Contents

Specifications:

See Eaton's *Product Specification Guide*, available on CD or on the Web.

CSI Format:	1995	2010
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Application Considerations and Definitions

Eaton's Pow-R-Line® family of distribution switchboards incorporates new design concepts that fit the ever-increasing need for applications on high short circuit systems, while retaining maximum flexibility, safety and convenience throughout the line.

Front Access

Front-access switchboards align at the rear, enabling them to be placed against a wall (Type Pow-R-Line C™ front accessible). If the main section is deeper than others, due to physical size of the main device, the necessary offset in lineup will occur in front, and the main section will be accessible from the side as well as from the front. Eaton also offers front accessible switchboards that align at the front and rear.

Rear Access

Rear-access switchboards align at the front and the rear. Bus maintenance and cable entry and exit require rear access. There are two types of rear accessible switchboards. Both types use the same incoming utility and/or main structures. The first type uses group-mounted feeder devices with panel construction (Type Pow-R-Line C rear accessible). The second type uses individually compartmentalized feeder devices with load side insulated bus bar extensions (Type Pow-R-Line *i*).

Individually Mounted

Larger overcurrent protective devices (OCPD) may be individually mounted. In most cases, this means that the OCPD is mounted vertically in the switchboard and is connected via bus bar. All insulated case circuit breakers, power air circuit breakers and bolted pressure contact switches are individually mounted. Molded case circuit breakers 600 A and above may be individually mounted when used as a main or as a feeder device feeding other OCPD within a section or adjacent sections.

Compartmentalized Feeder and Branch Devices

Compartmentalized molded case circuit breakers and fusible switches provide additional isolation. Individually mounted molded case circuit breakers and fusible switches through 1200 A are available in a compartmentalized, rear-access, rear-connected switchboard. See Pow-R-Line *i* switchboards in this section for details.

Standard Switchboard Height

Standard Pow-R-Line switchboard height is 90.00 inches (2286.0 mm). Contact Eaton for special heights.

Group Mounting

Group-mounted circuit protective devices are an assembly of units mounted on a panelboard type chassis. Units may be molded-case breakers, fusible switches, customer metering and surge protective devices.

A main molded case breaker or main fusible switch, within the sizes listed for panelboard design, can be included in the panel-mounted assembly in lieu of a separate, individually mounted unit.

Space Only for Future Devices Group-Mounted Construction

Where space only for future circuit protective devices is required, the proper space and a blank filler plate will be supplied. Connections and mounting hardware are not included.

Provision for Future Devices

Where provisions for future circuit protective devices are required, space for the device, corresponding vertical bus, device connectors and the necessary mounting hardware will be supplied.

Bus Bar System

Standard bus in the switchboards is tin-plated aluminum. Copper, silver-plated copper or tin-plated copper are also available.

Main bus and sub-main buses meet UL® and NEMA® standards for temperature rise on all Pow-R-Line switchboards. Special density rated bus is available.

Overcurrent Devices

To properly select and size overcurrent devices for use in a switchboard, the allowable temperature rise must be taken into account as to its effect on the tripping characteristics of the devices in question per UL 891.

Accordingly, the NEC® requires overcurrent devices to be rated not less than 125% of the continuous load they are protecting. To comply with this, an 80% derating factor must be used with all overcurrent devices such as molded case breakers and FDPW fusible switches unless they are tested and listed for application at 100% of the rating. All Magnum type breakers and bolted pressure switches are 100% rated.

Short-Circuit Rating

Standard bus and connectors on all switchboards are rated for use on systems capable of producing up to 65,000 A rms symmetrical short-circuit current at the incoming terminals.

Increased bus short-circuit ratings equal to that of connected switchboard devices, up to 200,000 A rms symmetrical, are available in most Pow-R-Line C switchboards when approved main devices are installed. UL labeled switchboard sections are marked with their applicable short-circuit rating.

When air power circuit breakers are used as feeder devices in a switchboard, these devices may experience up to a 30-cycle (1/2 second) delay if the instantaneous setting is turned off. Eaton has qualified our low voltage switchboards when air power circuit breakers are used as feeders (and mains) to 30 cycles. This rating is not recognized under the UL 891 standard. However, Eaton has witness tested the structure bussing with a qualified National Recognized Testing Laboratory (NRTL) at 30 cycles (1/2 second) up to 100 kAIC symmetrical.

Provision for Busway Entrance and Exit

Busway connections to switchboard sections include cutout and drilling in the top of the switchboard with riser connections from the switchboard device or bus, up to the point where the bus duct enters the switchboard. No connections are furnished external to the switchboard.

In all transactions involving busway attached to switchboards, it is essential that information regarding orientation of the busway with respect to the front of the switchboard be supplied to the coordinating assembly plant.

On Pow-R-Line C switchboards, a solid bus bar is used to connect the bus duct to the individually mounted main device, main or sub-main switchboard bus, or vertical main bus of panel-mounted circuit protective device panels. **Busway fed by group-mounted branch devices are cable connected.**

Aluminum riser connections are standard. Copper- or silver-plated copper is available as an option.

Transitions

Transition structures are required for connecting switchboards to the secondary of power center transformer (fluid filled), motor control centers, and for other special switchboard configurations such as "L" or "U" shaped lineups. In some applications, an extra structure complete with connections is required; in others, where switchboard depth and space permit, only the connection conductors are required. Refer to Eaton for these applications.

Auxiliary Structures

These are normally mounted adjacent to service structures or distribution structures, and used where incoming service or feeder conductors require additional space or facilities not included in the standard switchboard, such as:

1. Mounted adjacent to a top connected service structure and used as a cable pull structure where service conductors are brought in underground. Auxiliary structures are the same depth and height as the service structure, and are wide enough to accommodate the incoming cables.
2. Mounted adjacent to a service structure and used as a bus transition compartment for running riser bus from the load-side of the service structure up to top outgoing bus duct connection when distribution structures are not required. Auxiliary structures are the same depth and height as service structures.

In addition to the above applications, auxiliary structures may be mounted adjacent to a distribution structure and used as a structure for lighting panel or other device that may be cable-connected to a branch circuit device in the distribution structure. Dimensions are compatible with the arrangements required.

Switchboards Used as Service Equipment

Service equipment is the electrical equipment that constitutes the main control and means of power cutoff the electric service (normally Power Company supply) brought into the building.

Where switchboards are to be used as service equipment, certain NEC and UL requirements apply that necessitate modifications not normally supplied in switchboards.

The following is a summary of the requirements that are pertinent to the application of a switchboard for service equipment:

A. A switchboard with main lugs only (no main disconnect) must be designed so that all circuits in the switchboard can be disconnected from the supply source by the operation of no more than six operating handles (breaker or switch).

   Switchboard equipped with main disconnect devices are not subject to the above six disconnect limitation, as the entire board can be de-energized with the main disconnect device.

   Ground fault protection of equipment must be provided for solidly grounded wye electrical services of more than 150 V to ground, but not exceeding 600 V phase-to-phase for each service disconnecting means rated 1000 A or more.

B. For testing purposes, means are also required to disconnect the switchboard neutral bus from the grounded service neutral conductor (single-phase, three-wire; and three-phase, four-wire systems). To comply with this requirement, a removable link (solid bar) is provided in the switchboard neutral bus. This link is generally located near the point where the main feeders enter the switch-board or in the area of the main disconnect device where one is provided.

To further comply with NEC and UL requirements, a separate bonding strap is connected from the neutral bus to the switchboard frame. This bonding connection is located on the line side of the removable neutral link, maintaining a service ground to the switchboard frame when the test link is removed. See **Figure 21.0-1**.

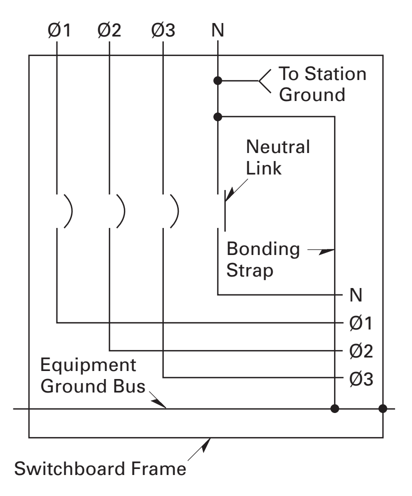


Figure 21.0-1. Neutral Link

UL labeling will clearly indicate service equipment listed switchboards.

Underwriters Laboratories Requirements and Labeling

The basic requirement for obtaining a UL label on a switchboard, is that all the component devices (breakers, switches, and so on) in the switchboard assembly are UL listed. In addition, the switchboard must comply with all applicable provisions of UL 891.

Today's modern electrical systems require that switchboards offer a wide selection of electrical devices, many of which do not fall within the scope of UL listed devices. Therefore, the conditions under which a switchboard may be labeled are limited.

Listed below are several important guidelines for consideration when a UL label is specified:

1. UL nameplates, where applicable, are supplied for each vertical structure rather than one common nameplate for the complete switchboard lineup. Where all of the component devices in the switchboard are UL listed and all applicable provisions of UL 891 are met, each of the switchboard sections may be labeled.
2. Individual vertical structures of a switchboard may be labeled where they comply with UL requirements, although other vertical structures in the same switchboard lineup may not meet the UL standards, and will not be labeled.
3. All Pow-R-Line C switchboards are UL labeled when all mounted devices are UL listed.

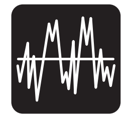
Alternate Power Source Capabilities

Multiple solutions are available to accommodate alternate power sources available. Due to the large number of customer and system requirements, details are not provided in this guide. Eaton offers solutions that include main-main configuration and main-tie-main configurations. Automatic transfer equipment, including UL 1008 listed transfer switches and other automatic transfer schemes, are available.

Automatic Transfer Equipment

For continuity of service, automatic transfer equipment between two incoming sources may be required. This equipment transfers the load upon failure of the normal (or preferred) source to the standby (or alternate) source. Upon restoration of the normal source, the load is automatically transferred back to it. To accomplish this, electrically operated main protective devices (and bus tie devices, if required) must be employed. Additional relays also are required to detect source voltage failure and to transfer control power, when required. A manual selector switch is usually provided to select the mode of operation—automatic or manual transfer.

Seismic Qualification



Refer to **Tab 1** for information on seismic qualification for this and other Eaton products.

Power Xpert Release Trip Unit

Power Xpert Release Trip Unit

Description

Eaton's Power Xpert Release (PXR) trip units are programmable communicating microprocessor-based low-voltage electronic trip unit systems for Eaton insulated case circuit breakers. PXR trip units are available in two models: PXR20 and PXR25.

The PXR electronic trip units provide an enhanced and easy-to-use interface that enables end users and maintenance engineers to more easily change set points, test and configure circuit breakers, and review energy and power information. Also, the Power Xpert Protection Manager software provides the capability of secondary injection tests and reports on-demand without the need of expensive test kits.

Standards and Certifications

The PXR trip units are listed by Underwriters Laboratories (UL) and Canadian Standards Association (CSA) for use in Series NRX™ NF and Series NRX RF circuit breakers. All PXR units have also passed the IEC 60947-2 test program that includes EMC testing. All trip units meet the low-voltage and EMC directives and carry the CE mark.

