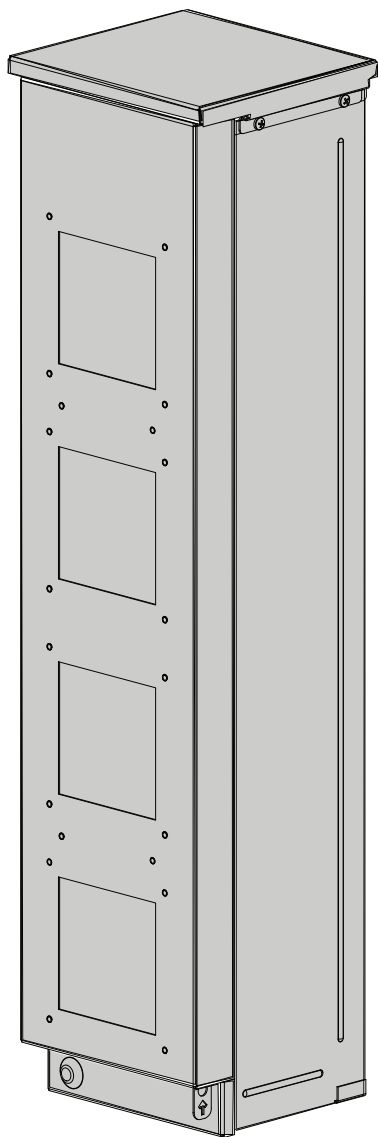


PowerLogic™ High Density Metering System 4-Meter Enclosure

Installation Guide

63230-508-212A1

08/2014



Safety information

Important information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

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

WARNING

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

CAUTION

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

NOTICE

NOTICE is used to address practices not related to physical injury.

Please note

Electrical equipment should be installed, operated, serviced and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

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Introduction

The PowerLogic™ High Density Metering System—4-Meter Enclosure is used to monitor the amount of electricity used in individual units of multi-unit residential or commercial buildings. The system consists of one or more power meters housed in a wall-mounted metal cabinet or enclosure. Multiple enclosures may be installed at a single location.

Meters are assigned to a tenant who occupies an individual unit within a complex. The meter monitors and records the energy consumed inside the unit. At pre-determined times, tenant billing software polls the meter through a communications link to gather usage information. This information can be used as a means of monitoring overall electrical usage or to generate an electric bill for the tenant.

NOTE: Some locations/jurisdictions do not permit sub-billing. Before billing tenants, check your location/jurisdiction regarding regulations.

Box Contents

The following components are shipped with the 4-Meter Enclosure:

- Enclosure containing pre-installed meters, shorting block, and wiring harness
- Shorting screws (already mounted)
- Meter hardware kit - includes terminating resistor
- Installation sheet for relevant meter
- This installation guide

Parts and Accessories

The 4-meter enclosure can house any of the following PowerLogic meters:

- PM5110
- PM5330
- PM5560

The enclosure is shipped with meters already installed and wired. Table 1 lists part numbers and accessories for the High Density Metering System—4-Meter Enclosure.

Table 1: Parts and Accessories

Description	Part Number
PowerLogic Power Meter	See power meter installation document (METSEPM5110, METSEPM5330, METSEPM5560).
Cover Plate Assembly Kit	96DINCVRPLT

For more information on your particular meter, refer to the included meter documentation or search for your meter at www.schneider-electric.com.

Safety Precautions

Installation, wiring, testing and service must be performed in accordance with all local and national electrical codes.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E in the USA, CSA Z462 or applicable local standards.
- Turn off all power supplying this device and the equipment in which it is installed before working on the device or equipment.
- Always use a properly rated voltage sensing device to confirm that all power is off.
- Do not exceed the device's ratings for maximum limits.
- Do not use this device for critical control or protection applications where human or equipment safety relies on the operation of the control circuit.
- Replace all devices, doors and covers before turning on power to this equipment.
- Do not alter factory-installed wiring inside the enclosure.

Failure to follow these instructions will result in death or serious injury.

Specifications

Table 2: Enclosure Technical Specifications

PHYSICAL/MECHANICAL CHARACTERISTICS	
Dimensions	
Without hood	W 7.42 inches, H 30.80 inches, D 7.40 inches (W 189 mm, H 782 mm, D 188 mm)
With hood	W 7.88 inches, H 31.40 inches, D 7.50 inches (W 200 mm, H 798 mm, D 190 mm)
Weight (maximum including meters and hood)	46 lbs. (22.2 kg.)
Mounting	Vertical
COMMUNICATIONS	
RS-485 port Modbus RTU, Modbus ASCII (7 or 8 bit) JBUS	2-Wire, 9600, 19200 or 38400 baud, Parity - Even, Odd, None, 1 stop bit if parity Odd or Even, 2 stop bits if None; (Optional)
POWER	
Power specifications vary according to equipment configuration. See separate power specifications in Table 3.	
ENVIRONMENTAL CHARACTERISTICS	
Operating temperature	
PM5110, PM5330, and PM5560	-25° C to +70° C (-13° F to +158° F) (Display responsiveness reduced at -25° C)
Storage temperature	-40° C to +85° C (-40° F to +185° F)
Humidity rating	5% to 95% RH non-condensing
Maximum dewpoint	37° C (99° F)
Pollution degree	2
Altitude	
PM5110 and PM5330	< 2000 m (6562 ft) CAT III / < 3000 m (9843 ft) CAT II
PM5560	< 3000 m (9843 ft) CAT III
Ingress protection	
Type 1 Enclosure	Type 1 per UL 50
Type 3R Enclosure	Type 3R per UL 50
STANDARDS	
US and Canada	
Enclosure	UL 50; UL 508A

Table 2: Enclosure Technical Specifications *(continued)*

Meter Accuracy Rating	
Active Energy - PM5110 and 5330	Class 0.5S as per IEC 62053-22
Active Energy - PM5560	± 0.2% Class 0.2S as per IEC 62053-22

Table 3: Input Specifications

Meter	Control Power Specification
PM5110 and PM5330	AC: 100-277 V L-N ± 10%; 45 to 65 Hz
	AC: 100-415 V L-L ± 10%; 45 to 65 Hz
	DC: 125 to 250 ± 20%
PM5560	AC: 100-480 V L-N ± 10%; 45 to 65 Hz
	AC: 100-480 V L-L ± 10%; 45 to 65 Hz
	DC: 125 to 250 ± 20%
Current Specification	
CT inputs	Nominal: 1 A or 5 A
Voltage Specification	
PM5110 and PM5330	20 to 400 V L-N / 35 to 690 V L-L (Wye) or 35 to 600 V L-L (Delta)
PM5560	20 to 400 V L-N / 20 to 690 V L-L (Wye) or 20 to 600 V L-L (Delta)

