Electro Industries GaugeTech

Shark MP200™ in Enclosure

For Three Phase and Single Phase MP200™ Metering Systems

www.electroind.com

User Manual
V.1.12
April 21, 2025

HUBBELL

1800 Shames Drive, Westbury, NY 11590 Tel: (516) 334-0870 Fax: (516) 338-4741 Email: sales@electroind.com

This page intentionally left blank.

MP200™ in Enclosure User Manual Version 1.12

Published by:

Electro Industries/GaugeTech

1800 Shames Drive

Westbury, NY 11590

Copyright Notice

Customer Service and Support

Customer support is available 8:00 am to 8:00 pm, Eastern Standard Time, Monday through Friday. Please have the model, serial number and a detailed problem description available. If the problem concerns a particular reading, please have all meter readings available. When returning any merchandise to EIG, a return materials authorization number is required. For customer or technical assistance, repair or calibration, phone 516-334-0870 or fax 516-338-4741.

Product Limited Warranty Certificate

1.Electro Industries/Gauge Tech ("Electro") warrants its metering products ("the Product") against defects in material and workmanship, subject to the terms and conditions stated herein. This limited warranty extends to and covers only the Customer, as the purchaser of Electro's Product; the Customer represents and warrants to Electro that the Customer is subject to and bound by the limited warranty and disclaimer of warranty contained herein.

2.PRODUCT LIMITED WARRANTY

Electro warrants that commencing from the Product's date of delivery (the date the Product leaves Electro's manufacturing facility) and continuing immediately following thereafter for a period of four (4) consecutive years, that the Product will be free from defects in material and workmanship, and except for the foregoing, the Product is sold AS IS with all faults. This warranty does not apply to defects resulting from unauthorized modification, misuse, or use of the Product for any use other than electrical power monitoring, which is the intended and normal use of the Product. The Customer's sole and exclusive remedy and the entire liability of Electro under this limited warranty will be, at Electro's option, as follows: (i) the Product's repair; or (ii) shipment of a replacement Product within the above stated warranty period. To exercise this limited warranty, the Customer must give notice (See Section 5) to Electro's customer-support department and give additional notice to Electro's customer-support department by facsimile or by telephone for Electro's instructions for the Product's return or repair. If the Product is repaired, Electro will ship the repaired Product to the Customer. THE FOREGOING WARRANTIES ARE THE SOLE WARRANTIES, EXPRESS OR IMPLIED, GIVEN BY ELECTRO IN CONNECTION WITH THE PRODUCT, AND ELECTRO DISCLAIMS ALL OTHER WARRANTIES, INCLUDING BUT NOT LMITED TO WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT OF THIRD-PARTY RIGHTS AND WARRANTIES AGAINST LATENT DEFECTS. The Cus-

tomer must notify Electro promptly, but in no event more than four (4) year after the Product's date of delivery of any claimed breach of this warranty, or such claim shall be time barred.

3.PRODUCT LIMITED WARRANTY RESTRICTIONS

THE LIMITED WARRANTY CONTAINED HEREIN WILL NOT BE GIVEN OR APPLY, AND NO EXPRESS OR IMPLIED WARRANTY, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE NON-INFRINGEMENT OF THIRD PARTY RIGHTS AND WARRANTIES AGAINST LATENT DEFECTS SHALL BE DEEMED APPLICABLE, GIVEN OR PROVIDED BY ELECTRO WITH RESPECT TO OR CONCERNING THE PRODUCT, IF: (a) the Product has been altered, except by Electro or Electro's authorized representative; (b) the Product has not been installed, operated, repaired, or maintained in accordance with instructions supplied by Electro; (c) the Product has been subjected to abnormal physical or electrical stress, abnormal environmental conditions, misuse, negligence, or accident; (d) the Product is used in ultrahazardous activities; or (e) the Customer failed to pay Electro the Product's purchase price pursuant the Terms of Sale published by Electro at https://www.electroind.com/pdf/docs/electro-terms-of-sale.pdf.

4.DISCLAIMER OF WARRANTY AND LIMITATIONS OF LIABILTY

EXCEPT AS EXPRESSLY GIVEN IN THIS LIMITED WARRANTY SECTION, ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS, AND WARRANTIES INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON- INFRINGEMENT, SATISFACTORY QUALITY, NON-INTERFERENCE, ACCURACY OF INFORMATIONAL CONTENT, OR ARISING FROM A COURSE OF DEALING, LAW, USAGE, OR TRADE PRACTICE, ARE HEREBY EXCLUDED IN THEIR ENTIRETY TO THE FULL EXTENT ALLOWED BY APPLICABLE LAW AND ARE EXPRESSLY DISCLAIMED BY ELECTRO, AND ARE WAIVED BY THE CUSTOMER. TO THE EXTENT AN IMPLIED WARRANTY CANNOT BE EXCLUDED, SUCH WARRANTY IS LIMITED IN DURATION TO THE EXPRESS WARRANTY PERIOD STATED HEREIN. THIS DISCLAIMER AND EXCLUSION SHALL APPLY EVEN IF THE EXPRESS LIMITIED WARRANTY SET FORTH ABOVE FAILS OF ITS ESSENTIAL PURPOSE.

EXCEPT AS EXPRESSLY PROVIDED IN THIS SECTION, ELECTRO HEREBY DISCLAIMS AND CUSTOMER WAIVES ALL REPRESENTATIONS, CONDITIONS AND WARRANTIES (WHETHER EXPRESS, IMPLIED, OR STATUTORY), INCLUDING, WITHOUT LIMITATION,

ANY WARRANTY OR CONDITION (A) OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT, TITLE, SATISFACTORY QUALITY, QUIET ENJOYMENT, ACCURACY, OR SYSTEM INTEGRATION, OR (B) ARISING FROM ANY COURSE OF DEALING, COURSE OF PERFORMANCE, OR USAGE IN THE INDUSTRY. TO THE EXTENT AN IMPLIED WARRANTY OR CONDITION CANNOT BE DISCLAIMED, SUCH WARRANTY OR CONDITION IS LIMITED IN DURATION TO THE APPLICABLE EXPRESS WARRANTY PERIOD. CUSTOMER SHALL NOT IN ANY EVENT BE ENTITLED TO, AND ELECTRO SHALL NOT BE LIABLE FOR, INDIRECT, SPECIAL, INCIDENTAL, PUNITATIVE OR CONSEQUENTIAL DAMAGES OF ANY NATURE INCLUDING, BUT NOT LIMITED TO AND WITHOUT LIMITATION, BUSINESS INTERRUPTION COSTS, REMOVAL OR REINSTALLATION COSTS, REPROCUREMENT COSTS, LOSS OF PROFIT OR REVENUE, LOSS OF DATA, PROMOTIONAL OR MANUFACTURING EXPENSES, OVERHEAD, INJURY TO REPUTATION OR LOSS, EVEN IF ELECTRO HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

ELECTRO'S LIABILITY TO THE CUSTOMER, AND CUSTOMER'S RECOVERY FROM ELECTRO FOR ANY CLAIM, INCLUDING BUT NOT LIMITATED TO A WARRANTY CLAIM, SHALL NOT EXCEED CUSTOMER'S PURCHASE PRICE FOR THE PRODUCT PAID BY THE CUSTOMER FOR THE PRODUCT, WHICH GAVE RISE TO SUCH CLAIM IRRESPECTIVE OF THE NATURE OF THE CLAIM, WHETHER IN CONTRACT, TORT, WARRANTY OR OTHERWISE. ELECTRO SHALL NOT BE LIABLE FOR, AND THE CUSTOMER SHALL INDEMNIFY, DEFEND AND HOLD ELECTRO HARMLESS FROM THE FOLLOWING: ANY CLAIMS BASED ON ELECTRO'S COMPLIANCE WITH END USER'S OR CUSTOMER'S DESIGNS, SPECIFICATIONS OR INSTRUCTIONS; MODIFICATION OF ANY PRODUCT BY A PARTY OTHER THAN ELECTRO; MODIFICATION OF ANY SOFTWARE MADE BY A PARTY OTHER THAN ELECTRO; THE USE OF THE PRODUCT OR SOFTWARE FOR ANY USE OTHER THAN ELECTRICAL POWER MONITORING; AUTHORIZED OR UNAUTHORIZED USE OF THE PRODUCT OR SOFTWARE; MISUSE OF THE PRODUCT OR SOFTWARE; THE SOFTWARE'S OR PRODUCT'S USE IN COMBINATION WITH OTHER EQUIPMENT, GOODS, SOFTWARE OR PRODUCT. IF, FOR ANY REASON, THE FOREGOING LIMITATIONS ARE FOUND BY AN ARBITRATION PANEL OR COURT OF COMPETENT JURISDICTION TO BE INVALID OR INAPPLICABLE UNDER ANY APPLICABLE LAW, CUSTOMER AGREES THAT ELECTRO'S TOTAL LIABILITY FOR ALL DAMAGES, LOSSES, OR CAUSES OF ACTION OF ANY KIND OR NATURE SHALL BE LIMITED TO CUSTOMER'S PURCHASE PRICE FOR THE PRODUCT LICENSED BY THE CUSTOMER FROM ELECTRO, WHICH GAVE RISE TO SUCH CLAIM, WITHOUT REGARD TO ANY ACTUAL DAMAGES; INDIRECT, SPECIAL,

DIRECT OR CONSEQUENTIAL DAMAGES; PUNITIVE OR EXEMPLARY DAMAGES PROVIDED FOR BY ANY SUCH APPLICABLE LAW.

5.NOTICES

All notices required or permitted under this limited warranty will be in writing and will be deemed given one (1) day after deposit with a commercial express courier specifying next day delivery (or two (2) days for international courier packages specifying 2-day delivery), with written verification of receipt. All communications will be sent to the address set forth below, and notices to Electro shall be further addressed to Attn: Customer Support.

Electro Industries/Gauge Tech
1800 Shames Drive
Westbury, NY 11590
Attn: Customer Support

Use of Product for Protection

OUR PRODUCTS ARE NOT TO BE USED FOR PRIMARY OVER-CURRENT PROTECTION. ANY PROTECTION FEATURE IN OUR PRODUCTS IS TO BE USED FOR ALARM OR SECONDARY PROTECTION ONLY.

Statement of Calibration

Our instruments are inspected and tested in accordance with specifications published by Electro Industries/GaugeTech. The accuracy and a calibration of our instruments are traceable to the National Institute of Standards and Technology through equipment that is calibrated at planned intervals by comparison to certified standards. For optimal performance, EIG recommends that any meter, including those manufactured by EIG, be verified for accuracy every five years using NIST traceable accuracy standards. In general, EIG metering devices should not require regular adjustments to maintain published accuracy. If the meter is to be used for revenue purposes, follow the verification and calibration guidelines adopted by your local utility.

Disclaimer

The information presented in this publication has been carefully checked for reliability; however, no responsibility is assumed for inaccuracies. The information contained in this document is subject to change without notice.

Symbols Used in This Manual

This warning symbol indicates that the operator must refer to an important explanation in the operating instructions. The word following the symbol indicates the type of warning being given.
Ce symbole d'avertissement indique que l'opérateur doit se référer à une explication importante dans les instructions d'utilisation. Le mot suivant le symbole indique le type d'avertissement ne soit donné.

CAUTION! The instructions given must be followed to prevent damage to equipment.
Les instructions doivent être respectées pour éviter d'endommager l'équipement.

WARNING! The instructions given must be followed to prevent serious injury to people.
Les instructions doivent être respectées pour d'éviter de graves blessures aux personnes.

Our Focus at Electro Industries/GaugeTech (EIG)

EIG exclusively delivers integrated energy and power quality monitoring solutions utilizing AI and deep industry expertise to improve reliability, efficiency, and sustainability. With over 50 years' experience in the electrical industry, EIG has developed extensive energy management and power quality expertise to help customers find ideal solutions to complex challenges. Our corporate culture promotes being cutting edge and investing in R&D to continually improve our customer experience.

Our solutions are designed to deliver results in days, not years. Known for our reputation as being a dependable provider and for exemplary service and support, EIG is committed to customer satisfaction.

Table of Contents

1: Introduction

The MP200™ in Enclosure lets you expand your switchgear capability and/or easily meter circuits without expensive and time-consuming redesign. Simply mount the enclosure in any convenient location, next to your switchgear or on a wall, and you are ready to go, with no downtime.

This is an ideal solution for a retrofit when there is no metering compartment available. The unit comes standard with either a NEMA 1 or NEMA 4* rated enclosure and is factory wired with the metering system installed. Standard safety equipment includes voltage fuses and shorting blocks for current transformers.

The enclosure can be ordered with either the MP200-Y three phase circuit configuration or the MP200-S single phase circuit configuration, and comes standard with either a 3”x5” or 5”x7” touch-screen display. BACnet® or LonWorks® protocol is available as an add-on to the existing standard Modbus® capability. See Chapter 6 for ordering instructions.

1.1: Product Handling

CAUTION! READ AND UNDERSTAND THE INSTRUCTIONS CONTAINED IN THIS DOCUMENT BEFORE ATTEMPTING TO UNPACK, INSTALL, OPERATE, OR MAINTAIN THIS EQUIPMENT.

Every effort is made to insure that the equipment arrives undamaged and ready to be installed. Packing is designed to protect internal components as well as the enclosure. Do not remove protective packing until you are ready to install the equipment.

When you receive the equipment, you should inspect the shipping container for any obvious signs of rough handling and/or external damage that occurred during transportation. Record any external and internal damage for reporting to the transportation carrier and EIG. All claims should be as specific as possible and include general order numbers.

You will find a plastic bag of instruction booklets in the shipping container. Store these documents in a safe place.

* Images of the enclosure used in this manual show a NEMA 1 enclosure, unless there are significant differences between the NEMA 1 and NEMA 4 enclosures.

1.2: Safety Precautions

WARNING! All safety codes, safety standards, and/or regulations must be strictly observed in the installation, operation, and maintenance of this device.

Hazardous voltages that can cause death or severe personal injury are present inside enclosure. Follow proper installation, operation, and maintenance procedures to avoid these voltages.

Avertissement! tous les codes de sécurité, normes de sécurité et règlements doivent être suivis strictement dans l'installation, le fonctionnement et la maintenance de cet appareil.

Des tensions dangereuses peuvent provoquer la mort ou des blessures graves. suivre l'installation adéquate, le fonctionnement et les procédures de maintenance pour éviter ces tensions.

Completely read and understand the material presented in this document before attempting installation, operation, or application of the equipment. In addition, only qualified persons should be permitted to perform any work associated with the equipment. Any wiring instructions presented in this document must be followed precisely. Failure to do so could cause permanent equipment damage.