Features

Table 21.0-1. Power Xpert Features

Trip Unit	PXR 20	PXR 25
Diagnostics and Indication Features		
Trip Log	10 trip events 200 summary Additional storage available via CAM module	
Alarm log	10 alarm events—through COM	
Waveform capture	One waveform event captured in ETU	
Display	LCD dot matrix	
LEDs	ETU Status, Long trip, Short trip Instantaneous trip, Ground trip, ARMS status	
Power for cause of trip LEDs	Control power or battery	
Battery Indication	Display (no PTT)	
Maintenance/wellness health and diagnostics	ETU temp. and max. Trip count Ops count / last date Operating (run) time Health bar (algorithm)	
PXR Metering, Communications and Other Features		
Metering—current	Yes Phase, Neutral, Ground, min., max., demand, peak	
Metering—voltage	No	Yes L-L, L-N, avg. min., max., Frequency, min., max.
Metering—power	No	Yes kW, kVA, kvar Demand-kW, kVA, kvar Peak Demands
Metering—Energy	No	Yes kWh-fwd, rev, net, tot kvarh-lead, lag, net, tot
Metering—PF apparent	No	Yes min., max.
Communications	Modbus RTU optional CAM modules opt.	Modbus RTU native CAM modules opt.
Testing method	PC via USB port Internal Secondary injection test circuit	
Relay outputs—alarms or trips	3	
QR code—support information	Yes	
Password—setting menu and test	Yes	
RoHS	Yes	
Protection Features		
Ordering options	LSI, LSIG/A	
Number of sensors	1 Sensor—NF 1 Sensor—RF	
Sensor (rating) plug (I_n)	No plug Programmable I_n (21)	
Slopes	It, I^2t, I^2t IEEE—MI, VI, EI	
System frequency	50 / 60 Hz	
Long delay pickup (I_r)	0.4 –1.0 x (I_n)(10)	
Long delay time I^2T at 6x (I_r)	0.5–24 s (10)	
Long delay thermal memory	Yes—Program disable	
Short delay pickup	1.5–10 x (I_n)(10)	
Short delay time I^2t at 8x (I_r)	0.1, 0.3, 0.4, 0.5 s	
Short delay time flat	0.0, 0.1, 0.2, 0.3, 0.4, 0.5 s	
Instantaneous pickup	2–15 x (I_n)(10)	
Ground (earth) fault pickup	Trip: 0.2–1.0 x (I_n)(5) Alarm: 0.2–1.0 x (I_n)(4) Off	
Ground (earth) fault time I^2t at 0.625 x (I_n)	0.1, 0.2, 0.3, 0.4, 0.5 s	
Ground (earth) fault time flat	0.1, 0.2, 0.3, 0.4, 0.5 s	
ZSI, short delay and ground	Programmable Display indication	
Neutral protection	Yes Off, 60, 100%	
ARMS—arc flash—mode/settings	Optional—on or off/remote 5 settings (x I_n)	

Power Xpert Meters 2000

Power Xpert Meters 2000

The Power Xpert 2250 Meter

This meter provides all the core functions for monitoring power consumption and power quality, Ethernet connectivity and onboard gateway card limits. This unit uses D/A technology to sample circuits at 400 samples per cycle for extremely accurate measurement of power factor and energy consumption. In addition, the meter has 256 MB for logging meter data.

The Power Xpert 2260 Meter

This meter adds the ability to monitor total harmonic distortion and the ability to set onboard meter limits. The meter also will illuminate LEDs on the faceplate, indicating that a limit has been exceeded and provides 512 MB for data logging.

The Power Xpert 2270 Meter

This meter adds the ability to monitor individual harmonics and visualize waveforms on your desktop using the embedded Web server and raises the storage to 768 MB for data logging.

Meter series benefits include:

- Fully understand your facility's power quality
- Detailed event information; pinpoint the root causes of problems—or prevent them from occurring
- Measure, trend and analyze power via information through onboard Web and comma separated values (CSV) exporting capabilities
- Up to 768 MB of storage; typically 15 years of storage capability depending on the meter model and frequency of events
- Local or remote configuration

Power Xpert Meter 4000/6000/8000

Power Xpert Meter 4000/6000/8000

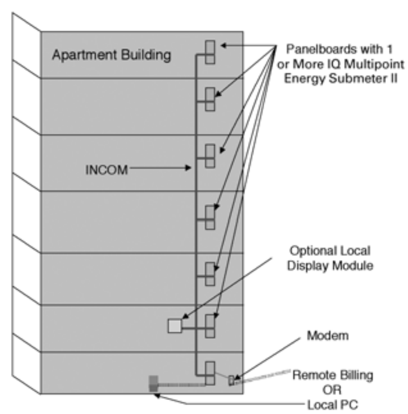
- The Power Xpert Meter 4000/6000/8000 series is an Internet-enabled (including a built-in Web server), power quality and energy meter with comprehensive power and energy measurement, and integrated quality analysis. These meters allow you to use a standard Web browser to surf the meter and visualize a waveform and analyze trends
- Accurate detection of fast transients
- Early warning of impending problems
- At-a-glance view of power quality
- Reduces power monitoring cost
- Supports continuous, non-disruptive monitoring
- Accessible via the Ethernet
- Uses industry-standard communication protocols

IQ 130/140/150

IQ 130/140/150

Providing the first line of defense against costly power problems, Eaton's IQ 100 electronic power meters can perform the work of an entire wall of legacy metering equipment using today's technology.

- 24-bit AD converters that sample at more than 400 samples per cycle
- Meet ANSI C12.20 standards for accuracy of 0.5 percent
- Confidently used for primary revenue metering and submetering applications
- Direct-reading metered values such as watts, watt demand, watthours, voltage amperes (VA), VA-hours, VARs, VARhours and power factor
- Also available in Eaton's enclosed meter product



IQ 250/260

IQ 250/260

The IQ 250 and IQ 260 electronic meters provide capabilities you wouldn't normally expect in an affordable, ultra-compact meter—such as fast sampling rate and accurate metering for a full range of power attributes. Built-in slots allow for future upgrades.

- Comprehensive metering
- High-end accuracy
- Self-test capability to validate accuracy
- Large, easy-to-read display
- Local or remote configuration
- Industry-standard communication protocols
- Mix-and-match input/output options
- Integration with Eaton's Power Xpert Architecture
- Field-upgradeable

Note: For full technical information, see **Tab 3**.

For information on other available power meters, visit www.eaton.com/meters.

Power Xpert Gateway

Power Xpert Gateway

Eaton's Power Xpert Gateway (PXG) bridges the IT and facilities management worlds by bringing disparate panelboards, switchboards and other power equipment onto the network. The PXG takes the complexity out of connecting power equipment to the network. The Web-enabled PXG is an out-of-the-box device that can support up to 96 devices, translate most industrial communication protocols, and offer user-selectable events and real-time trending. It also features e-mail notification of events, waveform capture and data/event logging—all with no special software. Adding basic meters or the utility's meter, the PXG assists in tracking energy usage. The PXG recognizes the interdependence of IT systems and power systems, and delivers what organizations need to bring these worlds together for seamless, end-to-end system reliability.

The PXG consolidates data available breakers, meters, motor controllers and protective relays, and presents the information in a variety of ways (a Web browser being the most widely used method). The PXG is a stand-alone solution. As needs change and grow, the PXG can be integrated through Power Xpert Software into a broader solution that encompasses other intelligent hardware and can integrate with third-party network management systems (NMS) or building management systems (BMS) for system-wide monitoring and reporting of power and IT.

For detailed information, please refer to **Tab 2**.

Integrated Surge Protective Devices

Integrated Surge Protective Devices

Eaton integrates our industry-leading surge protective devices (SPD) in to switchboards. Lead length is kept to a minimum to maximize SPD performance. SPD units are available with ratings up through 400k, and are UL listed and labeled to UL 1449 3rd Edition.

All switchboards with integrated SPD units are connected to a lineside overcurrent protective device for disconnecting means. When applied on the lineside of a service entrance main, the disconnecting means does not count as a service disconnect per National Electrical Code Article 230.71[A].

For complete SPD product description, application and ratings, refer to **Tab 34**.

Pow-R-Line C Switchboards

Meets NEMA Standard PB-2 and UL 891.

Construction Details

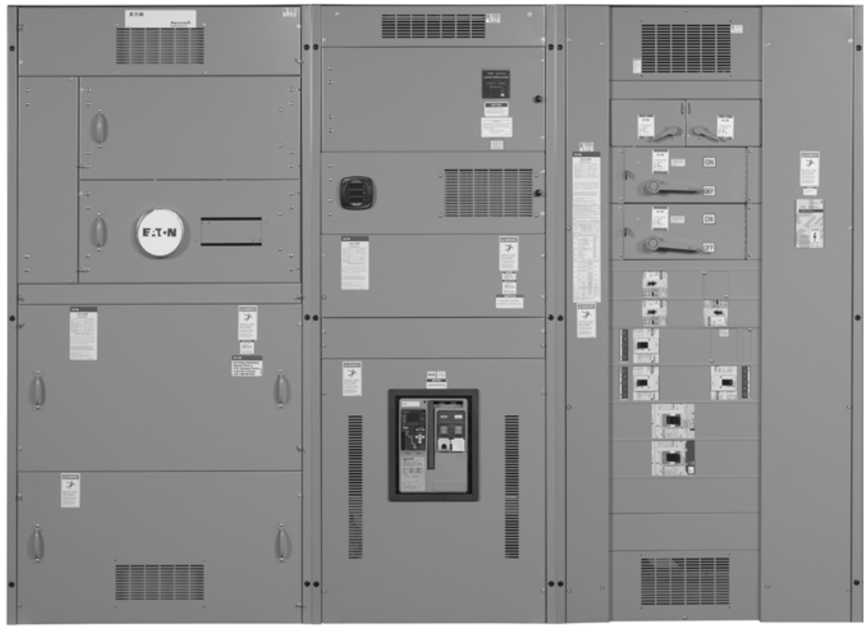
- 6000 A main bus maximum
- Front accessible—main sections front- and/or side-access
- Front- and rear-access; main sections front- and/or side-access
- Feeder devices group-mounted
- Sections rear-aligned or front- and rear-aligned

Main Devices, Individually Mounted

- Molded case circuit breakers, 400–2500 A, fixed-mounted
- Insulated case circuit breakers, Magnum SB, 800–5000 A, fixed and drawout
- Air power circuit breakers, Magnum™ DS, 800–5000 A, fixed or drawout
- Air power circuit breakers with current limiting fuses, Magnum DSL, 800–5000 A
- Bolted pressure switches, 800–5000 A, fixed
- Insulated case circuit breakers, Series NRX NF, 800–1200 A, fixed and drawout
- Insulated case circuit breakers, Series NRX RF, 800–3000 A, fixed and drawout
- Fusible switches, 400–1200 A, fixed

Feeder Devices, Group-Mounted

- Bolt-on molded case circuit breakers, 15–1200 A
- Drawout molded case circuit breakers, 70–1200 A
- Fusible switches, 30–1200 A



Pow-R-Line C Switchboard

Feeder Devices, Individually Mounted

- Molded case circuit breakers, 800–2500 A, fixed
- Insulated case circuit breakers, Magnum SB, 800–5000 A, fixed and drawout
- Air power circuit breakers, DS and Magnum DS, 800–4000 A, fixed and drawout
- Insulated case circuit breakers, Series NRX NF, 800–1200 A, fixed and drawout
- Insulated case circuit breakers, Series NRX RF, 800–3000 A, fixed and drawout
- Bolted pressure switches, 800–1600 A, fixed

Selective Coordination

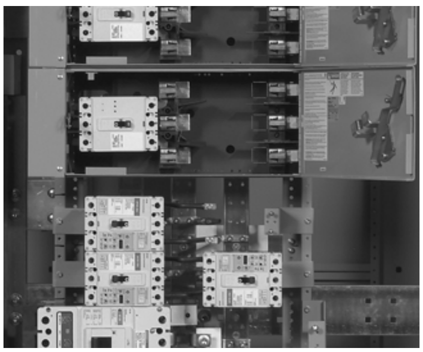
Selectively coordinated systems dictated by code and customer mandates may be achieved with Eaton switchboards to either 0.1 or 0.01 seconds as mandated by codes and/or customers. Refer to **Tab 1, Section 1.4** for additional details.

Note: For selection and layout guidelines, please reference **Page 21.1-1**.

For a complete product specification in CSI format, see Eaton's Product Specification Guide. . . . . **Section 16429**

Features

- Eaton's circuit breaker ratings up to 200 kAIC
- Trip units that integrate Eaton's Arcflash Reduction Maintenance System™ reduces potential arc flash available
- Integral ground fault protection available in electronic trip units from 15–5000 A
- Electronic trip units that integrate zone selective interlocking capabilities available in molded case, insulated case and air power circuit breaker
- Available with circuit breakers and fusible switches on the same chassis

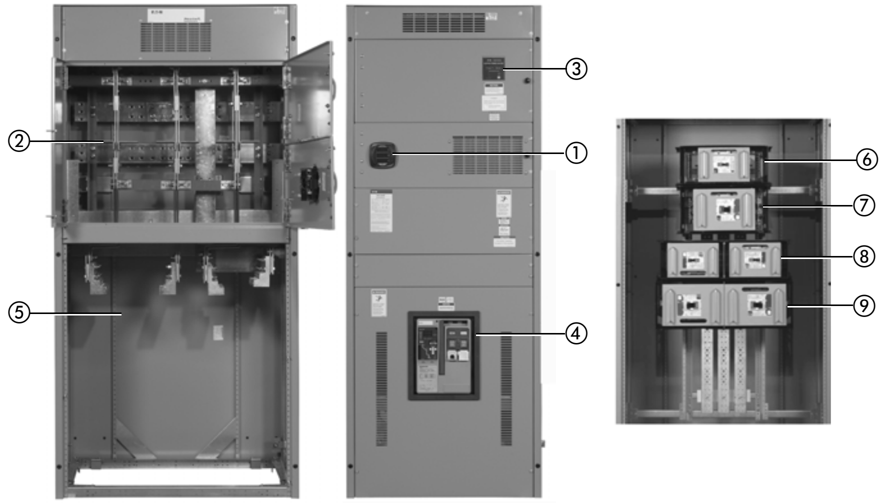


The Single Chassis Design Provides Device Flexibility

- UL listed and labeled. Meets NEC and NEMA standards
- Eaton microprocessor-based metering devices are standard when metering is specified. Conventional metering is available. IQ and Power Xpert devices can provide a communications capability. See **Tab 3**
- Optional integral surge protective device (SPD) is available in Pow-R-Line C switchboards, when specified. See **Tab 34**
- Aluminum, copper or silver-plated copper bus
- A full range of device modifications is available
- Available in NEMA Type 1 and 3R enclosures, UL listed

Modifications

- Ground fault protection on mains and distribution devices
- Coordination with other Eaton divisions for busway and transformer connections



Type 1 Pow-R-Line C Features

① Customer metering.
② Utility metering compartment.
③ Surge protective device.
④ Main breaker (Magnum SB).
⑤ Cable pull and termination space.
⑥ 250 A frame single mount.
⑦ 600 A frame single mount.
⑧ 250 A frame dual mount.
⑨ 600 A frame dual mount.

