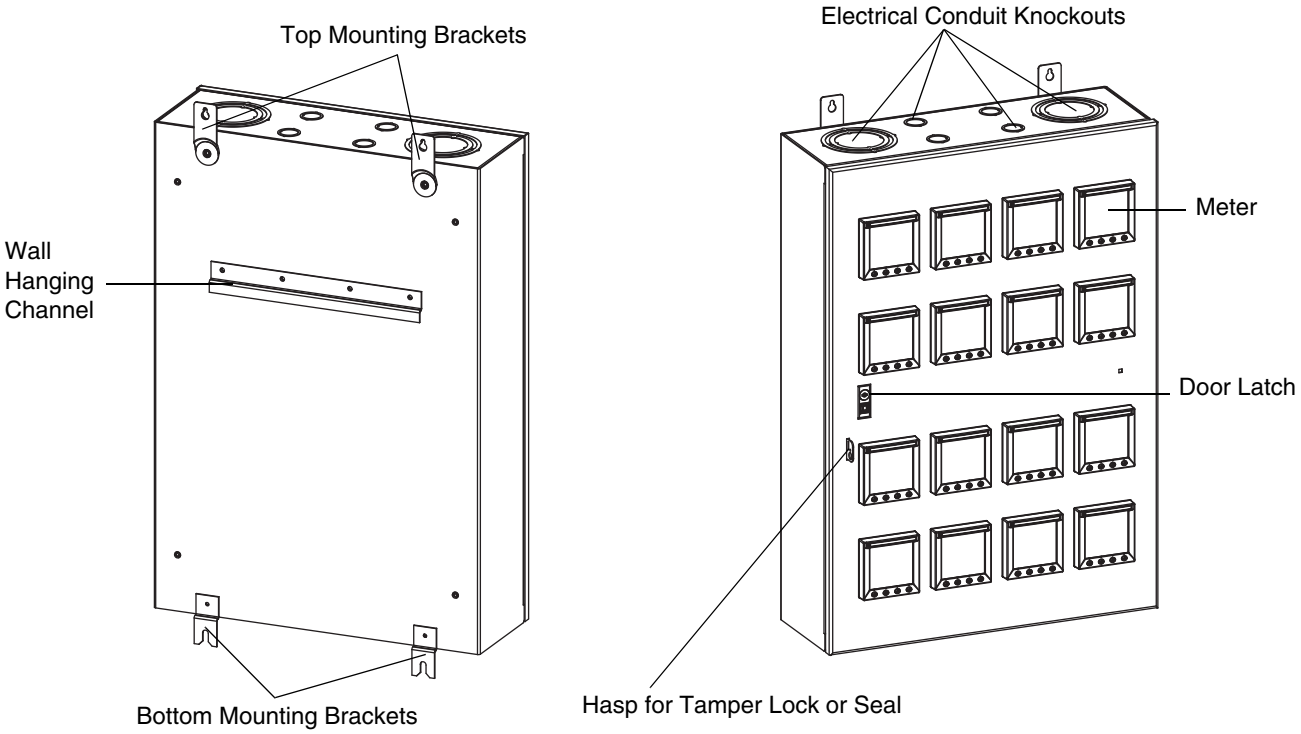
PowerLogic® High Density Metering System
Metering Cabinet
Installation Guide

Retain for future use.

INTRODUCTION

The PowerLogic® High Density Metering System is a sub-metering system 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. Figure 1 shows the front and back view of an enclosure.

Figure 1: Front and back view of enclosure



Each meter is assigned to a tenant who occupies an individual unit within 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 as a means of monitoring 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.

