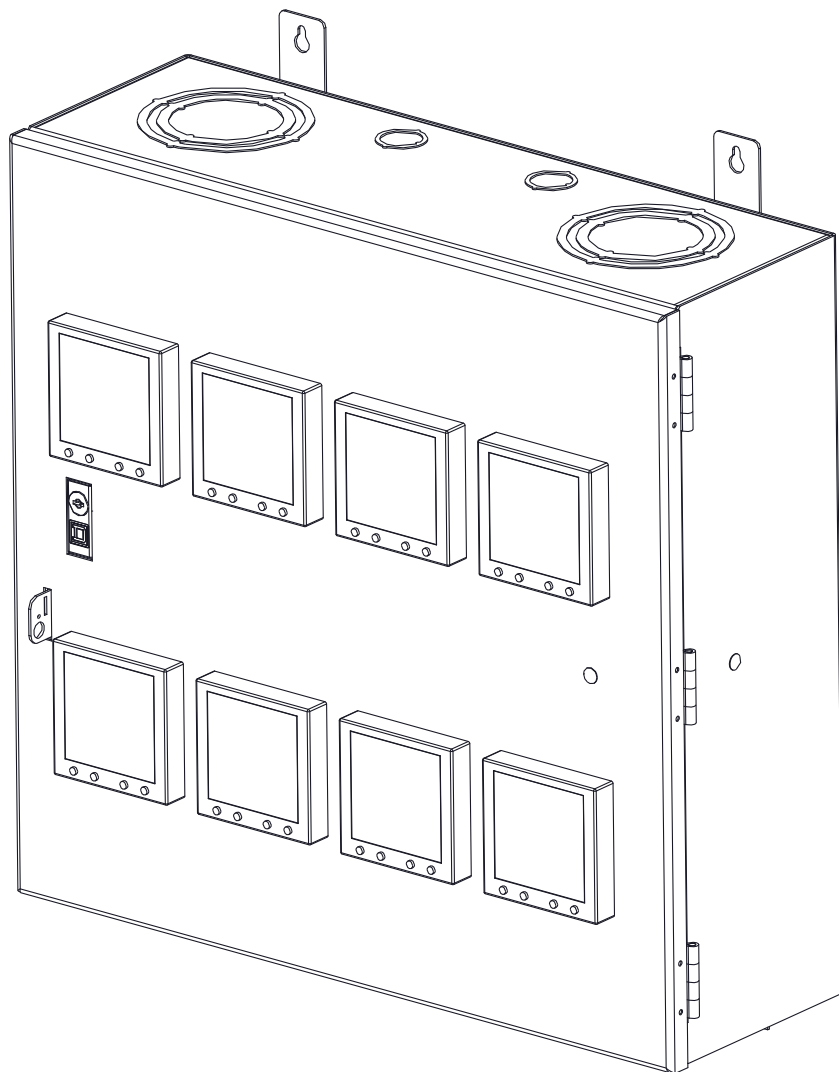


PowerLogic™ High Density Metering System 8-Meter Enclosure

Installation Guide

63230-504-212A1

11/2014



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.

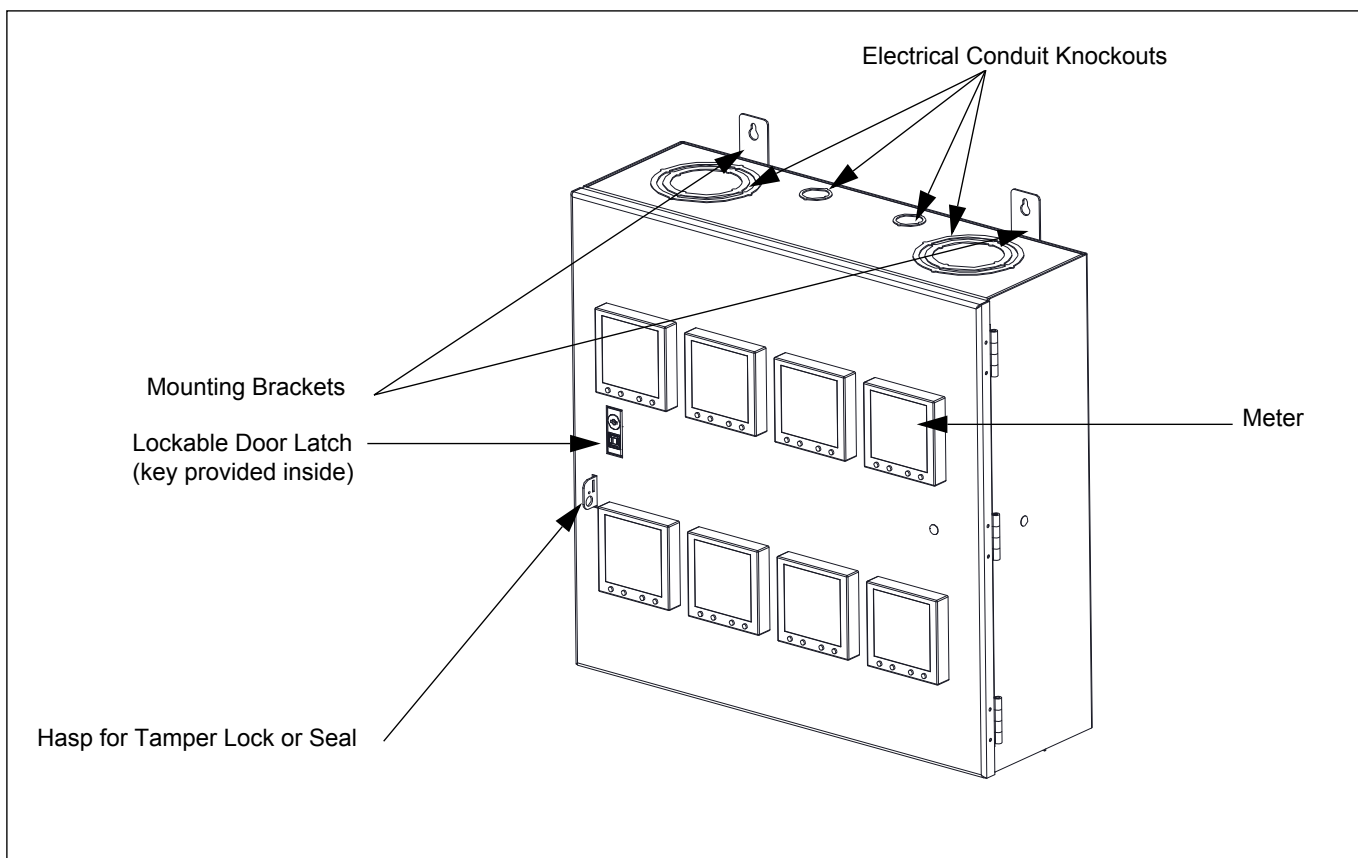
A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

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Introduction

The PowerLogic™ High Density Metering System is a sub-metering system that monitors 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. Figure 1 shows the front view of an enclosure.

