC and applicable local codes.
- **Do not run cables through the Reactor!**

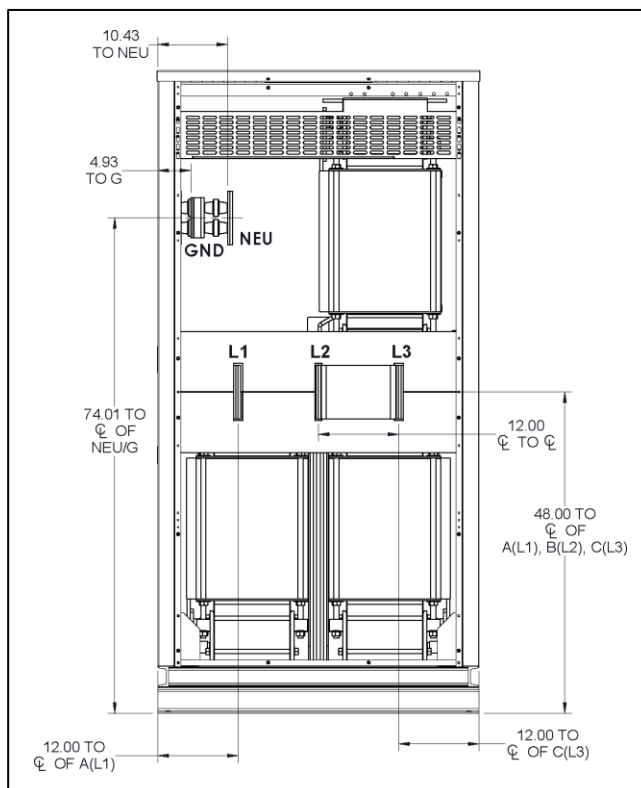
4.1 Reactor Connections to Adjacent Equipment

Adjacent switchboard and switchgear should be installed about the Reactor on its left and right sides. Power connections to the Reactor are made only at its sides. There are no top or bottom conduit panels.

Side panels must be removed on the Reactor and on adjacent equipment where they face each other in order to make power connections.

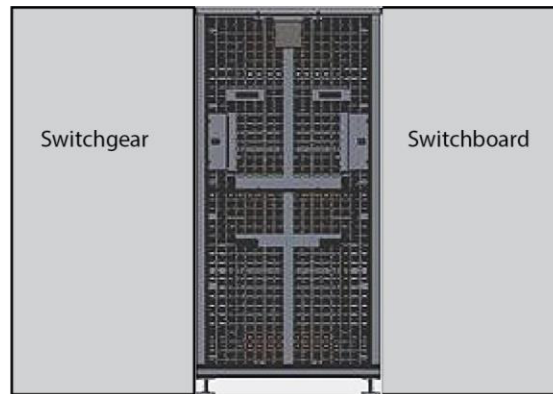
L1/L2/L3/N/G power connections are symmetrically placed on both the left and right sides of the unit.

Figure 3. Power Connection Locations



The Reactor does not have directional power flow. Switchboard and switchgear are installed on opposite sides of the Reactor, but their positions can be reversed (that is, switchgear left side, switchboard right side, OR, switchgear right side, switchboard left side) without requiring modification of the Reactor.

Figure 4. Reactor Position with Switchgear and Switchboard



4.2 Flex Connectors

Power connections between the Reactor and adjacent switchboard and switchgear busbars are made with flexible busbar connectors (or “flex connectors”).

Flex connectors each have a NEMA 2 1.75-inch [44.5 mm] 2-hole bolt pattern on each end for attachment to busbars. Flex connectors are provided by others. Contractor or installer should provide sufficient flex connectors for the Reactor’s 5000 A ampacity.

Eaton's flex connectors, which are used for Reactor testing, are rated such that Qty (8) (or Qty (4) per busbar side) are required for each busbar-to-busbar connection between the Reactor and the adjacent equipment, except for ground, which requires Qty (6) (see [Figure 12](#) Detail B).