All possible contingencies that may arise during installation, operation, or maintenance, and all details and variations of this equipment do not purport to be covered by these instructions. If further information is desired by purchaser regarding a particular installation, operation, or maintenance of particular equipment, contact an Electro Industries/GaugeTech (EIG) representative.

1.3: Storage

Although it has been well packaged, this equipment should not be stored outdoors. If the equipment is to be stored indoors for any period of time, it should be stored with its protective packaging in place. Refer to the *MP200™ Metering System User Manual*, available on EIG's website: https://marketing.electroind.com/acton/openapi/form/v1/gated/25598/fcd21524-3721-455a-ab88-3c0fdc5ac4af/p-002f/f-516fe49b-a3c8-4310-8a5f-923500294283

The temperature rating for enclosure storage is (-20 to +60) ^{o}C/(-4 to +140) ^{o}F.

1.4: Compliance

UL / cUL Listed, UL508A, File number: E358101.

This page intentionally left blank.

2: Installation

WARNING! All safety codes, safety standards, and/or regulations shall be strictly observed in the installation, operation, and maintenance of this device. **This device shall be installed in an un-energized condition and as per the National Electric Code.**

AVERTISSEMENT! Tous les codes de sécurité, normes de sécurité et règlement doivent être suivis strictement pour l'installation, le fonctionnement et la maintenance de cet appareil. **Cet appareil doit être installé hors tension conformément au code électrique national (National Electric Code).**

Choose a mounting location that offers a flat, rigid mounting surface capable of supporting the weight of the equipment. The unit weighs 48.5 lbs (22 kg) maximum. Mount the equipment in a suitable environment. This enclosures is designed for NEMA 1 rated environments and is manufactured of painted steel.

Check to make certain that there are no pipes, wires, or other mounting hazards in the immediate mounting area that could create a problem. Also make sure you have enough clearance around the enclosure to run wiring to it safely. EIG recommends at least 2 feet of clearance around the enclosure. See Section 2.1 for enclosure dimensions.

Carefully remove all packing material from the unit. Even though an equipment inspection was made when the equipment was received, make another careful inspection of the enclosure and the devices inside as packing material is removed. Be especially alert for distorted metal, loose wires, or damaged components. This is important because wiring can come loose in shipping and could cause a short circuit or voltage to be on the wrong terminal.

WARNING! Extreme care shall be taken when mounting the enclosure, and making wire entry holes, to prevent metal chips, filings, and other contaminants from entering the enclosure which may damage the equipment and create a hazardous condition.

AVERTISSEMENT! Attention extrême lors de la monture de l'enceinte et lors de la mise à terre pour prévenir les articules métalliques, remplissage et autre contaminant de l'entrée de l'enceinte qui peuvent provoquer une condition dangereuse de l'équipement.

2.1: Installation Step 1 - Unpack the MP200™ in Enclosure

The enclosure components are shown in the image below:

- A: MP200 current inputs (24 of them)
- B: CT shorting blocks (eight of them)
- C: CT connections
- D: Voltage inputs and six fuses
- E: Earth ground on inside of enclosure
- F: Ground wire on enclosure door
- G: Cable assembly
- H: Display cables
- I: LCD display
- J: If ordered, optional Add-on Protocol - ProtoCom/ProtoCom-Lon

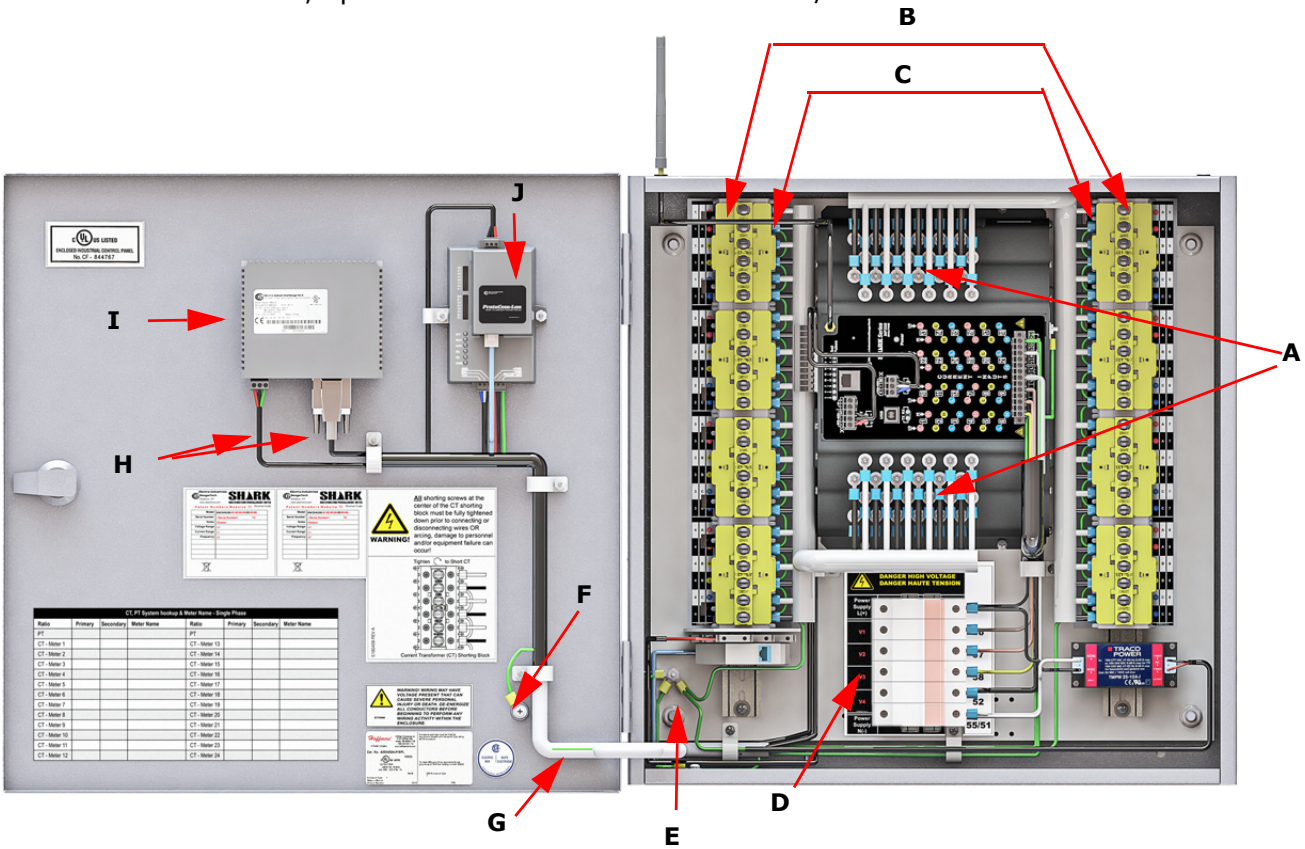


Figure 2.1: MP200™ in NEMA 1 Enclosure as Shipped

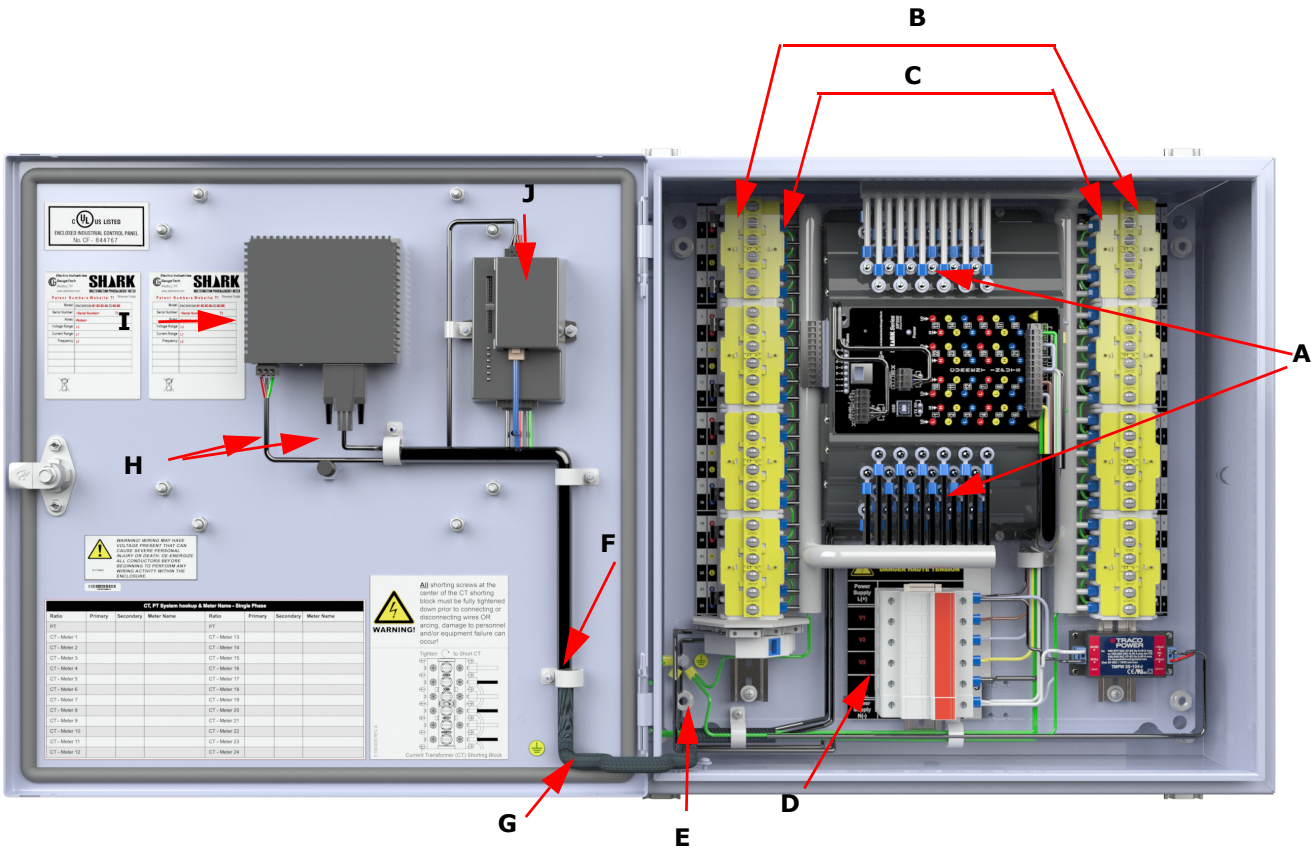


Figure 2.2: MP200™ in NEMA 4 Enclosure as Shipped

2.2: Installation Step 2 - Drill the Wiring Holes

Cut the holes you need in the bottom of the enclosure for the power, CT, and communications wiring. See the figure below for the allowable location.

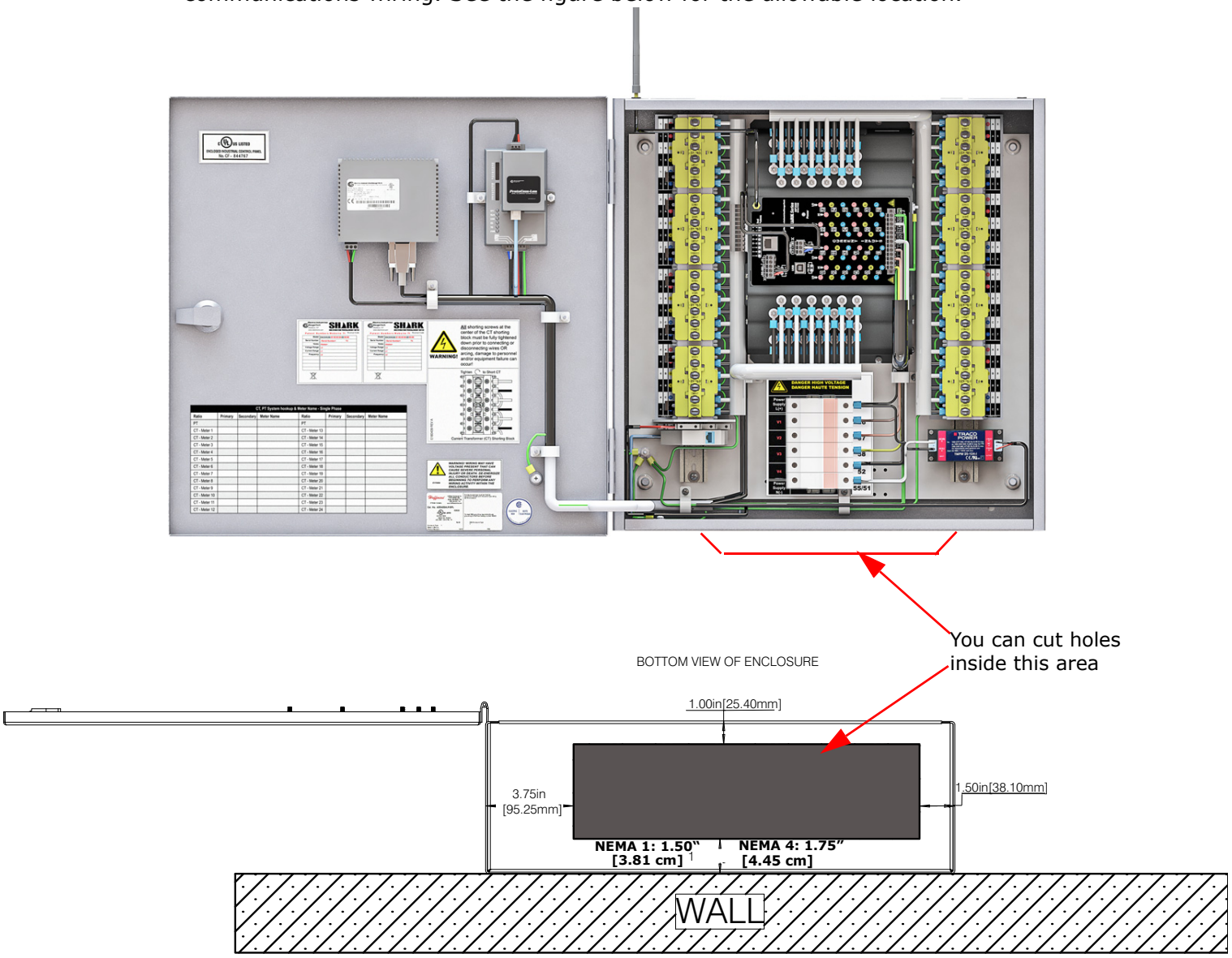


Figure 2.3: Location for Punch Entries

Note that the NEMA 1 enclosure is shown. The NEMA 4 enclosure installation is the same. The drawings show the area in the bottom of the enclosure where wiring holes can be cut: 1" [2.54 cm] from the front of the enclosure, 1.5" [3.81 cm] from the right side of the enclosure, NEMA 1: 1.5" [3.81 cm] / NEMA 4:1.75" [4.45 cm] from the back of the enclosure, and 3.75" [9.53 cm] from the left side of the enclosure.