Installation

DANGER

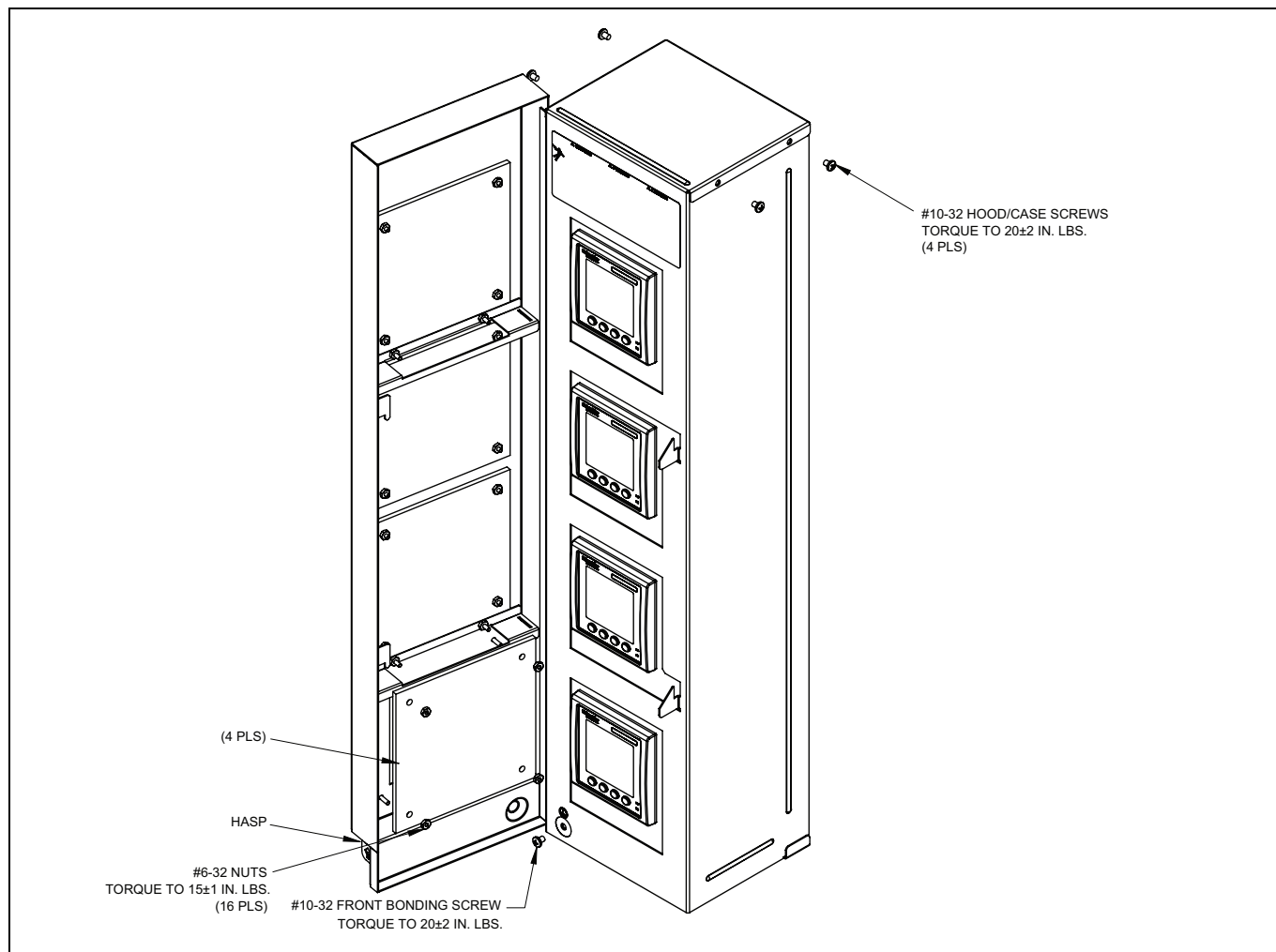
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E in the USA, CSA Z462 or applicable local standards.
- Turn off all power supplying this device and the equipment in which it is installed before working on the device or equipment.
- Always use a properly rated voltage sensing device to confirm that all power is off.
- Do not exceed the device's ratings for maximum limits.
- Do not use this device for critical control or protection applications where human or equipment safety relies on the operation of the control circuit.
- Replace all devices, doors and covers before turning on power to this equipment.
- Do not alter factory-installed wiring inside the enclosure.
- Replace front bonding screw before applying power to the device.

Failure to follow these instructions will result in death or serious injury.

The 4-meter enclosure is available in two configurations (see Figure 1 and Figure 2). The Type 1 configuration is intended only for indoor use. It has a clear viewing window in the door, but does not have a rain hood. The Type 3R configuration is intended only for outdoor use. It has a rain hood, but does not have a viewing window in the door. Both enclosures feature a hasp to lock or seal the door.

Figure-1: 4-Meter Enclosure - Type 1 Assembly



The meters, interior components, and wiring connections are covered by a protective, removable, exterior case. To access the interior, remove the case from the supporting base/backplate (see Figure 3). The meters are positioned on a supporting bracket attached to the base/backplate that swivels outward to allow access to the back of the meter and terminals for field wiring. The bracket has a small locking feature to hold the door open in the 90° position. The bracket can be swiveled out by lifting up slightly and out from the left side.

The following steps summarize the installation:

1. Unpack and verify the box contents.
2. Remove the front bonding screw.
3. Lift the case off.

⚠ DANGER

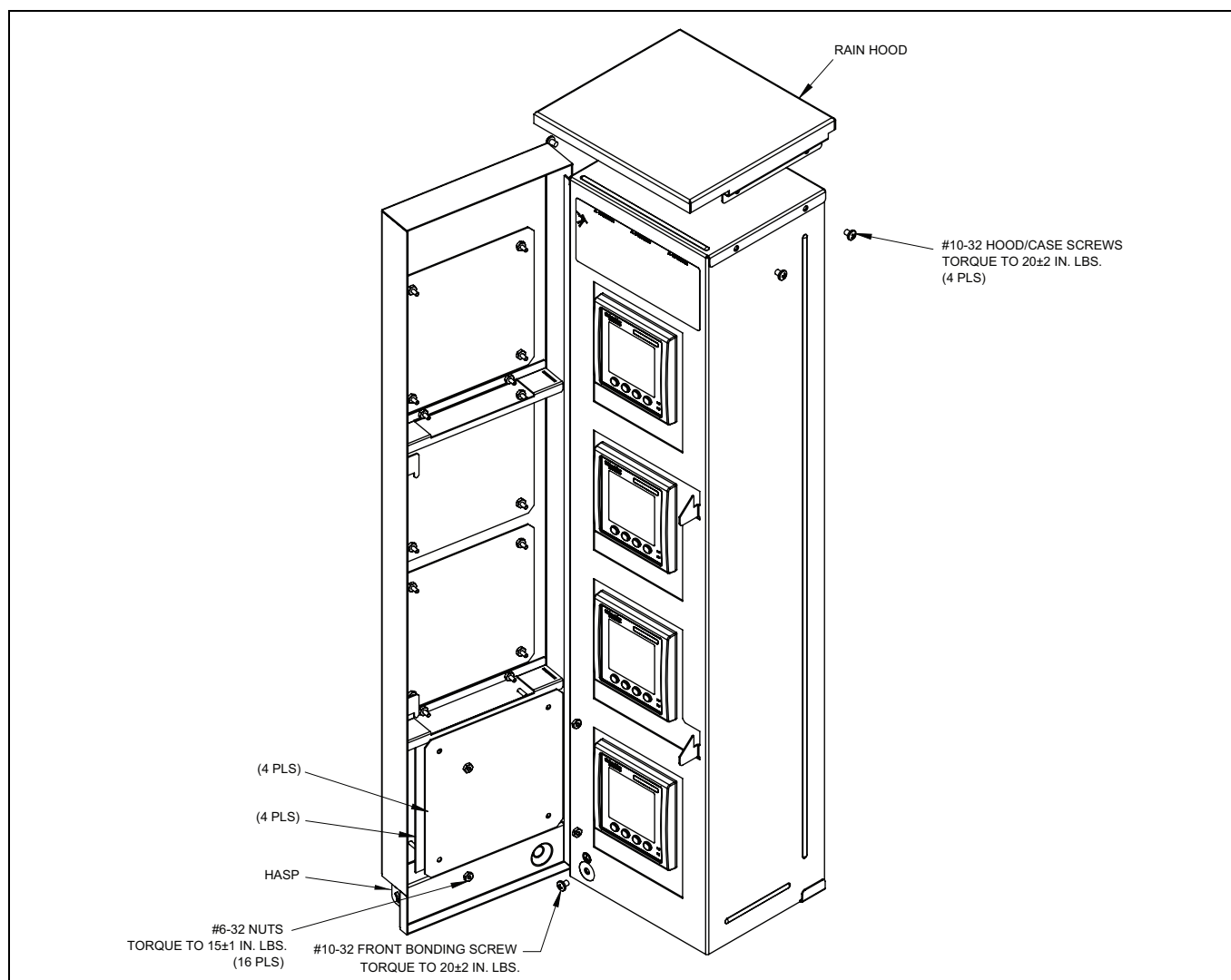
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not drill into the enclosure.

Failure to follow these instructions will result in death or serious injury.

4. Remove the appropriate knock outs.
5. Mount the enclosure.
6. Make the voltage, current, and communications connections.
7. Replace the cover.