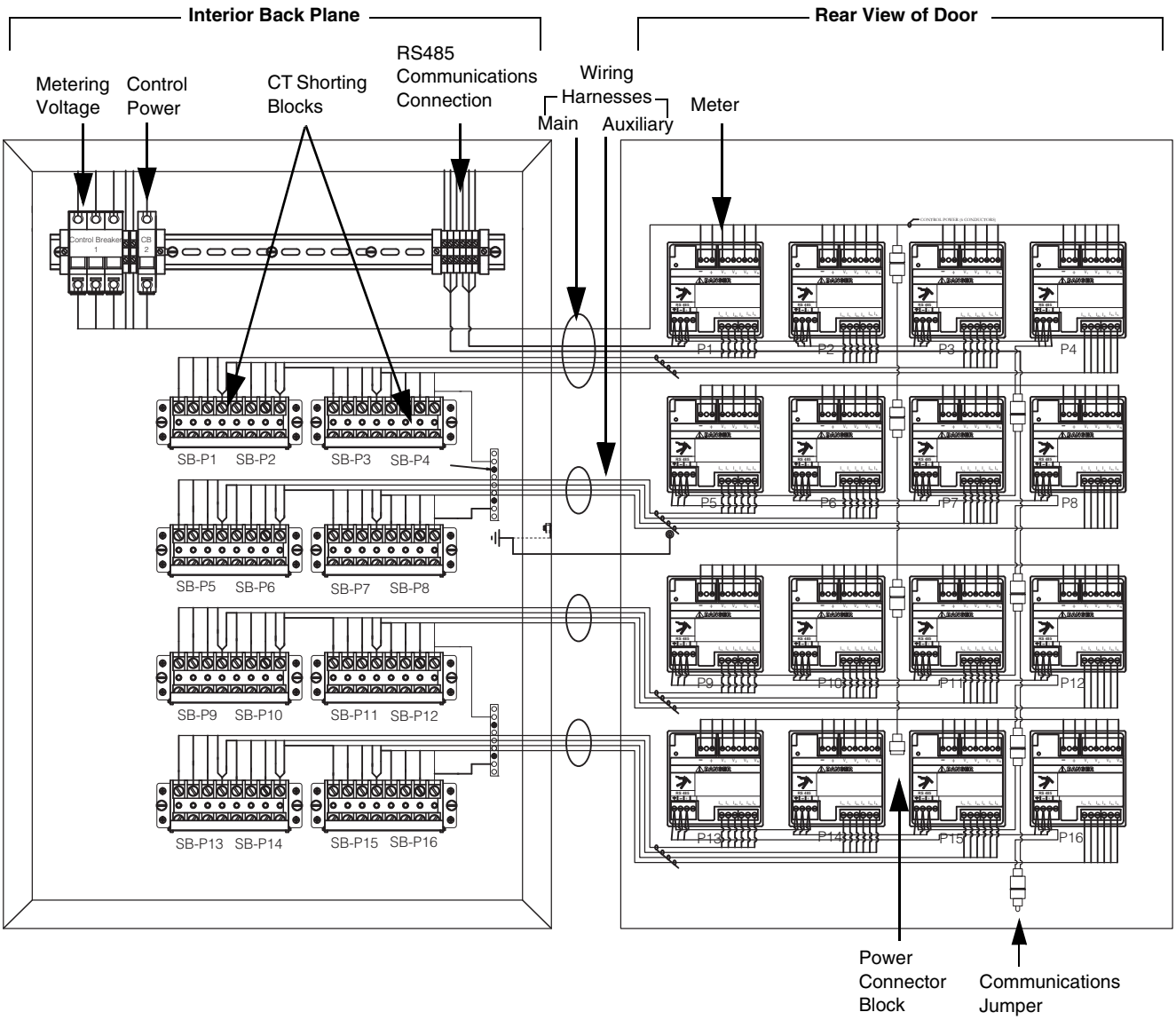
The enclosure is available in the following sizes:

- 8-meter model—contains up to 8 meters
- 16-meter model—contains up to 16 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 identifies the interior sections of the enclosure.

Figure 2: Enclosure interior

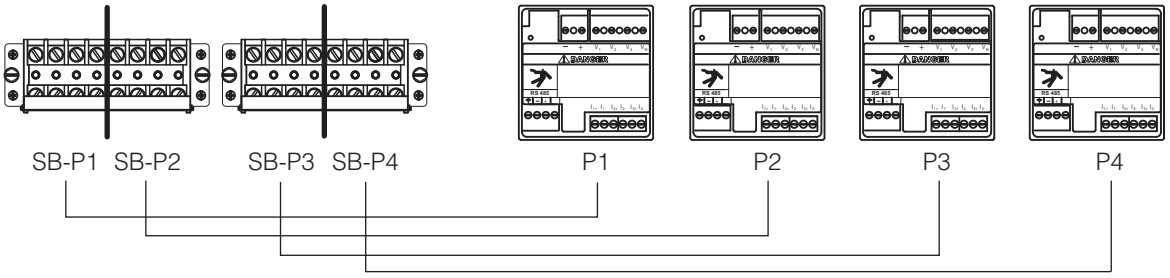


The meters are arranged in a grid of 4 across and up to 4 rows down. When viewing the back of the meter grid (see Figure 2), the meter positions (P) are numbered sequentially from P1 to P*n*, *n* being the maximum number the enclosure will hold. Position P1 is in the top left position, position *Pn* is the right-most position of the bottom row.

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



Parts and Accessories

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 13 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.
Auxiliary Harness Assembly Kit	HDMPMHKIT27
Cover Plate Assembly Kit	96DINCVRPLT

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
- MCT2W terminating resistor
- Wiring diagram
- Shorting block information sheet
- Cover Plate Assembly Kit
- Installation bulletin for meters
- This installation guide

Topics Not Covered

Separate meter documentation is shipped with the enclosure. For more information on the meters, see the separate meter installation bulletin (also available in the technical library at *www.powerlogic.com*).

PowerLogic®Tenant Metering Software is purchased separately and includes installation and use instructions.

SAFETY PRECAUTIONS

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must be installed and serviced only by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm that power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.
- Before energizing enclosure, all unused spaces must be filled with blank covers.

Failure to follow this instruction will result in death or serious injury.

SPECIFICATIONS

Table 2: Technical specifications

PHYSICAL CHARACTERISTICS	
Dimensions	
8 openings	W 21.875 inches, H 21.125 inches, D maximum of 8.701 inches (includes meter)
16 openings	W 21.875 inches, H 31.25 inches, D maximum of 8.701 inches (includes meter)
Mounting	Wall mount
Maximum Weight	
8 openings	Approximately 55 lbs.
16 openings	Approximately 80 lbs.
COMMUNICATIONS	
RS485 port	2-wire, up to 19200 baud, Modbus RTU
POWER	
Control power	
AC	115 to 415 ± 10% Vac, 5 VA; 50 to 60 Hz
DC	125 to 250 ± 20% Vdc, 3W
CT inputs	5 A nominal, 6 A maximum
ENVIRONMENTAL CHARACTERISTICS	
Operating temperature	0° C to +55° C
Storage temperature	-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
SAFETY	
US and Canada	
Enclosure	UL 50, Type 1; UL 508A; FCC Class B

MOUNTING THE ENCLOSURE

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

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.