CAUTIONS!

- There are numerous methods for making wire entry holes in the enclosure but it is imperative that no loose material generated during the process remains in the enclosure. During installation and cutting the wire holes, all equipment mounted or on the enclosure shall be protected from loose material.

atter what procedure is used the installer shall verify that the hole cutting process will not damage any of the wiring or components installed inside or on the enclosure.

a. The two recommended procedures for cutting the wire entry holes are as follows:

- Use a "C" frame punch to cut the wire entry holes. This type of punch does not require a pilot hole. A typical "C" frame punch is shown below.

Figure 2.4: "C" Frame Punch

- Regular punch:

1. Place a magnet inside the enclosure where the pilot hole is to be cut and completely cover the area with masking tape (or other very sticky tape).

2. Drill the pilot hole from the outside and do not let the drill pass more than ¼" into the enclosure.

3. Remove the tape, magnet, and cuttings and punch the hole.

b. After wiring and before energizing, vacuum the inside of the enclosure to make sure that it is free of foreign material. If a vacuum is not available use an alternate method to clean the inside of the enclosure. Do not use compressed air (or pressurized gas) to clean the inside of the enclosure as this may force cuttings into areas that cannot be seen, creating a hazardous condition.

IMPORTANT! All wire entry into the enclosure shall be accomplished with the use of recognized fittings or strain reliefs. Bare holes shall not be used.

NOTE: The panel can be removed to facilitate drilling of wiring holes. See the following procedure.

2.2.1: Removing and Reinstalling the Panel

Note that this image shows the NEMA 1 enclosure. The instructions are the same for the NEMA 4 enclosure. If it will make it easier to drill the wiring holes, you may remove the panel.

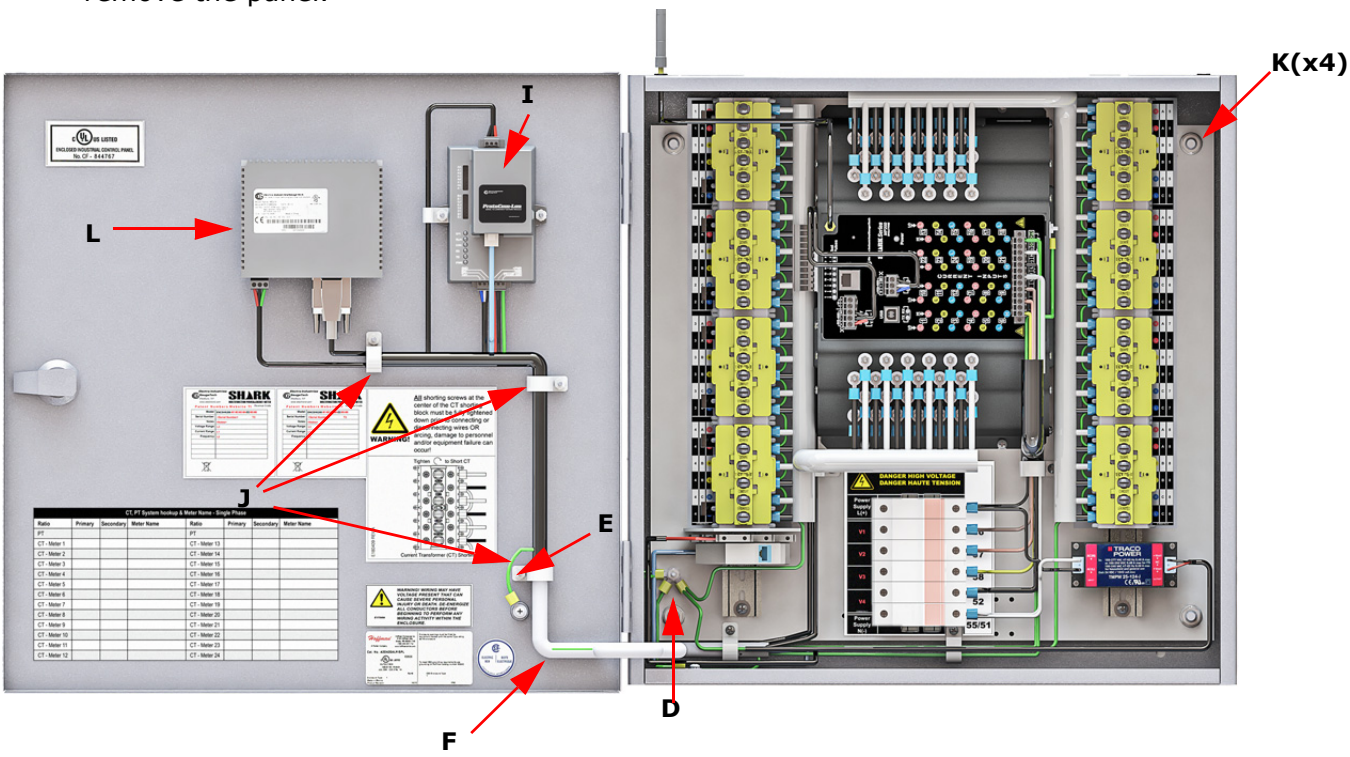


Figure 2.5: Removing the Panel

1. If the MP200™ in enclosure is equipped with a ProtoCom/ProtoCom-Lon add-on protocol unit remove all connections from the ProtoCom/ProtoCom-Lon (I).
2. Remove all connections from the LCD display (L).
3. Disconnect the green ground wires from the door (E).
4. Open the cable clamps on the door (J) and remove the cable assembly (F).
5. Remove the green ground wires on the lower left side of the enclosure (D).
6. Remove the four nuts, one in each corner of the panel [K].
7. Carefully remove the panel from the enclosure.

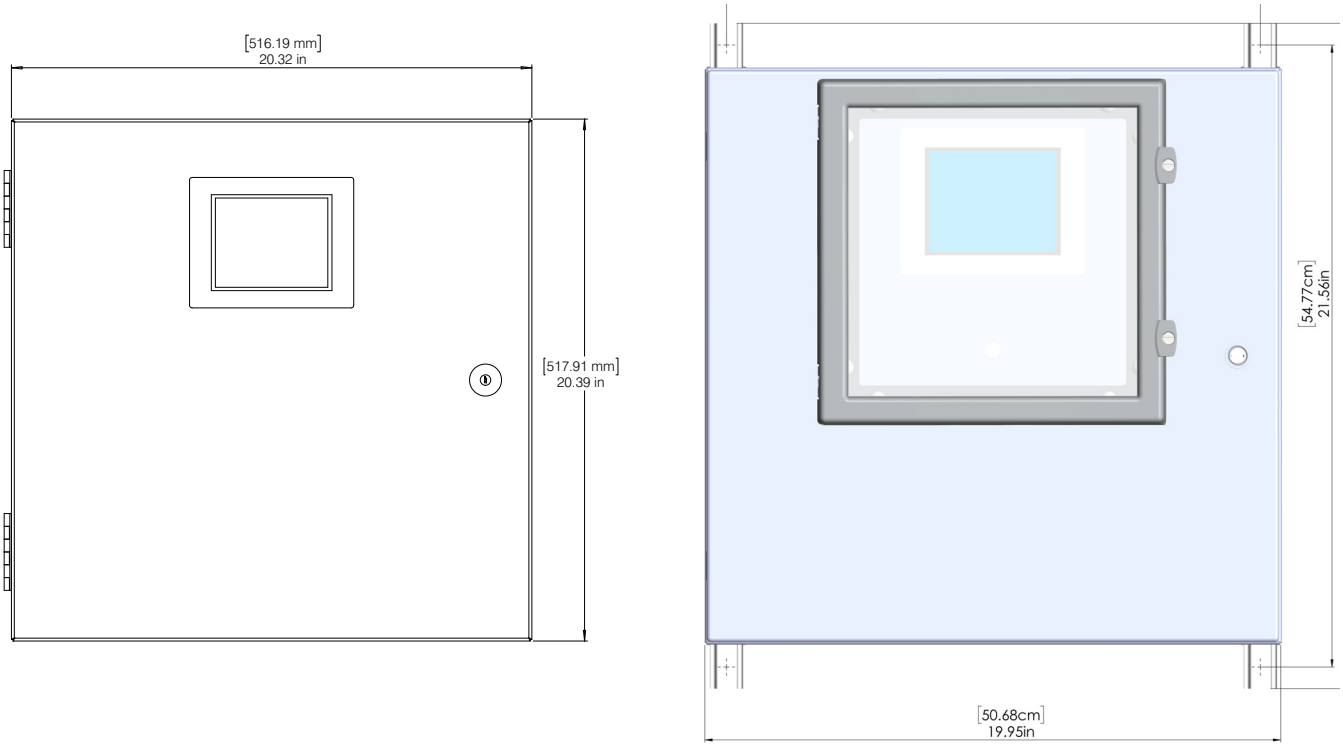
Drill the wiring holes per the instructions in Section 2.2. You can then re-install the panel.

1. Place the panel on the four mounting studs in the enclosure and install and tighten a nut on each of the studs (K).
2. Connect the green ground wires to the ground stud on the bottom left of the enclosure (D).
3. Insert the cable assembly (F) into the cable clamps on the door (J).
4. Connect the two green ground wires to the stud on the door (E).
5. Attach the connections to the LCD display (L).
6. If the MP200™ in enclosure is equipped with a ProtoCom/ProtoCom-Lon, attach all connections to it (I).

Continue to Section 2.3 to mount the enclosure.

2.3: Installation Step 3 - Mount the Enclosure

1. Determine the enclosure mounting location - where there are no obstacles and the exterior wiring can be easily accomplished. Install as per the NEC or local code requirements. Refer to the following diagrams for the enclosure dimensions.