Figure-2: 4-Meter Enclosure - Type 3R Assembly

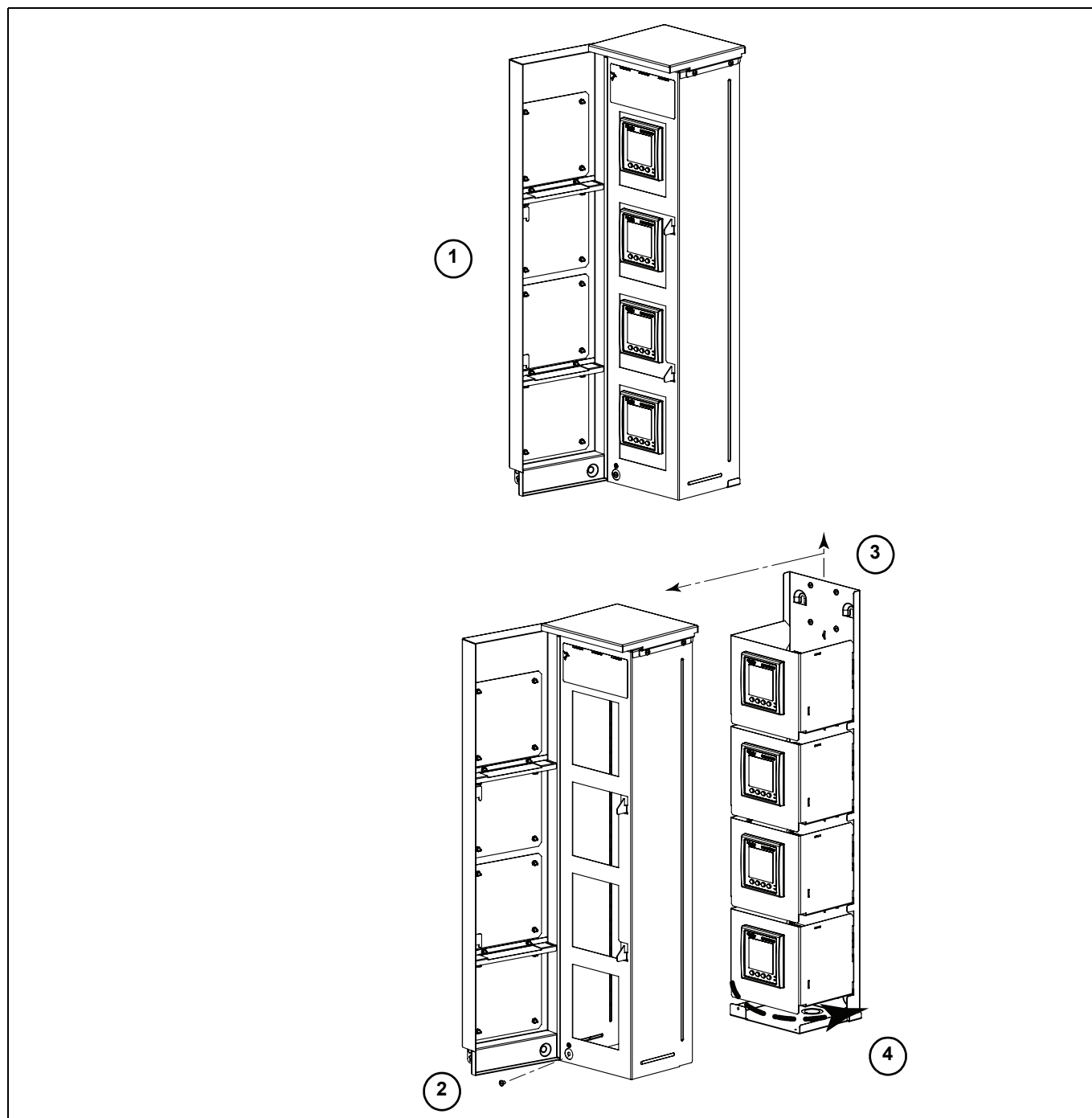


To remove the case, complete these steps:

1. Open the door.
2. Remove the front bonding screw.
3. Lift the case up and out to slide it off the base/backplate.
4. Swing the supporting bracket and meters around to the side.

To re-install the case, reverse the steps.

Figure-3: Case Removal

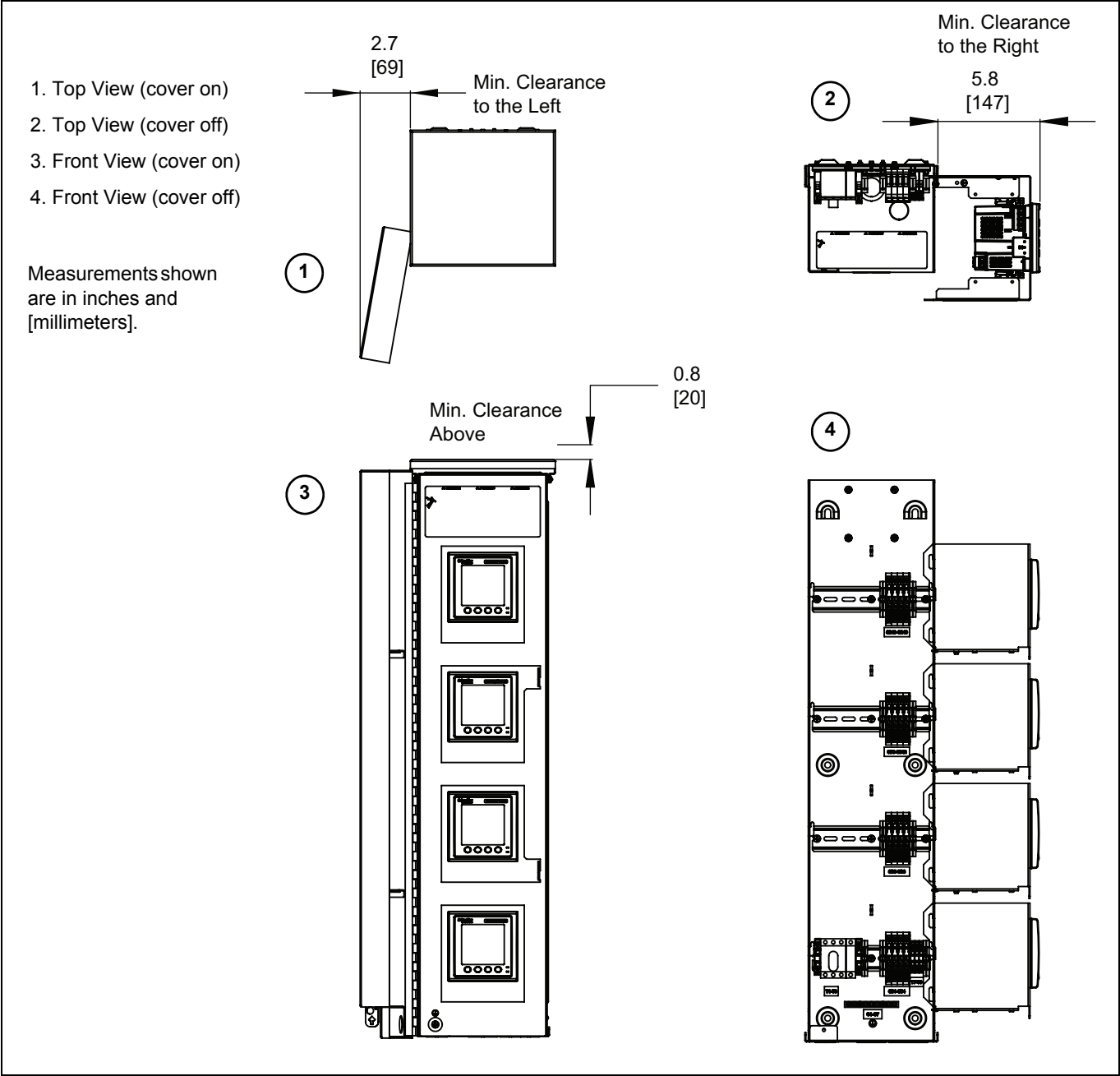


Mounting the Enclosure

Mount the metering enclosure next to the distribution panelboard that serves the load to be monitored.

The recommended clearances for the installed enclosure are shown in the Figure 4 below.

Figure-4: Recommended Enclosure Clearances



Drilling will produce metal shavings that may fall into vents, reduce spacings, and possibly create electrical short circuits.