⚠ CAUTION

LIFTING HAZARD

- Note weight of enclosure before lifting. See Table 2 on page 4 for weight amounts.
- Observe safe lifting practices when mounting the enclosure.

Failure to follow this instruction can result in personal injury.

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.

CAUTION

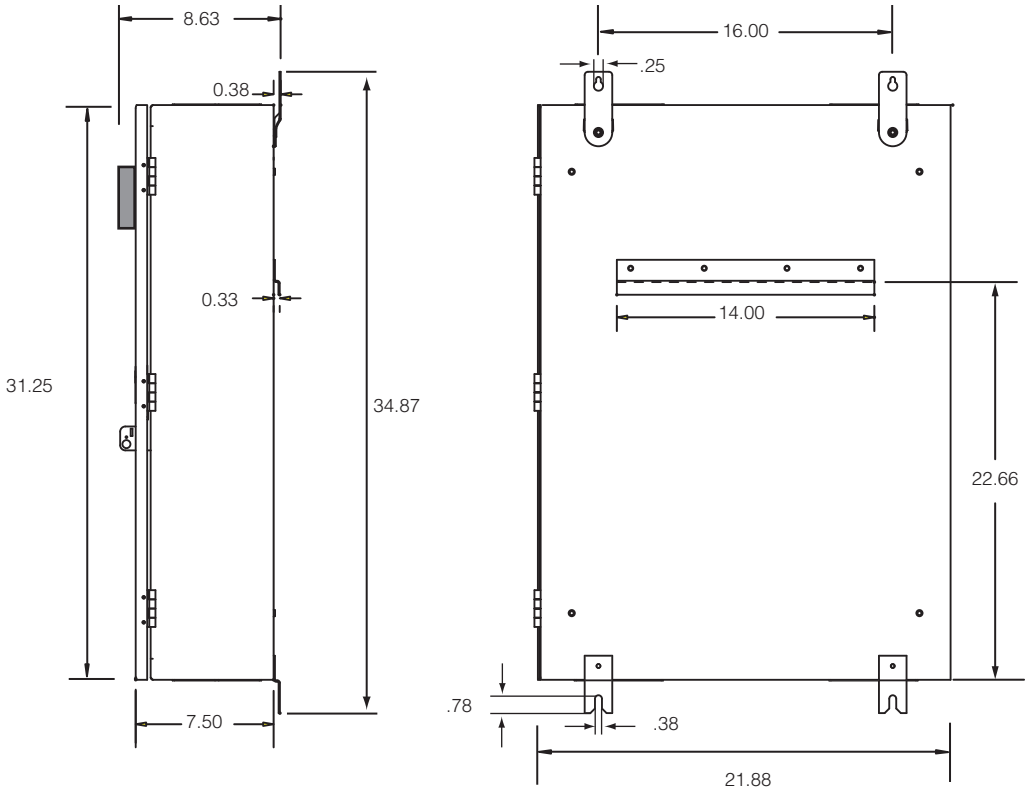
EQUIPMENT DAMAGE HAZARD

- Do not drill into the enclosure. Drilling can produce metal shavings that may fall into vents, reduce spacings, and possibly create electrical short circuits.

Failure to follow this instruction can result in equipment damage.

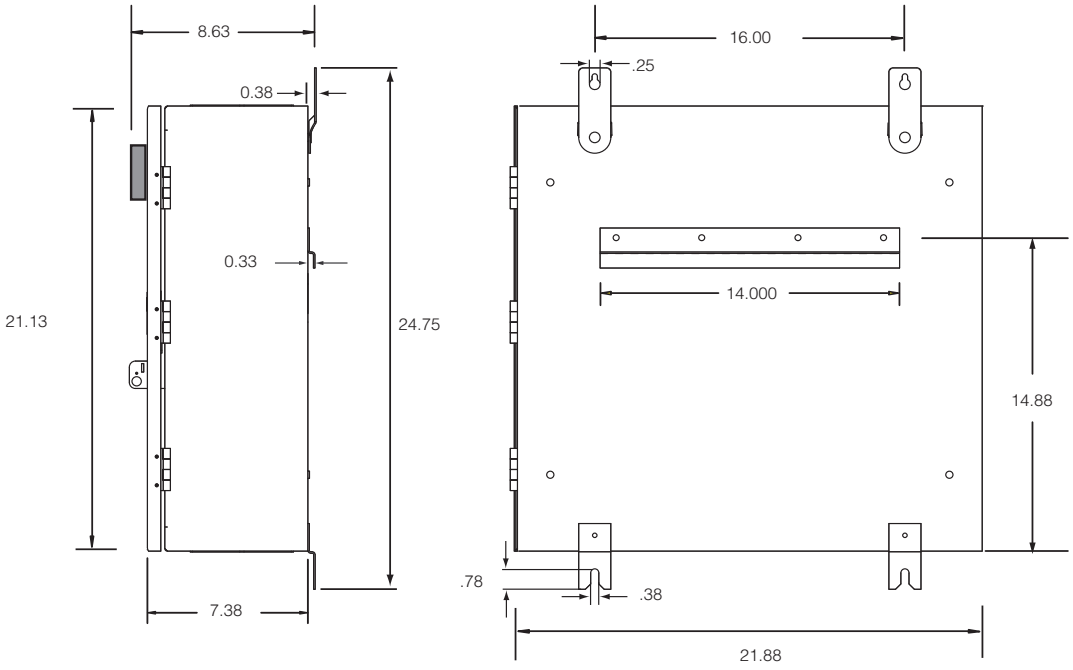
Mounting Dimensions (16-meter cabinet)

Measurements shown are in inches.