Figure–1: Front view of enclosure



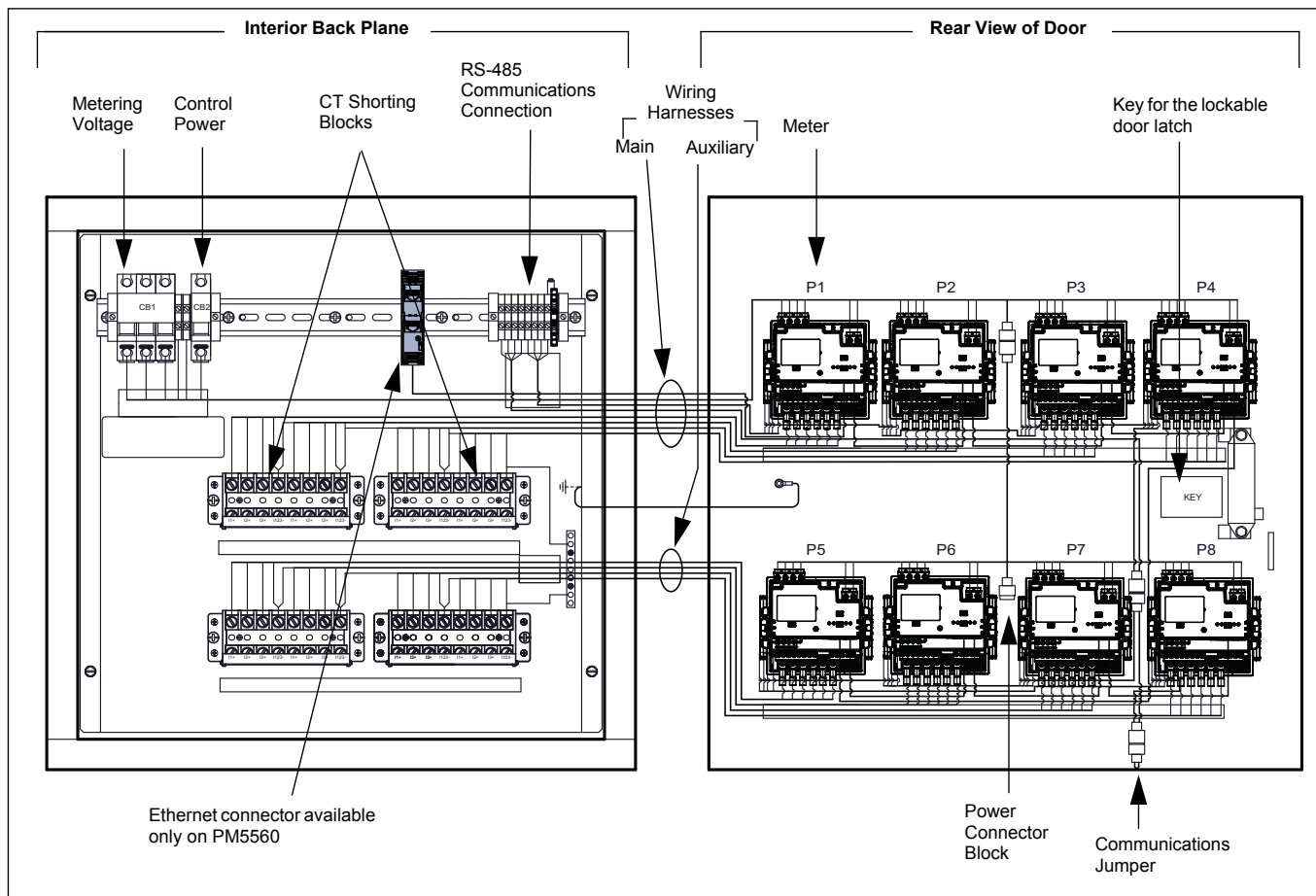
Each meter is assigned to a tenant who occupies an individual unit in the building. The meter monitors and records the number of kilowatt hours used inside the unit. At pre-determined times, tenant billing software polls all the meters through a communications link to gather usage information. This information can be used to monitor overall electrical usage or to generate an electric bill for the tenant.

NOTE: Some states do not permit sub-billing. Before billing tenants, check your state and local regulations.

The enclosure contains up to 8 meters. The meters are mounted in the door of the enclosure. The inside of the enclosure provides power and communication connection points and also houses wiring harnesses, shorting blocks, etc., for the meters. There is also DIN rail space available for other devices.

To aid in installation, the wiring for the enclosure is modularized and labeled. Figure 2 on page 6 identifies the interior sections of the enclosure.

Figure-2: Enclosure interior

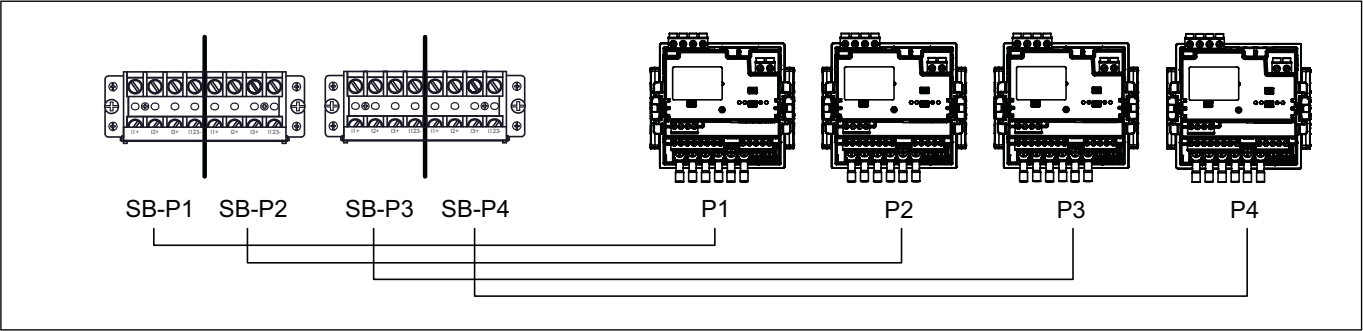


The meters are arranged in a four by two grid. When viewing the back of the meter grid (see Figure 2), the meter positions (P) are numbered sequentially from P1 to P n , n being the maximum number the enclosure will hold. Position P1 is in the top left position, position P n is the bottom right position.

The shorting blocks support two meters per block and are also numbered sequentially. The position numbers are significant when making shorting block connections. SB-P1 is wired to P1, SB-P2 is wired to P2, and so on.

Figure 3 shows the relationship between the meter positions and the shorting block positions. When another row of meters is added, the position numbers of both the shorting blocks and meters increment sequentially from left to right.

Figure–3: Position numbers for meters and shorting blocks



Box Contents

The following components are shipped with the High Density Metering System:

- Enclosure containing pre-installed meters, shorting blocks, and wiring harnesses
- Wall hanging channel
- Shorting screws (already mounted)
- Meter hardware kit - includes terminating resistor
- Installation sheet for pre-installed meters
- This installation guide

Parts and Accessories

The 8-meter enclosure can house any of the following PowerLogic meters:

- PM5110
- PM5330
- PM5560

NOTE: Meters must all be the same model.

The enclosure is shipped with meters already installed and wired. If an enclosure does not contain its maximum number of meters, additional meters can be added at a later time. See “Expanding the High Density Metering System” on page 24 for information on adding meters to the enclosure. Table 1 lists part numbers and accessories for the High Density Metering System.

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: Technical specifications

PHYSICAL CHARACTERISTICS	
Dimensions	W 21.88 inches, H 21.13 inches, D maximum 8.5 inches—includes meter (W 555.752 mm, H 536.702 mm, D maximum 215.9 mm—includes meter)
Mounting	Wall mount
Maximum Weight	Approximately 55 lbs. (24.95 kg)
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	+32° F to +131° F (0° C to +55° C)
Storage temperature	-40° F to +185° F (-40° C to +85° C)
Humidity rating	5 to 95% RH at 50° C (non-condensing)
Pollution degree	2
Metering category (voltage inputs and control power)	CAT III, for distribution systems up to 277 V L-N/480 Vac L-L
Altitude	3000 m (9842 ft)
STANDARDS	
US and Canada	
Enclosure	UL 50, Type 1; UL 508A; FCC Class B
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 $\pm$ 10%; 45 to 65 Hz AC: 100-415 V L-L $\pm$ 10%; 45 to 65 Hz DC: 125 to 250 $\pm$ 20%
PM5560	AC: 100-480 V L-N $\pm$ 10%; 45 to 65 Hz AC: 100-480 V L-L $\pm$ 10%; 45 to 65 Hz DC: 125 to 250 $\pm$ 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)

Mounting the Enclosure

Mount the metering cabinet next to the distribution panelboard that serves the loads to be monitored.