⚠ DANGER

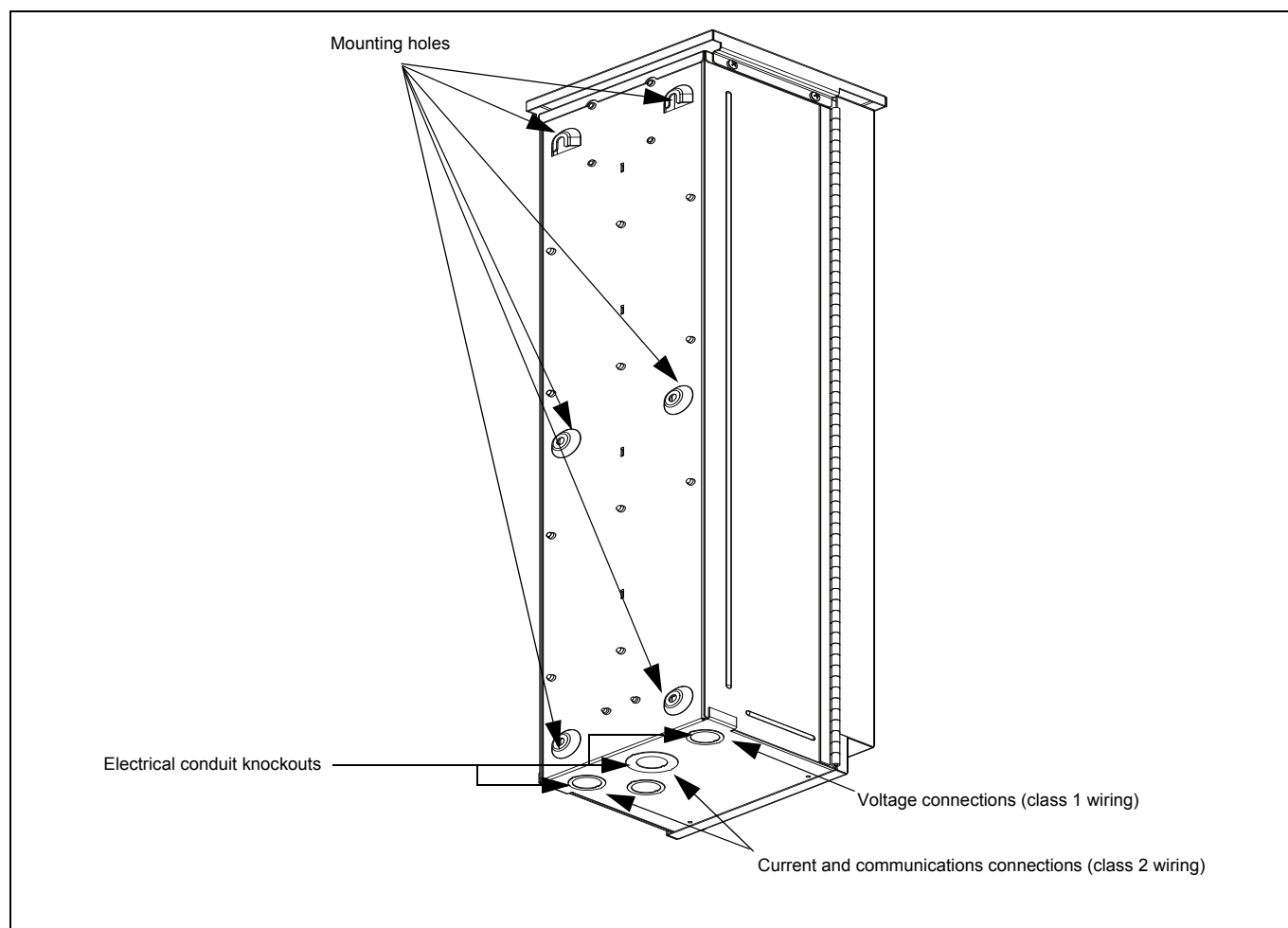
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not drill into the enclosure.

Failure to follow these instructions will result in death or serious injury.

Six (6) pre-drilled 0.32-inch/8.1-mm holes are provided on the backplane of the enclosure for mounting. Use #10 or up to 5/16-inch screws, with washers as needed, to attach the enclosure to the wall. Always mount with six (6) screws. Figure 5 shows the pre-drilled mounting holes and knockout points for the electrical conduit.

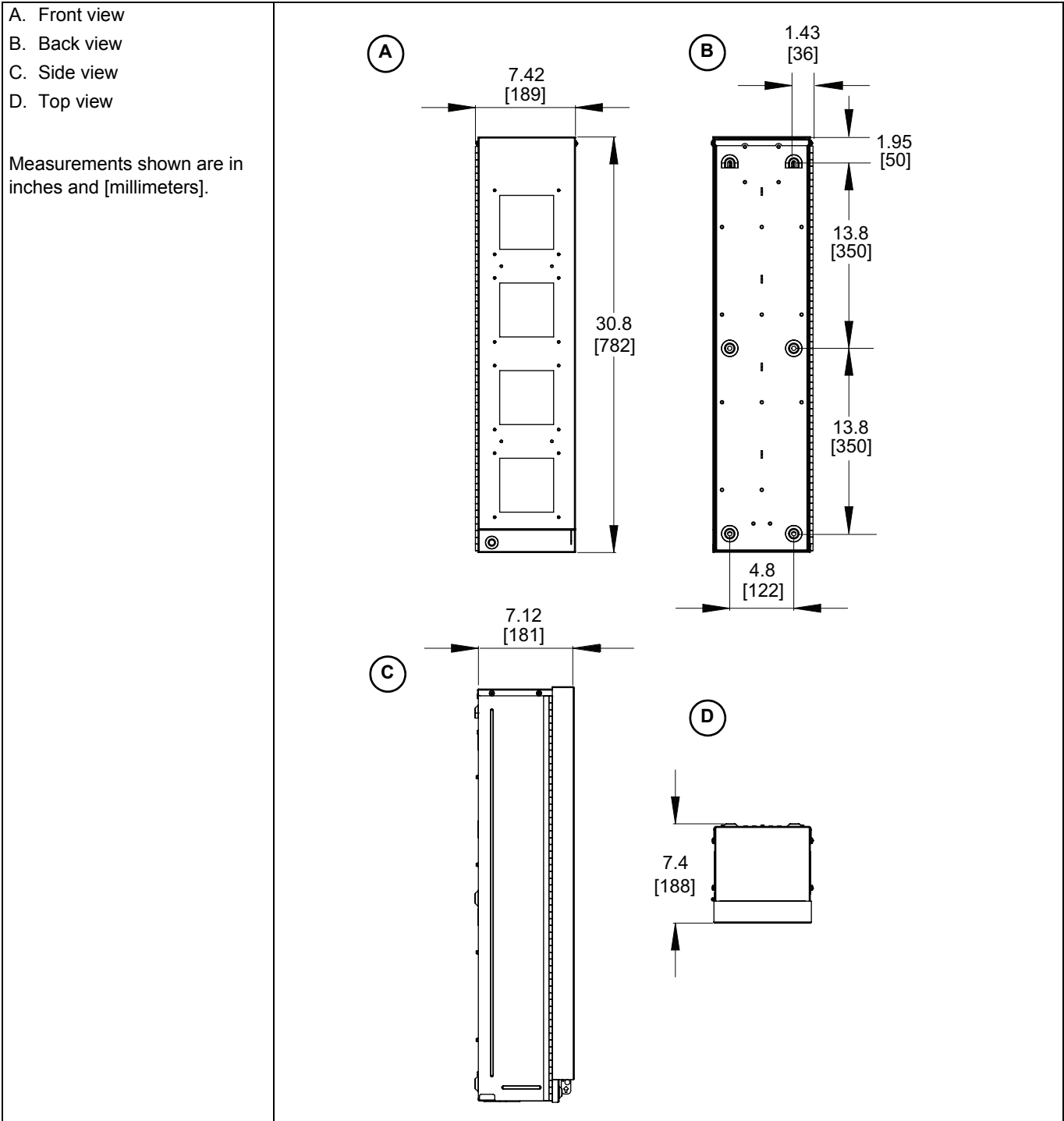
Figure—5: Mounting Holes and Conduit Knockouts