Mounting Dimensions (8-meter cabinet)

Measurements shown are in inches.



WIRING CONNECTIONS

The PowerLogic High Density Metering System can accommodate the following system types:

- 3-phase, 4-wire up to 480 volts

  NOTE: For 3-phase, 3-wire applications, please consult with your Schneider Electric sales representative.

- single-phase, 2-wire or 3-wire up to 240 volts

The enclosure is shipped with the wiring already connected to the meter(s) and shorting blocks. Conduit knockouts are provided on both the top and bottom of the enclosure. 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: The metering enclosure requires overcurrent protection external to the cabinet.

NOTE: The wiring configuration is designed specifically for the High Density Metering System application. Do not change the wiring configuration.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Turn off all power supplying this equipment before working on or inside equipment.
- Use a properly rated voltage sensing device to confirm that all power is off.
- Replace all devices, covers, and close all doors before turning on power to this equipment.
- Before energizing enclosure, all unused spaces must be filled with blank covers.
- Use only established wiring configuration designed for the High Density Metering System.

Failure to follow this instruction will result in death or serious injury.

Current Transformers

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

⚠ DANGER

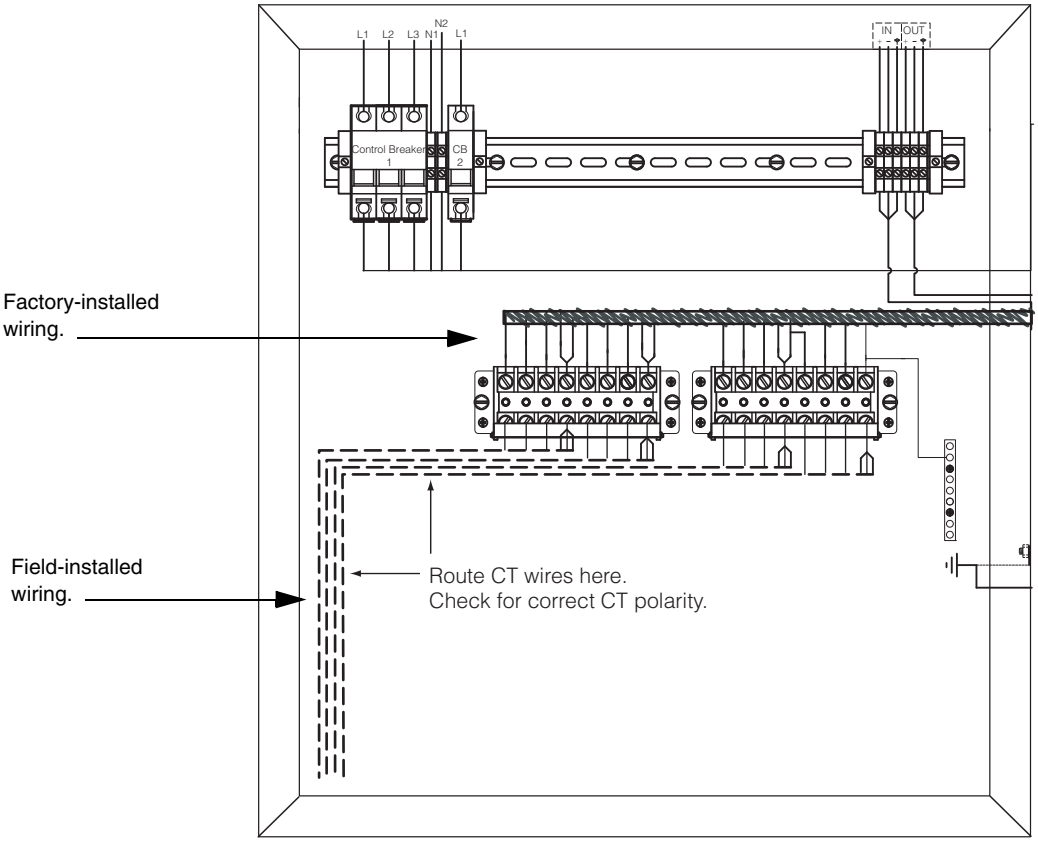
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Never open circuit a CT; use the shorting block to short circuit the leads of the CT before attaching or removing any meter.

Failure to follow this instruction will result in death or serious injury.

Route CT wires in the enclosure as shown in Figure 4.