Table 21.0-2. Pow-R-Line C Group-Mounted Switchboards
Voltage: 240–480–600 Vac, 250 Vdc
Mains: 400–6000 A

Main Device Type	Amperes	Short-Circuit Symmetrical Rating (kA)
Molded case circuit breakers	400–2500	14–200
Insulated case circuit breakers, Magnum SB	800–5000	30–100
Insulated case circuit breakers, Series NRX NF	800–1200	65–85
Insulated case circuit breakers, Series NRX RF	800–3000	65–100
Air power circuit breakers, Magnum DS		
Air power circuit breakers with CL fuses, DSL	800–5000	200
Bolted pressure switches	800–5000 ①	200
Fusible switches	400–1200	200
Main lugs only	400–6000	Rating determined by overcurrent protective device

Feeder Device Type	Amperes	Short-Circuit Rating (kA)
Bolt-on, fixed-mounted molded case circuit breakers	15–2500	10–200
Drawout, molded case circuit breakers	70–600	10–200
Fusible switches	30–1200	200
Stacked—main with branch devices	400–2500	18–200
Magnum SB up to two high	800–2000	30–100
Magnum DS up to two high ②	800–2000	30–100
Series NRX NF up to two high and quad stack	800–1200	65–85
Series NRX RF up to two high	800–3000	65–100

① 5000 A bolted pressure switches are not UL listed.
② Third-party witness tested at 30 cycles.

Pow-R-Line Drawout Molded Case Circuit Breaker Switchboard

Power-R-Line Drawout Switchboard

General Description

- Drawout molded case circuit breaker switchboard
- Front accessible
- Front connected
- Through-the-door design drawout mechanism through 600 A
- Insulated case UL 489 breakers up to 1200 A
- Visual indication of breaker status and position
- Large grab handles for easy removal
- 600 Vac maximum
- 600 A maximum, group-mounted, drawout molded case feeder breakers
- Individually mounted insulated UL 489 breakers through 1200 A

Application Description

- Drawout feeders in UL 891 distribution switchboards
- Rated as Service Entrance Equipment when appropriately equipped
- Ideal for:
  - Data centers
  - Industrial facilities
  - Process equipment manufacturing
  - Anywhere that requires quick change of feeder devices is needed

Features, Benefits and Functions

Eaton's Pow-R-Line drawout switchboard design is listed and labeled to the UL 891 standard. Switchboards may be rated up to 4000 A. Main breakers are available up to 4000 A in both fixed-mounted and drawout configurations. Main breakers may be Magnum DS® power circuit breakers or Magnum SB insulated-case circuit breakers in either drawout or fixed-mounted configurations. Both are front-accessible configurations. Fixed-mounted molded case circuit breaker mains are available up through 2500 A.

Utility and customer-owned metering is available. Customer metering includes Web-enabled communicating systems.

Aluminum bus is standard with copper and silver-plated copper optional. Other common options include surge protective devices (SPDs), seismically qualified designs, density rated bus and many more.

Drawout feeder MCCBs are available in two-pole and three-pole offerings from 20 A to 600 A in the high-density, group-mounted design.

Drawout feeders above 600 A through 1200 A integrate the molded case NX drawout breaker. Drawout breakers above 1200 A through 2000 A use the Magnum SB insulated case circuit breaker. All are front accessible and front connected.

Certifications

- UL 891 listed

Instructions

On an interim basis until Bid Manager™ is updated, please use the Pow-R-Line C® switchboard Bid Manager take-off as the basis for the following:

- Utility compartments
- Service entrance or non-service entrance information
- Voltage
- Bus rating
- Bus material
- Nameplate
- Ground bus material
- Short-circuit current rating
- Top or bottom entrance
- Incoming cable location
- Customer metering
- Surge protective device
- Bus bracing

Pow-R-Line® *i* Switchboards

Meets NEMA Standard PB-2 and UL 891.

Construction Details

- 4000 A main bus maximum
- Front and rear accessible—main and distribution sections
- Feeder devices individually compartmentalized
- Sections front and rear aligned
- Designed for mounting with code clearance to a wall

Main Devices, Individually Mounted

- Molded case circuit breakers, 400–2500 A, fixed or drawout
- Insulated case circuit breakers, Series NRX NF, 800–1200 A, fixed and drawout
- Insulated case circuit breakers, Series NRX RF, 800–3000 A, fixed and drawout
- Insulated case circuit breakers, Magnum SB, 800–4000 A
- Air power circuit breakers, Magnum DS, 800–4000 A, fixed or drawout
- Air power circuit breakers with current limiting fuses, Magnum DSL, 800–4000 A
- Bolted pressure switches, 800–4000 A, fixed
- Fusible switches, 400–1200 A, fixed

Feeder Devices

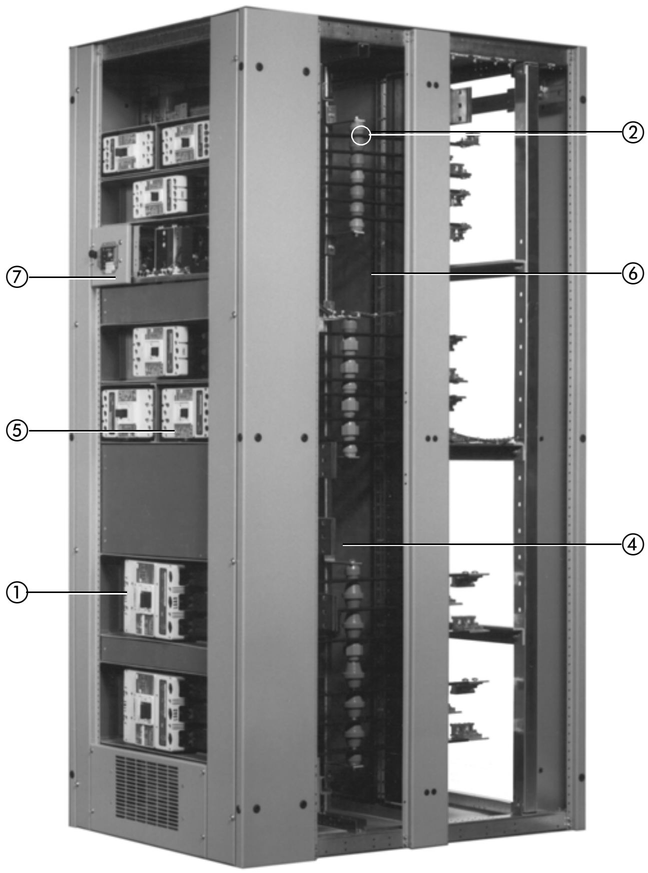
- Molded case circuit breakers, 15–1200 A are compartmentalized
- Molded case circuit breakers above 1200 A are not compartmentalized
- Fusible switches, 100–1200 A
- Insulated case circuit breakers, Magnum SB, 800–4000 A
- Air power circuit breakers, Magnum DS, 800–2000 A
- Bolted pressure switches, 800–2500 A
- Insulated case circuit breakers, Series NRX NF, 800–1200 A, fixed and drawout
- Insulated case circuit breakers, Series NRX RF, 800–3000 A, fixed and drawout
- Trip units that integrate Eaton's Arcflash Reduction Maintenance System to reduce potential arc flash
- Integral ground fault protection available in electronic trip units from 15–5000 A
- Electronic trip units that integrate zone selective interlocking capabilities available in molded case, insulated case and air power circuit breaker

Note: For selection and layout guidelines, please reference **Page 21.3-1**.

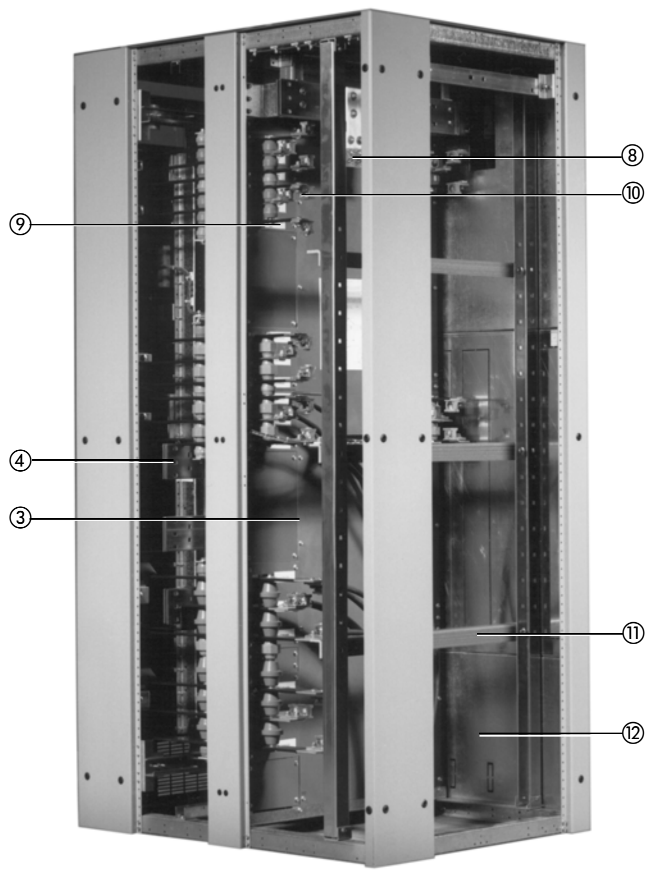
Pow-R-Line i Switchboard

For a complete product specification in CSI format, see Eaton's Product Specification Guide. . . . . **Section 16428**

Pow-R-Line *i* Construction Features



Distribution Section—Front View



Distribution Section—Rear View

① Glass polyester circuit breaker compartment.

② Insulated copper load side runbacks.

③ Full length barrier isolating the cable compartment.

④ Horizontal cross bus.

⑤ Tandem mounted circuit breakers through 400 A.

⑥ Isolating bus compartment.

⑦ Available zero sequence ground fault.

⑧ Angled neutral connections.

⑨ A, B, C phase connections.

⑩ Anti-turn lugs.

⑪ Movable cable support.

⑫ Generous conduit space.

Pow-R-Line *i* Switchboards... Greater Flexibility and Increased Safety Features

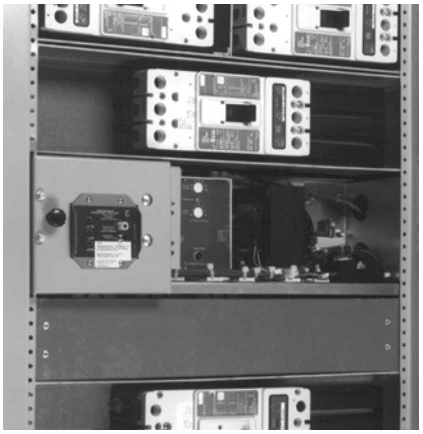
Eaton's Pow-R-Line *i* Switchboards are engineered in a new compartmentalized design for applications where a greater degree of safety is required. A wide variety of configurations is possible, including utility metering, customer metering, main devices, branch devices, accessories and enclosures.

Significant safety features include:

- Individual compartments for branch devices—glass polyester for circuit breakers and steel for fusible switches. These compartments help eliminate possible contact with the main bus and reduce fault propagation
- Three-section construction with each section barriered from the other
  - Device section. Each device is mounted in its own compartment
  - Bus bar section. Contains both horizontal and vertical buses
  - Rear cable compartment. Completely isolated from the bus bars
- Insulated copper runback. Power is taken from the protective device by the insulated copper runback through a standard full height glass polyester barrier to the rear cable compartment. This design virtually eliminates the possibility of accidental contact with the main buses during installation or maintenance

A Wide Selection of Main and Branch Devices

Main devices are available from 400–4000 A and can include molded case circuit breakers, Magnum SB and DS breakers, and fusible switches or bolted pressure switches. Main buses are rated up to 4000 A.