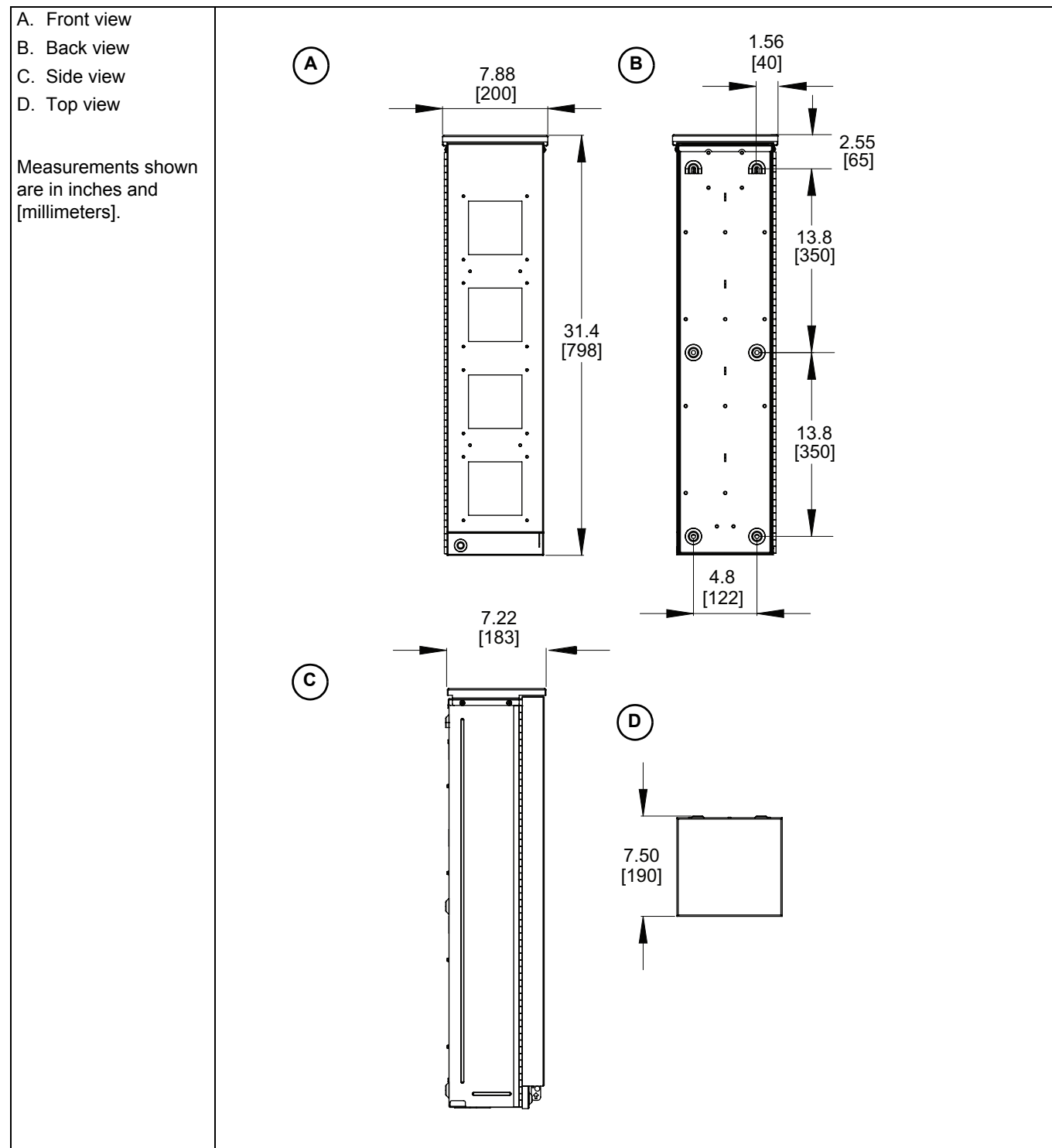
Mounting Dimensions

Figure 6 shows dimensions for the enclosure without a hood.
Figure 7 shows dimensions for the enclosure with a hood.

Figure-6: Dimensions for Type 1 Enclosure



Figure–7: Dimensions for Type 3R Enclosure



Wiring Connections

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E in the USA, CSA Z462 or applicable local standards.
- Turn off all power supplying this device and the equipment in which it is installed before working on the device or equipment.
- Always use a properly rated voltage sensing device to confirm that all power is off.
- Do not exceed the device's ratings for maximum limits.
- Do not use this device for critical control or protection applications where human or equipment safety relies on the operation of the control circuit.
- Never short the secondary of a voltage transformer (VT).
- Never open circuit a current transformer (CT).
- Always use grounded external CTs for current inputs.
- Replace all devices, doors and covers before turning on power to this equipment.
- Do not alter factory-installed wiring inside the enclosure.
- Replace front bonding screw before applying power to the device.
- Provide overcurrent protection external to the enclosure on control power and voltage measurement inputs.
- Before energizing enclosure, all unused spaces must be filled with blank covers.
- Do not loosen slider screws.

Failure to follow these instructions will result in death or serious injury.

Conduit knockouts are provided on the enclosure (see Figure 5 on page 13).

To comply with national and local standards, Class 1 (voltage input) wiring must be kept separate from Class 2 (current transformer and communications) wiring. Refer to NEC code and local codes before installing.

NOTE: Conduit hubs shall be rated to the same weather rating as the enclosure and must comply with the standard for Conduit, Tubing and Cable Fittings, UL 514B.

NOTE: Voltage inputs shall be connected to the load side of a Class CC, G, J, RK1, RK5, L or T 7A branch circuit fuse or inverse-time/instantaneous-trip circuit breaker. Use copper conductors only.

Figure 8 on page 18 shows a partial diagram of the typical field connections inside the enclosure. Meters are all wired in the same manner. Wire colors are listed in Table 5 on page 17.

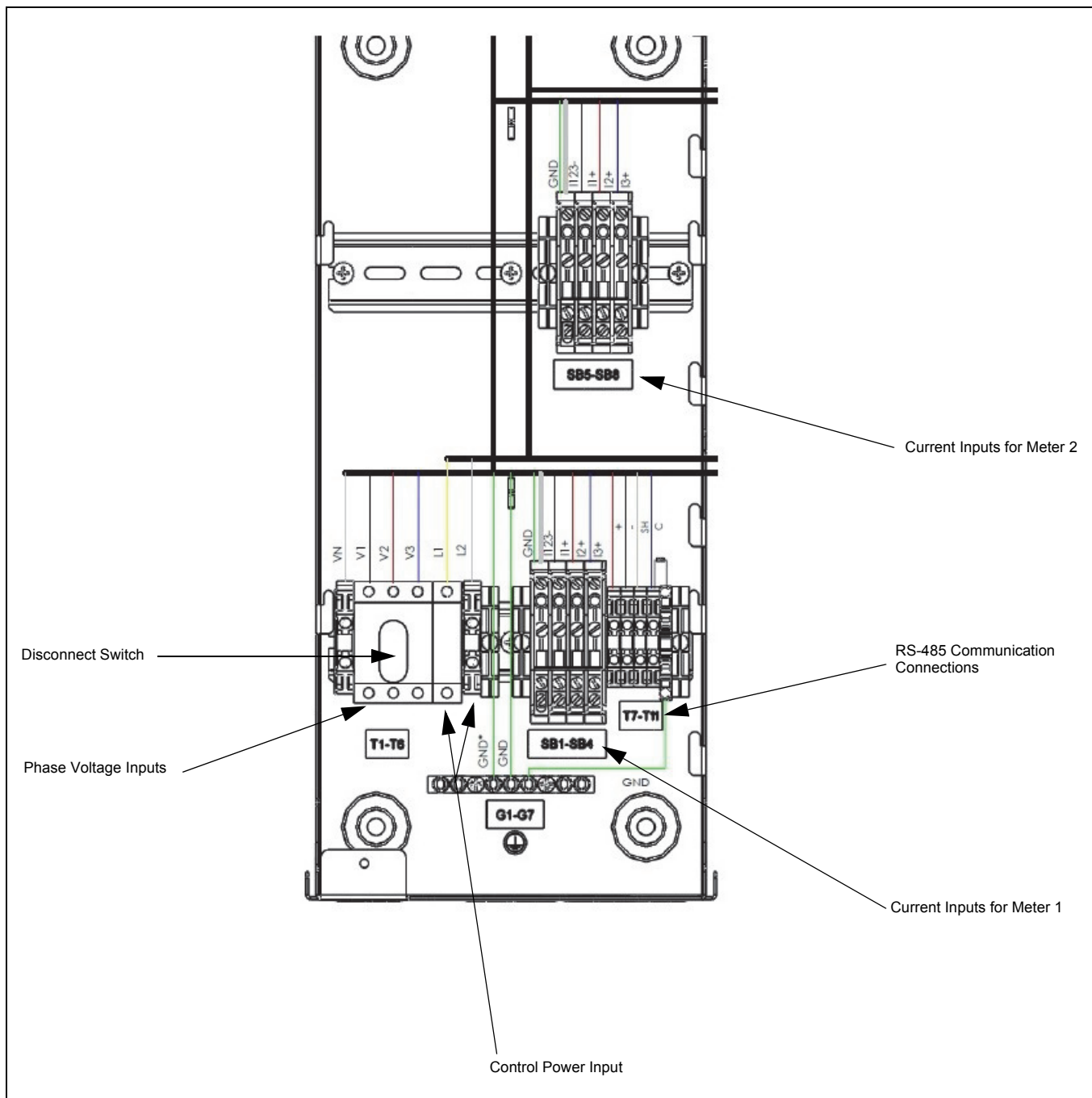
Table 4: Stripped Wire Terminal Specifications

Connection	Stripped Wire Length
Voltage	5/16 in (7.94 mm)
Ground	3/8 in (9.53 mm)
Comms	5/16 in (7.94 mm)
CT Shorting Block	3/8 in (9.53 mm)

Table 5: Wire Colors

Control Power	
V+	Yellow
V-	White
Voltage	
V1	Black
V2	Red
V3	Blue
VN	White
Current	
I123-	White
I1+	Black
I2+	Red
I3+	Blue
Comm	
-	Black
+	Red
SH	Bare
Common	Blue
Ground	
GND	Green/Yellow

Figure-8: Typical Field Connections for PM5000 Meters



Circuit Protection

Control power and voltage inputs require overcurrent protection external to the enclosure. The fuses/circuit breakers must be rated for the installation voltage and sized for the available fault current. Voltage inputs must be connected to the load side of a Class CC, G, J, RK1, RK5, L or T 7A branch circuit fuse or inverse-time/instantaneous-trip circuit breaker. Use copper conductors only.