Figure 5. Flex Connectors

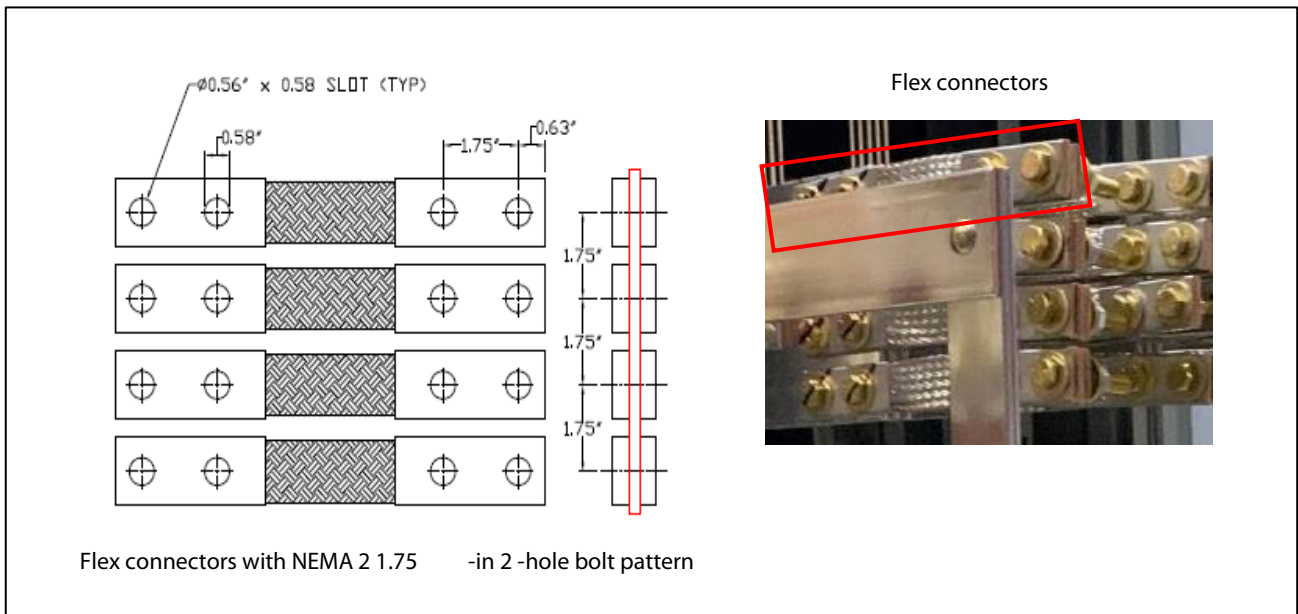


Figure 6. Neutral and Ground with Flex Connectors

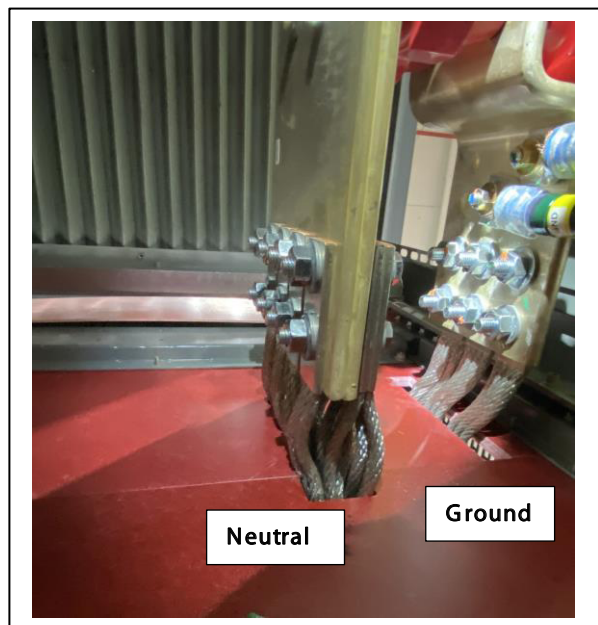
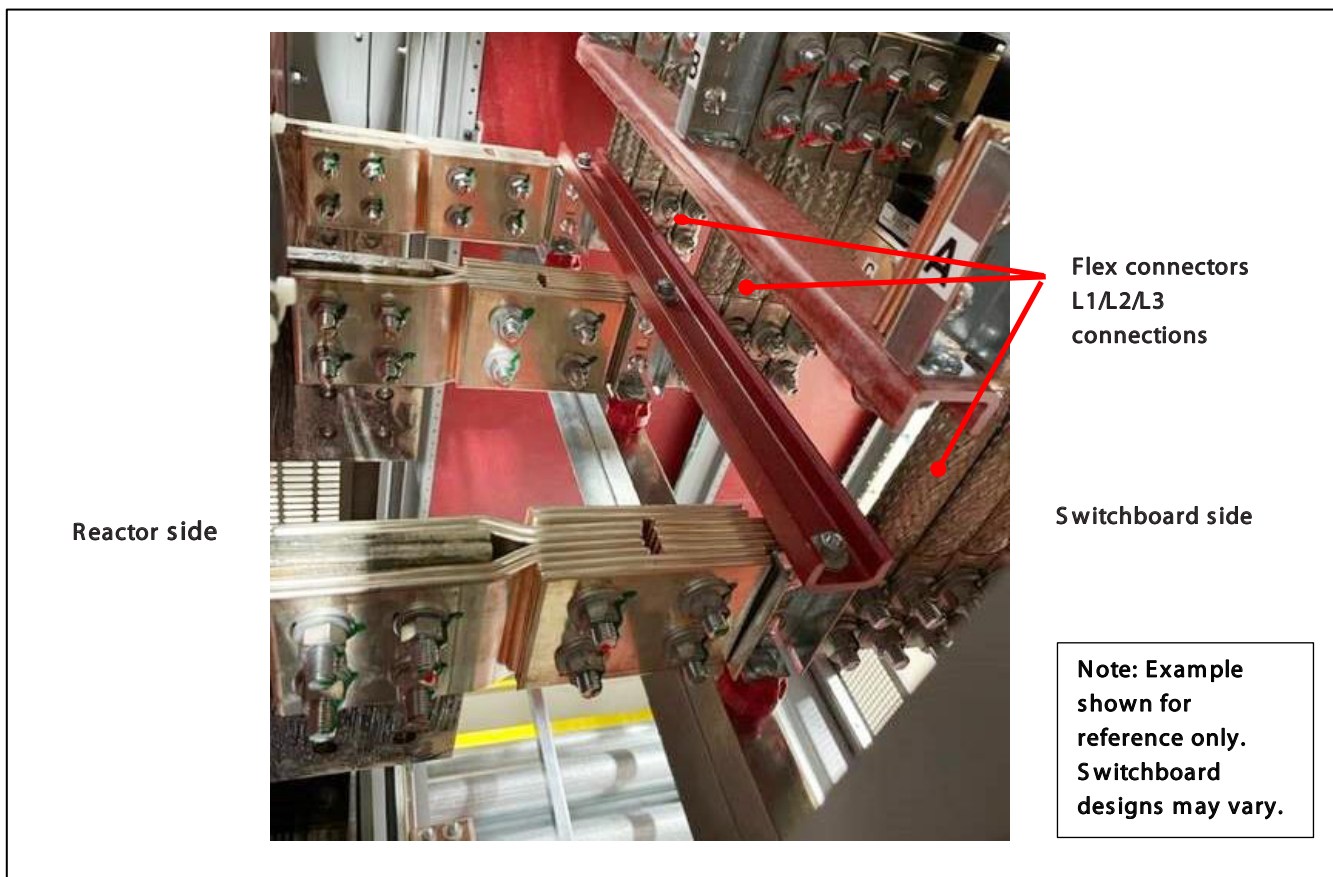


Figure 7. Phases L1/L2/L3 with Flex Connectors



Chapter 5 Monitoring Connections

Each single-phase reactor has Qty. (6) Pt100 temperature sensors installed in reactor windings.

Sensors wires are terminated to the terminal block in the Reactor controls compartment, which provides an interface between the Reactor and an external customer-provided monitoring system.

Remove the cover of the controls compartment to expose the terminal block. External monitoring system connections are made to the top of the terminal block and are provided by others.