Stabilize the enclosure using the back and wall hanging channels and the top and bottom mounting tabs. Do not rely solely on the hanging channels for stability and load support.

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

⚠ DANGER

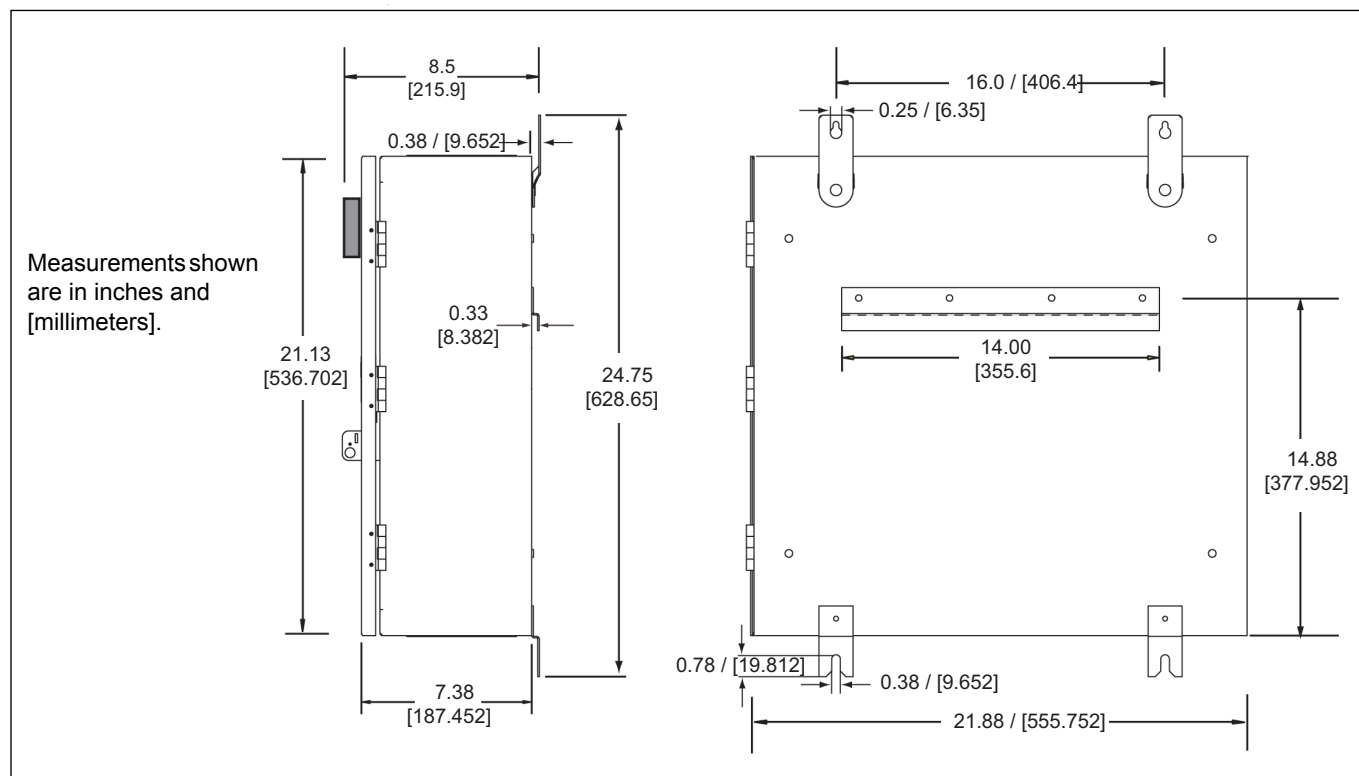
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Do not drill into the enclosure.
- Note weight of enclosure before lifting. See Table 2 on page 8 for system weights.
- Observe safe lifting practices when mounting the enclosure.

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

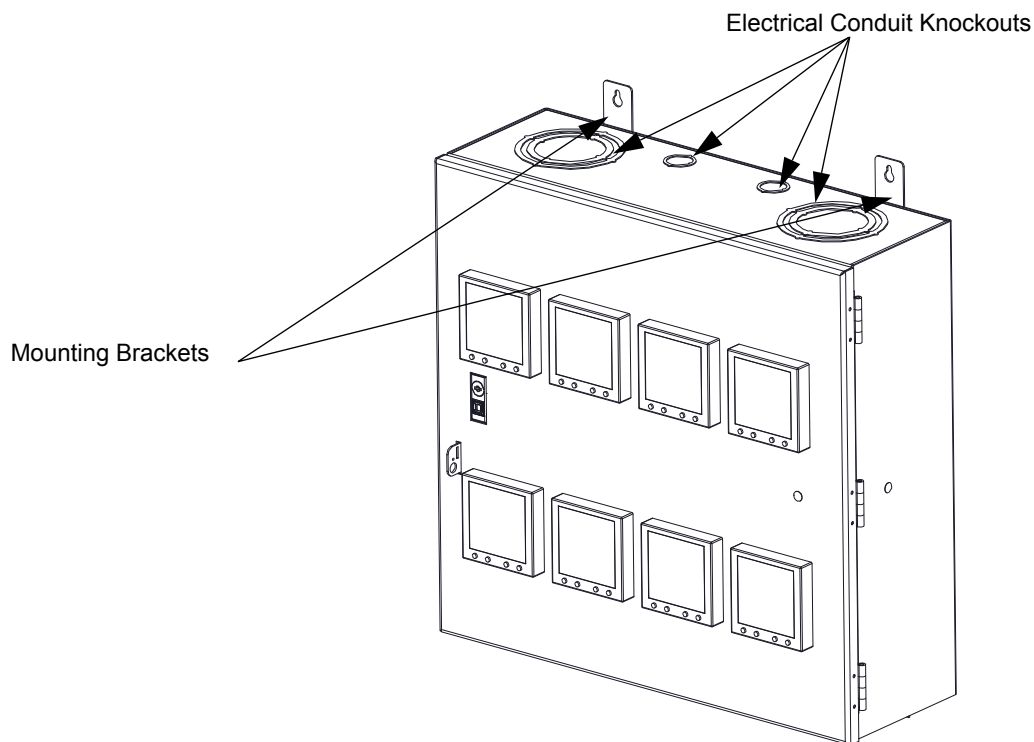
NOTE: To allow for future expansion, when mounting an enclosure that does not contain meters in all available slots, consideration should still be given for the total weight of a fully-populated enclosure.

Figure—4: Mounting Dimensions



Four mounting brackets 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 four screws. Figure 5 shows the mounting brackets and knockout points for the electrical conduit.

Figure–5: Mounting Brackets and Conduit Knockouts



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 11).

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.