Figure 4: Current transformer routing



Wiring Diagrams

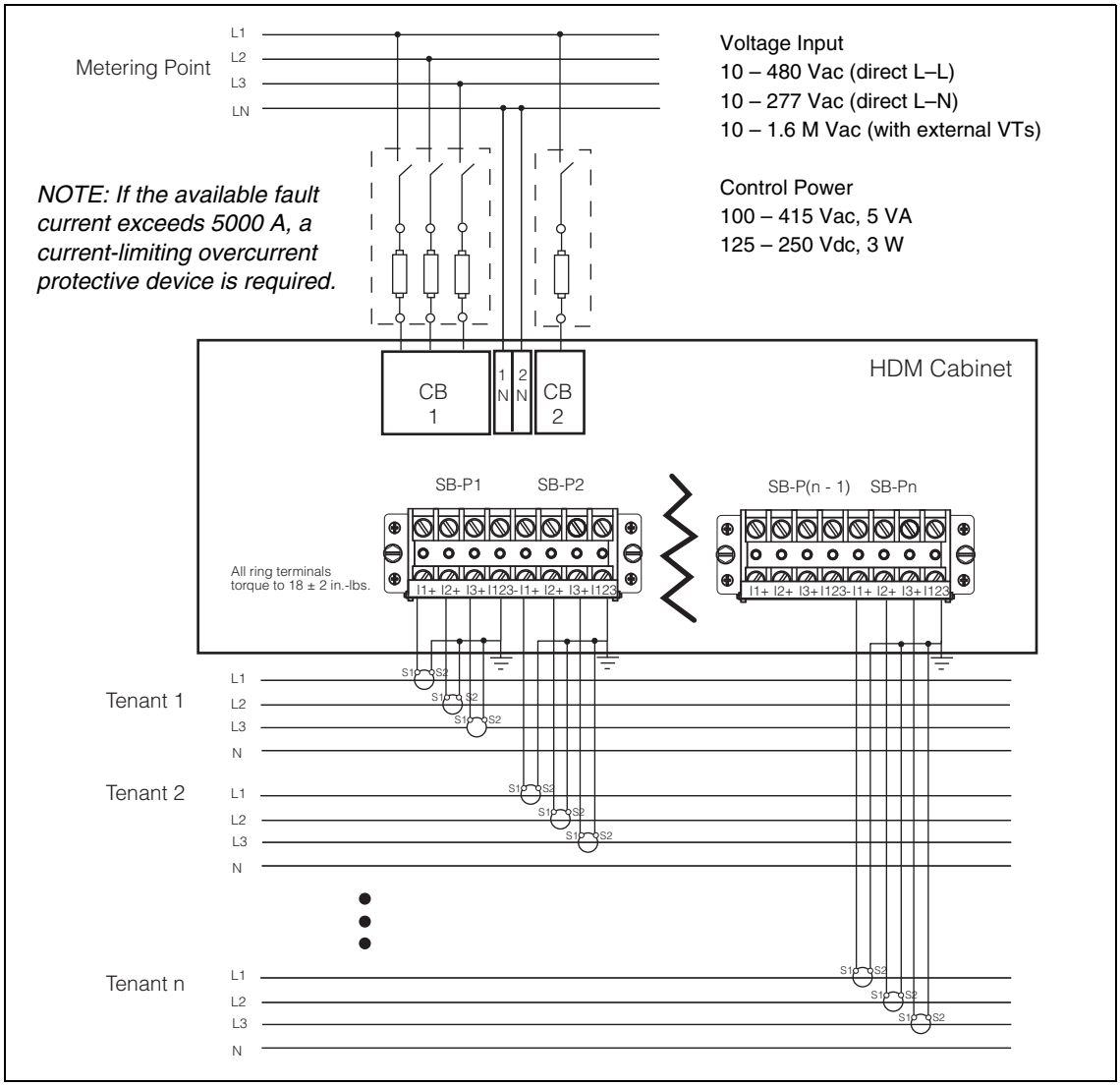
The wiring diagrams in this manual use the symbols shown in Table 3.

Table 3: Wiring Diagram Symbols

Symbol	Description
	Earth ground (GRD)
	Current transformer
	Fuse

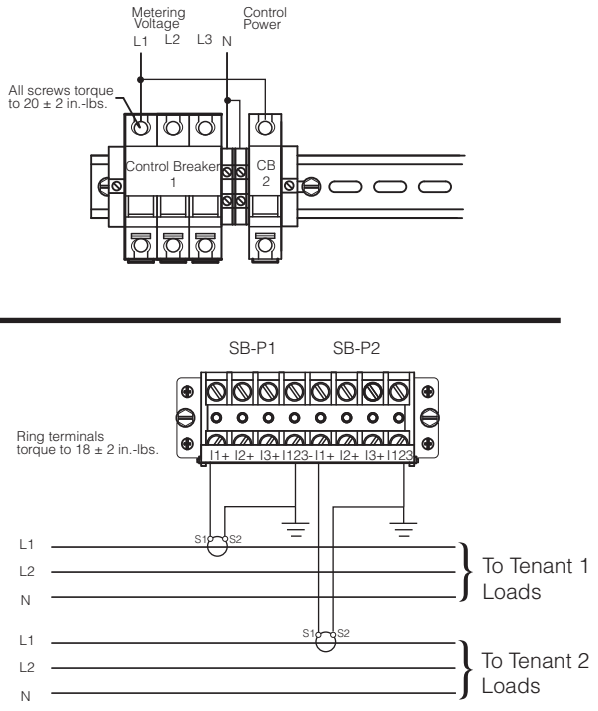
Figure 5 shows an overview of the field wiring configuration and how it scales depending on the number of meters in the enclosure.

Figure 5: Wiring configuration overview



Figures 6 – 8 show wiring diagram examples for different system types.