Figure 8. Controls Compartment

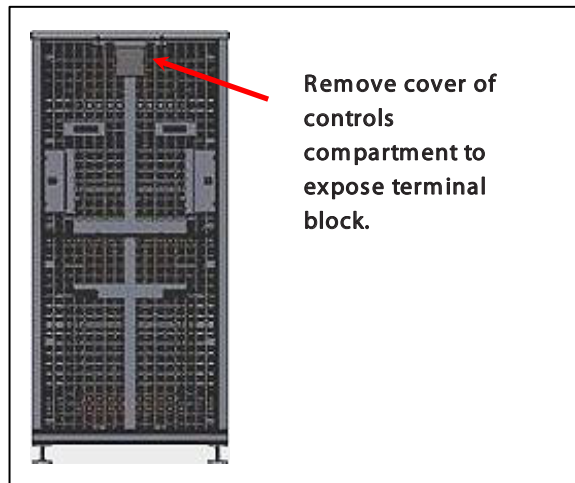


Figure 9. Terminal Block for Sensor Wiring

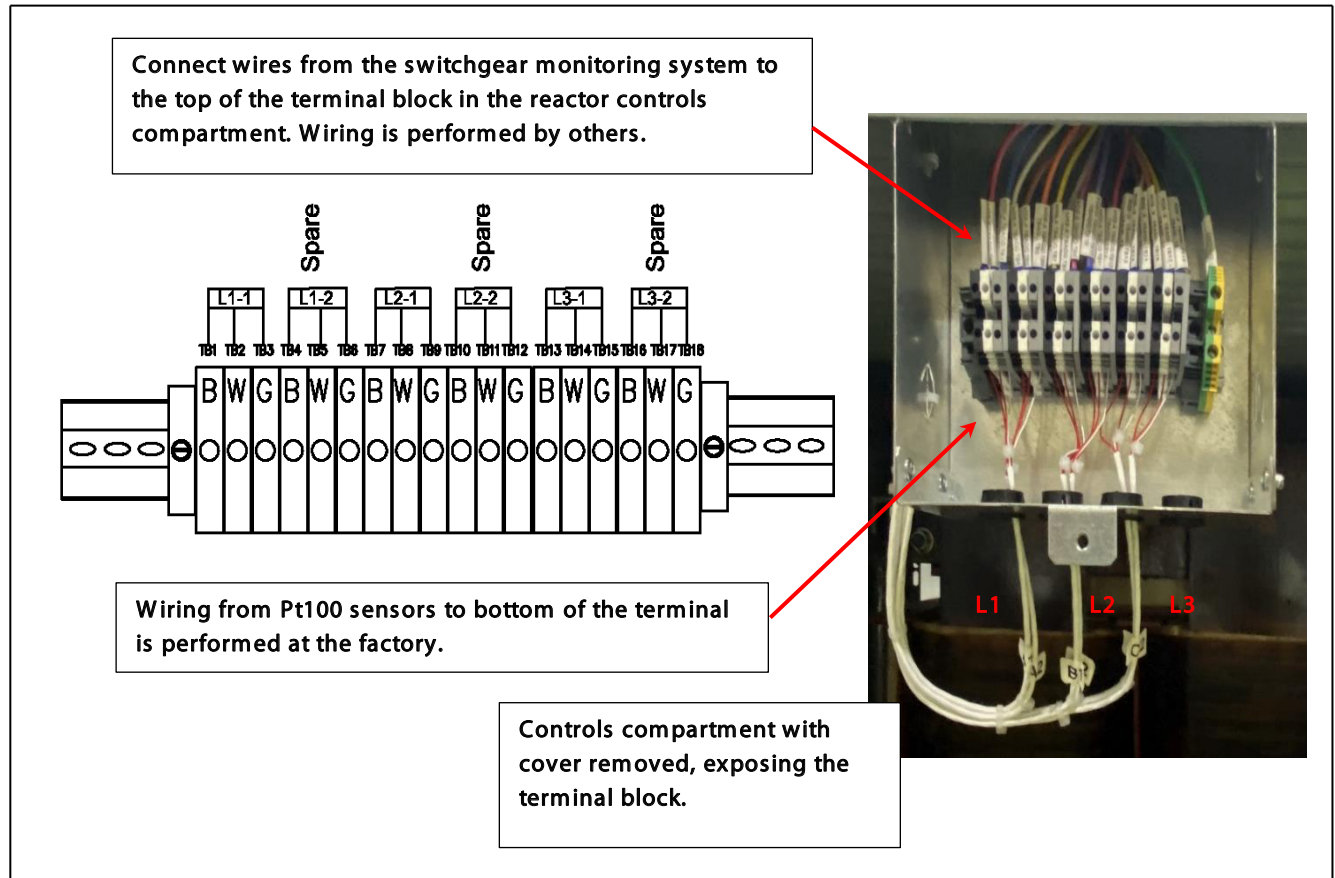
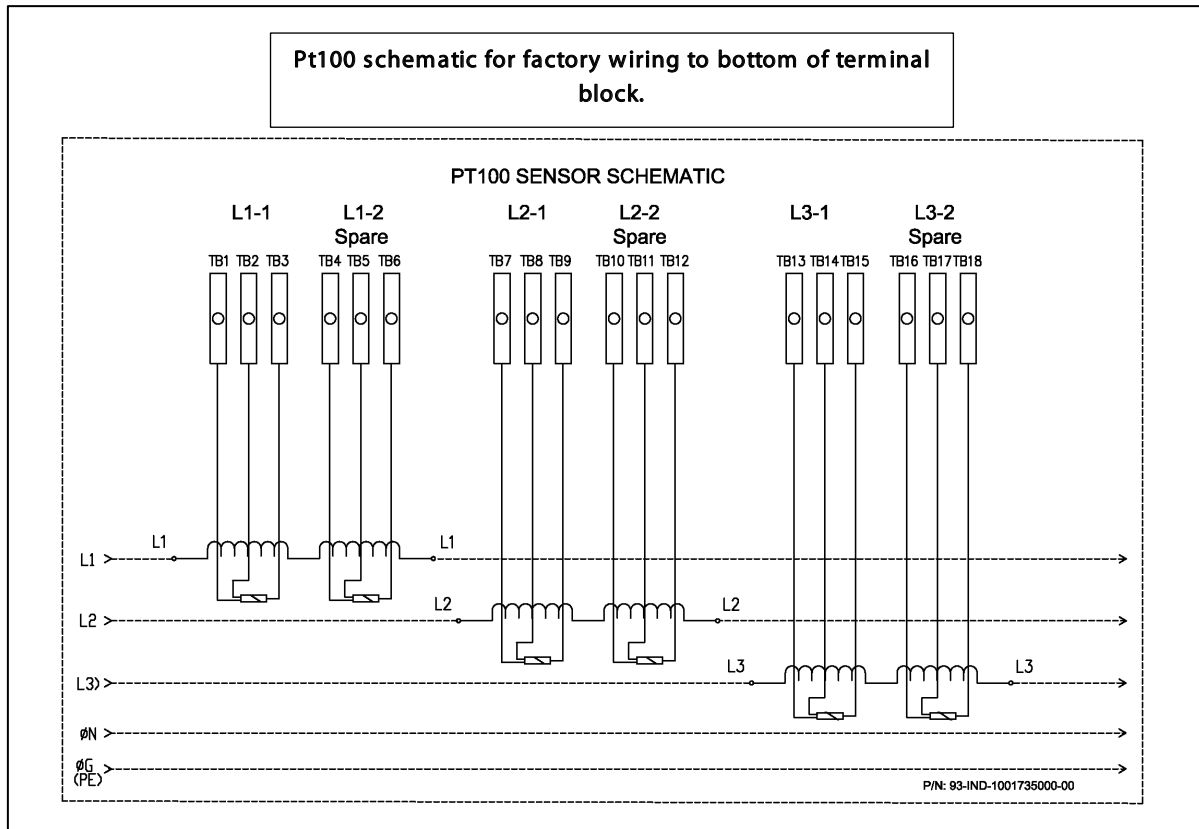