See Figure 9 and follow the instructions below for using the shorting block.

Figure-9: Shorting Block Use



Removing Short from Current Inputs

To measure the energy from the circuit, you must remove the default short from the current inputs. To remove the short from the current inputs, complete these steps:

1. Turn OFF and tag out the main external breaker supplying this equipment before working on or inside it.
2. Use a properly rated voltage sensing device to confirm that all power is off.
3. Ensure field wiring leads from current transformers are securely connected to the shorting block.
4. Ensure wiring within the enclosure is securely connected to a metering device.
5. Loosen all four (4) shorting bar screws.
6. Slide the shorting bar away from the field connection screws or toward the top of the enclosure (UP position in Figure 9 on page 19).
7. Tighten the left-most (GND) shorting bar screw.
8. Remove the tag from the main external breaker.
9. Energize the system.

Shorting the Current Inputs

By default, the current inputs are shorted when you receive the enclosure. To short the current inputs, complete these steps:

1. Turn OFF and tag out the main external breaker supplying this equipment before working on or inside this equipment.
2. Use a properly rated voltage sensing device to confirm that all power is off.
3. Loosen the four (4) shorting bar screws on the shorting block.
4. Slide the shorting bar toward the field connection screws or the bottom of the enclosure (DOWN position in Figure 9 on page 19).
5. Tighten all four (4) shorting bar screws 6 ± 1 lb-in ($0.678 \text{ N}\cdot\text{m} \pm 0.1$).

Current Transformers

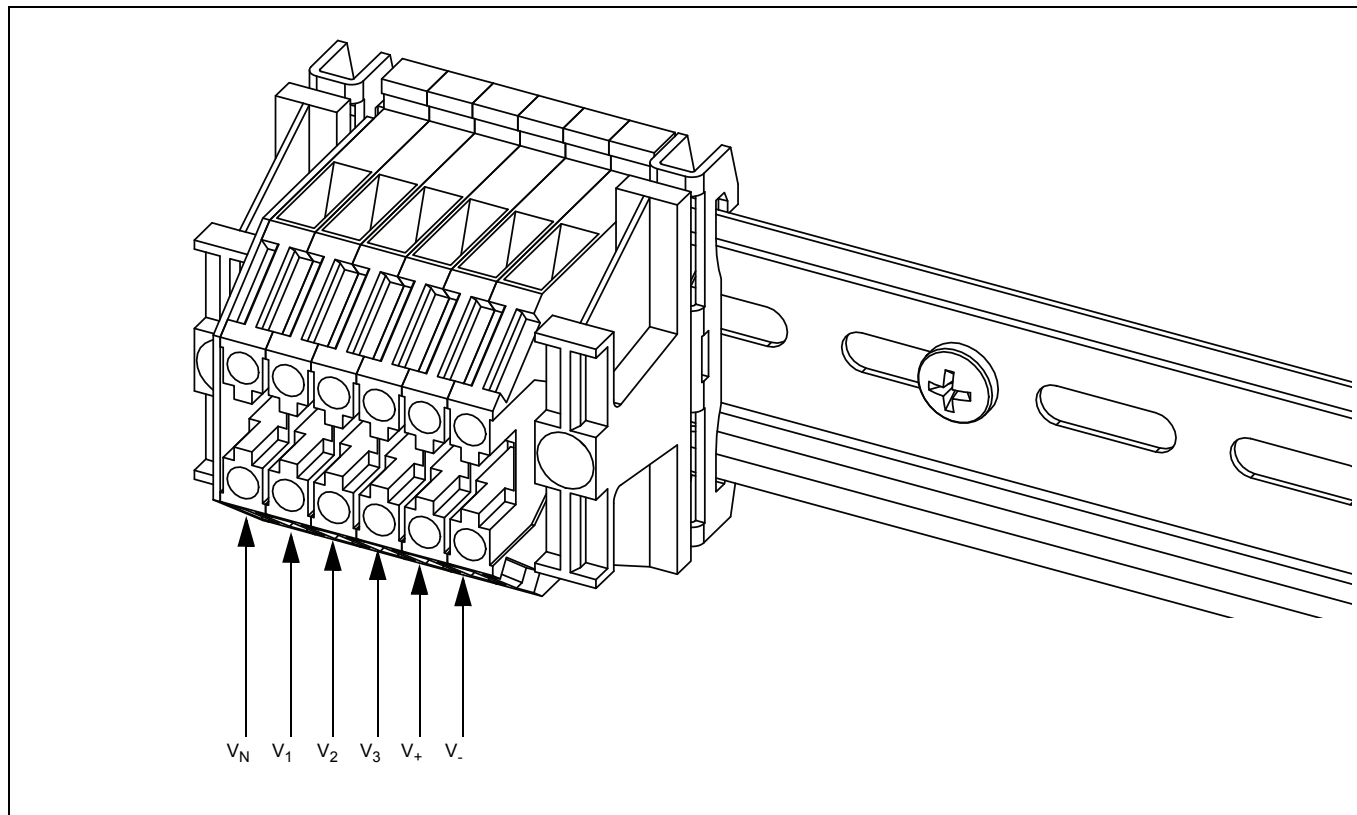
Field-installed current transformer (CT) leads require stripped wire terminal connections. Refer to Table 4 on page 16 for stripped wire specifications. The CT shorting block is shipped in the shorted position by default from the factory.

NOTE: Schneider Electric recommends metering class current transformers with 5 A secondary.

Voltage Input Connectors

Refer to Figure 10 for voltage input connections.

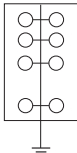
Figure–10: Voltage Input Connectors



Wiring Diagrams

The wiring diagrams in this guide use the symbols shown in Table 6.

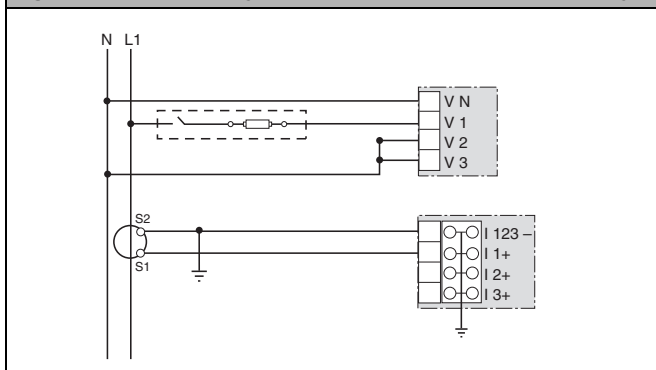
Table 6: **Wiring Diagram Symbols**

Symbol	Description
	Voltage disconnect switch
	Fuse
	Earth ground
	Protective conductor terminal symbol
	Current transformer
	Shorting block
	Potential transformer US equivalent: 
NOTE: The disconnect circuit breaker must be placed within reach of the power meter and labeled: Disconnect Circuit Breaker for Power Meter.	

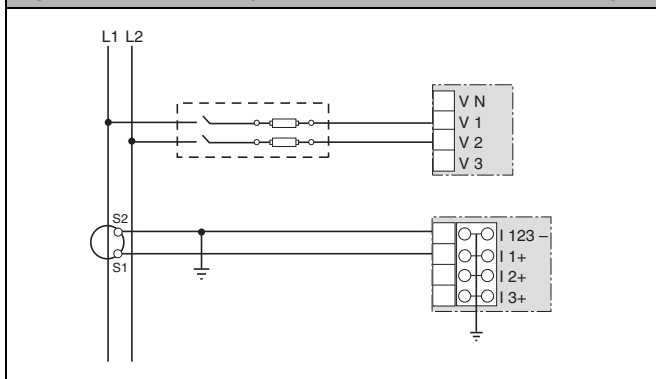
Single-Phase Tenants: Single-Phase Source

Refer to the applicable meter's user manual for details on basic setup configuration.