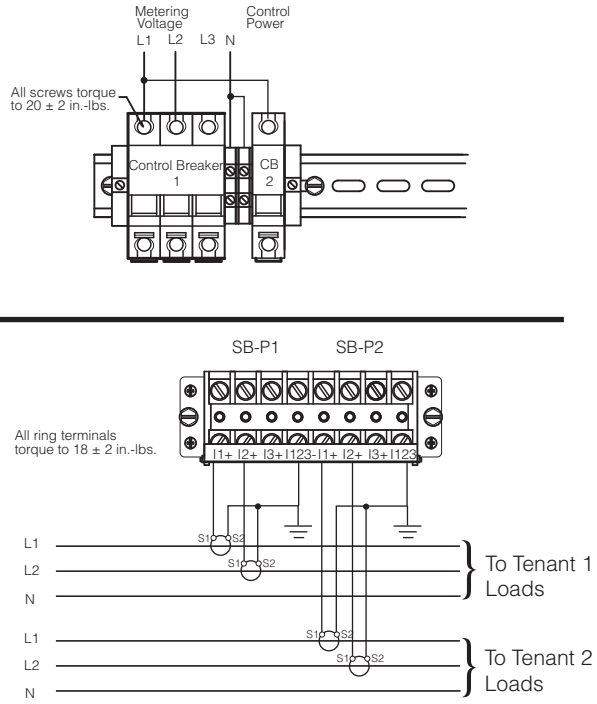
Figure 6: 1-phase 2-wire L-N with 1 CT



NOTES:

- Connect all CTs to the meters in the same way.
- Use system type 10. See the separate meter instruction bulletin for more information on system types.
- Control power range is100–415 Vac, 5 VA; 125–250 Vdc , 3W.
- External control power can be provided. (See “Control Power” on page 12.)

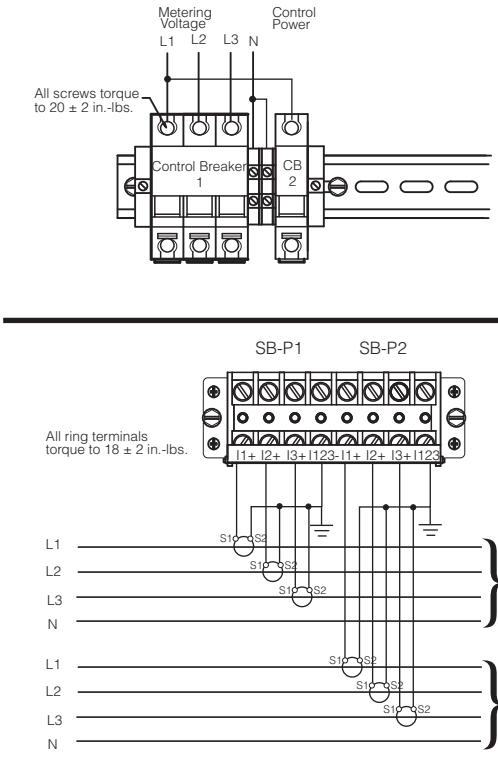
Figure 7: 1-phase Direct Connection with 2 CTs



NOTES:

- Connect all CTs to the meters in the same way.
- Use system type 12. See the separate meter instruction bulletin for more information on system types.
- Control power range is100–415 Vac, 5 VA; 125–250 Vdc , 3W.
- External control power can be provided. (See “Control Power” on page 12.)

Figure 8: 3-phase 4-wire Wye Direct with 3 CTs



NOTES:

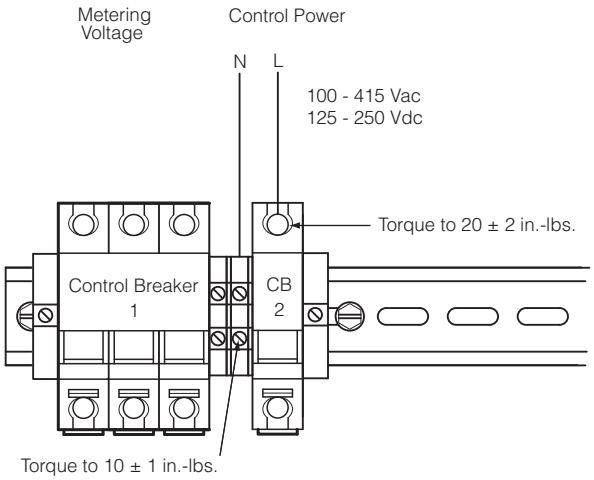
- Connect all CTs to the meters in the same way.
- Use system type 40. See the separate meter instruction bulletin for more information on system types.
- Control power range is100–415 Vac, 5 VA; 125–250 Vdc , 3W.
- External control power can be provided. (See “Control Power” on page 12.)

NOTE: For information on 3-phase, 3-wire wiring configurations, please consult with your local Schneider Electric sales representative.

Control Power

Using jumpers, control power can be derived from the phase conductors, as shown in Figures 6 – 8. Control power can also be supplied by a separate feed. Figure 9 shows an example of a separate control power connection.