Ground fault test panels can be mounted in compartments with the circuit breakers for convenience and space savings.

Branch circuit breakers range from 150–1200 A frames. Branch fusible switches are available from 100–1200 A frames.

Short-circuit ratings up to 200,000 A are UL listed.

Pow-R-Line *i* switchboards are UL listed and meet all applicable requirements of NEMA and NEC. They are rear-accessible and front- and rear-aligned.

The Magnum DS breaker includes the Digitrip™ RMS trip unit that provides circuit protection, information and testing functions, and true rms sensing.

Pow-R-Line i switchboards can help to provide for future distribution system requirements by including empty compartments for branch circuit breakers and fusible switches. (Circuit breaker provisions shown.)

Space-Saving Ground Fault Test Panels

Pow-R-Line *i* switchboards can accommodate either integral or zero sequence types of ground fault protection. Depending on the specific application, a test panel can be mounted in the circuit breaker compartment, which may eliminate the need for an auxiliary structure.

Provisions for the Future

Future expansion provisions include line side connectors, load side runbacks, terminals, and glass polyester compartments and covers (for circuit breakers).

Customer Metering

Eaton microprocessor-based metering devices are standard when customer metering is specified. Conventional metering is available. IQ and Power Xpert devices can provide communications capabilities. See **Tab 3**.

Circuit Breaker and Fusible Switch Technical Data

Table 21.0-3. Molded Case Circuit Breakers

Circuit Breaker Type	Continuous Ampere Rating at 40 °C	No. of Poles	Voltage AC	Voltage DC	Trip Type ①	UL Listed Interrupting Ratings rms Symmetrical Amperes									
						ac Ratings Volts						dc Ratings Volts ②			
						120	120/240	240	277	480	600	125	250	125/250	600
EDB	100–225	2, 3	240	125	N.I.T.	—	—	22	—	—	—	10	—	—	—
EDS	100–225	2, 3	240	125	N.I.T.	—	—	42	—	—	—	10	—	—	—
ED	100–225	2, 3	240	125	N.I.T.	—	—	65	—	—	—	10	—	—	—
EDH	100–225	2, 3	240	125	N.I.T.	—	—	100	—	—	—	10	—	—	—
EDC	100–225	2, 3	240	125	N.I.T.	—	—	200	—	—	—	10	—	—	—
EHD	15–100	1	277	125	N.I.T.	—	—	—	14	—	—	10	—	—	—
EHD	15–100	2, 3	480	250	N.I.T.	—	—	18	—	14	—	—	10	—	—
HFDDC ③	15–150	2, 3	—	600	N.I.T.	—	—	—	—	—	—	42	42	—	35
FDB	15–225	2, 3	600	250	N.I.T.	—	—	18	—	14	14	—	10	—	—
FDB	15–225	4	600	250	N.I.T.	—	—	18	—	14	14	—	10	—	—
FD, FDE	15–225	1	277	125	N.I.T.	—	—	—	35	—	—	10	—	—	—
FD, FDE	15–225	2, 3	600	250	N.I.T.	—	—	65	—	35	18	—	10	—	—
FD, FDE	15–225	4	600	250	N.I.T.	—	—	65	—	35	18	—	10	—	—
HFD, HFDE	15–225	1	277	125	N.I.T.	—	—	—	65	—	—	10	—	—	—
HFD, HFDE	15–225	2, 3	600	250	N.I.T.	—	—	100	—	65	25	—	22	—	—
HFD, HFDE	15–225	4	600	250	N.I.T.	—	—	100	—	65	25	—	22	—	—
FDC, FDCE	15–225	2, 3	600	250	N.I.T.	—	—	200	—	100	35	—	22	—	—
FDC, FDCE	15–225	4	600	250	N.I.T.	—	—	200	—	100	35	—	22	—	—
JD	70–250	2, 3	600	250	I.T.	—	—	65	—	35	18	—	10	—	—
HJD	70–250	2, 3	600	250	I.T.	—	—	100	—	65	25	—	22	—	—
JDC	70–250	2, 3	600	250	I.T.	—	—	200	—	100	35	—	22	—	—
HJDDC ③	70–250	2, 3	—	600	I.T.	—	—	—	—	—	—	42	42	—	35
JGS ④	70–250	2, 3	600	250	I.T.	—	—	65	—	35	25	—	—	—	—
JGH ④	70–250	2, 3	600	250	I.T.	—	—	100	—	65	35	—	—	—	—
JGC ④	70–250	2, 3	600	250	I.T.	—	—	200	—	100	50	—	—	—	—
DK	250–400	2, 3	240	250	N.I.T.	—	—	65	—	—	—	—	10	—	—
KD	70–400	2, 3	600	250	I.T.	—	—	65	—	35	25	—	10	—	—
CKD ⑥	70–400	3	600	250	I.T.	—	—	65	—	35	25	—	10	—	—
HKD	70–400	2, 3	600	250	I.T.	—	—	100	—	65	35	—	22	—	—
CHKD ⑥	70–400	3	600	250	I.T.	—	—	100	—	65	35	—	22	—	—
KDC	70–400	2, 3	600	250	I.T.	—	—	200	—	100	50	—	22	—	—
HKDDC ③	100–400	2, 3	—	600	I.T.	—	—	—	—	—	—	42	42	—	35
LHH ⑦	125–400	2, 3	600	250	I.T.	—	—	100	—	65	35	—	42	—	—
NHH	150–350	3	600	—	--	—	—	100	—	65	35	—	—	—	—
LGE ⑦	300–600	2, 3	600	250	I.T.	—	—	65	—	35	25	10	22	—	—
LGH ⑦⑧	300–600	2, 3	600	250	I.T.	—	—	100	—	65	35	10	22	—	—
LGC ⑦⑧	250–600	2, 3	600	250	I.T.	—	—	200	—	100	50	—	42	—	—
LGU ⑦	250–600	2, 3	600	250	I.T.	—	—	200	—	150	65	—	50	—	—
LD	300–600	2, 3	600	250	I.T.	—	—	65	—	35	25	—	22	—	—
CLD ⑥	300–600	3	600	250	I.T.	—	—	65	—	35	25	—	22	—	—
HLD	300–600	2, 3	600	250	I.T.	—	—	100	—	65	35	—	25	—	—
CHLD ⑥	300–600	3	600	250	I.T.	—	—	100	—	65	35	—	25	—	—
LDC	300–600	2, 3	600	250	I.T.	—	—	200	—	100	50	—	25	—	—
CLDC ⑥	300–600	3	600	250	I.T.	—	—	200	—	100	50	—	25	—	—
HLDDC ③	300–600	2, 3	—	600	I.T.	—	—	—	—	—	—	42	42	—	—
MDL ⑦	400–800	2, 3	600	250	N.I.T.	—	—	65	—	50	25	—	22	—	—
CMDL ⑥⑦	400–800	3	600	—	N.I.T.	—	—	65	—	50	25	—	22	—	—
HMDL ⑦	400–800	2, 3	600	—	N.I.T.	—	—	100	—	65	35	—	25	—	—
CHMDL ⑥⑦	400–800	3	600	—	N.I.T.	—	—	100	—	65	35	—	25	—	—
HMDLDC ③	300–800	2, 3	—	600	I.T.	—	—	—	—	—	—	42	42	—	—
NG	600–1200	2, 3	600	—	N.I.T.	—	—	65	—	50	25	—	—	—	—
CNG ⑥	600–1200	3	600	—	N.I.T.	—	—	65	—	50	25	—	—	—	—
NGH	600–1200	2, 3	600	—	N.I.T.	—	—	100	—	65	35	—	—	—	—
CNGH ⑥	600–1200	3	600	—	N.I.T.	—	—	100	—	65	35	—	—	—	—
NGC	600–1200	2, 3	600	—	N.I.T.	—	—	200	—	100	50	—	—	—	—
CNGC ⑥	600–1200	3	600	—	N.I.T.	—	—	200	—	100	50	—	—	—	—
NBDC ③	700–1200	2, 3	—	600	I.T.	—	—	—	—	—	—	42	42	—	50
RG 1600	800–1600	3	600	—	N.I.T.	—	—	125	—	65	50	—	—	—	—
CRG 1600 ⑥	800–1600	3	600	—	N.I.T.	—	—	125	—	65	50	—	—	—	—
RG 2000	1000–2000	3	600	—	N.I.T.	—	—	125	—	65	50	—	—	—	—
CRG 2000 ⑥	1000–2000	3	600	—	N.I.T.	—	—	125	—	65	65	—	—	—	—
RG 2500	1000–2500	3	600	—	N.I.T.	—	—	200	—	100	65	—	—	—	—
RGC 1600	800–1600	3	600	—	N.I.T.	—	—	200	—	100	65	—	—	—	—
CRGC 1600 ⑥	800–1600	3	600	—	N.I.T.	—	—	200	—	100	65	—	—	—	—
RGC 2000	1000–2000	3	600	—	N.I.T.	—	—	200	—	100	65	—	—	—	—
CRGC 2000 ⑥	1000–2000	3	600	—	N.I.T.	—	—	200	—	100	65	—	—	—	—
RGC 2500	1000–2500	3	600	—	N.I.T.	—	—	200	—	100	65	—	—	—	—
RGC ③⑨	1600–2000	2, 3	—	600	I.T.	—	—	—	—	—	—	42	65	—	65

① N.I.T. is non-interchangeable trip unit. I.T. is interchangeable trip unit.
② Two-pole circuit breaker, or two poles of three-pole circuit breaker at 250 Vdc.
③ For use on dc systems only.
④ For use with drawout feeder device only.
⑤ Electronic trip unit adjustable from 20 to 250 A.
⑥ 100% rated.
⑦ Not available in Pow-R-Line *i* switchboards.
⑧ Available in bolt-on fixed mount or drawout feeder device.
⑨ Individually, vertically mounted.

Table 21.0-4. Magnum SB Insulated Case Circuit Breaker Interrupting Ratings ①

Circuit Breaker Type	Frame Amperes	Trip Unit Current Sensor and Rating Plug Ranges	Ratings rms Symmetrical Amperes (kAIC) Interrupting Ratings 208/240 Vac	480 Vac	600 Vac
SBS-608	800	200–800	65	65	65
SBS-C08	800	200–800	100	100	85
SBS-612	1200	200–1200	65	65	65
SBS-C12	1200	200–1200	100	100	85
SBS-616	1600	200–1600	65	65	65
SBS-C16	1600	200–1600	100	100	85
SBS-620	2000	200–2000	65	65	65
SBS-C20	2000	200–2000	100	100	85
SBS-625	2500	200–2500	65	65	65
SBS-C25	2500	200–2500	100	100	85
SBS-630	3000	200–3000	65	65	65
SBS-C30	3000	200–3000	100	100	85
SBS-840	4000	2000–4000	65	65	65
SBS-C40	4000	2000–4000	100	100	85
SBS-850	5000	2500–5000	65	65	65
SBS-C50	5000	2500–5000	100	100	85

① Fixed internal instantaneous trip set at approximately 18 x I_n symmetrical.

Table 21.0-5. Series NRX RF Insulated Case Circuit Breaker Interrupting Ratings

Circuit Breaker Type	Frame Amperes	Trip Unit Current Sensor Ranges	Ratings rms Symmetrical Amperes (kAIC) Interrupting Ratings 208/240 Vac	480 Vac
NRX-RF PXR 20/25	800	800	100	65
NRX-RF PXR 20/25	1200	800–1200	100	65
NRX-RF PXR 20/25	1600	800–1600	100	65
NRX-RF PXR 20/25	2000	800–2000	100	65
NRX-RF PXR 20/25	2500	800–2500	100	65
NRX-RF PXR 20/25	3000	800–3000	100	65
NRX-NF PXR 20/25	800	200–800	85	65
NRX-NF PXR 20/25	1200	200–1200	85	65

Table 21.0-6. Magnum DS Power Breaker Interrupting Ratings

Circuit Breaker Type	Frame Amperes	Ratings rms Symmetrical Amperes (kAIC)					
		Interrupting Ratings			Short-Time Rating ②		
		208/240 V	480 V	600 V	208/240 V	480 V	600 V
MDS-408	800	42	42	42	42	42	42
MDS-608	800	65	65	65	65	65	65
MDS-808	800	85	85	85	85	85	85
MDS-C08	800	100	100	100	85	85	85
MDS-616	1600	65	65	65	65	65	65
MDS-816	1600	85	85	85	85	85	85
MDS-C16	1600	100	100	100	85	85	85
MDS-620	2000	65	65	65	65	65	65
MDS-820	2000	85	85	85	85	85	85
MDS-C20	2000	100	100	100	85	85	85
MDS-632	3000	65	65	65	65	65	65
MDS-832	3000	85	85	85	85	85	85
MDS-C32	3000	100	100	100	85	85	85
MDS-840	4000	130	85	85	85	85	85
MDS-C40	4000	130	100	100	100	100	100
MDS-850	4000	130	85	85	85	85	85
MDS-C50	5000	130	100	100	100	100	100

② Also ratings without instantaneous trip.