NEMA 1

NEMA 4

Figure 2.6: Enclosure Front Dimensions

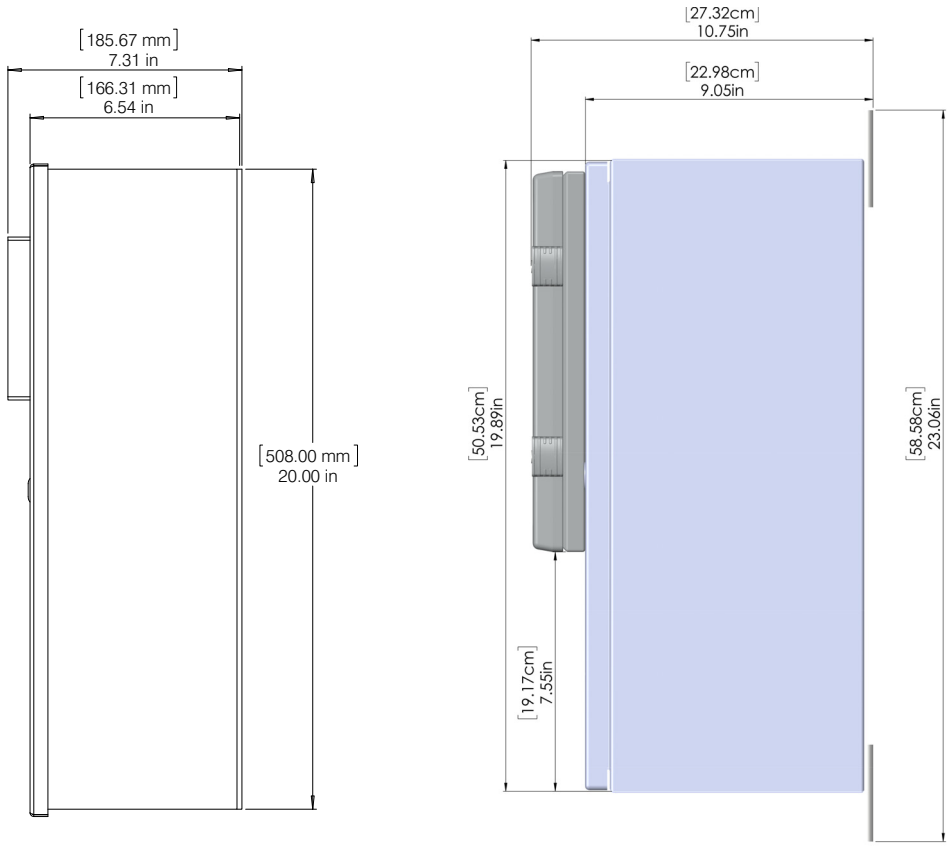


Figure 2.7: Enclosure Side Dimensions

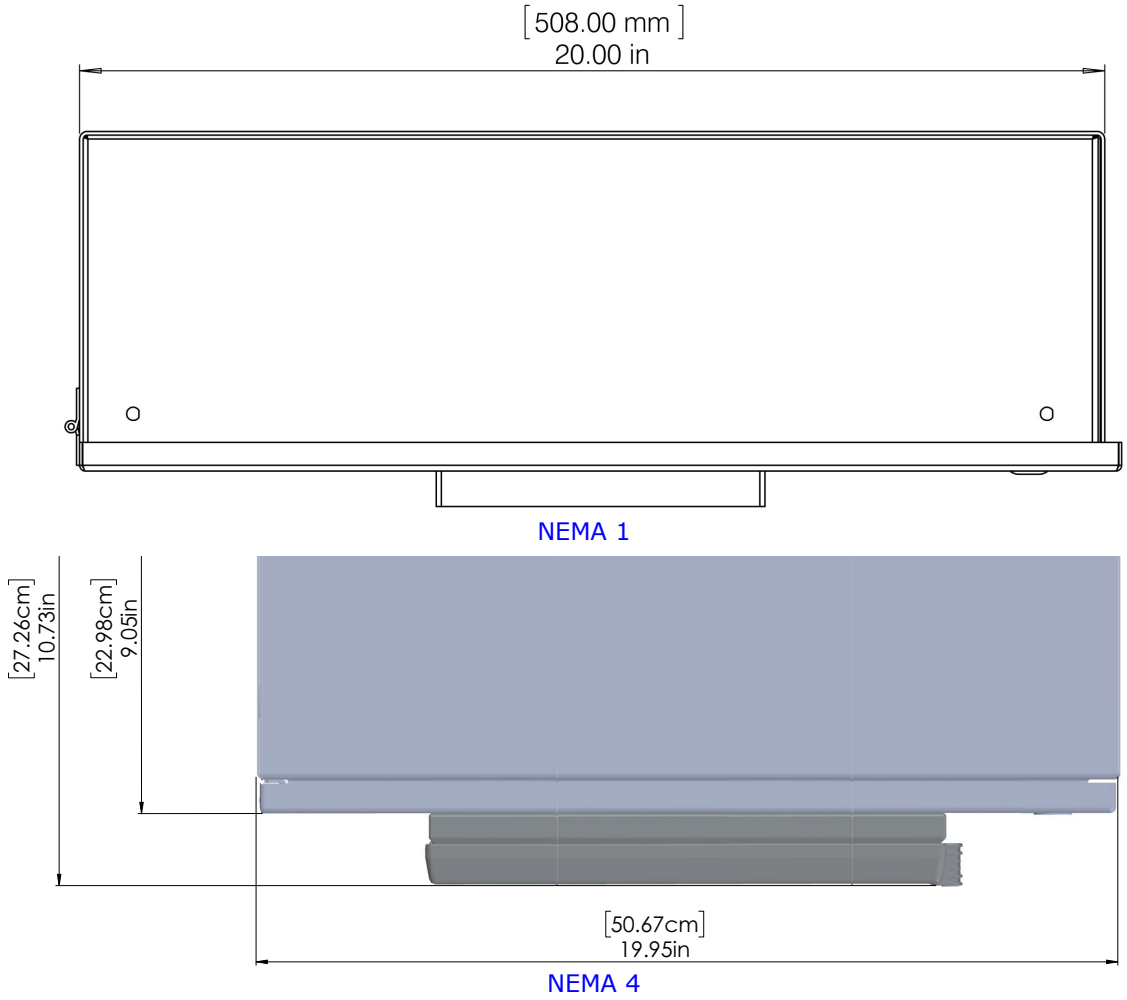


Figure 2.8: Enclosure Top Dimensions

2. Mark the location of the four mounting points on the surface where the enclosure will reside.

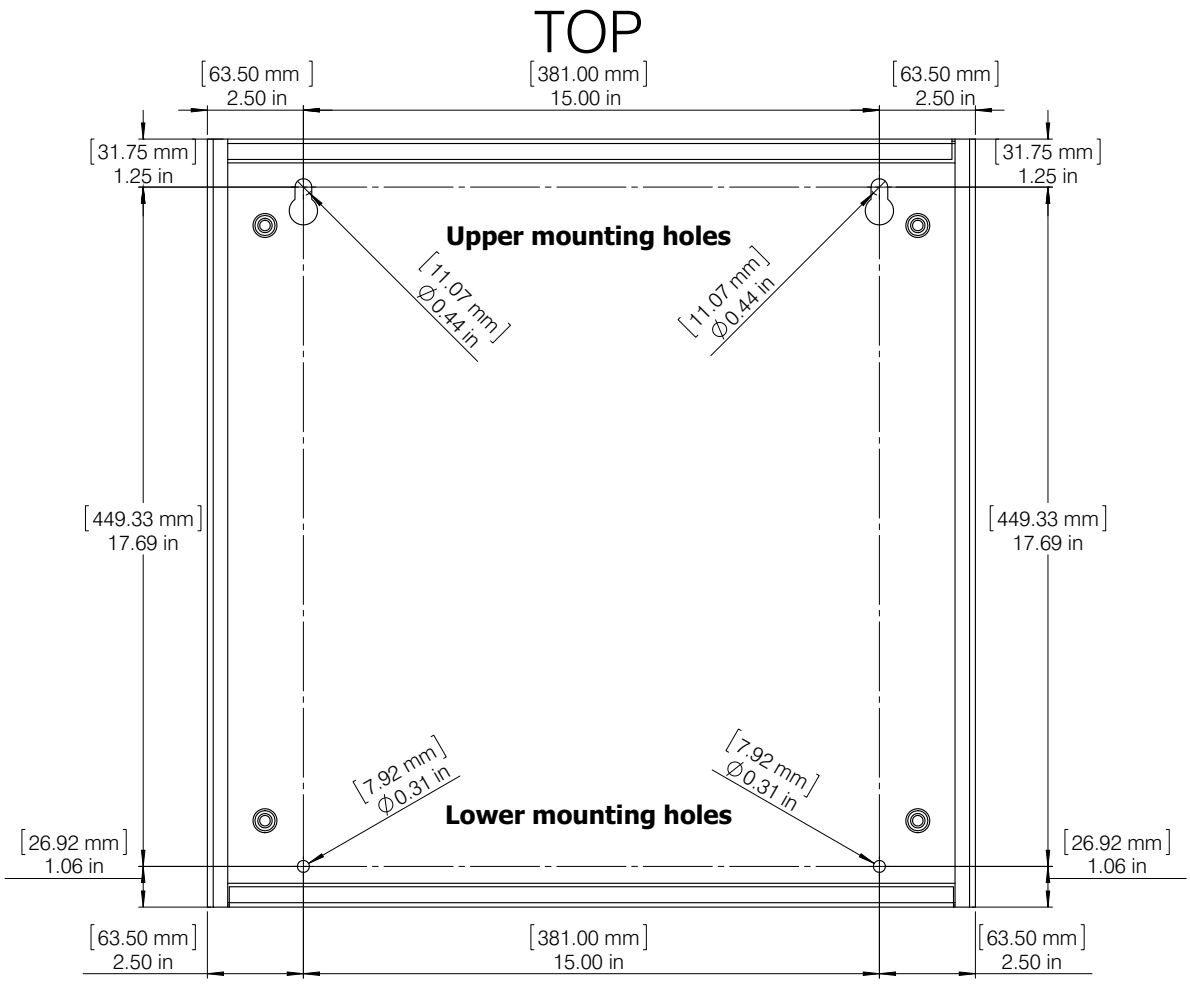


Figure 2.9: NEMA 1 Mounting Hole Locations and Dimensions

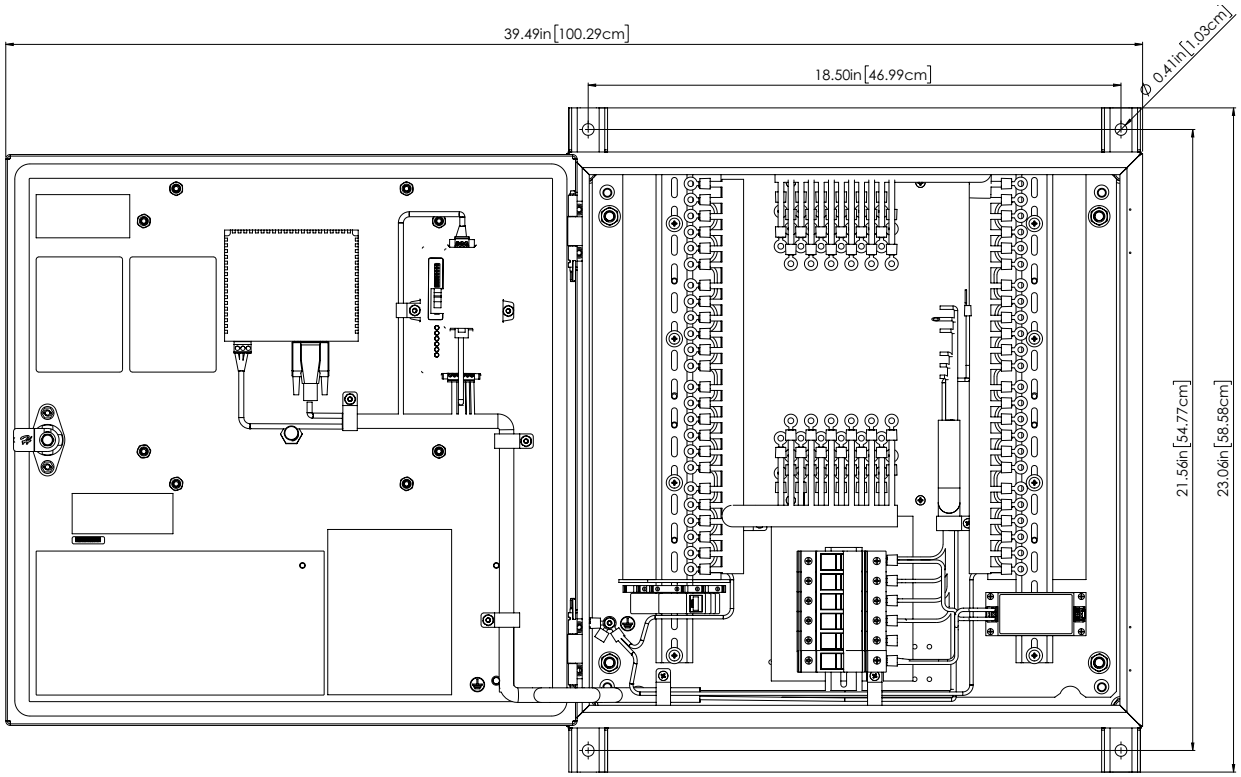


Figure 2.10: NEMA 4 Mounting Hole Locations and Dimensions

3. Prepare the mounting points using attachment means appropriate for the surface supporting the enclosure.

4. Put two fasteners (screws or bolts) in the top two mounting locations, the fasteners shall have a head diameter of no greater than 0.65" and a maximum body diameter of 0.25".

5. Install upper mounting screws; leave a 3/8" gap between the screw head and the mounting surface.

6. Lift the enclosure and hang it from the top two bolts.

7. Install lower mounting screws from the inside of the cabinet. Loosely tighten.

8.If necessary shim between the mounting surface and the enclosure to compensate for any irregularities.

9.Tighten the lower two fasteners.

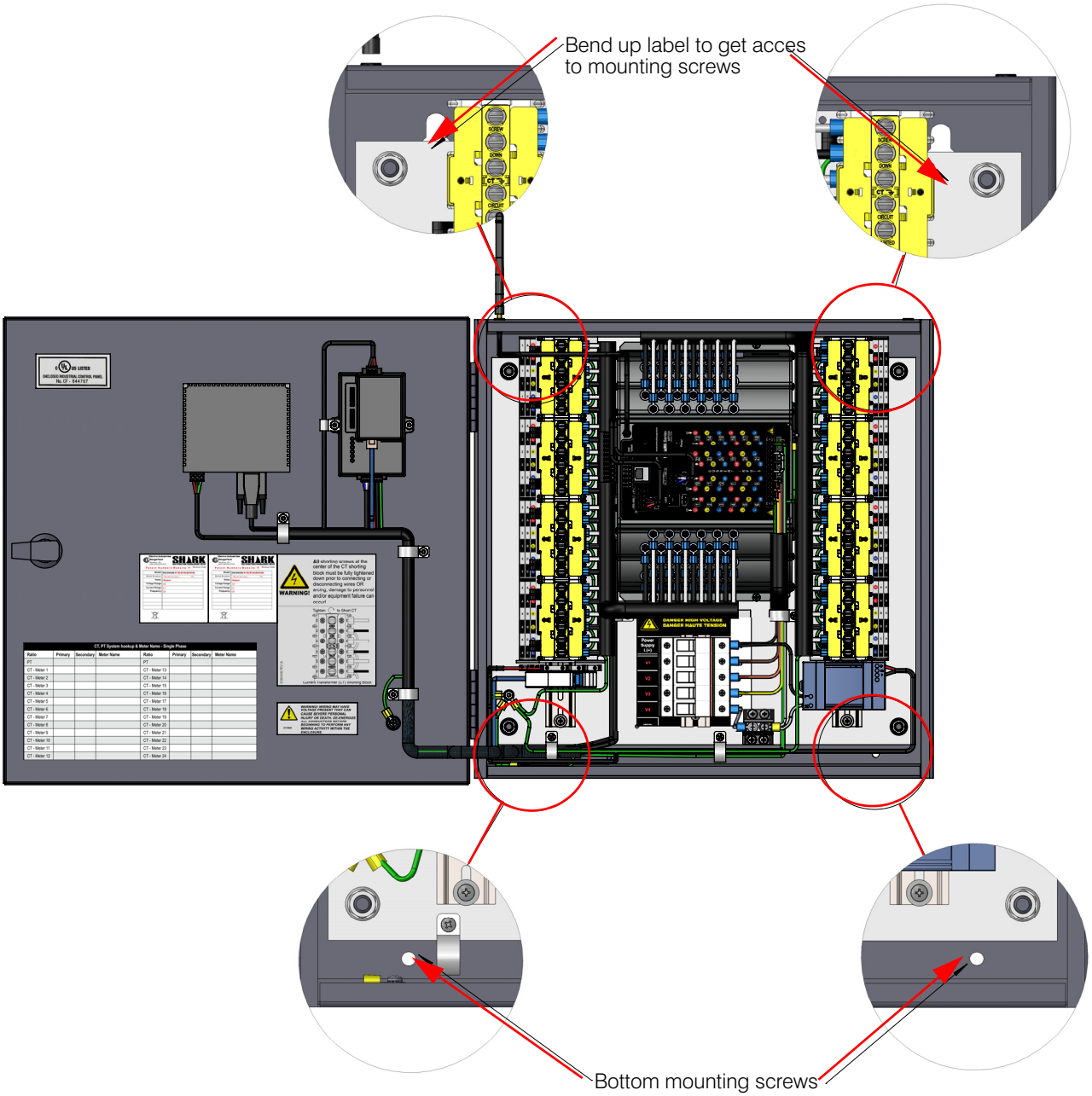


Figure 2.11: Location of Mounting Screws

10. Fold back the CT wiring labels in the upper right and left corners of the enclosure (see figure above) and tighten the upper two mounting fasteners.

2.4: Installation Step 4 - Install the Display

NOTE: As of Fall 2021, the enclosure is shipped with the display already mounted. You will only need this procedure if the display was not mounted when you received the enclosure.

The contents of the display box are shown below.

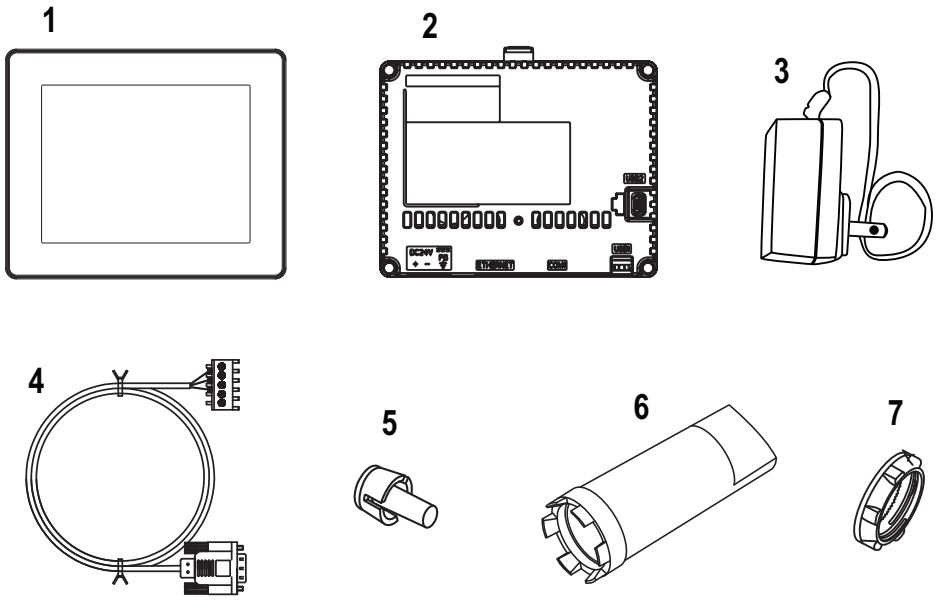


Figure 2.12: Display Kit Contents

(1) Display
(2) Rear Module
(3) Power Supply- NOT NEEDED FOR ENCLOSURE - see IMPORTANT, below.
(4) RS485 Serial Cable (10 feet) - NOT NEEDED FOR ENCLOSURE - see IMPORTANT, below.