Figure 9: Separate Connect Control Power (Phase to Neutral)



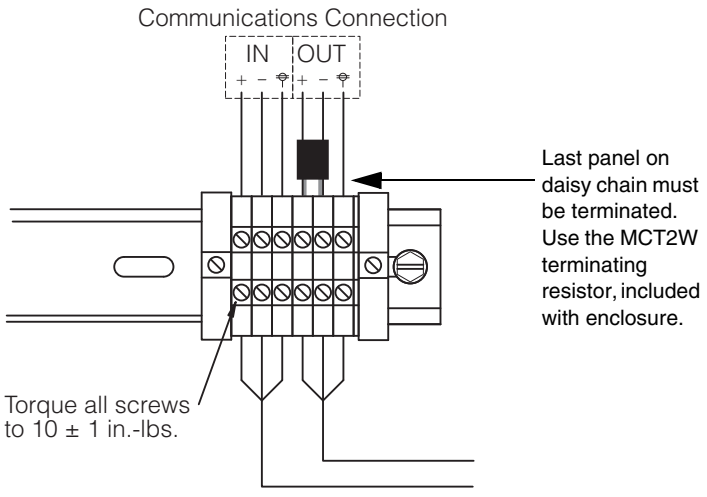
NOTES:

- Phase to Neutral only when voltage < 415 + 10% Vac maximum.
- All meters see the same voltage and control power wiring.
- See the separate meter instruction bulletin for more information.

Communications

The meters use common daisy-chain wiring and communicate using the RS485 Modbus communications protocol. The last meter in the chain must be terminated. Figure 10 shows the Communications connections on the DIN rail.

Figure 10: RS485 Serial Modbus connections.



NOTE: Multiple enclosures can be daisy-chained together. The maximum number of meters on a daisy-chain is 32. See the separate meter instruction bulletin for more information on communications connections.

NOTE: Terminator should be removed when connecting additional panels.

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 for part numbers and contact your local PowerLogic/Schneider Electric representative to expand your system.

Adding a Meter to an Existing Harness

The main wiring harness is shipped with the enclosure and accommodates up to four meters. 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.
- This equipment must be installed and serviced only by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm that power is off.
- Replace all devices, covers, and close all doors before turning on power to this equipment.
- Before energizing enclosure, all unused spaces must be filled with blank covers.
- Never open circuit a CT; use the shorting block to short circuit the leads of the CT before attaching or removing any meter.

Failure to follow this instruction will result in death or serious injury.

To add a meter, complete the following steps:

1. Turn OFF main breaker supplying this equipment.
2. Turn OFF Circuit Breaker 1 and Circuit Breaker 2 inside the enclosure.
3. Use a properly rated voltage sensing device to confirm that power is OFF.
4. Remove the attached label from the shorting block that corresponds to the meter position being installed.
5. Place 4 shorting screws into position in the shorting block for the new meter.
6. Remove the blank cover plate on the door.
7. Insert the meter into the door opening, display facing out.
8. Attach the meter's spring clips. These hold the meter in place.
9. Snap into place the voltage plug, control power plug, and communications plug. Each plug is labeled and pre-wired.
10. Remove the wire caps from meter CT leads.
11. Attach labeled current leads to the meter. Torque all screws to 4 in.-lbs.
12. Install meter CTs to the shorting block based on system type. Make sure the CT position matches the position of the meter being installed.
13. Verify all connections.
14. Remove previously inserted shorting screws from the shorting block.
15. Turn on Circuit Breakers 1 and 2.

continued

16. Energize the system.
17. Set up the meter. For information on setting up the meters, see the separate meter instruction bulletin.

Adding an Auxiliary Wiring Harness

When adding a new row of meters, an auxiliary wiring harness kit is required (see Table 1 on page 3 for part number). The kit contains an auxiliary wiring harness and shorting block assembly. A bag of shorting screws is also included. The auxiliary wiring harness accommodates up to four meters.

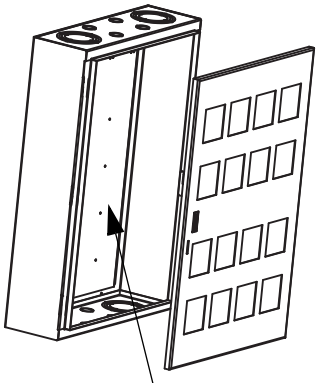
The enclosure is equipped with labels and pre-drilled mounting holes on the interior back plane for adding additional shorting blocks. Figure 11 on page 15 shows an abbreviated view of the wiring harness connections.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must be installed and serviced only by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm that power is off.
- Replace all devices, covers, and close all doors before turning on power to this equipment.
- Before energizing enclosure, all unused spaces must be filled with blank covers.
- Use only established wiring configuration designed for the High Density Metering System.