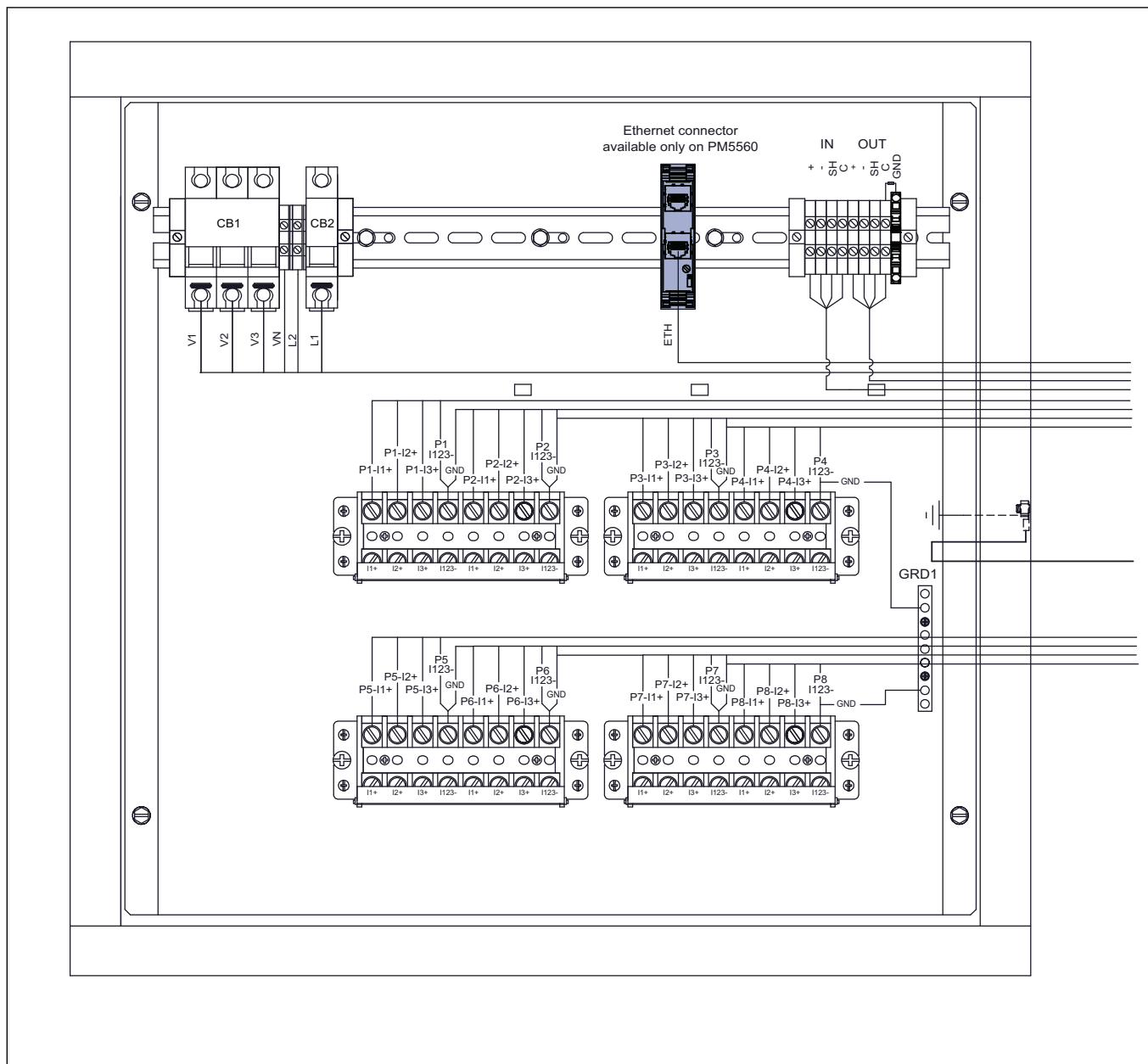
Figure 6 on page 14 shows a partial diagram of the typical field connections inside the enclosure. Meters are all wired in the same manner. Wire colors are listed in Table 5 on page 13.

Table 4: Stripped Wire Terminal Specifications

Connection	Stripped Wire Length
V1, V2, V3	14 mm (0.55 inches)
L1	14 mm (0.55 inches)
VN, L2, Comms (+, -, SH, C)	9 mm (0.35 inches)

Table 5: Wire Colors

Control Power	
L1 (V+)	Red
L2 (V-)	White
Voltage	
V1	Pink
V2	Violet
V3	Gray
VN	White
Current	
I123-	White
I1+	Pink
I2+	Violet
I3+	Gray
Comm	
+	Red
-	Black
SH	Bare
C	Blue
Ground	
Ground	Green/Yellow

Figure-6: Typical Field Connections for PM5000 Meters

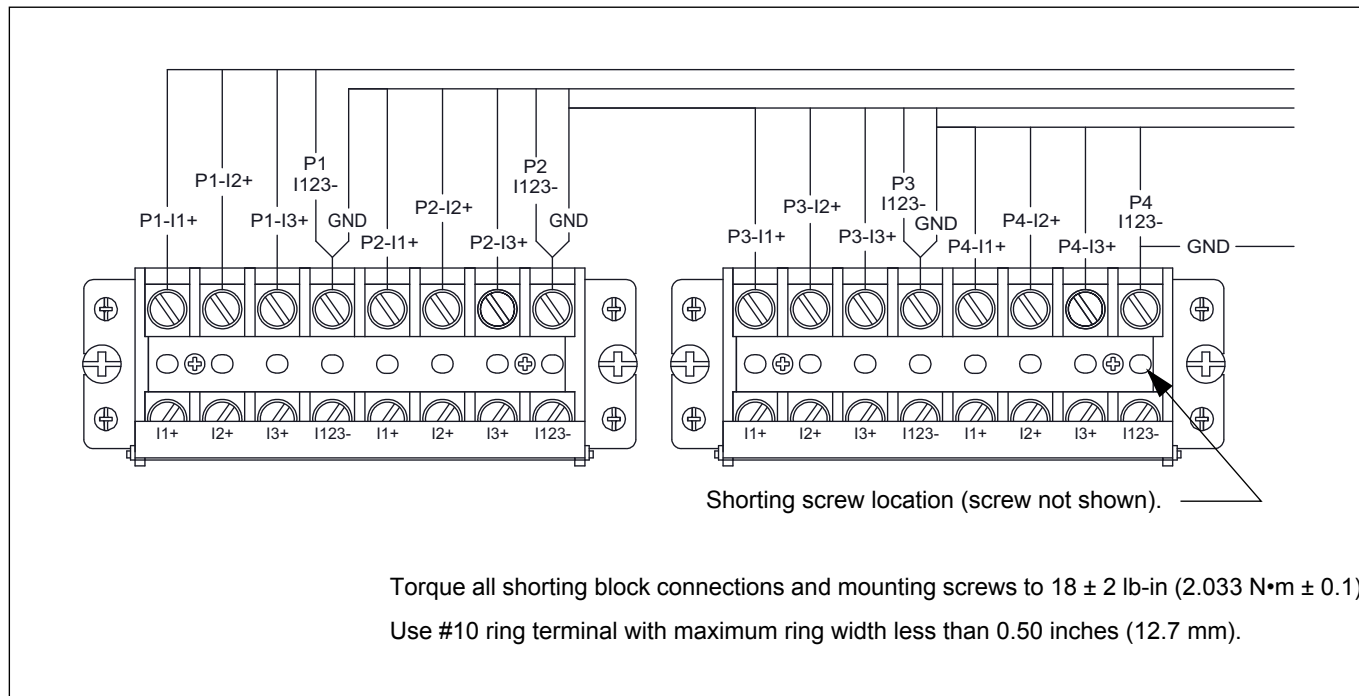
Circuit Protection

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.

Shorting Block Use

See Figure 7 and follow the instructions below for using the shorting block.

Figure–7: 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. Remove shorting screws from all eight (8) blocks.
6. Remove the tag from the main external breaker.
7. 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. Insert shorting block screws into all eight (8) blocks.
4. Tighten all eight (8) shorting bar screws 18 ± 2 lb-in ($2.033 \text{ N}\cdot\text{m} \pm 0.1$).