Figure 10. Pt100 Sensor Wire Schematic



Chapter 6 Service and Maintenance

Eaton Service contracts help to provide the added insurance that the reliability of your critical power systems is intact. By following our stringent maintenance procedures, Eaton's factory trained Customer Support Engineers provide the added assurance for the availability of critical systems, thereby maximizing the company's profitability. See below for further details.

6.1 The Service Promise

With factory-trained technicians in every major city in North America, Eaton can respond rapidly and provide on-site assistance in emergency down time situations. Eaton provides telephone support 24 hours a day, 7 days a week with a direct line to Service (1-800-843-9433).

6.2 Preventive Maintenance

During a preventive maintenance visit, Eaton technicians inspect, test, calibrate, update and clean components, as well as update software as applicable. You'll receive a report at the end of the visit detailing the results of the inspection and specific recommendations for remedial actions, proactive replacements, and upgrades.

6.3 Eaton Provides Flexibility and Commitment

- We understand that service plans are not "one size fits all." That's why we offer a broad range of service options, designed to meet the varied requirements and applications of businesses of all shapes and sizes. Eaton can modify your contract on variables such as number of PM visits per year, scope of coverage, response time and length of contract.
- Eaton employs 250+ field technicians with an average tenure of more than ten years. Eaton CSEs are experts on Eaton products and receive ongoing product training and certification. Our technicians have expertise in power, electrical engineering, software and connectivity, batteries, UPSs and related products, and can deliver advanced troubleshooting and a reduced mean time to repair.
- When you rely on an Eaton service plan, rest assured that every factory-trained field technician stocks a solid inventory of parts to remedy emergencies.