Mounting Hardware:

(5) anti-rotation tee
(6) socket wrench
(7) installation nut, attached to the back of the display

IMPORTANT! The power supply and cable are included in the box, but are NOT NEEDED for the display in the enclosure. (They would ONLY be needed if you wanted to mount the display remotely, rather than in the enclosure. If you are mounting remotely, cover up the display mounting hole that is in the enclosure cover.)

Follow the instructions beginning below to mount the display in the enclosure front cover.

1.There are 5 parts to the display as installed in the MP200™ in enclosure:

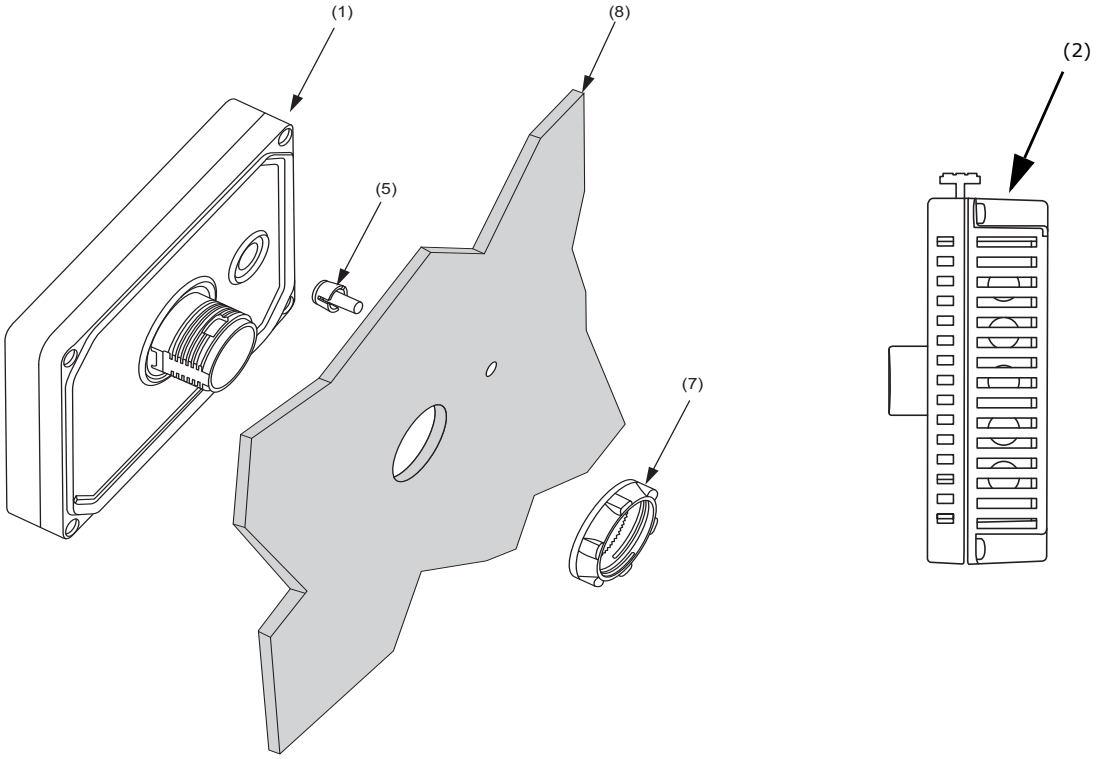


Figure 2.13: Display Components for Mounting in Enclosure

- Display module and touch screen (1)
- Panel with cutout (8)
- Display installation nut (7)
- Anti-rotation Tee (5)
- Rear module, containing the electronics to run the display (2)

2. Press the Anti-rotation tee (5) into the display module (1), in the hole provided [9].

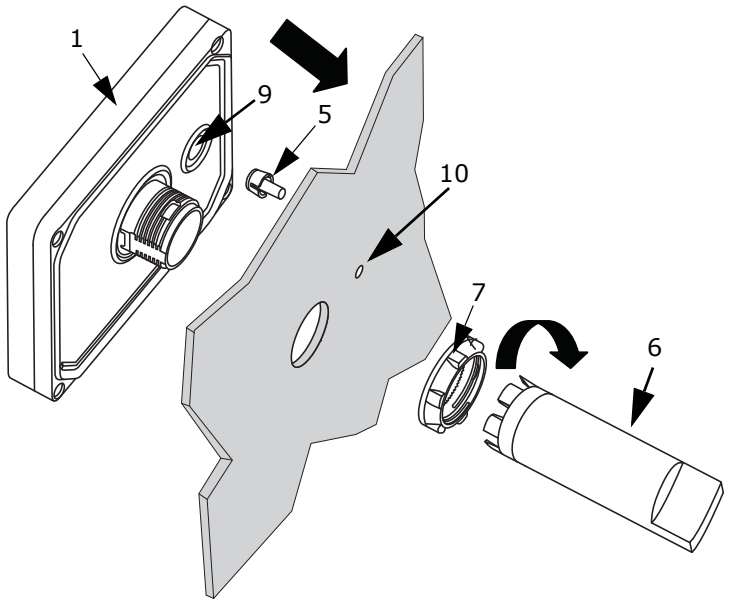


Figure 2.14: Inserting the Display into the Panel

3. Insert the display module, with the anti-rotation Tee attached, into the cutout, aligning the anti-rotation tee so that it passes through the small hole in the panel (10).

4. Place the display installation nut on the portion of the display passing through the panel and "finger tighten" it.

5. Using the socket wrench supplied [6], tighten the display installation nut (7) with a torque between 1.2 and 1 Nm (10.6 to 17.7 in-lb).

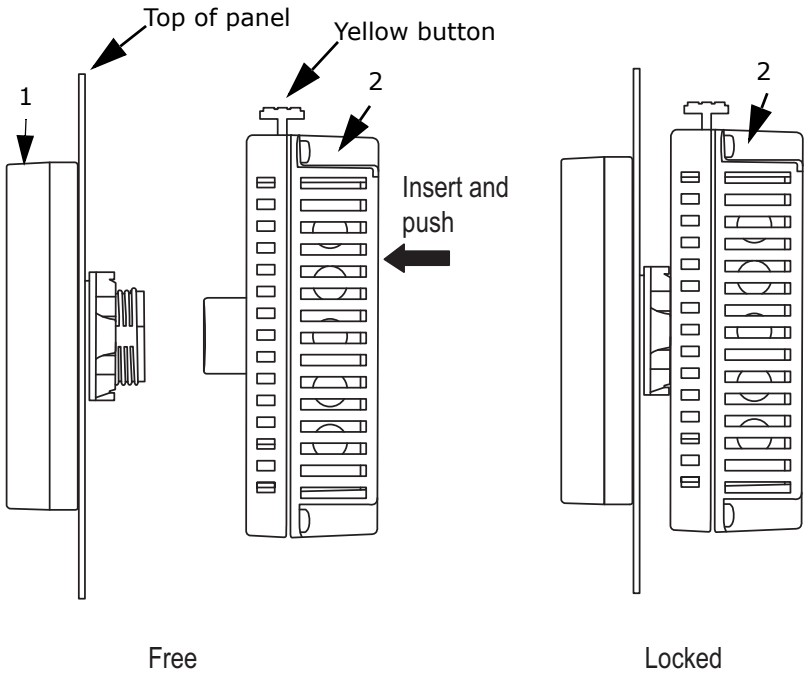


Figure 2.15: Connecting the Rear Module to the Display Module

6. Carefully insert the rear module (2), with the yellow button to the top of the enclosure, and push the rear module until it locks into place. When it is in place you will hear a "click."

7. Connect the cable to the rear module: see figures 2-1 for a NEMA 1 enclosure or 2-2 for a NEMA 4 enclosure.

2.5: Installation Step 5 - Lock the Enclosure

The enclosure has been fitted with means for securing the door so it cannot be opened or tampered with. A key lock is provided along with two keys.

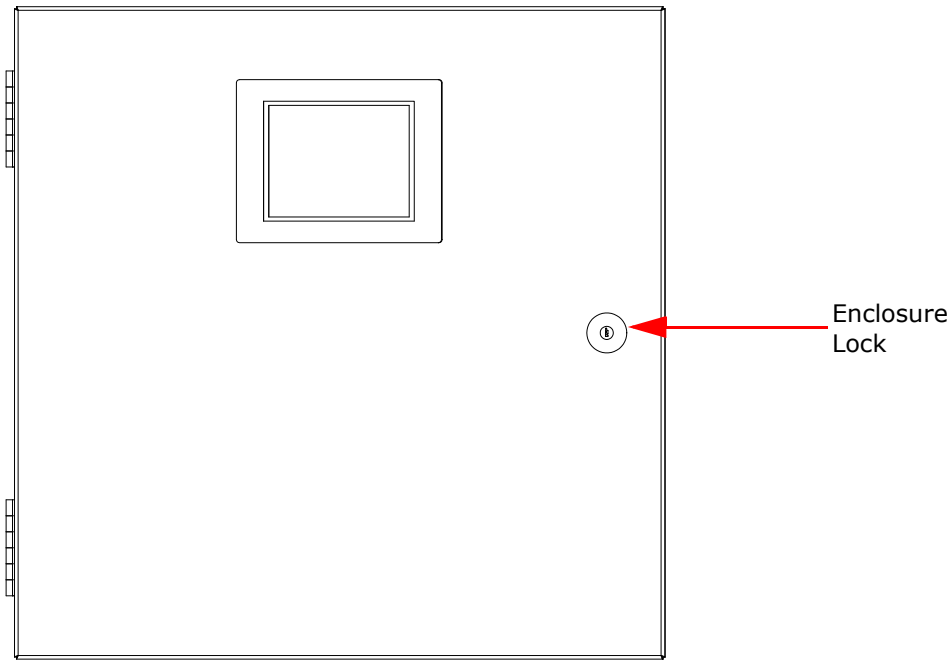


Figure 2.16: Location of Enclosure Lock

1. Lock the enclosure by putting the key in the lock and turning it clockwise.

2. Remove the key and store it in a safe place. When you want to open the enclosure, put the key in the lock and turn it counter-clockwise. Repeat step 1 to re-lock the enclosure.

This page intentionally left blank.

3. Electrical Wiring

The MP200™ in Enclosure is factory wired and tested. Installation requires solidly mounting the enclosed unit and connecting field wiring. This document has diagrams of wiring options. Review and understand the appropriate diagrams for the unit you have ordered.

NOTE: See the diagram below for input wiring specifications. Consult your local and/or National Electric Code for external wiring requirements.

IMPORTANT! ALL CONNECTIONS TO THIS PRODUCT ARE TO BE WITH COPPER WIRE ONLY! TOUS LES CONNEXIONS À CE PRODUIT DOIVENT FAIRE UN FIL DE CUIVRE SEULEMENT!

Both enclosure models are pre-wired and programmed for either three phase or single phase operation.

NOTE: The current inputs are only to be connected to external current transformers provided by the installer. The CT's shall be Listed to ANSI/IEEE C57.13 and rated for the current of the meter used.

A DISCONNECTING MEANS AND UPSTREAM PROTECTION SHOULD BE INSTALLED FOR ALL CIRCUITS. A SHORT-CIRCUITING–TYPE TERMINAL BLOCK IS PROVIDED FOR THE CURRENT TRANSFORMER CIRCUIT.

INPUT WIRING SPECIFICATIONS*			
Location	**Wire Size**	**Screw Size**	**Maximum Torque**
Shorting Block	#6-22 AWG CU	#10-32	20 lbf-in (2.3 N-m)
Fuse Block L(+), V1-V3	#10-18 AWG CU	#10-32	20 lbf-in (2.3 N-m)
Fuse Block V4	#10-12 max CU	#10-32	20 lbf-in (2.3 N-m)
Earth Ground	#10-12 AWG CU	#8-32	10 lbf-in (1.2 N-m)

* **NOTE**: All wires shall be rated 90 ^{o}C/194 ^{o}F Minimum; use copper conductors only. Short circuit current rating is 10kA rms symmetrical.

3.1: Wiring Instructions

WARNING!

First connect Earth Ground as shown in the figure below.

AVERTISSEMENT! Branchez d'abord la mise à la terre comme indiqué dans le dessin ci-dessous.