Circuit Breaker and Fusible Switch Technical Data

Table 21.0-7. Current Limit-R Current Limiting Circuit Breakers—Non-Fused Type

Circuit Breaker Type	Cont. Ampere Rating at 40 °C	No. of Poles	Voltage		Trip Type ③	Federal Spec. W-C-375b	UL Listed Interrupting Ratings rms Symmetrical Amperes								
			AC	DC			AC Ratings Volts						DC ④		
							120	120/240	240	277	480	600	125	250	125/250
FCL	15–100	2, 3	480	—	N.I.T.	⑤	—	—	200,000	—	150,000	—	—	—	—
LCL	125–400	2, 3	600	—	N.I.T.	⑤	—	—	200,000	—	200,000	100,000	—	—	—

③ N.I.T. is non-interchangeable trip unit and I.T. is interchangeable trip unit.
④ Two-pole circuit breaker, or two poles of three-pole circuit breaker at 250 Vdc.
⑤ Not defined in W-C-375b.

Table 21.0-8. TRI-PAC Current Limiting Circuit Breakers—Fused Type

Circuit Breaker Type	Cont. Ampere Rating at 40 °C	No. of Poles	Voltage		Trip Type ⑥	Federal Spec. W-C-375b	UL Listed Interrupting Ratings rms Symmetrical Amperes								
			AC	DC			AC Ratings Volts						DC ⑦		
							120	120/240	240	277	480	600	125	250	125/250
FB	15–100	2, 3	600	250	N.I.T.	16a, 16b, 17a, 26a	—	—	200,000	—	200,000	200,000	—	—	100,000
LA	70–400	2, 3	600	250	I.T.	16a, 16b, 17a, 26a	—	—	200,000	—	200,000	200,000	—	—	100,000
NB	300–800	2, 3	600	250	I.T.	16b, 17a, 26a	—	—	200,000	—	200,000	200,000	—	—	100,000
PB	600–1600	2, 3	600	250	I.T.	17a, 26a	—	—	200,000	—	200,000	200,000	—	—	100,000

⑥ N.I.T. is non-interchangeable trip unit and I.T. is interchangeable trip unit.
⑦ Two-pole circuit breaker, or two poles of three-pole circuit breaker at 250 Vdc.

Table 21.0-9. Electrical Characteristics of Fusible Switches

Device Type	System Voltage	Ampere Rating	Interrupting Capacities kA Symmetrical Amperes
Fusible switch	240 or 600	30–600 300–1200 30–600 800, 1200	200 kAIC with Class R Fuses 200 kAIC with Class T Fuses 200 kAIC with Class R and J Fuses 200 kAIC with Class L Fuses
Bolted pressure switch	240 or 480	800, 1200, 1600 2000, 2500, 3000, 4000, 5000 ①	200 kAIC with Class L Fuses 200 kAIC with Class L Fuses 200 kAIC with Class L Fuses

① 5000 A bolted pressure contact switch is not UL listed.

Table 21.0-10. Standard Switchboard Terminals Standard Main Breaker, Branch Breaker, Main Switch or Branch Switch Terminals

Type Breaker	Ampere Rating	Wire Size Ranges
EDB, EDS, ED, EDH, EDC	100–225	# 4–#4/0 or # 6–300 kcmil
EHD, FDB, FD, HFD, FDC, FDE, HFDE, FDCE	15–100 125–225	#14–#1/0 # 4–#4/0 or #6–300 kcmil
FCL	15–100	#14–#1/0
JD, HJD, JDC, JGS, JGH, JGC	70–250	# 4–350 kcmil
DK	250–350 400	(1) 25–500 kcmil (2) 3/0–250 kcmil or (1) 3/0–500 kcmil
KD, HKD, KDC, CKD ②, CHKD ②	100–225 250–350 400	(1) #3–350 kcmil (1) 250–500 kcmil (2) 3/0–250 kcmil (1) 3/0–500 kcmil
LGE, LGH, LD, HLD, LDC, CLD ②, CHLD ②, CLDC ②, LHH, LGC, LGU NHH	300–500 600 150–350	(2) 250–350 kcmil (2) 400–500 kcmil (1) #2–600 kcmil
MDL, CMDL ②, HMDL, CHMDL	400–600 700–800	(2) #1–500 kcmil (3) 3/0–400 kcmil (2) 500–750 kcmil
NG, NGH, NGC, NG ②, NGH ②, NGC ②	600–1000 1200	(3) 3/0–400 kcmil (4) 4/0–500 kcmil
LCL	125–225 250–400	(1) #6–350 kcmil (1) #4–250 kcmil and (1) 3/0–600 kcmil
FB-P	15–100	#14–1/0
LA-P	70–225 250–400	(1) #6–350 kcmil (1) #4–250 kcmil and (1) 3/0–600 kcmil
NB-P	350–700 800	(2) #1–500 kcmil (3) 3/0–400 kcmil

② 100% rated breaker.

Note: All terminal sizes are based on wire ampacities corresponding to those shown in NEC Table 310.16 under the 75 °C insulation columns (75 °C wire). The use of smaller size (in circular mills), regardless of insulation temperature rating is not permitted without voiding UL labels on devices and equipment.

Note: For other terminals available on some ratings of molded case circuit breakers and fusible switches, refer to **Tab 27**.

Cable Ranges for Standard Secondary Device Terminals

Wire and cable terminals supplied on switchboard mounted devices for making up incoming or outgoing cable connections are of the mechanical screw clamp pressure type. All standard terminals are suitable for use with either aluminum or copper cable except as noted in the table. Panel mounted devices use the standard terminal provided with that device.

Table 21.0-11. Fusible Switches

Ampere Rating	Wire Size Ranges
30, 60, 100 200	#14–1/0 #4–300 kcmil
400	250–750 kcmil or (2) 3/0–250 kcmil
600	(2) #4–600 kcmil or (4) 3/0–250 kcmil
800	(3) 250–750 kcmil or (6) 3/0–250 kcmil
1200	(4) 250–750 kcmil or (8) 3/0–250 kcmil

Table 21.0-12. Standard Mechanical Incoming Terminal Ranges for Main Lugs Only and Main Devices Including Circuit Breakers and Fusible Devices

Ampere Rating	Cable Range
400 600 800	(2) #2–500 kcmil (2) #2–500 kcmil (3) #2–500 kcmil
1000 1200 1600	(4) #2–500 kcmil (4) #2–500 kcmil (5) #2–500 kcmil
2000 2500 3000	(6) #2–500 kcmil (7) #2–500 kcmil (10) #2–500 kcmil

Table 21.0-13. Range Taking Compression Main Terminals

Main Ampere	Number of Conductors and Wire Range Per Phase	
	Aluminum Conductors	Copper Conductors
1200 1600 2000 2500	(4) 500–750 kcmil (5) 500–750 kcmil (6) 500–750 kcmil (7) 500–750 kcmil	(3) 500–750 kcmil (4) 500–750 kcmil (4) 500–750 kcmil (6) 500–750 kcmil
3000 4000 5000	(8) 500–750 kcmil (11) 500–750 kcmil (13) 500–750 kcmil	(7) 500–750 kcmil (9) 500–750 kcmil (11) 500–750 kcmil

③ Compression terminations will take a range of conductors and include 500, 600, 700 and 750 kcmil.

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Layout Guide for Pow-R-Line C, Front-Access, Group-Mounted Feeders

PRLC Switchboard—Front-Access

Drawings

Drawings and data on the following pages reflect dimensions for worst case switchboard designs. Smaller switchboard dimensions may be available. Both preliminary and as-built approval drawings are available from Eaton. These drawings reflect the actual switchboard configured, and include height, width and depth dimensions.

Building Information Model

In addition, a building information model (BIM) 3D compatible drawing is available for all configured to order switchboards.

A BIM is a three-dimensional digital representation of a facility's physical and functional characteristics. It serves as a shared knowledge resource for information about a facility and forms a reliable basis for decisions throughout its life-cycle.

Eaton offers 3D BIM compatible models to support a variety of MEP software, including Autodesk AutoCAD MEP, Revit MEP and NavisWorks, Bentley Building Electrical Systems, Graphisoft ArchiCAD MEP Modeler, Nemetschek N.A. VectorWorks, and others.

Table 21.1-1. Front-Access Group-Mounted Feeders Pow-R-Line C

Steps	Description		Page
Step 1 ①	Layout incoming main section (with or without main device) as follows: Special Utility Metering Compartment West Coast Utility Metering Compartment Standard NEMA® Utility Metering Compartment Customer Only Metering Compartment No Metering Compartment		 **21.1-2** **21.1-6** **21.1-8** **21.1-9** **21.1-9**
Step 2	Layout Feeder Devices in Distribution Sections Pow-R-Line C	 Group-Mounted Type Bolt-on Fixed or Drawout Individually Mounted Type ② Outdoor Enclosures	 **21.1-11** **21.1-15** **21.4-1**
Step 3	Technical data, e.g., interrupting ratings, terminal size.		**21.0-14**
Step 4	Specification Data	For a complete product specification in CSI format, see Eaton's *Product Specification Guide*, Section 16429.	

① Because utility compartment dimensions are the minimum required by utility, check "no metering" main device widths and use the larger width of either the main device or utility metering compartment.
② Feeders are individually mounted, not compartmentalized.

Table 21.1-2. Rear-Access Group-Mounted Feeders Pow-R-Line C

Steps	Description		Page
Step 1 ③	Layout incoming main section (with or without main device) as follows: Special Utility Metering Compartment West Coast Utility Metering Compartment Standard NEMA® Utility Metering Compartment Customer Only Metering Compartment No Metering Compartment		 **21.2-3** **21.2-5** **21.2-7** **21.2-8** **21.2-8**
Step 2	Layout Feeder Devices in Distribution Sections Pow-R-Line C	 Group-Mounted Type Individually Mounted Type ④ Outdoor Enclosures	 **21.2-12** **21.1-15** **21.4-1**
Step 3	Technical data, e.g., interrupting ratings, terminal size.		**21.0-14**
Step 4	Specification Data	For a complete product specification in CSI format, see Eaton's *Product Specification Guide*, Section 16429.	

③ Because utility compartment dimensions are the minimum required by utility, check "no metering" main device widths and use the larger width of either the main device or utility metering compartment.
④ Feeders are individually mounted, not compartmentalized.

Table 21.1-3. Rear-Access Compartmentalized Feeders Pow-R-Line *i*

Steps	Description		Page
Step 1 ⑤	Layout incoming main section (with or without main device) as follows: Special Utility Metering Compartment West Coast Utility Metering Compartment Standard NEMA® Utility Metering Compartment Customer Only Metering Compartment No Metering Compartment		 **21.2-3** **21.2-5** **21.2-7** **21.2-8** **21.2-8**
Step 2	Layout Feeder Devices in Distribution Sections Pow-R-Line C	 Compartmentalized Type Individually Mounted Type ⑥ Outdoor Enclosures	 **21.3-1** **21.1-15** **21.4-1**
Step 3	Technical data, e.g., interrupting ratings, terminal size.		**21.0-14**
Step 4	Specification Data	For a complete product specification in CSI format, see Eaton's *Product Specification Guide*, Section 16429.	

⑤ Because utility compartment dimensions are the minimum required by utility, check "no metering" main device widths and use the larger width of either the main device or utility metering compartment.
⑥ Feeders are individually mounted, not compartmentalized.