6.4 Time and Materials

In most cases the customer will be covered by startup service or Maintenance Contracts, however, there may be times when the customer needs Eaton service and lacks the benefits that these two packages provide. Therefore, Eaton provides Time and Material coverage for those in need of our customer support engineers.

6.5 Startup

At the initial startup of the Current-limiting Reactor, an Eaton factory-authorized technician is recommended to validate correct operation. The product warranty may be voided if the correct startup procedures are not followed.

6.6 Infrared Scanning

To gain access to bus bars and cables for infrared scanning, open the left or right scanning panels on the front of the unit.

Chapter 7 Drawings

Figure 11. Reactor Assembly Drawing — Sheet 1

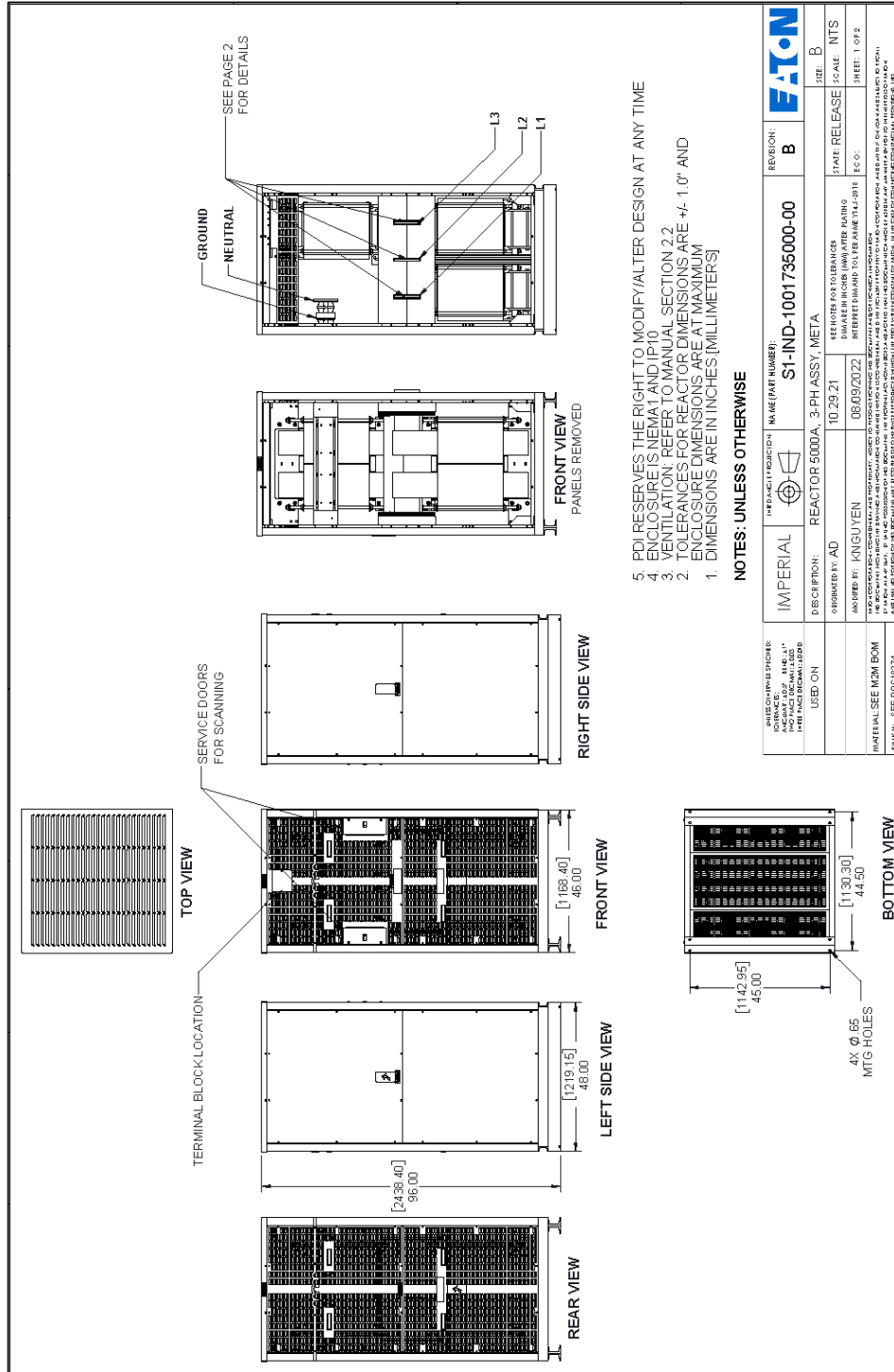
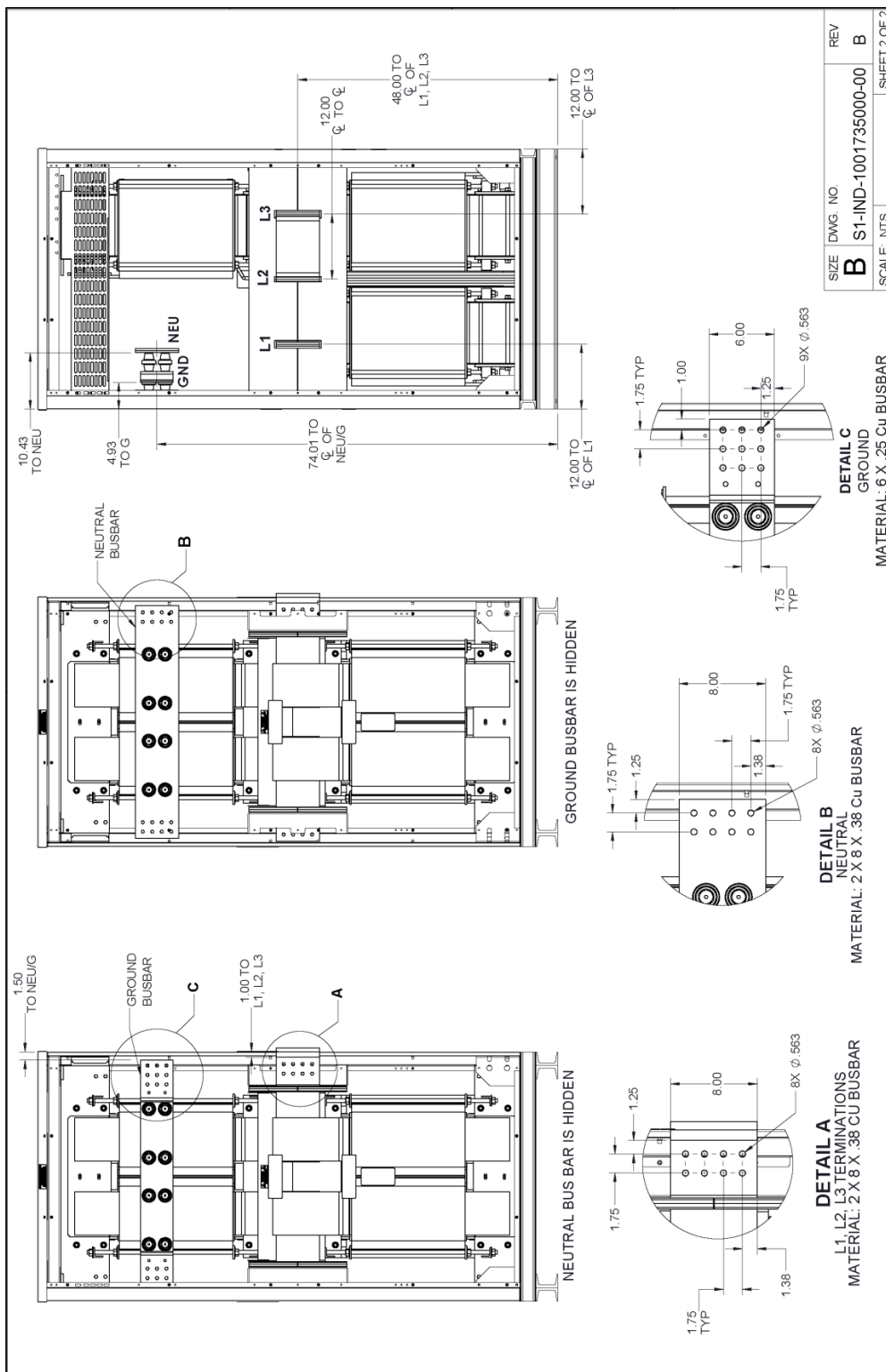


Figure 12. Reactor Assembly Drawing — Sheet 2



Drawings