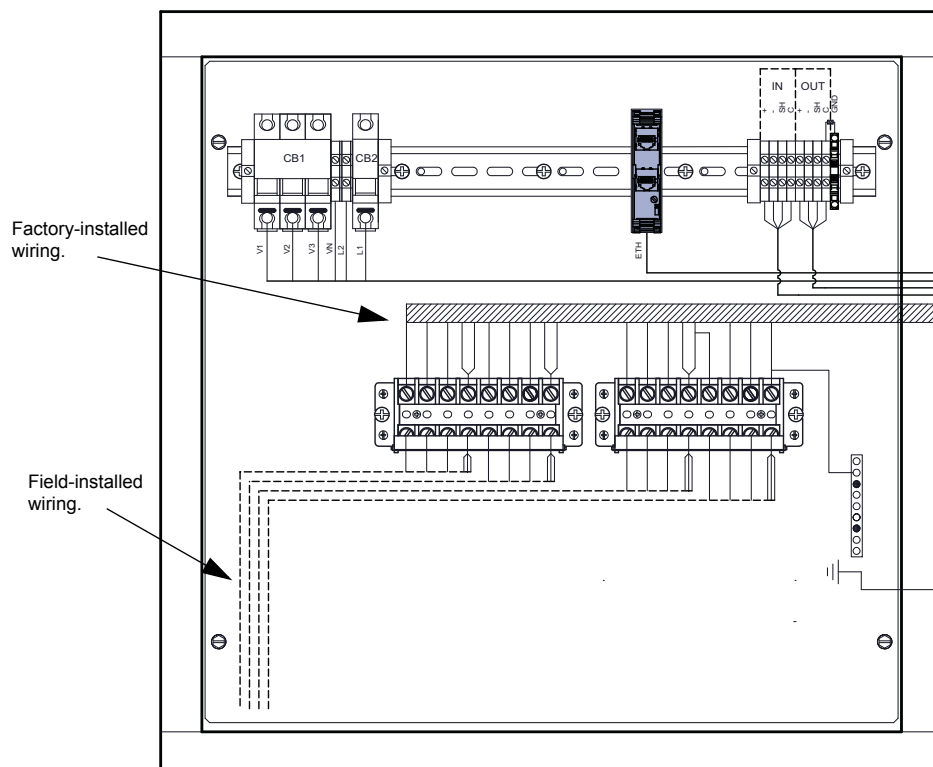
Current Transformers

Field-installed current transformer (CT) leads should have ring terminals or similar terminals for proper connection. CT shorting screws are shipped with the enclosure for use when servicing the meters.

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

Route CT wires in the enclosure as shown in Figure 8.

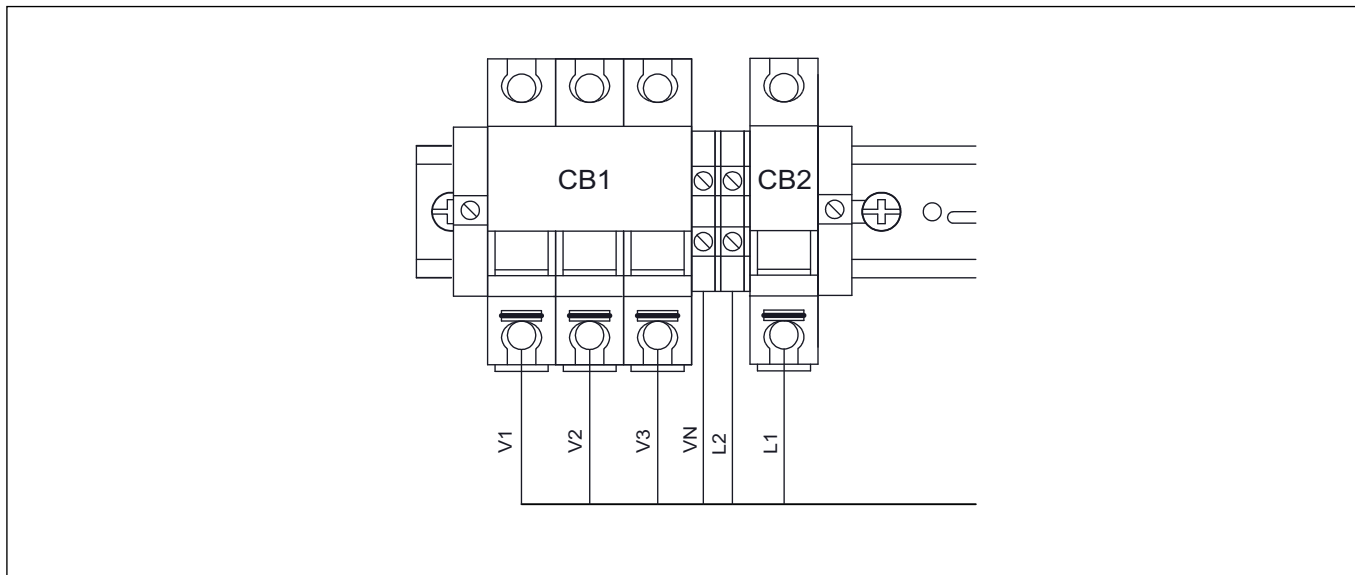
Figure–8: Current transformer routing



Voltage Input Connectors

Refer to Figure 9 for voltage input connections.

Figure–9: Voltage Input Connectors



Wiring Diagrams

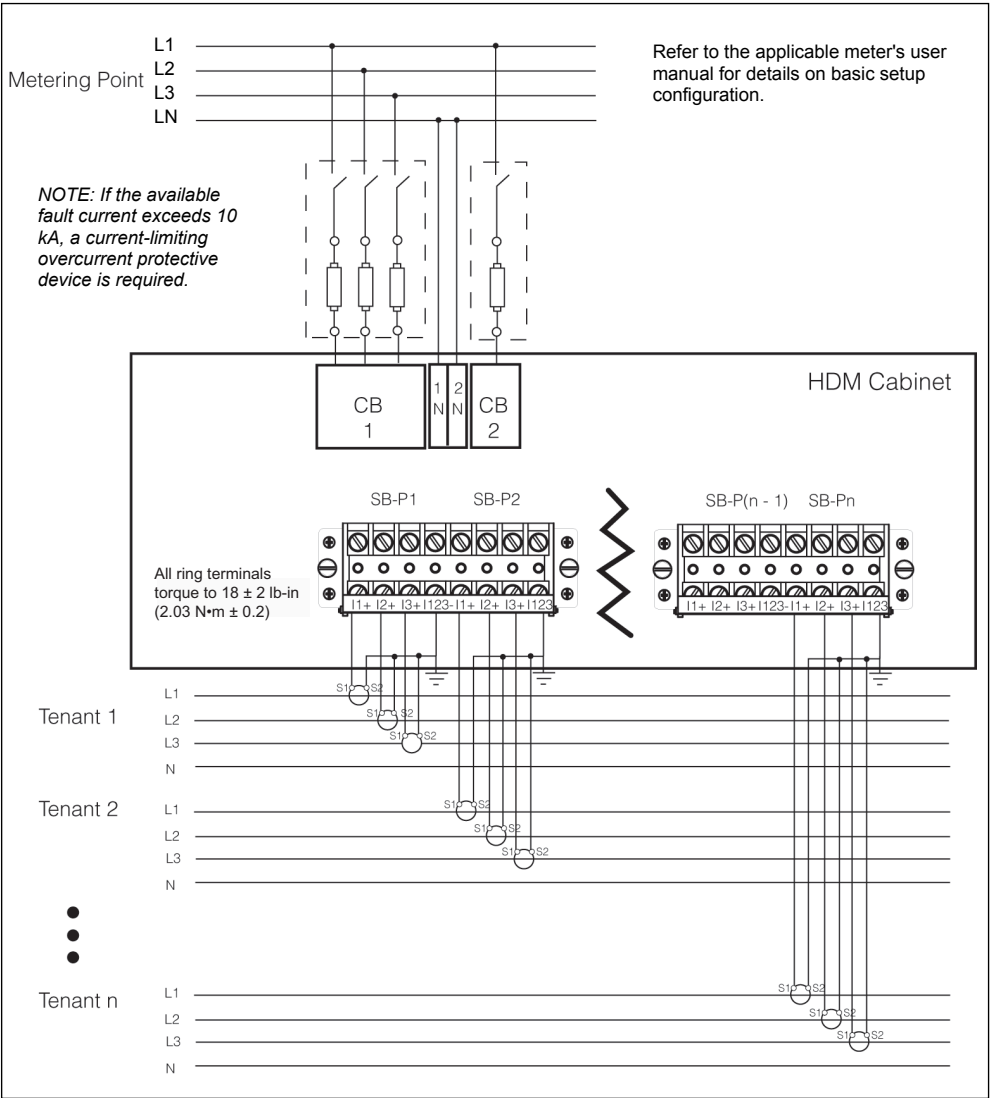
The wiring diagrams in this manual use the symbols shown in Table 6.