Layout Dimensions—Pow-R-Line C, Front-Access

Incoming Utility Compartments and/or Main Devices

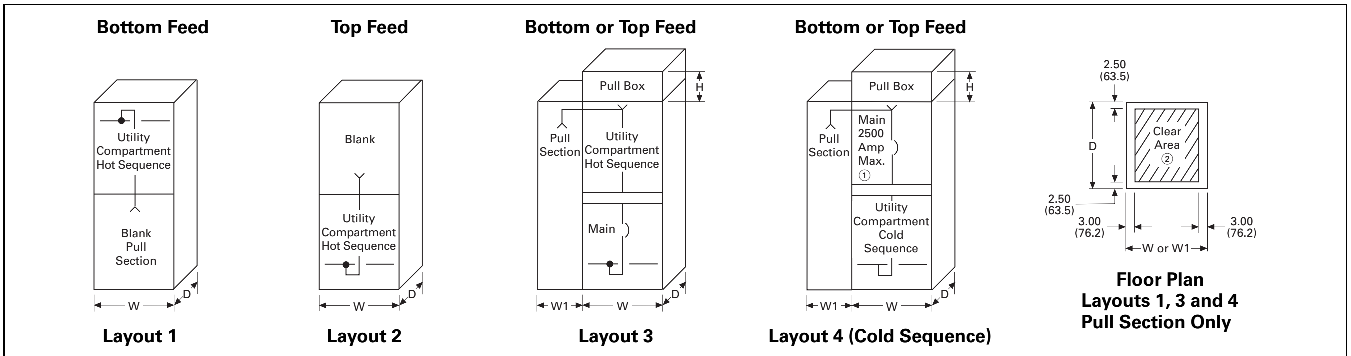


Figure 21.1-1. Incoming Utility Compartment—Dimensions in Inches (mm)

① Cold Sequence: 3000 or 4000 A main device must be mounted in separate structure. Refer to **Page 21.1-9**, Layouts 1 and 2 in **Figure 21.1-5**. The utility compartment will then be housed in the second structure. Branch devices or customer metering can then be mounted in remaining half of utility compartment structure.
② Clear area assumes no floor channels used under bottom frame.

Table 21.1-4. Dimensions for Figure 21.1-1 Layouts—Dimensions in Inches (mm)

Power Company Compartments Ampere Ratings	Metering Sequence	Front-Access							
			Layout 1	Layout 2	Layout 3		Layout 4	Top-Mounted Pull Box	Pull Section
		Width (W)	Depth (D)	Depth (D)	Depth (D)		Depth (D)	Height (H)	Width (W1)
Atlantic City Electric	Hot				Bottom	Top			
800 1200 1600–2000 2500–4000		36 (914.4) 36 (914.4) 45 (1143.0) 45 (1143.0)	30 (762.0) 30 (762.0) 36 (914.4) 36 (914.4)	30 (762.0) 30 (762.0) 36 (914.4) 36 (914.4)	30 (762.0) 30 (762.0) 36 (914.4) 36 (914.4)	30 (762.0) 30 (762.0) 36 (914.4) 36 (914.4)	N/A N/A N/A N/A	N/A N/A N/A N/A	30 (762.0) 30 (762.0) 30 (762.0) 30 (762.0)
BGE (Baltimore Gas and Electric) ③	Hot								
800 1200–2500 3000–4000		36 (914.4)/ 36 (914.4)/ 45 (1143.0) ③	36 (914.4) 36 (914.4) 36 (914.4) ③	36 (914.4)/ 36 (914.4)/ 36 (914.4) ③	N/A N/A N/A		N/A N/A N/A	N/A N/A N/A	N/A N/A N/A
NSTAR (Boston Edison, Cambridge Electric, Commonwealth Electric)	**Cold**								
800–1600 2000–2500 3000–4000		36 (914.4) 36 (914.4) 45 (1143.0) ④	N/A N/A N/A	N/A N/A N/A	N/A N/A N/A		30 (762.0) 36 (914.4) 36 (914.4) ④	18 (457.2) 24 (609.6) N/A ④	30 (762.0) 30 (762.0) N/A
CH Energy Group (Central Hudson Gas and Electric)	Hot ⑤/Cold	⑥	⑥	⑥	⑥		⑥	N/A	⑥
Central Vermont Public Service	Hot	⑥	⑥	⑥	⑥		⑥	N/A	⑥
Cinergy/CG&E (Cincinnati Gas and Electric)	Hot				Bottom	Top			
800 1200–2000 2500–4000		36 (914.4) 45 (1143.0) 45 (1143.0)	30 (762.0) 36 (914.4) 36 (914.4)	30 (762.0) 36 (914.4) 36 (914.4)	30 (762.0) 36 (914.4) 36 (914.4)	30 (762.0) 36 (914.4) 36 (914.4)	N/A N/A N/A	N/A N/A N/A	30 (762.0) 30 (762.0) 30 (762.0)
Exelon/ComEd (Commonwealth Edison)	Hot				Bottom	Top			
400–1000 1200–2000 2500–4000		36 (914.4) 36 (914.4) 36 (914.4)	30 (762.0) 36 (914.4) 36 (914.4)	30 (762.0) 36 (914.4) 36 (914.4)	30 (762.0) 36 (914.4) 36 (914.4)	30 (762.0) 36 (914.4) 36 (914.4)	N/A N/A N/A	12 (304.8) ⑦ 18 (457.2) 24 (609.6)	30 (762.0) 30 (762.0) 30 (762.0)

③ For BG&E, the utility compartment is mounted in the bottom for Layout 1 and top for Layout 2. For bottom feed (Layout 1); up to 2500 A, the main is mounted in top. For 3000 and 4000 A bottom feed, the main is in a separate structure. For top feed (Layout 2), maximum amperes is 4000 A and the main is mounted in the bottom.
④ Cold Sequence: 3000 or 4000 A main device must be mounted in separate structure. Refer to **Page 21.1-9**, Layouts 1 and 2 in **Figure 21.1-5**. The utility compartment will then be housed in the second structure. Branch devices or customer metering can then be mounted in remaining half of utility compartment structure.
⑤ For special applications approved by the utility.
⑥ Dimensions are the same as standard NEMA utility compartments, refer to **Figure 21.1-4**.
⑦ Only required for 750 kcmil incoming cables.

Note: "W" or "D" of structure is determined by the dimensions of the utility compartment or main device—whichever is greater. For main device dimensions, see **Figure 21.1-5**. N/A = Not Applicable.

Dimensions for estimating purposes only.

Table 21.1-4. Dimensions for Figure 21.1-1 Layouts—Dimensions in Inches (mm) (Continued)

Power Company Compartments Ampere Ratings	Metering Sequence		Front-Access						
			Layout 1	Layout 2	Layout 3		Layout 4	Top-Mounted Pull Box	Pull Section
		Width (W)	Depth (D)	Depth (D)	Depth (D)		Depth (D)	Height (H)	Width (W1)
Connecticut Light and Power (Northeast Utilities)	Hot ①/Cold								
800–1200 1600–2000 2500–4000		② 36 (914.4) 36 (914.4) 45 (1143.0)	② 30 (762.0) 36 (914.4)	② 30 (762.0) 36 (914.4)	② 30 (762.0) 36 (914.4)		② 30 (762.0) 36 (914.4) ③	N/A 18 (457.2) 24 (609.6) ③	② 30 (762.0) 30 (762.0)
ConEdison (Consolidated Edison)	Hot				Bottom	Top			
800–1200 (Spec. 298) 1200–2000 (Spec. 377) 2500–4000 (Spec. 377)		38 (965.2) 45 (1143.0) 45 (1143.0)	24 (609.6) 36 (914.4) 36 (914.4)	24 (609.6) ③ 36 (914.4) ③ 36 (914.4) ③	24 (609.6) 48 (1219.2) 48 (1219.2)	24 (609.6) 48 (1219.2) 48 (1219.2)	N/A N/A N/A	12 (304.8) **Fig. 3** 18 (457.2) 24 (609.6)	30 (762.0) 30 (762.0) 30 (762.0)
DTE Energy (Detroit Edison)	Hot				Bottom	Top			
800 1200–25000 3000–4000		36 (914.4) 36 (914.4) 45 (1143.0)	30 (762.0) 30 (762.0) 36 (914.4)	30 (762.0) 30 (762.0) 36 (914.4)	30 (762.0) 30 (762.0) 36 (914.4)	30 (762.0) 30 (762.0) 36 (914.4)	N/A N/A N/A	N/A N/A N/A	30 (762.0) 30 (762.0) 30 (762.0)
Florida Power and Light	Hot	②	②	②	②	②	②	N/A	②
Georgia Power Co.	Hot	②	②	②	②	②	②	N/A	②
IPL (Indianapolis Power Co.)	Hot/Cold ①				Bottom	Top			
800 1200–2500 3000–4000		36 (914.4) 36 (914.4) 36 (914.4)	36 (914.4) 36 (914.4) 36 (914.4)	36 (914.4) 36 (914.4) 36 (914.4)	36 (914.4) 36 (914.4) 36 (914.4)	36 (914.4) 36 (914.4) 36 (914.4)	36 (914.4) 36 (914.4) 36 (914.4) ③	12 (304.8) 18 (457.2) 24 (609.6) ③	30 (762.0) 30 (762.0) 30 (762.0)
Jersey Central Power (First Energy)	Hot ①/Cold				Bottom	Top			
800 1200–2000 2500–4000		45 (1143.0) 45 (1143.0) 45 (1143.0)	36 (914.4) 36 (914.4) 36 (914.4)	36 (914.4) 36 (914.4) 36 (914.4)	36 (914.4) 36 (914.4) 36 (914.4)	36 (914.4) 36 (914.4) 36 (914.4)	36 (914.4) 36 (914.4) 36 (914.4)	N/A 18 (457.2) 24 (609.6)	30 (762.0) 30 (762.0) 30 (762.0)
Kansas City Power and Light	Hot	②	②	②	②		②	N/A	②
PSEGLI (Public Service Electric-Long Island)	Hot				Bottom	Top			
800–1200 1600–2000 2500–4000		38 (965.2) 45 (1143.0) 45 (1143.0)	24 (609.6) 36 (914.4) 36 (914.4)	24 (609.6) 36 (914.4) 36 (914.4)	24 (609.6) 36 (914.4) 36 (914.4)	24 (609.6) 36 (914.4) 36 (914.4)	N/A N/A N/A	12 (304.8) 18 (457.2) 24 (609.6)	30 (762.0) 30 (762.0) 30 (762.0)
LG&E Energy (Louisville Gas and Electric)	Hot				Bottom	Top			
800 1200–2000 2500–4000		36 (914.4) 45 (1143.0) 45 (1143.0)	36 (914.4) 36 (914.4) 36 (914.4)	36 (914.4) 36 (914.4) 36 (914.4)	36 (914.4) 36 (914.4) 36 (914.4)	36 (914.4) 36 (914.4) 36 (914.4)	N/A N/A N/A	12 (304.8) 18 (457.2) 24 (609.6)	30 (762.0) 30 (762.0) 30 (762.0)
Madison Gas and Electric	Cold				Bottom	Top			
800–1200 1600–2000 2500–4000		36 (914.4) 36 (914.4) 45 (1143.0)	30 (762.0) 30 (762.0) 36 (914.4)	30 (762.0) 30 (762.0) 36 (914.4)	30 (762.0) 30 (762.0) 36 (914.4)	30 (762.0) 30 (762.0) 36 (914.4)	30 (762.0) 30 (762.0) 36 (914.4) ③	12 (304.8) 18 (457.2) 24 (609.6) ③	30 (762.0) 30 (762.0) 30 (762.0) ③
Massachusetts Electric (National Grid)	Hot				Bottom	Top			
800 1200–2000 2500–4000		② 36 (914.4) 36 (914.4)	② 30 (762.0) 30 (762.0)	② 30 (762.0) 30 (762.0)	② 30 (762.0) 30 (762.0)	② 30 (762.0) 30 (762.0)	N/A N/A N/A	N/A N/A N/A	② 30 (762.0) 30 (762.0)
Metropolitan Edison (First Energy)	Hot	②	②	②	②		②	N/A	②
Monongahela Power	Hot	②	②	②	②	②	②	N/A	②
Naperville	Hot	②	②	②	②		②	N/A	②
Narragansett (National Grid)	Hot				Bottom	Top			
800 1200–2000 2500–4000		② 36 (914.4) 36 (914.4) 45 (1143.0)	② 30 (762.0) 36 (914.4)	② 30 (762.0) 36 (914.4)	② 30 (762.0) 36 (914.4)	② 30 (762.0) 36 (914.4)	N/A N/A N/A	N/A N/A N/A	② 30 (762.0) 30 (762.0)

① For special applications approved by the utility.
② Dimensions are the same as standard NEMA utility compartments, refer to **Page 21.1-8**.
③ Cold Sequence: 3000 or 4000 A main device must be mounted in separate structure. Refer to **Page 21.1-9**, Layouts 1 and 2 in **Figure 21.1-5**. The utility compartment will then be housed in the second structure. Branch devices or customer metering can then be mounted in remaining half of utility compartment structure.

Note: "W" or "D" of structure is determined by the dimensions of the utility compartment or main device—whichever is greater. For main device dimensions, see **Page 21.1-9**. N/A = Not Applicable.