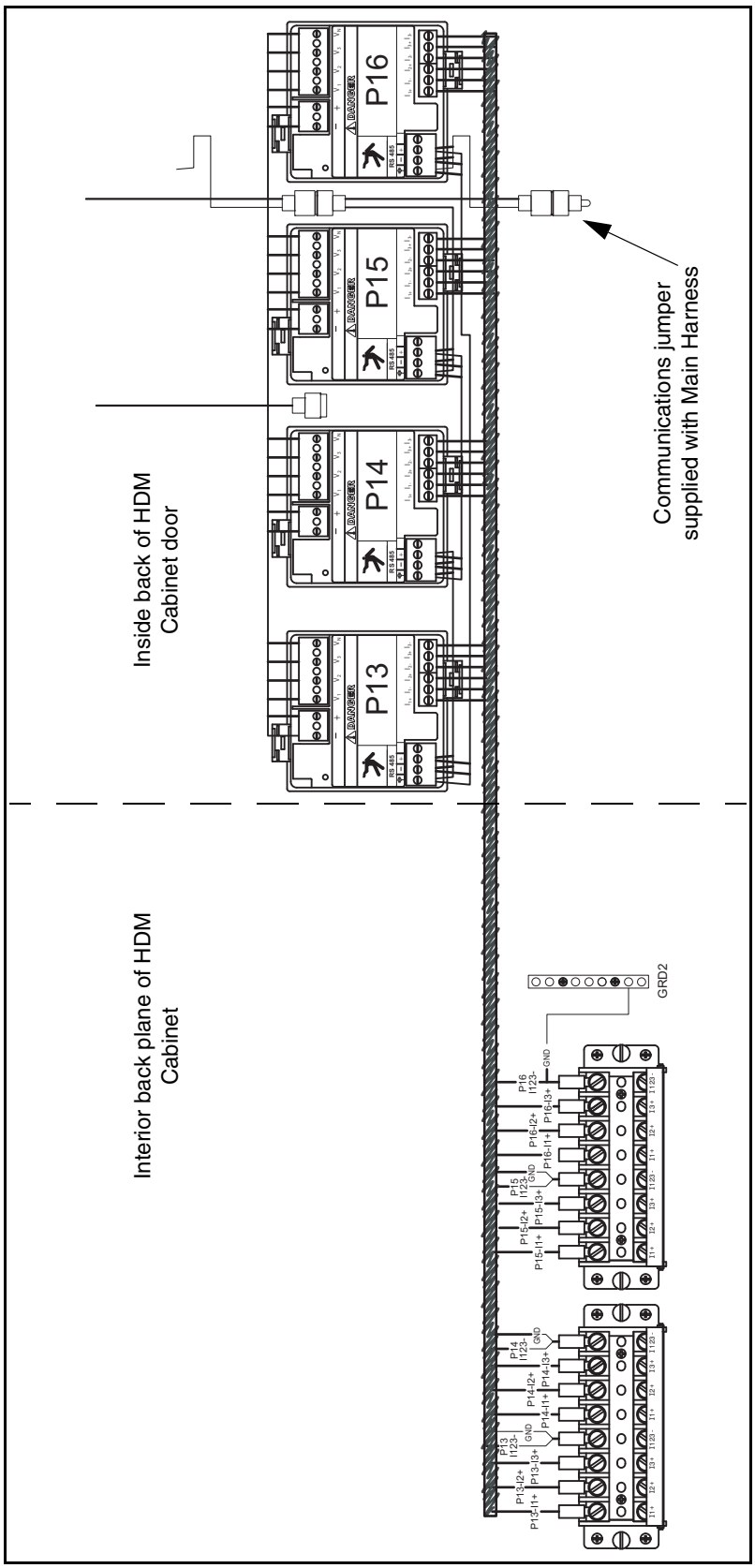
Failure to follow this instruction will result in death or serious injury.



To add an auxiliary wiring harness, complete the following steps:

1. Turn off main breaker supplying this equipment.
2. Turn off Control Breaker 1 and Control Breaker 2.
3. Use a properly rated voltage sensing device to confirm that power is off.
4. Install the shorting blocks into the interior back plane using the pre-drilled holes and labels as guides (the wires point toward the top of enclosure).Torque at 18 ± 2 in.-lbs. Do not over torque.
5. Attach the ground wire to the grounding bar. Torque at 20 ± 2 in.-lbs.
6. Remove the communications jumper from the row above.
7. Attach the auxiliary communications plug into the communications plug in the harness above. Then attach the communications jumper to the auxiliary harness plug.
8. Attach the auxiliary harness voltage plug to the voltage plug in the harness above.
9. See “Adding a Meter to an Existing Harness” on page 13 to add meters to the harness and energize the enclosure.

Figure 11: Abbreviated view of auxiliary harness connections



INITIALIZING THE METERS

The meters must be initialized before placing into service. For instructions on initializing the meters, see the separate meter instruction bulletin shipped with the cabinet (also available at *www.powerlogic.com*).

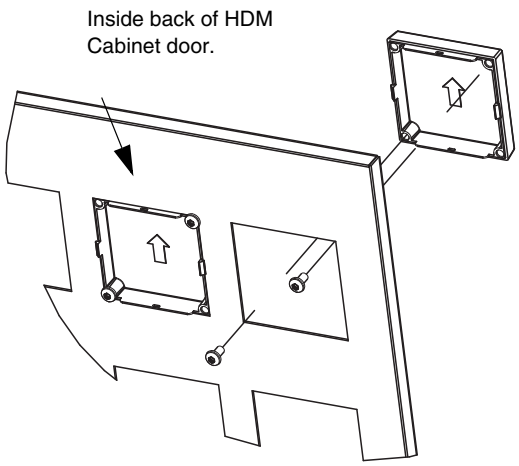
COVER PLATES

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 12 shows the cover plate assembly.

Figure 12: Cover plate

To Install:

1. Position the cover plate over one of the door cut-outs as shown .
2. Hook either the left or right locking tab into cut-out engaging edge of opening.
3. Rotate opposite tab until it contacts the edge of cut-out.
4. Press on cover plate surface to fully seat cover plate in opening.
5. Install the two thread-forming screws into opposite corners as shown.
6. Using an IP30 TORX® Plus driver, torque the screws to 40-45 in.-lbs.



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