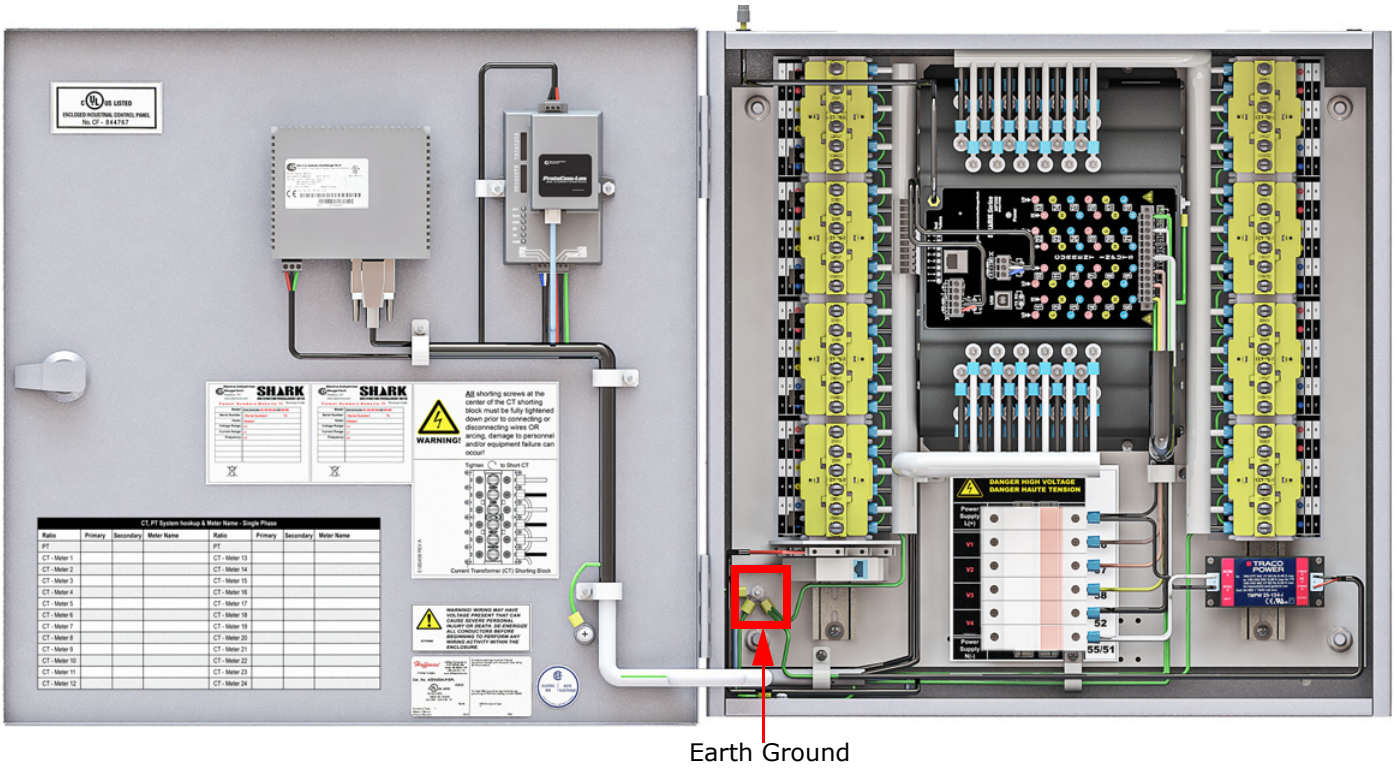


Figure 3.1: Earth Ground Connection

Understand the diagram(s) that pertain to your unit before you begin the field wiring. The following figures show the available wiring options. Understand your system and use the appropriate figures.

WARNING! CONTROL WIRING MAY HAVE VOLTAGE PRESENT THAT CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. DE-ENERGIZE ALL CONDUCTORS BEFORE BEGINNING TO PERFORM ANY WIRING ACTIVITY TO OR WITHIN THE MP200™ IN ENCLOSURE.

AVETISSEMENT! LE CÂBLAGE DES COMMANDES PEUT AVOIR UNE TENSION PRÉSENTE QUI PEUT PROVOQUER DES BLESSURES GRAVES POU LA MORT. METTRE HORS TENSION TOUS LES CONDUCTEURS AVANT DE COMMENCER LA RÉALISATION D'UNE ACTIVITÉ DE CÂBLAGE DANS L'ENCEINTE DE L'ASSEMBLAGE MP200™.

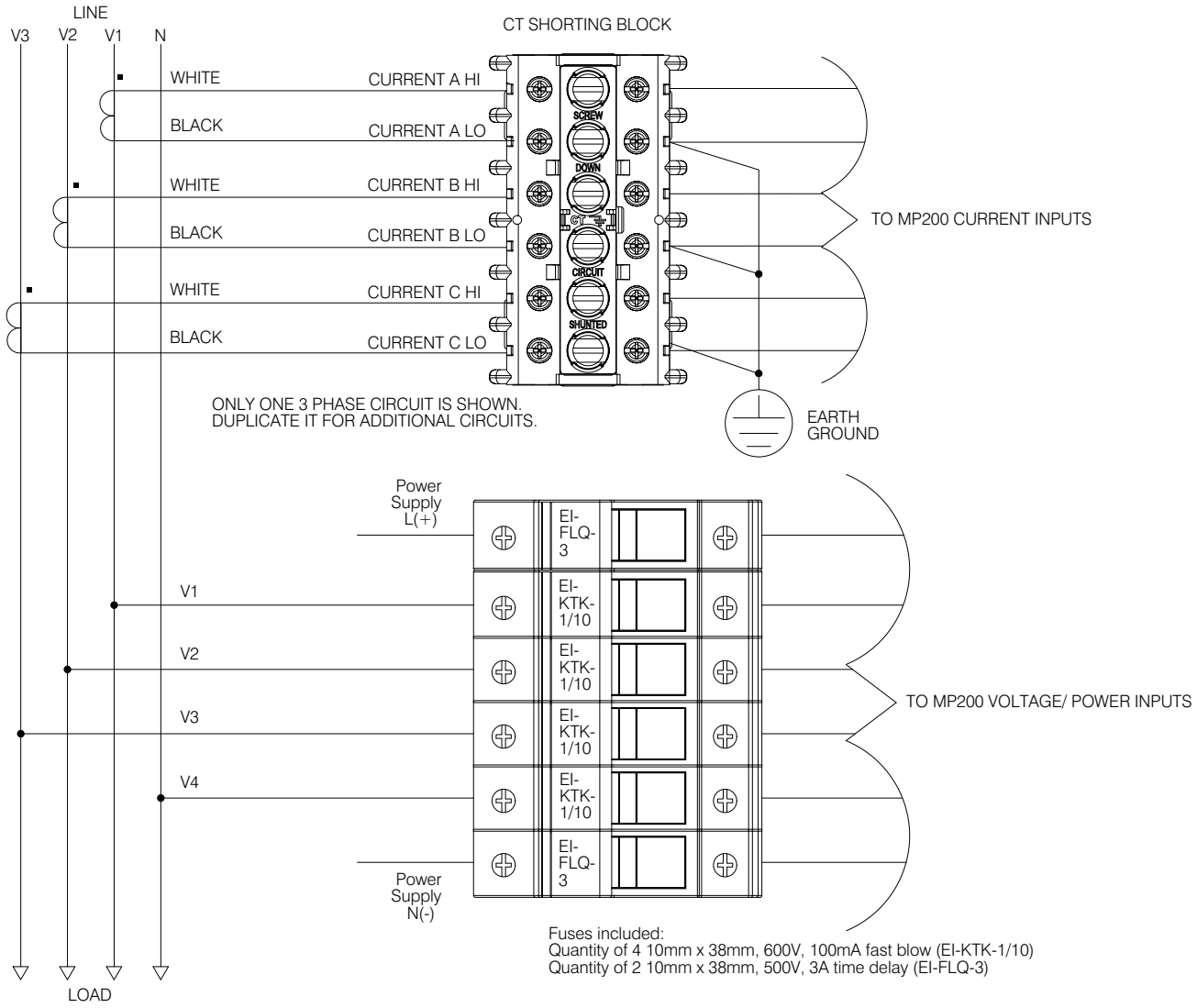


Figure 3.2: MP200-Y Three Phase WYE Wiring Diagram

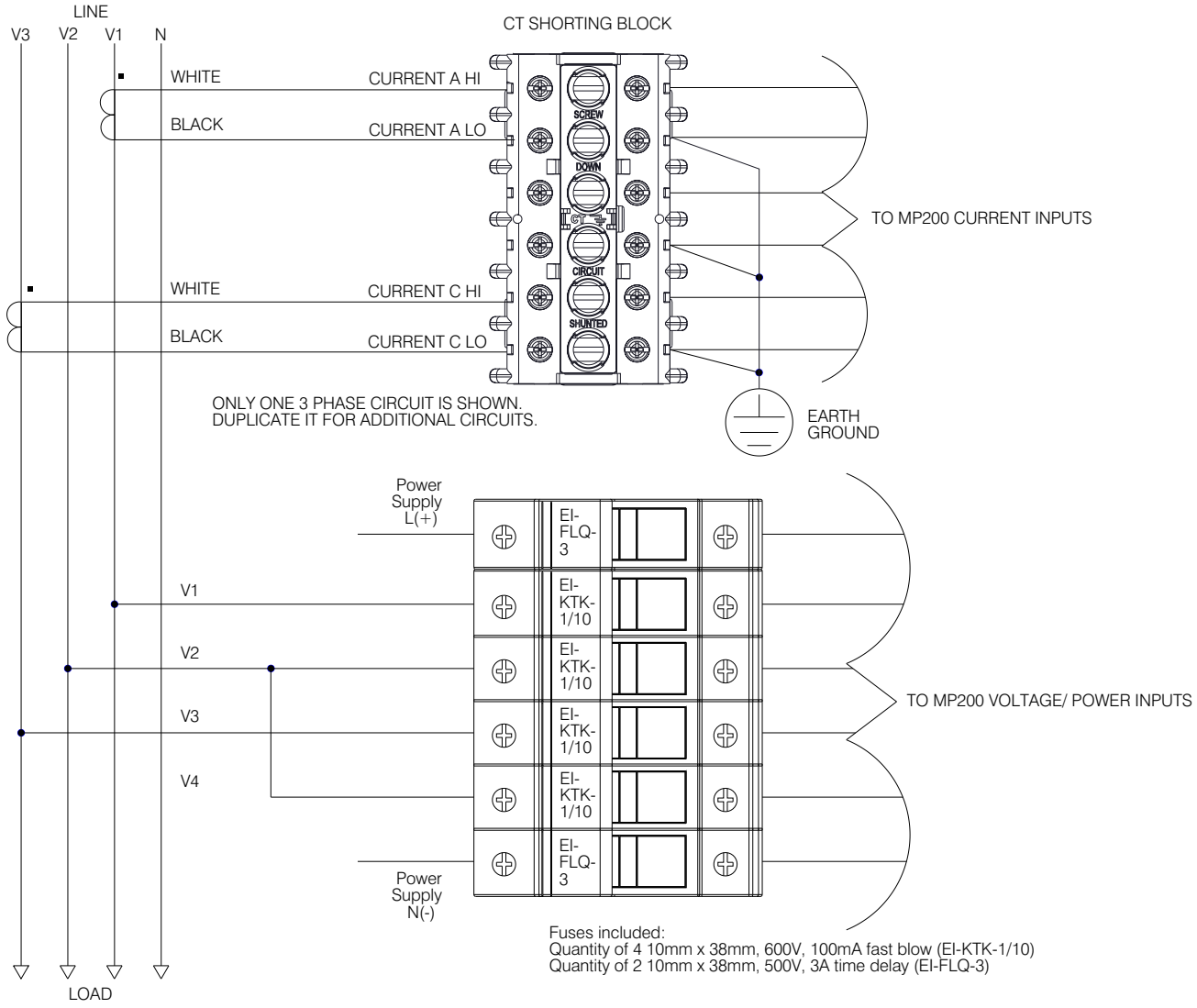
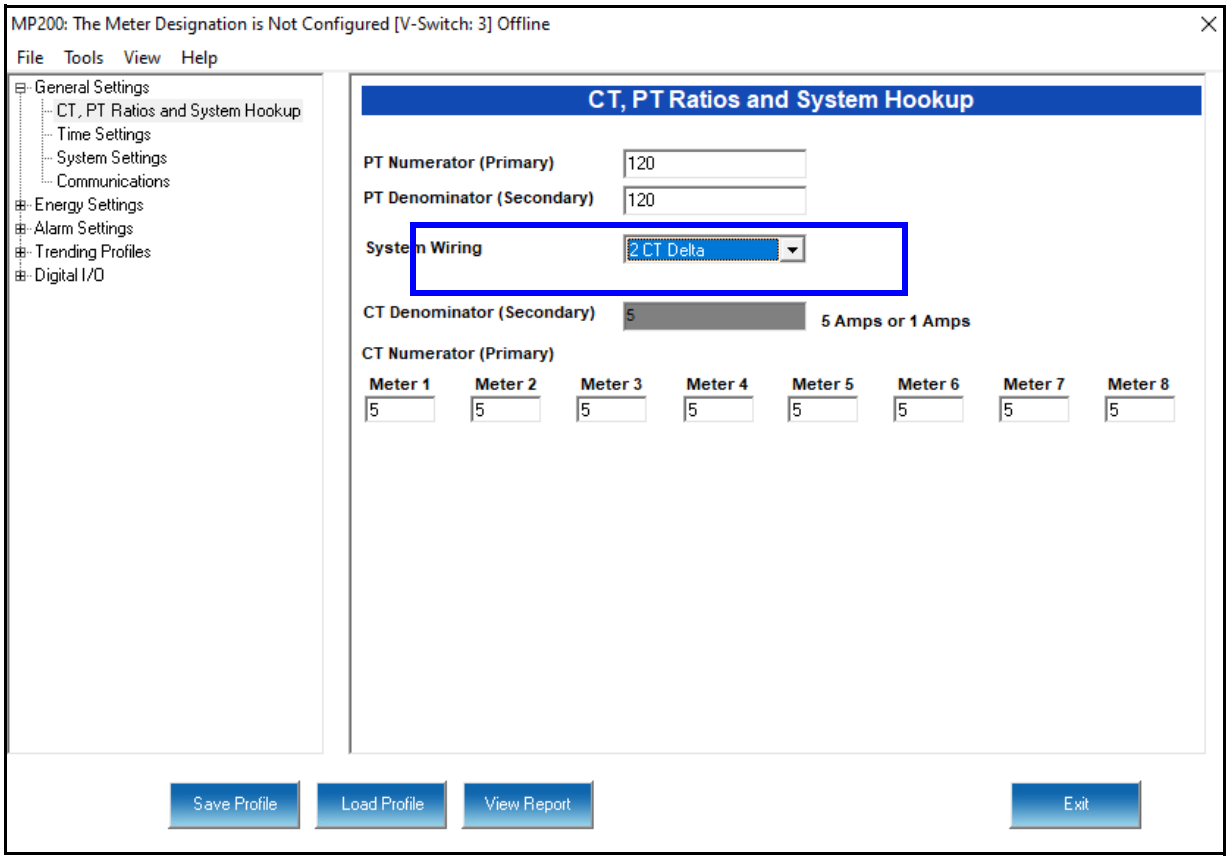


Figure 3.3: MP200-Y Three Phase Delta Wiring Diagram

NOTE: You must also use the CommunicatorPQA® application to set the meter's hookup to "2 CT Delta." See the example screen on the next page. See Chapter 10 in the *CommunicatorPQA® and MeterManagerPQA® Software User Manual* for instructions. The manual can be accessed directly from the software by clicking Help>Contents in the main screen's Title Bar.