Layout Dimensions—Pow-R-Line C, Front -Access

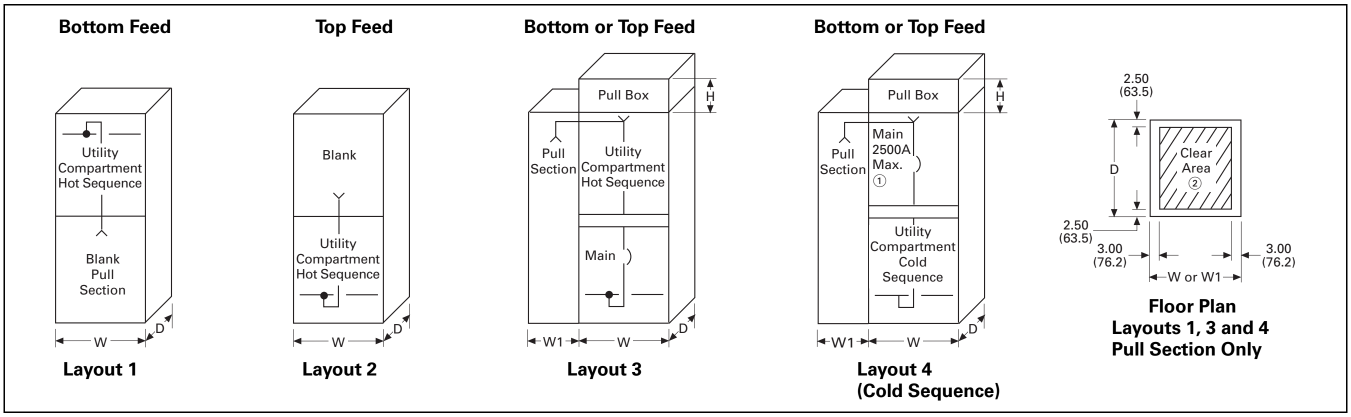


Figure 21.1-2. Incoming Utility Compartment and/or Main Devices—Dimensions in Inches (mm)

① Cold Sequence: 3000 or 4000 A main device must be mounted in separate structure. Refer to **Page 21.1-9**, Layouts 1 and 2 in **Figure 21.1-5**. The utility compartment will then be housed in the second structure. Branch devices or customer metering can then be mounted in remaining half of utility compartment structure.

② Clear area assumes no floor channels used under bottom frame.

Table 21.1-5. Dimensions for Figure 21.1-2 Layouts—Dimensions in Inches (mm)

Power Company Compartments Ampere Ratings	Metering Sequence		Front-Access						
			Layout 1	Layout 2	Layout 3		Layout 4	Top-Mounted Pull Box	Pull Section
		Width (W)	Depth (D)	Depth (D)	Depth (D)		Depth (D)	Height (H)	Width (W1)
New York State Electric and Gas	Cold				Bottom	Top			
800–1200 1600–2000 2500–4000		36 (914.4) 36 (914.4) 36 (914.4)	N/A N/A N/A	N/A N/A N/A	N/A N/A N/A	N/A N/A N/A	36 (914.4) 36 (914.4) 36 (914.4) ③	12 (304.8) 18 (457.2) 24 (609.6) ③	30 (762.0) 30 (762.0) 30 (762.0) ③
Niagara Mohawk (National Grid)	Cold				Bottom	Top			
800–1200 1600–2000 2500–4000		36 (914.4) 36 (914.4) 36 (914.4)	N/A N/A N/A	N/A N/A N/A	N/A N/A N/A	N/A N/A N/A	④ 30 (762.0) 30 (762.0) ③	N/A 18 (457.2) 24 (609.6) ③	④ 30 (762.0) 30 (762.0) ③
Northeast Utilities	Hot ⑤/Cold				Bottom	Top			
800–1200 1600–2000 2500–4000		④ 36 (914.4) 36 (914.4)	④ 30 (762.0) 36 (914.4)	④ 30 (762.0) 36 (914.4)	④ 30 (762.0) 36 (914.4)	④ 30 (762.0) 36 (914.4)	④ 30 (762.0) 36 (914.4) ③	N/A 18 (457.2) 24 (609.6) ③	30 (762.0) 30 (762.0) 30 (762.0)
XCEL (Northern States Power)	Hot ⑤/Cold				Bottom	Top			
800–1200 1600–2500 3000–4000		36 (914.4) 36 (914.4) 45 (1143.0)	30 (762.0) 30 (762.0) 36 (914.4)	30 (762.0) 30 (762.0) 36 (914.4)	30 (762.0) 30 (762.0) 36 (914.4)	30 (762.0) 30 (762.0) 36 (914.4)	N/A N/A	12 (304.8) 12 (304.8)	30 (762.0) 30 (762.0)
Orange and Rockland	Hot	④	④	④	④		④	N/A	④
PPL (Pennsylvania Power and Light)	Hot				Bottom	Top			
800–4000 480Y/277 V 800–4000 208Y/120 V		45 (1143.0) 45 (1143.0)	48 (1219.2) ⑥ 36 (914.4) ⑥	48 (1219.2) ⑦ 36 (914.4) ⑦	48 (1219.2) ⑥⑦ 36 (914.4) ⑥⑦	N/A N/A	N/A N/A	12 (304.8) ⑦ 12 (304.8) ⑦	45 (1143.0) ⑥⑧ 45 (1143.0) ⑥⑧

③ Cold Sequence: 3000 or 4000 A main device must be mounted in separate structure. Refer to **Page 21.1-9**, Layouts 1 and 2 in **Figure 21.1-5**. The utility compartment will then be housed in the second structure. Branch devices or customer metering can then be mounted in remaining half of utility compartment structure.

④ Dimensions are the same as standard NEMA utility compartments, refer to **Page 21.1-8**.

⑤ For special applications approved by the utility.

⑥ For limiter lugs or more than six (6) mechanical lugs per phase, use Layout 3.

⑦ For limiter lugs or more than six (6) mechanical lugs per phase, a 12-inch (304.8 mm) pull box is required.

⑧ For bottom incoming, front accessible applications only, 45-inch (1143.0 mm) wide pull section required.

Note: “W” or “D” of structure is determined by the dimensions of the utility compartment or main device—whichever is greater. For main device dimensions, see **Page 21.1-9**. N/A = Not Applicable.

Dimensions for estimating purposes only.

Layout Dimensions—Pow-R-Line C, Front-Access

Table 21.1-5. Dimensions for Figure 21.1-2 Layouts—Dimensions in Inches (mm) (Continued)

Power Company Compartments Ampere Ratings	Metering Sequence		Front-Access						
			Layout 1	Layout 2	Layout 3		Layout 4	Top-Mounted Pull Box	Pull Section
		Width (W)	Depth (D)	Depth (D)	Depth (D)		Depth (D)	Height (H)	Width (W1)
Exelon/PECO (Philadelphia Electric Company)	Hot	①	①	①	①	①	N/A	N/A	①
800–2000 2500 3000–4000		36 (914.4) 36 (914.4) 45 (1143.0)	30 (762.0) 36 (914.4) 36 (914.4)	30 (762.0) 36 (914.4) 36 (914.4)	N/A N/A N/A	N/A N/A N/A	N/A N/A N/A	N/A N/A N/A	N/A N/A N/A
PEPCO (Potomac Electric Power Co.)	Hot				Bottom	Top			
800–2000 2500–4000 800–3000 4000		36 (914.4) 36 (914.4) 36 (914.4) 36 (914.4)	30 (762.0) 36 (914.4) N/A N/A	N/A N/A 36 (914.4) 48 (1219.2)	N/A N/A N/A N/A	N/A N/A N/A N/A	N/A N/A N/A N/A	N/A N/A N/A N/A	N/A N/A N/A N/A
XCEL Energy of Colorado	Hot				Bottom	Top			
800–1200 1600–2500 3000–4000		① 36 (914.4) 45 (1143.0)	① 30 (762.0) 36 (914.4)	① 30 (762.0) 36 (914.4)	① 30 (762.0) 36 (914.4)	① 30 (762.0) 36 (914.4)	N/A N/A N/A	N/A 12 (304.8) ② 12 (304.8) ②	30 (762.0) 30 (762.0) 30 (762.0)
PSEG-New Jersey (Public Service Electric and Gas)	Hot				Bottom	Top			
800 1200–1600 2000–4000		36 (914.4) 45 (1143.0) 45 (1143.0)	30 (762.0) 36 (914.4) 36 (914.4)	30 (762.0) 36 (914.4) 36 (914.4)	30 (762.0) 36 (914.4) 36 (914.4)	30 (762.0) 36 (914.4) 36 (914.4)	N/A N/A N/A	N/A 18 (457.2) 24 (609.6)	30 (762.0) 30 (762.0) 30 (762.0)
Public Service of New Hampshire	Hot/Cold ③	①	①	①	①		①	N/A	①
First Energy Toledo Edison	Cold	①	①	①	①		①	N/A	①
Ameren (Union Electric)	Hot								
800–4000		①	①	①	①	①	N/A	①	①
Dominion (Virginia Power Company)	Hot				Bottom	Top			
800–1200 1600–2000 2500–4000		36 (914.4) 45 (1143.0) 45 (1143.0)	30 (762.0) 30 (762.0) 36 (914.4)	30 (762.0) 30 (762.0) 36 (914.4)	30 (762.0) 30 (762.0) 36 (914.4)	30 (762.0) 30 (762.0) 36 (914.4)	N/A N/A N/A	18 (457.2) 24 (609.6) 30 (762.0)	30 (762.0) 30 (762.0) 30 (762.0)
We Energies (Wisconsin Electric Power Co.)	Hot				Bottom	Top			
800–1200 1600–2000 2500–3000 4000		36 (914.4) 36 (914.4) 36 (914.4) 45 (1143.0)	30 (762.0) 36 (914.4) 36 (914.4) 36 (914.4)	30 (762.0) 36 (914.4) 36 (914.4) 36 (914.4)	30 (762.0) 36 (914.4) 36 (914.4) 36 (914.4)	30 (762.0) 36 (914.4) 36 (914.4) 36 (914.4)	N/A N/A N/A N/A	12 (304.8) 18 (457.2) 30 (762.0) 30 (762.0)	30 (762.0) 30 (762.0) 30 (762.0) 30 (762.0)
Alliant Energy (Wisconsin Power and Light)	Hot				Bottom	Top			
800–1200 1600–2000 2500–3000		36 (914.4) 36 (914.4) 45 (1143.0)	36 (914.4) 36 (914.4) 36 (914.4)	36 (914.4) 36 (914.4) 36 (914.4)	36 (914.4) 36 (914.4) 36 (914.4)	36 (914.4) 36 (914.4) 36 (914.4)	N/A N/A N/A	18 (457.2) 24 (609.6) 30 (762.0)	30 (762.0) 30 (762.0) 30 (762.0)
Wisconsin Public Service Corp.	Hot				Bottom	Top			
1000–4000		45 (1143.0)	30 (762.0)	30 (762.0)	N/A	N/A	N/A	N/A	N/A

① Dimensions are the same as standard NEMA utility compartments, refer to **Page 21.1-8**.
② Only required for 750 kcmil incoming cables.
③ For special applications approved by the utility.

Note: "W" or "D" of structure is determined by the dimensions of the utility compartment or main device—whichever is greater. For main device dimensions, see **Page 21.1-9**. N/A = Not Applicable.

Note: The following utilities have standardized on the National Electrical Manufacturers Association (NEMA) utility metering compartment standard. Refer to **Page 21.1-8** for specific sizing and requirements.

American Electric Power, Central Hudson Gas and Electric, Central Vermont, Consumers Power Company, Delmarva Power and Light, Georgia Power Company, Kansas City Power and Light, Orange And Rockland, Philadelphia Electric Company, Allegheny Power, Toledo Edison, Union Electric, Columbus Southern Power, Pennsylvania Electric Co. and Southern Maryland Electric Coop.

Dimensions for estimating purposes only.

Main Structures—Incoming West Coast Utility Compartments and/or Main Devices

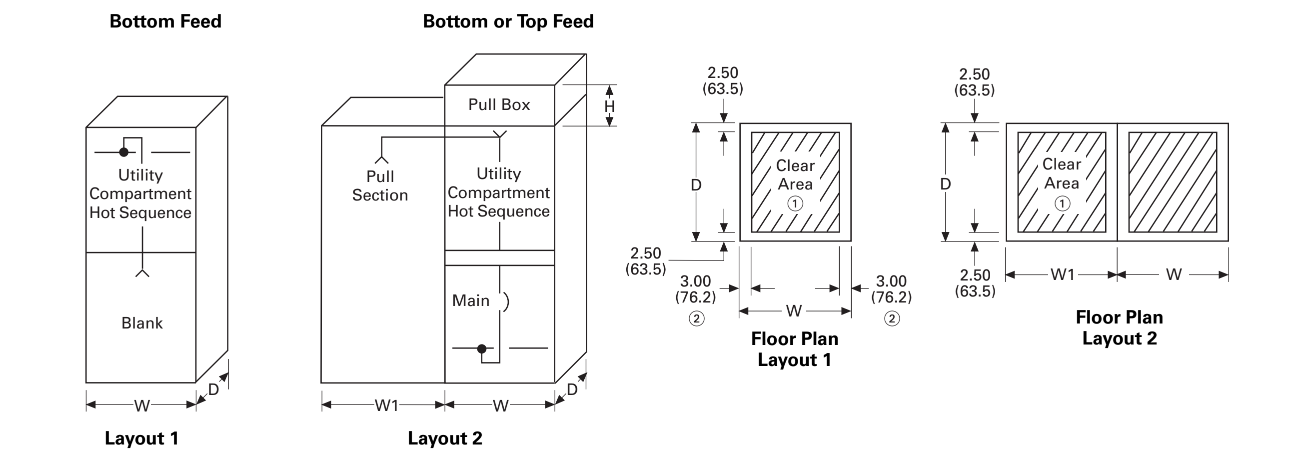


Figure 21.1-3. West Coast Utility Compartment Layouts—Dimensions in Inches (mm)

① Clear area assumes no floor channels used under bottom frame.