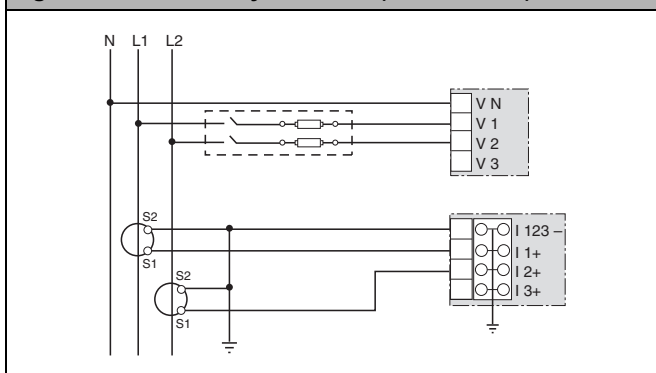
Figure–11: 2-Wire System Line-to-Neutral 1CT (L-N only)



Figure–12: 2-Wire System Line-to-Line 1CT (L-L only)

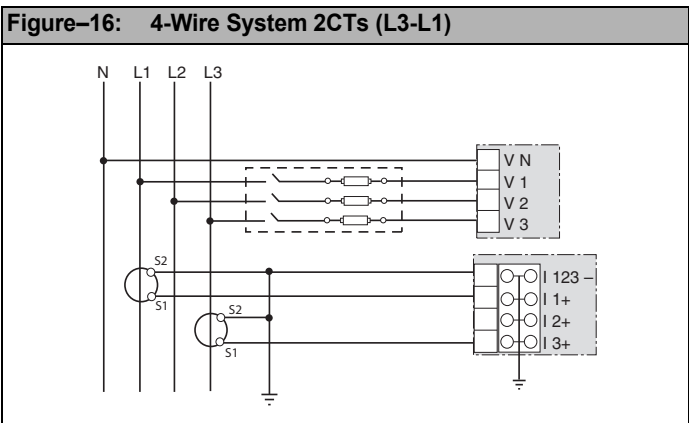
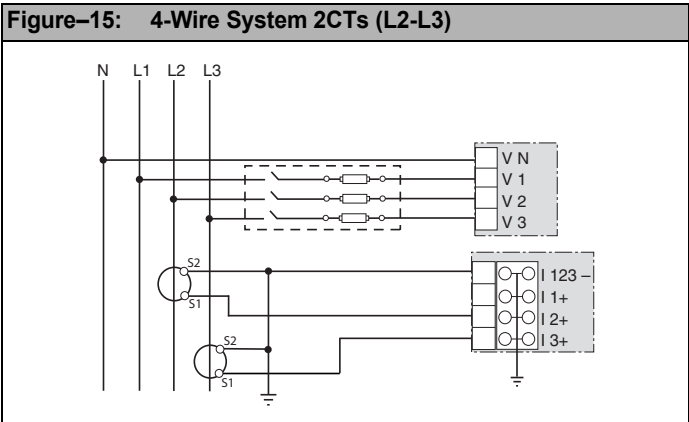
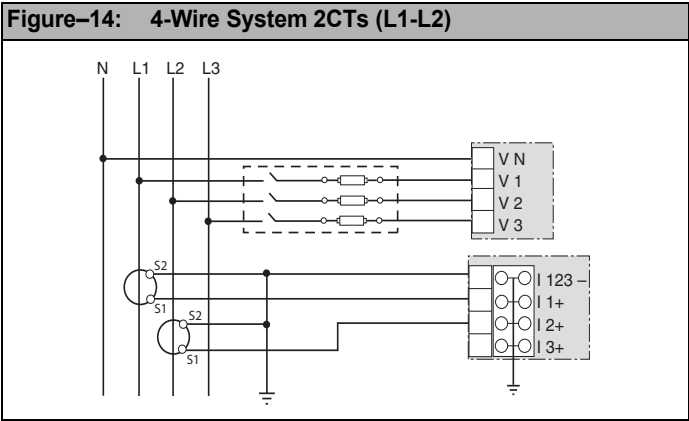


Figure–13: 3-Wire System 2CT (L-L with L-N)



Single-Phase Tenants: Three-Phase Source

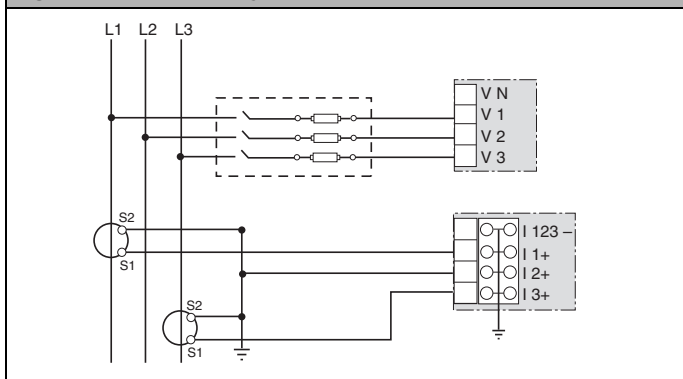
Refer to the applicable meter's user manual for details on basic setup configuration.



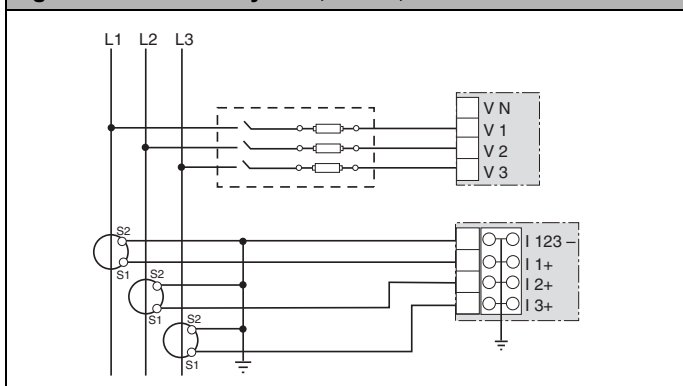
Three-Phase Tenants

Refer to the applicable meter's user manual for details on basic setup configuration.