Table 6: Wiring Diagram Symbols

Symbol	Description
	Earth ground (GRD)
	Current transformer
	Fuse

Figure 10 shows an overview of the field wiring configuration and how it scales depending on the number of meters in the enclosure.

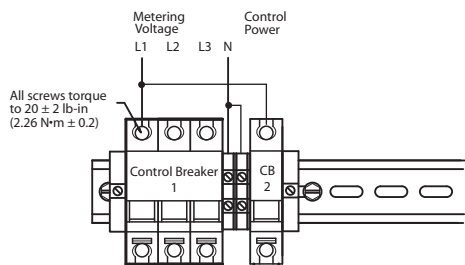
Figure–10: Wiring configuration overview



Single-Phase Tenants, Single-Phase Source

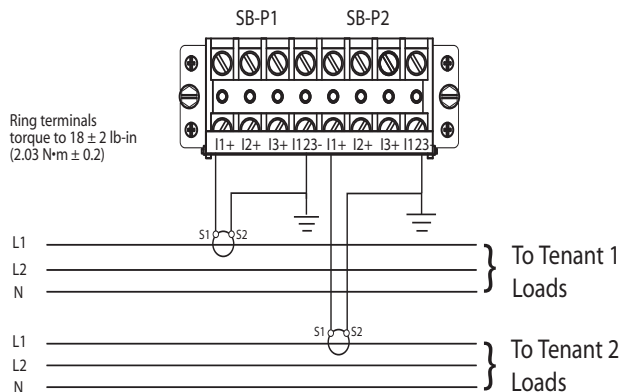
Refer to the applicable meter's user manual for details on basic setup configuration.

Voltage Connections for Figure 11

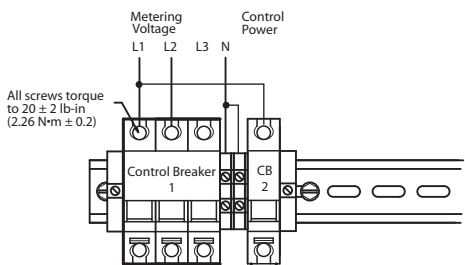


- External control power can be provided. (See "Control Power" on page 22.)

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

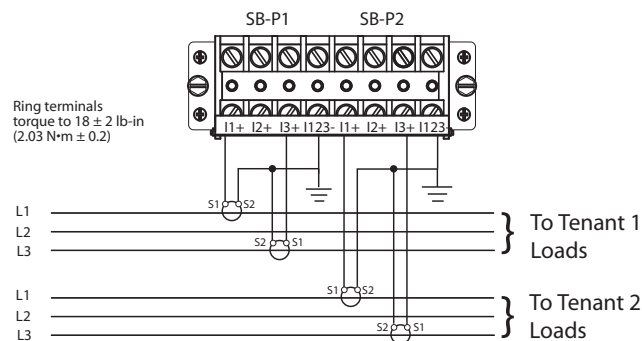


Voltage Connections for Figure 12



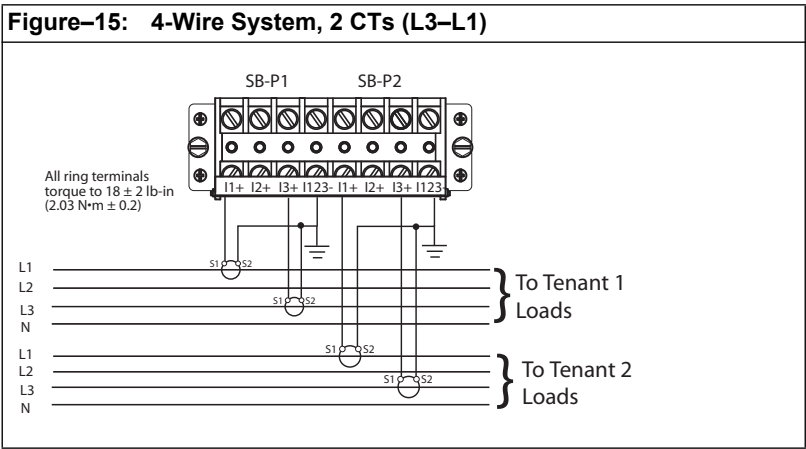
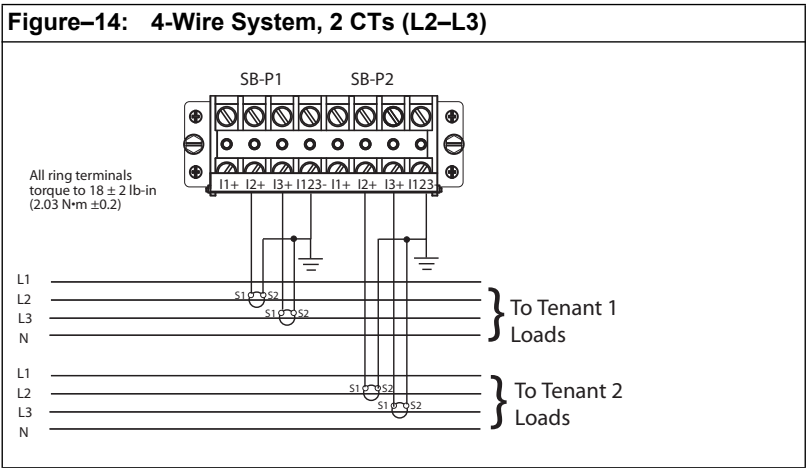
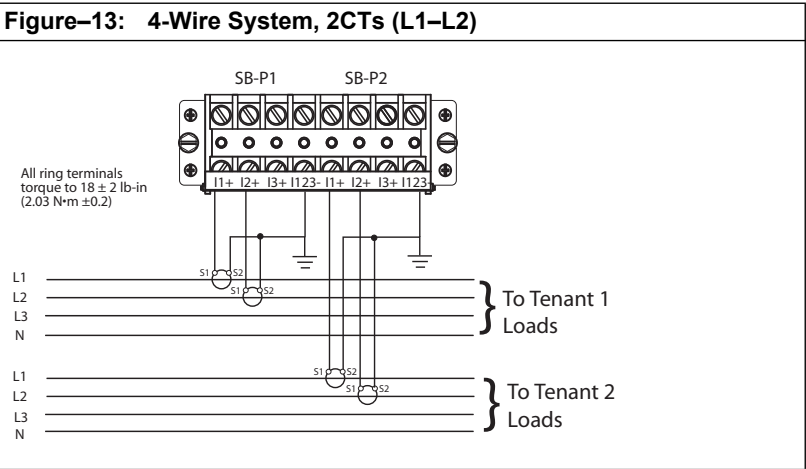
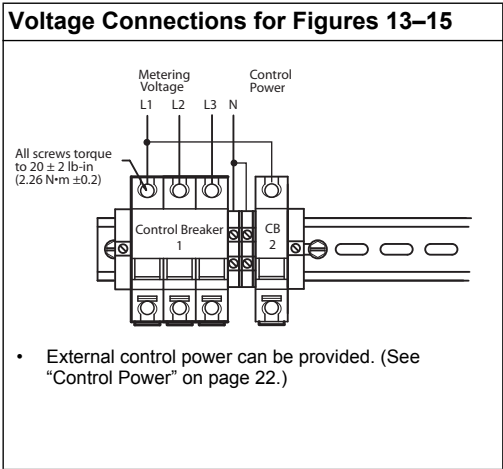
- External control power can be provided. (See "Control Power" on page 22.)