MP200: The Meter Designation is Not Configured [V-Switch: 3] Offline
File
Tools
View
Help
General Settings
CT, PT Ratios and System Hookup
Time Settings
System Settings
Communications
Energy Settings
Alarm Settings
Trending Profiles
Digital I/O
CT, PT Ratios and System Hookup
PT Numerator (Primary)
120
PT Denominator (Secondary)
120
System Wiring
2 CT Delta
CT Denominator (Secondary)
5
5 Amps or 1 Amps
CT Numerator (Primary)
Meter 1
Meter 2
Meter 3
Meter 4
Meter 5
Meter 6
Meter 7
Meter 8
5
5
5
5
5
5
5
5
Save Profile
Load Profile
View Report
Exit

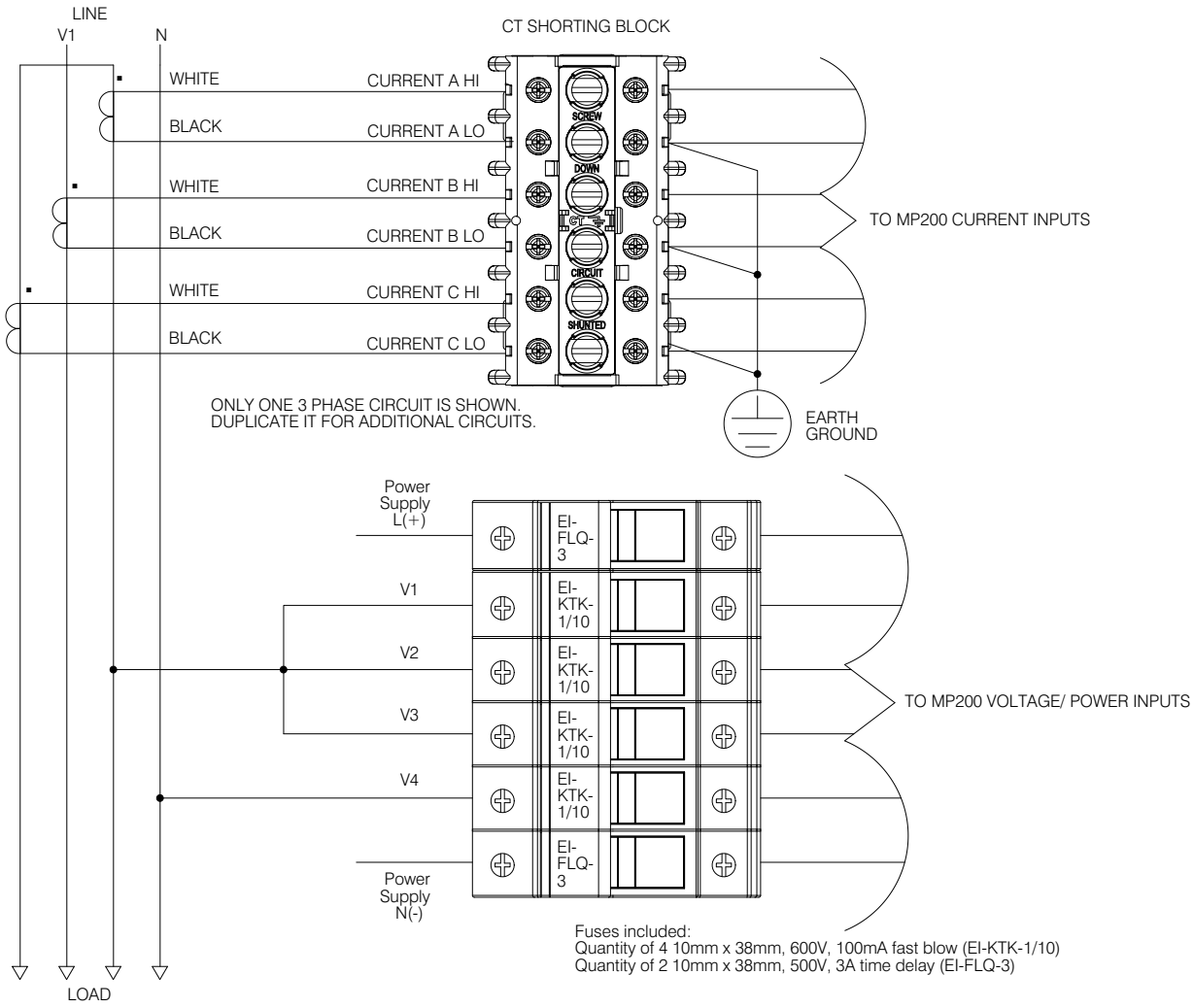


Figure 3.4: MP200-S Single Phase 2 Wire Wiring Diagram

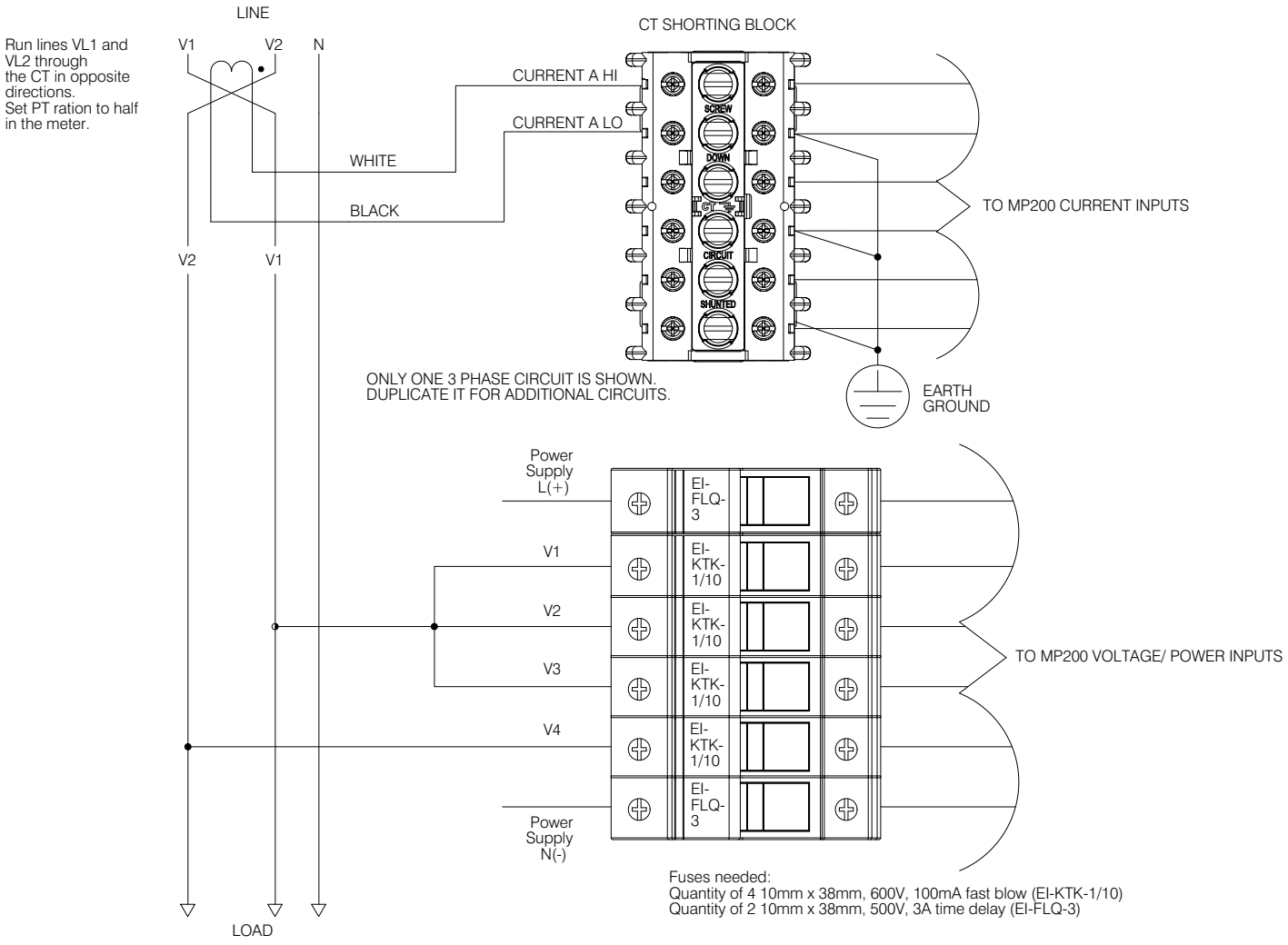


Figure 3.5: MP200-S Single Phase 3 Wire Wiring Diagram

4: Operation

4.1: Overview

The MP200™ in Enclosure is equipped with three 10mm x 38mm, 600V, 100mA, fast-acting fuses and two 10mm x 38mm, 500V, 3A, Time Delay fuse for the protection of the meter's sense voltage and control power circuits, respectively.

A disconnecting means and upstream protection should be installed for all circuits. Short-circuiting type terminal blocks are provided for the current transformer circuit and are equipped with captive shorting screws (see instructions in Section 5.1).

The temperature rating for enclosure operation is (0 to +50) ^{o}C/(32 to 122) ^{o}F.

Refer to the *MP200™ Metering System User Manual* for specific operating instructions for the system in your enclosure.

4.2: Troubleshooting

Symptom: Extremely inaccurate readings of voltage and/or harmonics.

Perform these two tests:

1. With fuses removed from the unit, test the fuses with an ohmmeter. All of the fuses must show a resistance of <2 Ohms.

2. With the unit fully powered, measure the voltage on the input side and output side of the fuse. The voltages should differ by less than 1 Volt.

This page intentionally left blank.

5. Maintenance

The MP200™ in Enclosure is designed to be relatively maintenance-free under normal use. However, because of the variability of application conditions and the importance placed on dependable operation and inspection, you should perform maintenance checks on a regularly scheduled basis. Visually inspect for loose parts, wires, and/or hardware; inspect for discoloration of insulation and damaged or discolored components; be alert for accumulation of dirt and/or moisture on structure; check operation of disconnecting means and continuity of fuses, where applicable.

If you ever need to remove the meter from service, refer to Appendix A. Removing a Meter from Service, on page A-1.

This page intentionally left blank.

6. Ordering Information

ENCMP200 - Y - 60 - 10 - V2 - 485P - MDSN - ProtoCom
1 2 3 4 5 6 7 8

1. Model:
   ENCMP200 - MP200™ Metering System in NEMA 1 Enclosure
   ENC4MP200 - MP200™ Metering System in NEMA 4 Enclosure

2. Circuit Configuration
   Y - Three Phase WYE
   S - Single Phase Only

3. Frequency
   50 - 50Hz
   60 - 60Hz

4. Current Class
   10 - 10 Amp Secondary
   2 - 2 Amp Secondary

5. V-Switch™ Key Pack
   V1 - Transducer
   V2 - Basic Logger
   V3 - Advanced Logger

6. Communication
   X - RS485 Only (Modbus)
   WIFI - Ethernet and WiFi (Modbus)

7. Display
   MDSN - 3.5" Touch Screen HMI Display with installation kit
   MDLN - 5.7" Touch Screen HMI Display with installation kit
   (Display Installation Kit includes: Display and Rear Module, RS485 Serial cable, Power Supply, Mounting Hardware)

8. Add-on Protocol
   X - No Add-on Protocol
   ProtoCom - BACnet Protocol
   ProtoCom-Lon - LonWorks Protocol

Example on previous page:

ENCSMP200-Y-60-10-V2-X-MDSN-ProtoCom

(MP200-Y Metering System, with 60Hz frequency, Current Class 10, V-2 V-Switch™ key, RS485 only, MDSN 3.5” Touch Screen HMI Display, and ProtoCom converter)

A. Removing a Meter from Service

This appendix contains instructions to follow if you ever need to remove the meter from service.

A.1: Removing the Meter

Follow these steps:

1. De-energize all circuits feeding the case.

2. If possible de-energize lines that the CTs are on.

3. Tighten all the shorting screws on all the CT shorting blocks by turning all the screws clockwise until they bottom out.

WARNING! If the meter must be removed from service, the secondary side of the current transformers **MUST** be short circuited to prevent a dangerous high voltage condition from appearing across the secondary wires of the current transformer. **Arcing and damage to personnel and/ or equipment can occur if the screws provided on the shorting block are not installed in the correct locations, prior to disconnecting any wires.**

AVERTISSEMENT! Si le compteur doit être enlevé du service, le côté secondaire du transformateur actuel DOIT être court-circuité pour prévenir une condition de haute tension dangereuse d'apparaitre dans les câblages secondaires du transformateur actuel. La brulure d'arc et l'endommagement d'un équipement ou des blessures sont susceptibles de se produire si les vis fournies sur le court-circuit ne sont pas installées dans les emplacements corrects avant de débrancher les câbles.

The six screws on each shorting block are used to short the high (+) sides and the low (-) side of the CT outputs to the brass bar that is internal to the shorting block. The pre-installed jumper connects all lows together and to ground.

WARNING! The screws need to be screwed down until the screw makes contact with the internal bar, enabling the bar to become electrically common with the terminal strip, and grounded.

Les vis doivent être vissées jusqu'à ce que la vis soit en contact avec la barre interne, permettant à la barre de devenir électriquement commune à la barrette de raccordement et mise à la terre.

The figure below shows where the screws are located that must be tightened down to short the CTs.