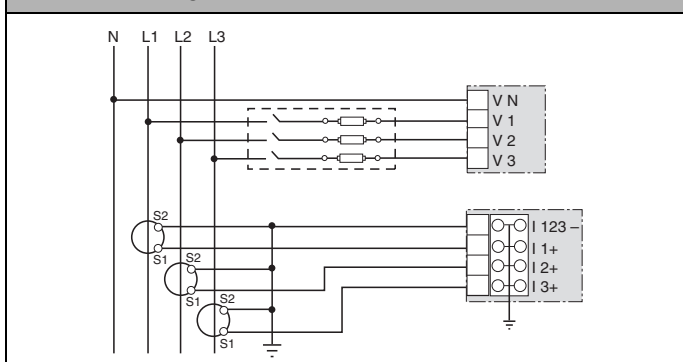
Figure–17: 3-Wire System, 2CTs, No PT



Figure–18: 3-Wire System, 3 CTs, No PT

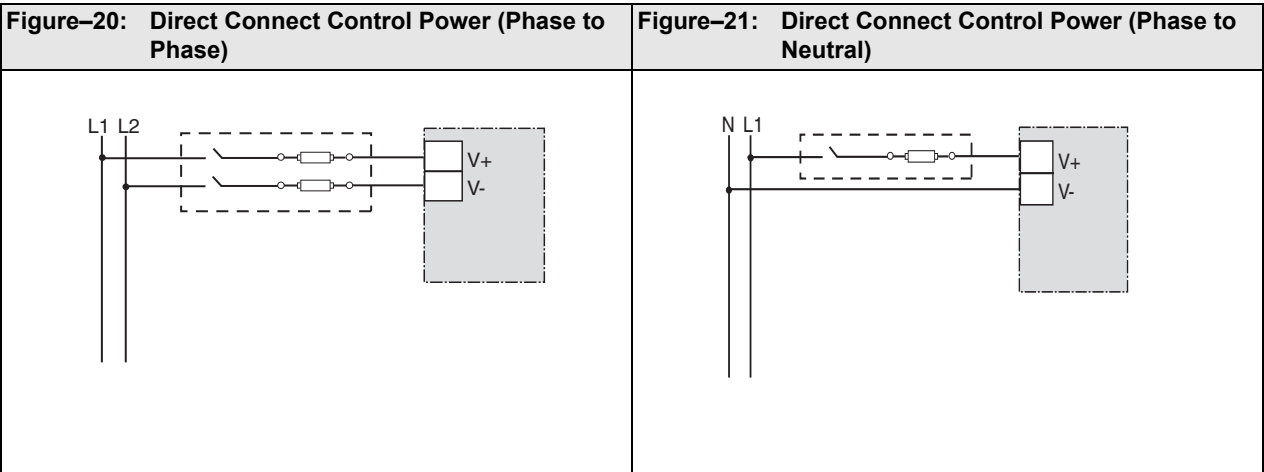


Figure–19: 4-Wire Wye Direct Voltage Input Connection, 3 CTs



Control Power

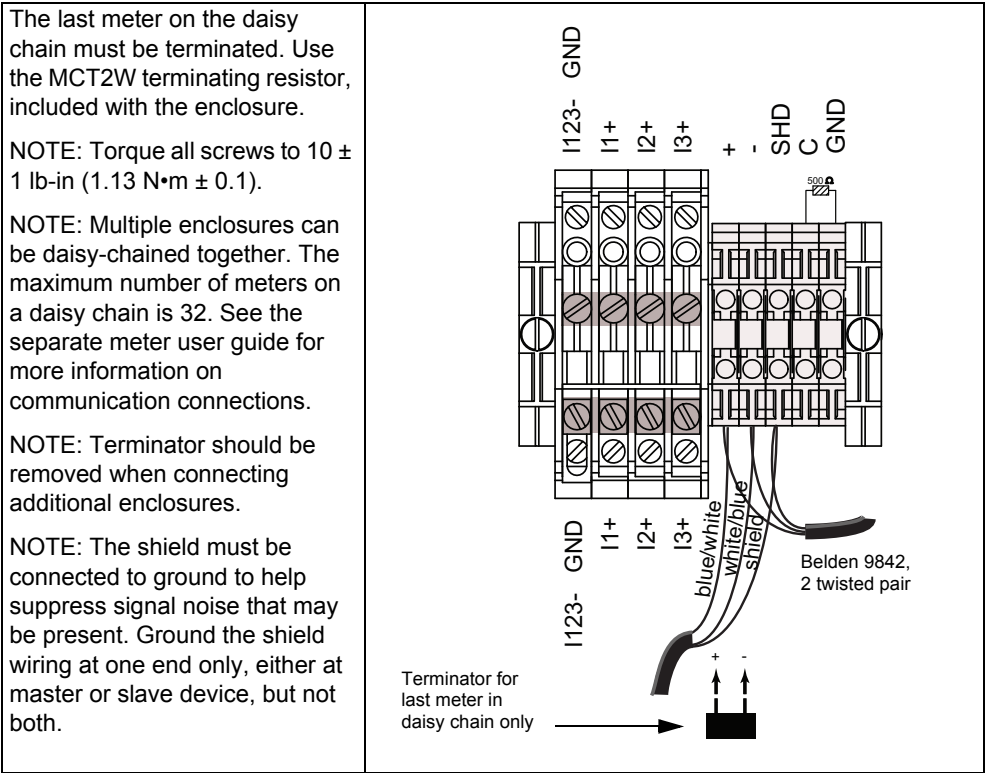
Using jumpers, control power can be supplied from the phase conductors. Control power can also be supplied by a separate feed.



Communications

The meters use common daisy-chain wiring and communicate using Modbus protocol over RS-485. Figure 22 shows the communications connections.

Figure–22: RS-485 Serial Modbus Connection



Initializing the Meters

The meters must be initialized before placing into service. For instructions on initializing, see the meter user guide shipped with the cabinet (also available at www.schneider-electric.com).

How to Upgrade Firmware

You can find meter firmware under Documents & Downloads on your meter's product page at www.schneider-electric.com.

Removing a Meter

If you need to remove a meter from the enclosure, a cover plate must be attached unless the meter is immediately replaced with another. See “Cover Plates” on page 28.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E in the USA, CSA Z462 or applicable local standards.
- Turn off all power supplying this device and the equipment in which it is installed before working on the device or equipment.
- Always use a properly rated voltage sensing device to confirm that all power is off.
- Do not exceed the device's ratings for maximum limits.
- Do not use this device for critical control or protection applications where human or equipment safety relies on the operation of the control circuit.
- Never short the secondary of a voltage transformer (VT).
- Never open circuit a current transformer (CT).
- Always use grounded external CTs for current inputs.
- Replace all devices, doors and covers before turning on power to this equipment.
- Do not alter factory-installed wiring inside the enclosure.
- Replace front bonding screw before applying power to the device.
- Provide overcurrent protection external to the enclosure on control power and voltage measurement inputs.
- Before energizing enclosure, all unused spaces must be filled with blank covers.
- Do not loosen slider screws.
- Do not use the enclosure if the wiring harness is damaged. Contact Schneider Electric Technical Support for assistance.

Failure to follow these instructions will result in death or serious injury.

NOTE: Do not remove the short on the current transformer shorting block while the meter is removed from the enclosure.

To remove a meter, complete these steps:

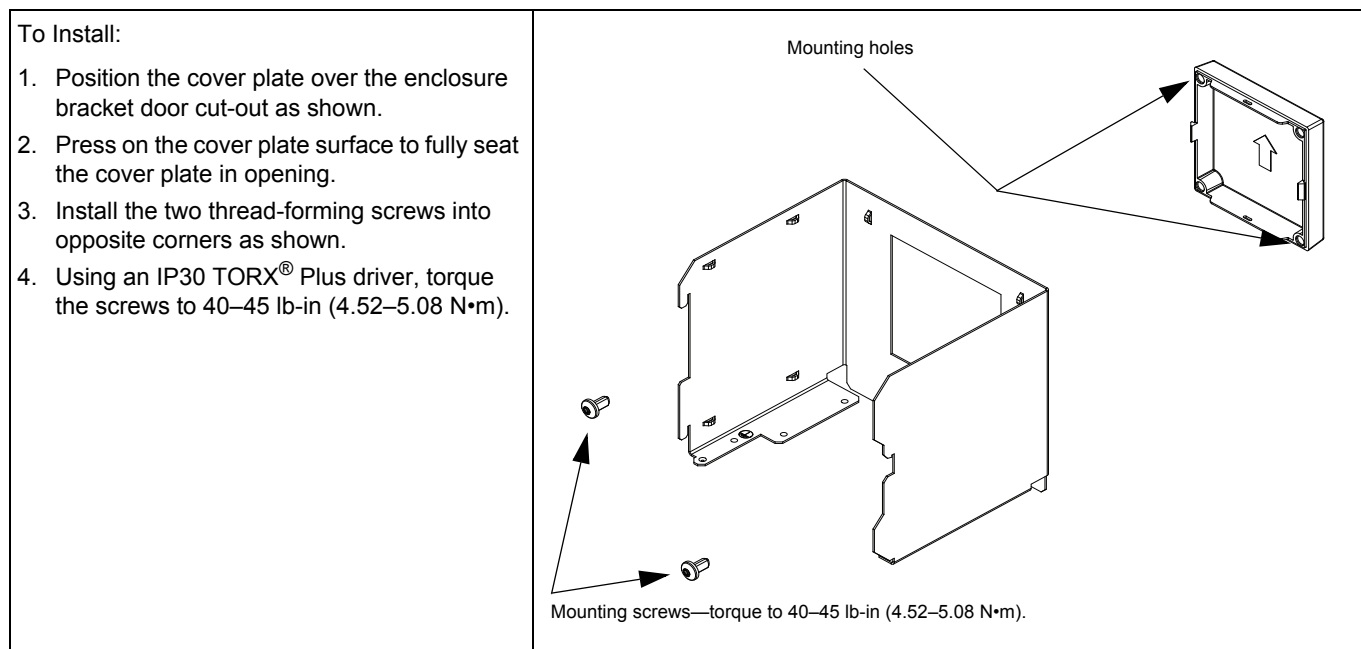
1. De-energize the external breaker supplying this equipment and follow the lock-out, tag-out procedure before working on or inside it. Use a properly rated voltage sensing device to confirm that all power is off.
2. Open the user-installed disconnect switch located behind the meter.
3. Remove the front case screw and open the enclosure.

4. Short CT shorting block.
5. Remove the meter.
6. Insulate any loose wires.
7. Close the disconnect switch.
8. Remove the tag from the main external breaker.
9. Energize the system.
10. Install a cover plate. Refer to “Cover Plates”.

Cover Plates

Cover plates are used to cover openings when no meter is present. Any time a meter is removed from the enclosure, a cover plate must be attached unless another meter is inserted into the slot. Figure 23 shows the cover plate assembly.

Figure–23: Cover Plate



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63230-508-212A1 08/2014

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