Figure-12: 3-Wire System, 2 CTs (L-L with L-N)



Single-Phase Tenants, Three-Phase Source

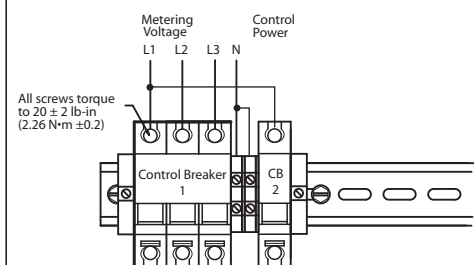
Refer to the applicable meter's user manual for details on basic setup configuration.



Three-Phase Tenants

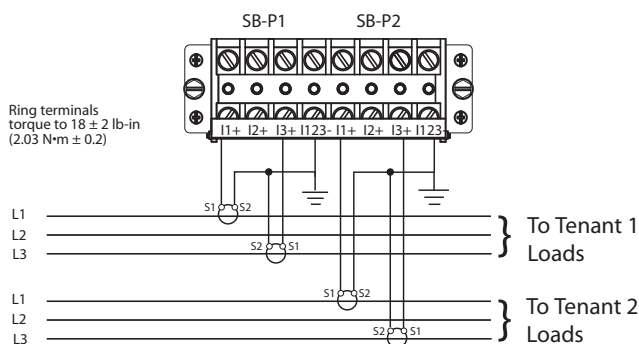
Refer to the applicable meter's user manual for details on basic setup configuration.

Voltage Connections for Figures 16–18

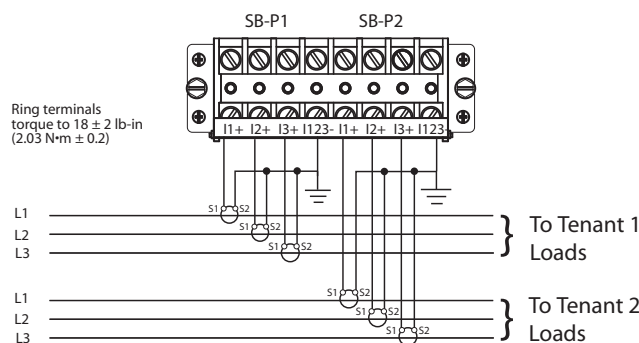


- External control power can be provided. (See "Control Power" on page 22.)

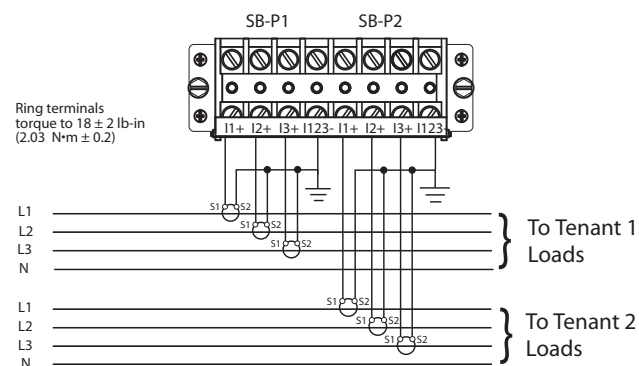
Figure–16: 3-Wire System, 2CTs, No PT



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

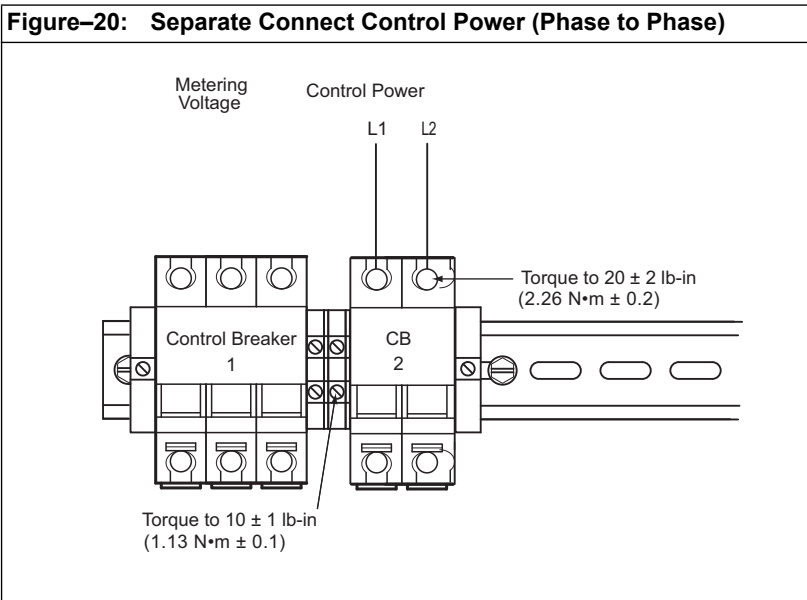
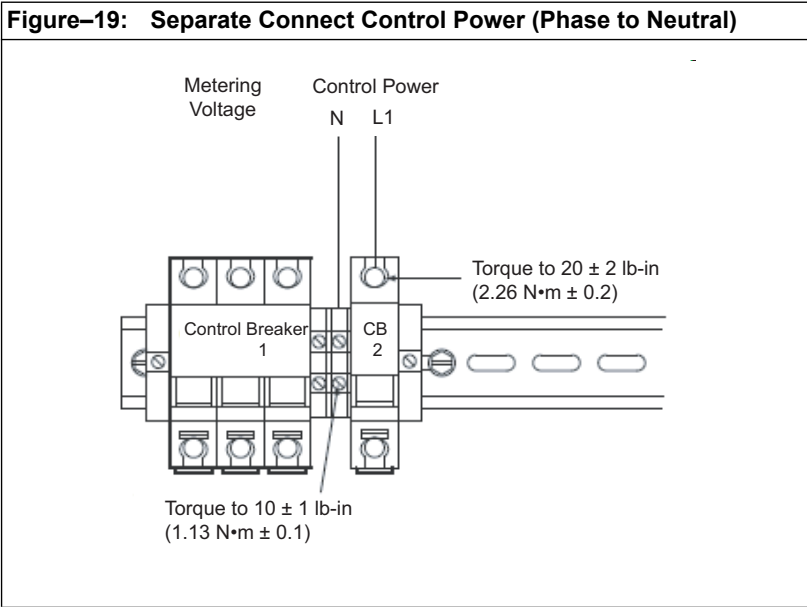