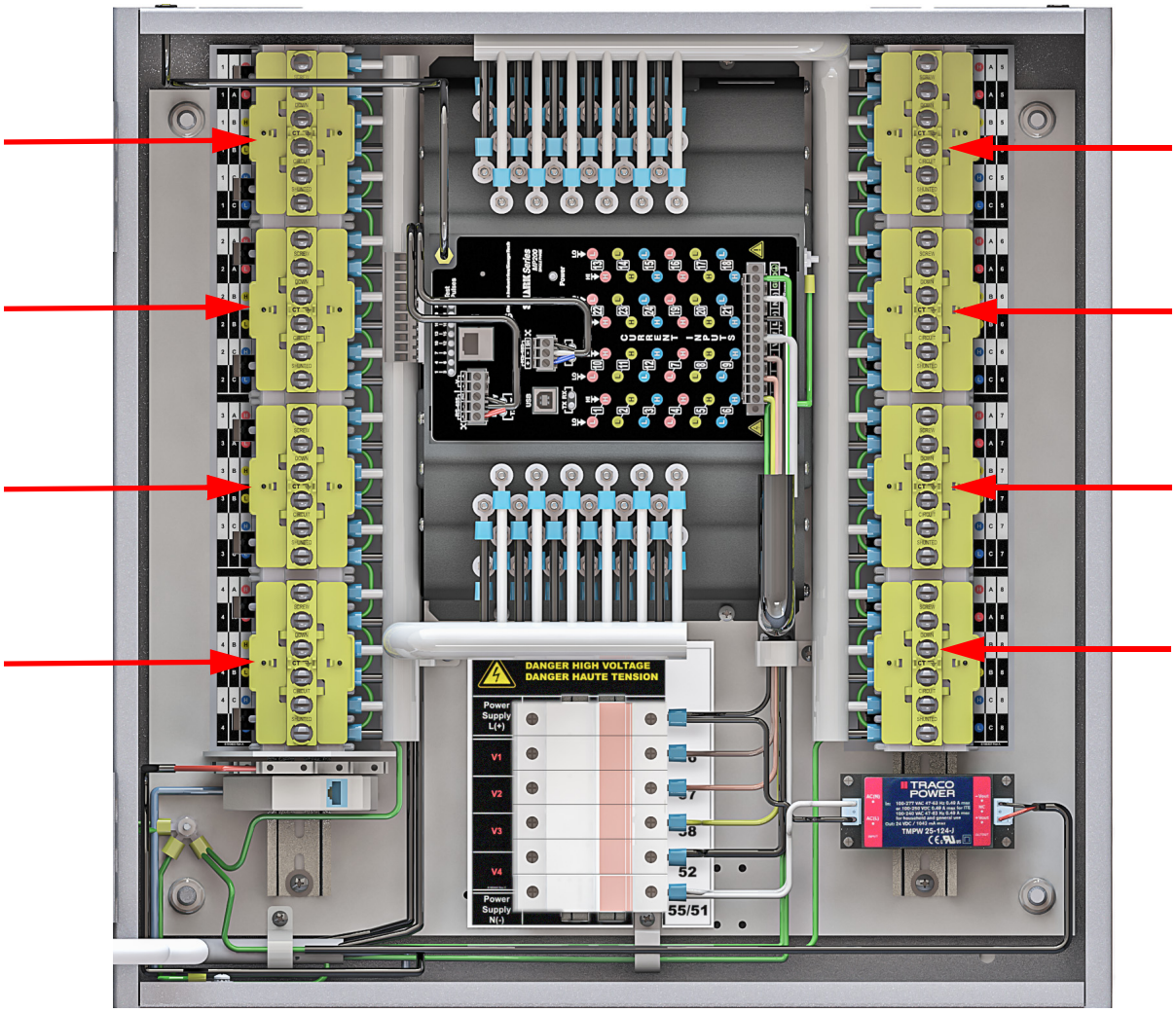
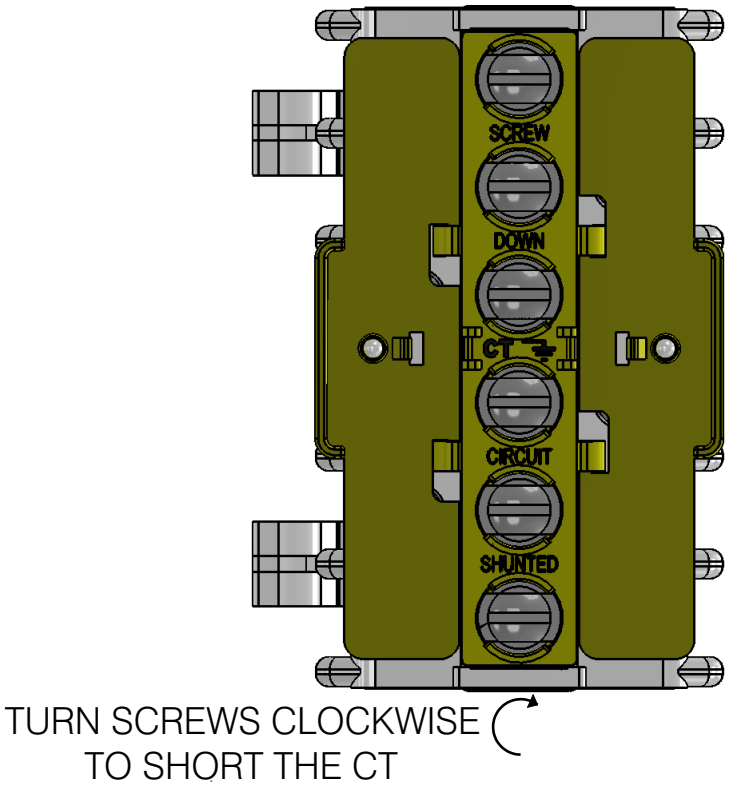


Figure A.1: CT/Shorting Block Location



A.2: Shorting the CT

WARNING! When you re-install the meter, make sure all CT connections are made **BEFORE** unscrewing the shorting screws. See A.2: Reinstalling the Meter, on page A-6

AVERTISSEMENT! Lorsque vous réinstallez le compteur, assurez-vous que toutes les connexions de TC (transformateur de courant) sont faites **AVANT** de dévisser les vis de court-circuit. Voir la section A.2.

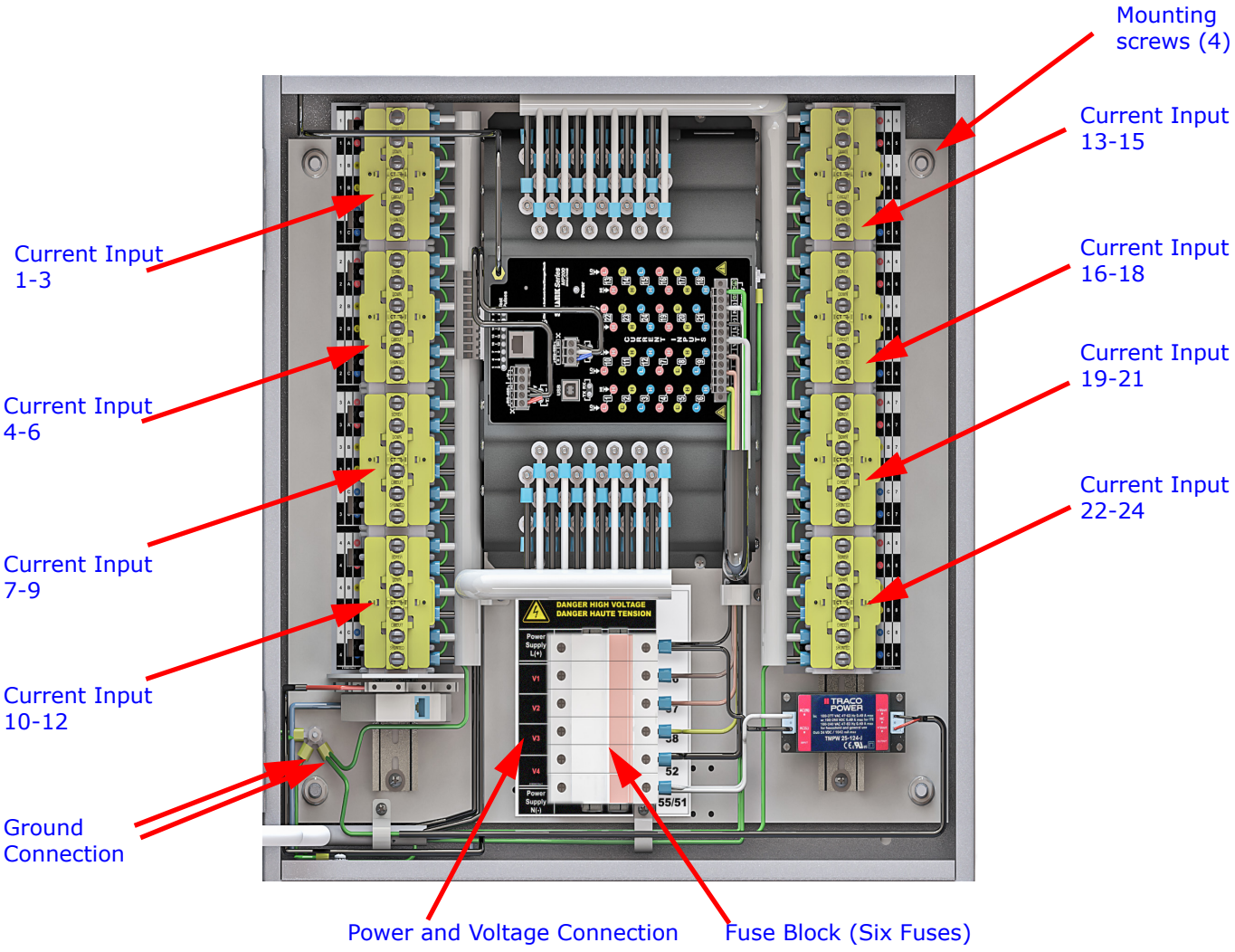


Figure A.3: MP200-S in Enclosure Location of Fuses, Current Leads, Connectors, Mounting Screws

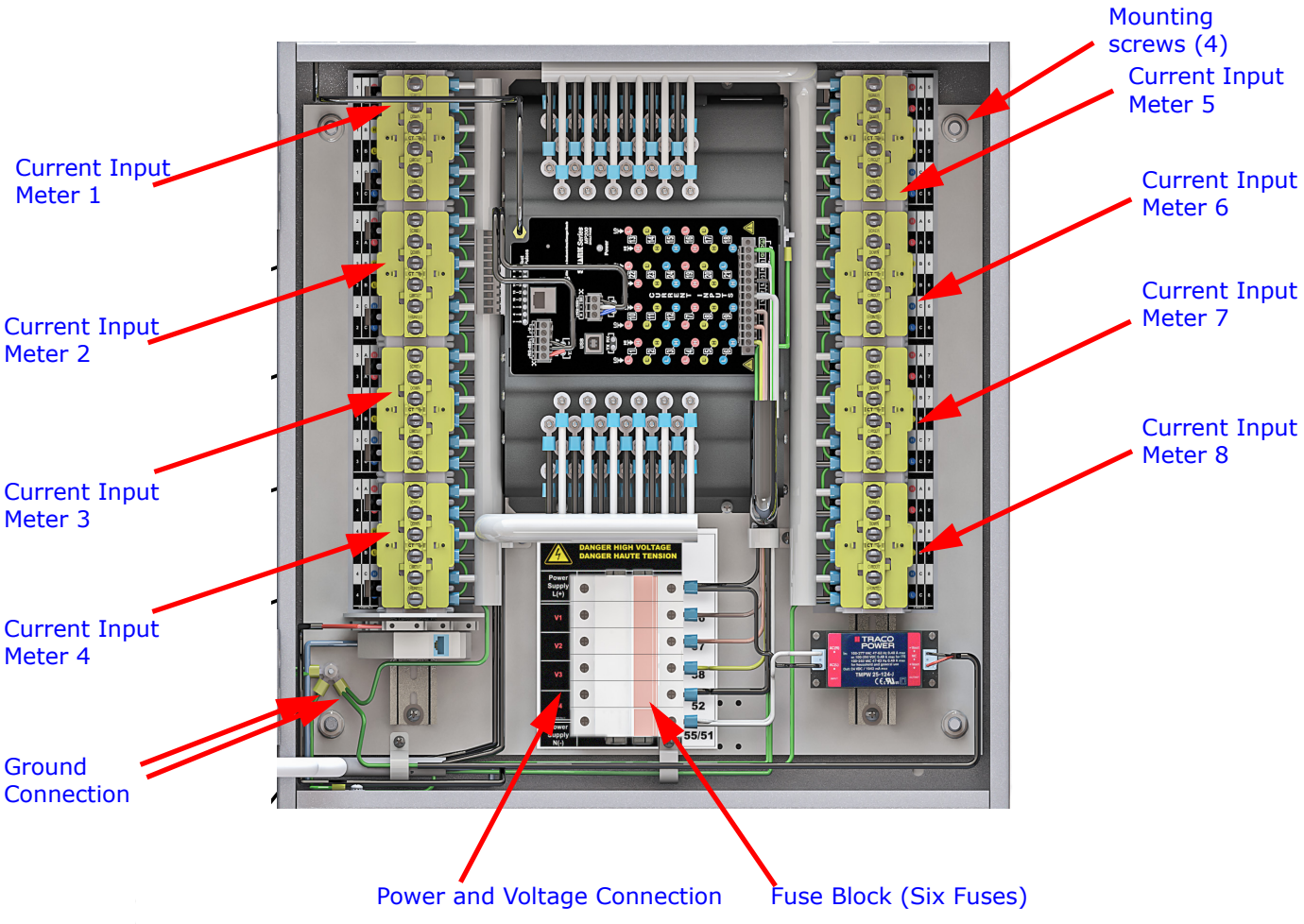


Figure A.4: MP200-Y in Enclosure Location of Fuses, Current Leads, Connectors, Mounting Screws

4. Remove the six fuses from the fuse block.

5. Un-screw and disconnect the 48 current leads to the meter.

6. Disconnect all connectors to the meter.

7. Remove the four mounting screws securing the MP200™ to the panel.

8. Remove the meter.

A.2: Reinstalling the Meter

Follow this procedure to reinstall the meter:

1. Place meter in its location on the panel.
2. Tighten the four mounting screws.
3. Insert all connectors into the appropriate sockets on the meter.
4. Connect the 48 current leads to the meter making sure they are attached in the proper order.
5. Install the six fuses in the fuse block in their proper location.
6. Unscrew all shorting screws on the CT connection block. See the figure below.

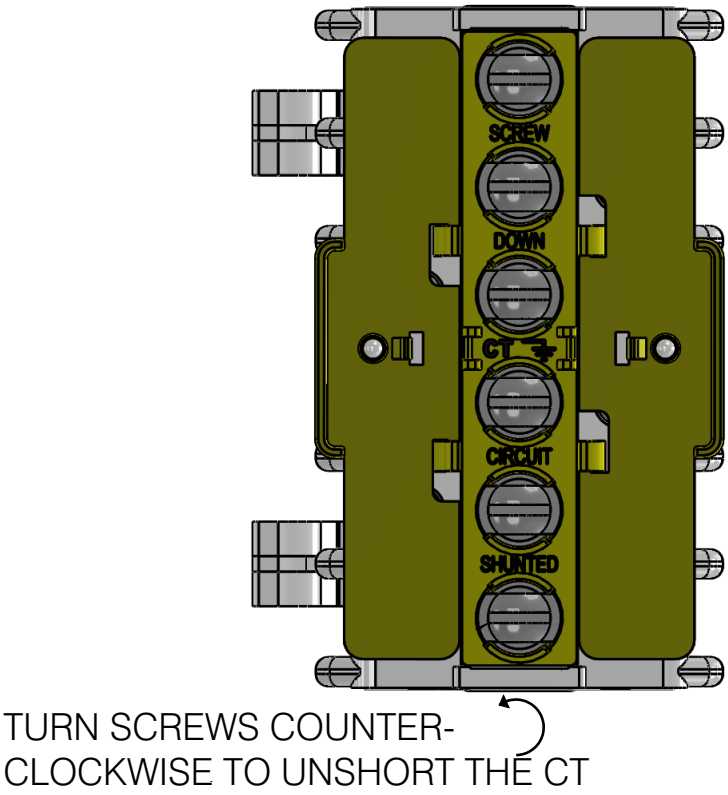


Figure A.5: Un-shorting the CTs

7. Verify that no foreign material remains inside the enclosure: clean it out if found.
8. Energize all circuits and verify operation.