Figure–18: 4-Wire Wye Direct Voltage Input Connection, 3 CTs



Control Power

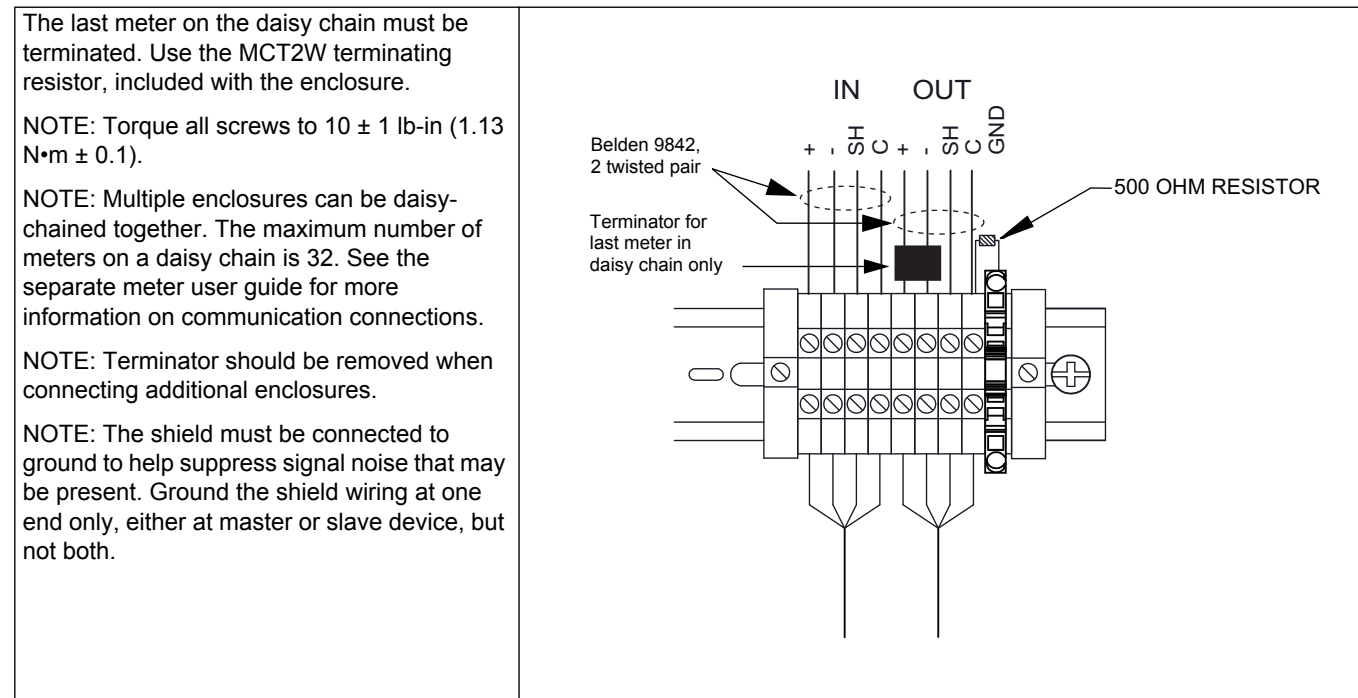
Using jumpers, control power can be derived from the phase conductors (see Figures 11–18). Control power can also be supplied by a separate feed (see Figures 19–20). Refer to the applicable meter's user manual for details.



Communications

The meters use common daisy-chain wiring and communicate using Modbus protocol over RS-485. Figure 21 shows the communications connections.

Figure–21: 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.

Expanding the High Density Metering System

The modular construction of the PowerLogic High Density Metering System makes it easy to add meters to an enclosure. See Table 1 on page 7 for part numbers and contact your local Schneider Electric representative to expand your system.

Adding a Meter to an Existing Harness

Each empty meter slot is pre-wired at the factory to receive a power meter. When adding more meters to an incomplete row, the additional meters are added to the harness and connected in the same way as those already installed.

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.

To add a meter, complete the following 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 enclosure.
3. Open the enclosure.
4. Open Circuit Breaker 1 (CB1) and Circuit Breaker 2 (CB2) inside the enclosure.
5. Use a properly rated voltage sensing device to confirm that power is OFF.
6. Remove the attached label from the shorting block that corresponds to the meter position being installed.

NOTE: The tag is present if the HDM was shipped from the factory with seven meters installed or if a meter has been removed following the procedure in "Removing a Meter" on page 25.

7. Install 4 shorting screws into position in the shorting block for the new meter. Torque to 18 ± 2 lb-in ($2.033 \text{ N}\cdot\text{m} \pm 0.1$).
8. Remove the blank cover plate on the door.
9. Install the new power meter following the installation guide provided with that power meter.
10. Connect external current transformer secondary leads to the shorting block. Refer to Figure 11 on page 19 through Figure 18 on page 21. Make sure the shorting block matches the position of the meter being installed.

11. Verify all electrical connections are secure and correctly terminated including those that may have been damaged or disconnected while adding the meter.
12. Remove previously inserted shorting screws (see step 7) from the shorting block.
13. Close Circuit Breakers 1 and 2.
14. Close the enclosure.
15. Close the user-installed disconnect switch located behind the enclosure.
16. Remove the tag from the main external breaker and energize the system.
17. Set up the meter. For information on setting up the meter, see the separate meter instruction bulletin.

Removing a Meter

If you need to remove a meter from the enclosure, a cover plate must replace it unless the meter is immediately replaced with another. See “Cover Plates” on page 26.

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.

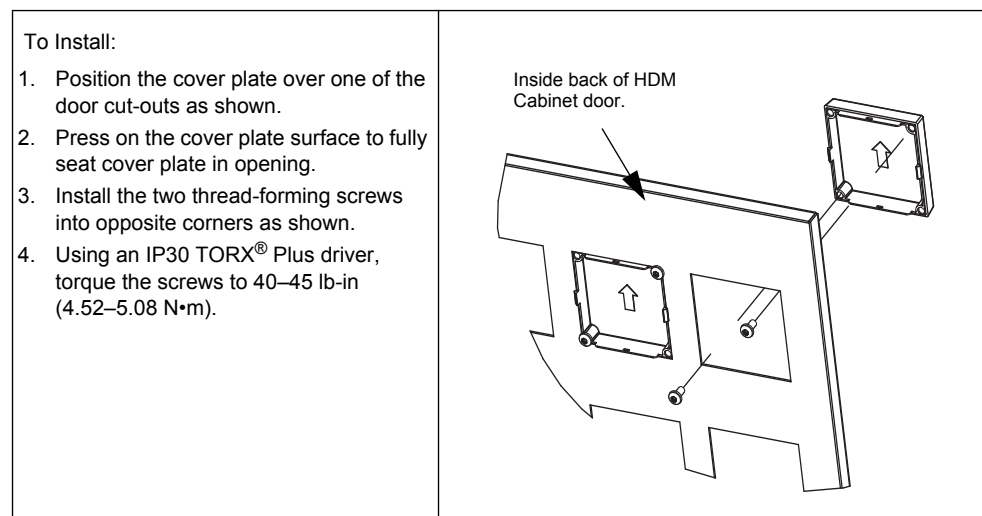
To remove a meter, complete these steps:

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 enclosure.
3. Open the enclosure.
4. Turn OFF Circuit Breaker 1 (CB1) and Circuit Breaker 2 (CB2) inside the enclosure.
5. Use a properly rated voltage sensing device to confirm that power is OFF.
6. Install 4 shorting screws into position in the shorting block for the meter to be removed. Torque to 18 ± 2 lb-in ($2.033 \text{ N}\cdot\text{m} \pm 0.1$).
7. Remove the meter following the reverse order of the installation procedure described in the meter's installation guide. Visit www.schneider-electric.com and search for this meter's model number to download its installation guide.
8. Insulate and restrain wires removed from the meter and verify that no other wires have been damaged or disconnected while removing the meter.
9. Install a blank cover plate on the door. Refer to Figure 22 on page 26.
10. Attach a label to the shorting block that corresponds to the meter position being removed.
11. Close Circuit Breaker 1 (CB1) and Circuit Breaker 2 (CB2) inside the enclosure.
12. Close the enclosure.
13. Close the user-installed disconnect switch located behind the enclosure.
14. Remove the tag from the main external breaker and energize the system.

Cover Plates

Cover plates are used to cover openings when no meter is present. All empty slots are covered with cover plates when the enclosure is shipped. Any time a meter is removed from the enclosure, a cover plate must be attached unless another meter is inserted into the slot. Figure 22 shows the cover plate assembly.

Figure—22: Cover plate



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