Table 21.1-6. Dimensions for Figure 21.1-3 Layouts—Dimensions in Inches (mm)

Power Company Compartments Ampere Ratings	Front-Access					
	Layout 1		Layout 2		(Top Feed) Top-Mounted Pull Box	(Bottom Feed) Pull Section
	Width (W)	Depth (D)	Width (W)	Depth (D)	Height (H)	Width (W1)
West Coast Utilities E.U.S.E.R.C.						
400–800	36 (914.4)	24 (609.6)	36 (914.4)	24 (609.6)	N/R	30 (762.0)
1000	36 (914.4)	24 (609.6)	36 (914.4)	24 (609.6)	30 (762.0)	36 (914.4)
1200	38 (965.2)	30 (762.0)	38 (965.2)	30 (762.0)	36 (914.4)	36 (914.4)
1600	45 (1143.0)	30 (762.0)	38 (965.2)	30 (762.0)	36 (914.4)	45 (1143.0)
2000	45 (1143.0)	30 (762.0)	38 (965.2)	30 (762.0)	36 (914.4)	45 (1143.0)
2500	51 (1295.4)	36 (914.4)	38 (965.2)	30 (762.0)	36 (914.4)	51 (1295.4)
3000	51 (1295.4)	36 (914.4)	38 (965.2)	30 (762.0)	36 (914.4)	51 (1295.4)
4000	51 (1295.4)	36 (914.4)	51 (1295.4)	36 (914.4)	36 (914.4)	51 (1295.4)
Southern California Edison (S.C.E.)						
400	36 (914.4)	24 (609.6)	36 (914.4)	24 (609.6)	N/R	30 (762.0)
600–800	36 (914.4)	24 (609.6)	36 (914.4)	24 (609.6)	N/R	30 (762.0)
1000	36 (914.4)	24 (609.6)	36 (914.4)	24 (609.6)	30 (762.0)	36 (914.4)
1200	38 (965.2)	30 (762.0)	38 (965.2)	30 (762.0)	36 (914.4)	36 (914.4)
1600	45 (1143.0)	30 (762.0)	38 (965.2)	30 (762.0)	36 (914.4)	45 (1143.0)
2000	45 (1143.0)	30 (762.0)	38 (965.2)	30 (762.0)	36 (914.4)	45 (1143.0)
2500	—	—	38 (965.2)	30 (762.0)	36 (914.4)	51 (1295.4)
3000	—	—	38 (965.2)	30 (762.0)	36 (914.4)	51 (1295.4)
4000	—	—	51 (1295.4)	36 (914.4)	36 (914.4)	51 (1295.4)
Los Angeles Department of Water and Power (L.A.D.W.P.)						
400	36 (914.4)	24 (609.6)	36 (914.4)	24 (609.6)	②	30 (762.0)
600–800	36 (914.4)	24 (609.6)	36 (914.4)	24 (609.6)	②	30 (762.0)
1000	36 (914.4)	24 (609.6)	36 (914.4)	24 (609.6)	②	36 (914.4)
1200	38 (965.2)	30 (762.0)	38 (965.2)	30 (762.0)	②	36 (914.4)
1600	45 (1143.0)	30 (762.0)	38 (965.2)	30 (762.0)	②	45 (1143.0)
2000	45 (1143.0)	30 (762.0)	38 (965.2)	30 (762.0)	②	45 (1143.0)
2500	—	—	38 (965.2)	30 (762.0)	②	51 (1295.4)
3000	—	—	38 (965.2)	30 (762.0)	②	51 (1295.4)
4000	—	—	51 (1295.4)	36 (914.4)	②	51 (1295.4)

② Refer to Eaton.

Note: "W" or "D" of structure is determined by the dimensions of the utility compartment or main device—whichever is greater. For main device dimensions, see **Page 21.1-9**. N/R = Not Required.

Dimensions for estimating purposes only.

Layout Dimensions—Pow-R-Line C, Front-Access

Table 21.1-6. Dimensions for Figure 21.1-3 Layouts—Dimensions in Inches (mm) (Continued)

Power Company Compartments Ampere Ratings	Front-Access					
	Layout 1		Layout 2		(Top Feed) Top-Mounted Pull Box	(Bottom Feed) Pull Section
	Width (W)	Depth (D)	Width (W)	Depth (D)	Height (H)	Width (W1)
West Coast Utilities						
Pacific Gas and Electric (P.G. and E.)						
400–800 1000 1200	36 (914.4) 36 (914.4) 38 (965.2)	24 (609.6) 24 (609.6) 30 (762.0)	36 (914.4) 36 (914.4) 38 (965.2)	24 (609.6) 24 (609.6) 30 (762.0)	N/R 30 (762.0) 36 (914.4)	30 (762.0) 36 (914.4) 36 (914.4)
1600 2000 2500	45 (1143.0) 45 (1143.0) —	30 (762.0) 30 (762.0) —	38 (965.2) 38 (965.2) 38 (965.2))	30 (762.0) 30 (762.0) 36 (914.4)	36 (914.4) 36 (914.4) 36 (914.4)	45 (1143.0) 45 (1143.0) 51 (1295.4)
3000 4000	— —	— —	45 (1143.0) 51 (1295.4)	30 (762.0) 36 (914.4)	36 (914.4) 36 (914.4)	51 (1295.4) 51 (1295.4)
San Diego Gas and Electric (S.D.G. and E.)						
400–800 1000 1200	36 (914.4) 36 (914.4) 38 (965.2)	24 (609.6) 24 (609.6) 30 (762.0)	36 (914.4) 36 (914.4) 38 (965.2)	24 (609.6) 24 (609.6) 30 (762.0)	30 (762.0) 30 (762.0) 36 (914.4)	30 (762.0) 36 (914.4) 36 (914.4)
1600–2000 (Copper) 1600 (Aluminum) 2000 (Aluminum)	45 (1143.0) 45 (1143.0) 45 (1143.0)	30 (762.0) 30 (762.0) 30 (762.0)	38 (965.2) 38 (965.2) 38 (965.2)	30 (762.0) 30 (762.0) 30 (762.0)	36 (914.4) 36 (914.4) 36 (914.4)	45 (1143.0) 45 (1143.0) 45 (1143.0)
2500 3000 4000	— — —	— — —	38 (965.2) 38 (965.2) 51 (1295.4)	30 (762.0) 30 (762.0) 36 (914.4)	36 (914.4) 36 (914.4) 36 (914.4)	51 (1295.4) 51 (1295.4) 54 (1371.6)

Note: "W" or "D" of structure is determined by the dimensions of the utility compartment or main device—whichever is greater. For main device dimensions, see **Page 21.1-9**. N/R = Not Required.

Dimensions for estimating purposes only.

Main Structure—Incoming Standard (NEMA) Utility Compartments and/or Main Device

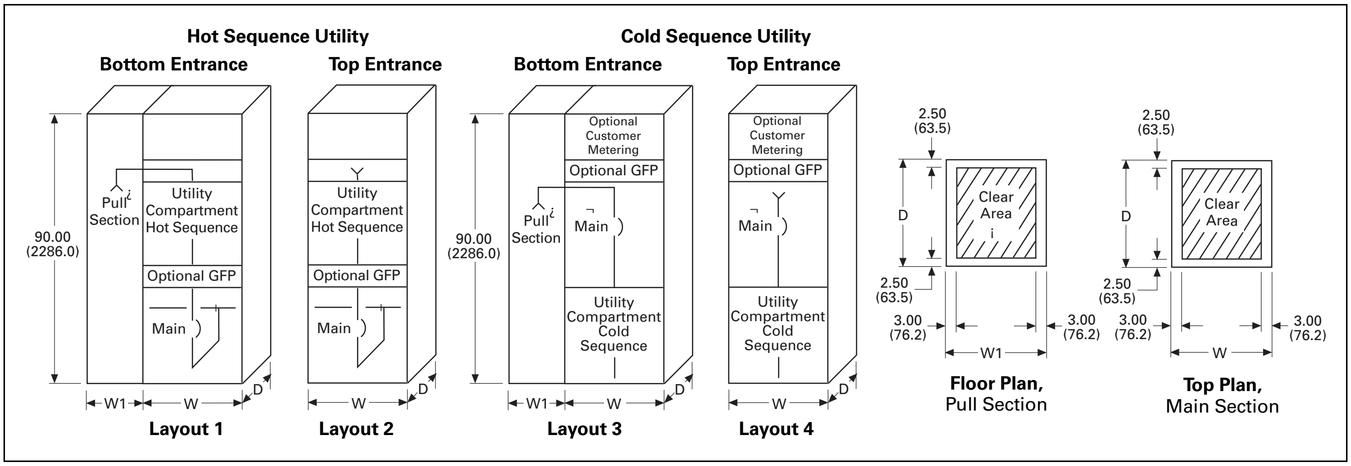


Figure 21.1-4. NEMA Utility Compartment Layouts—Dimensions in Inches (mm)

① Rigid bus extension into Pull Section is required above 2000 A.
② Clear area assumes no floor channels used under bottom frame.
③ IQ meter mounted to disconnect door as an alternate location. (When K, L, M, N and R fixed-mounted frames and fixed-mounted power circuit breakers are used.)

Table 21.1-7. Main Device Structure Size for Figure 21.1-4 Layouts

Main Device	Max. Amp. Rating	Width (W)	Depth (D)	Pull Section Width (W1)
Fixed-Mounted Devices				
Molded Case Breakers Available with Optional Integral GFP				
KD, HKD, KDC	400	36	30	30
LGS, LGH, LGC, LGU	600	36	30	30
LD, HLD, LDC	600	36	30	30
MDL, HMDL	800	36	30	30
NG, NGH, NGC	1200	36	30	30
RG, RGC	1600	36	30	30
RG	2000	36	30	30
RG	2500	36	30	30
100% Rated Molded Case Breakers Available with Optional Integral GFP				
CKD, CHKD	400	36	30	30
CLD, HCLD, CLDC	600	36	30	30
CMDL, CHMDL	800	36	30	30
NG, NGH, NGC	1200	36	30	30
RG, RGC	1600	36	30	30
RG, RGC	2000	36	30	30
TRI-PAC Fuse Type Current Limiting Breakers				
LA-P	400	36	30	30
NB-P	800	36	30	30
PB-P	1600	36	30	30

Note: Dimensions for **Figure 21.1-4.**

Note: Refer to **Pages 21.1-2** to **21.1-4** for dimensions on special utility CT compartments.

Main Device	Max. Amp. Rating	Width (W)	Depth (D)	Pull Section Width (W1)
Fixed-Mounted Devices				
100% Rated Insulated Case Circuit Breakers Available with Optional Integral GFP				
Magnum SB, DS ④	800	36	30	30
	1600	36	30	30
	2000	36	30	30
	3000	45	30	30
	4000	45	36	30
100% Rated Power Circuit Breakers Available with Optional Integral GFP				
Magnum DS	800	36	30	30
	1600	36	30	30
	2000	36	30	30
	3000	45	36	30
	4000	45	36	30
Fusible Switches				
400	400	36	30	30
600	600	36	30	30
800	800	36	30	30
1200	1200	36	30	30
100% Rated Electric Trip Bolted Pressure Switches Available with Optional GFP				
CBC-800	800	36	30	30
CBC-1200	1200	36	30	30
CBC-1600	1600	36	30	30
CBC-2000	2000	36	30	30
CBC-2500	2500	45	36	30
CBC-3000	3000	45	36	30
CBC-4000	4000	45	36	30

Note: See **Pages 21.1-11** to **21.1-14** for layout of distribution sections. See **Pages 21.4-1** and **21.4-2** for outdoor rainproof enclosures. Top-mounted pull boxes are available with heights of 12.00, 18.00, 24.00 and 30.00 inches (304.8, 457.2, 609.6 and 762.0 mm).

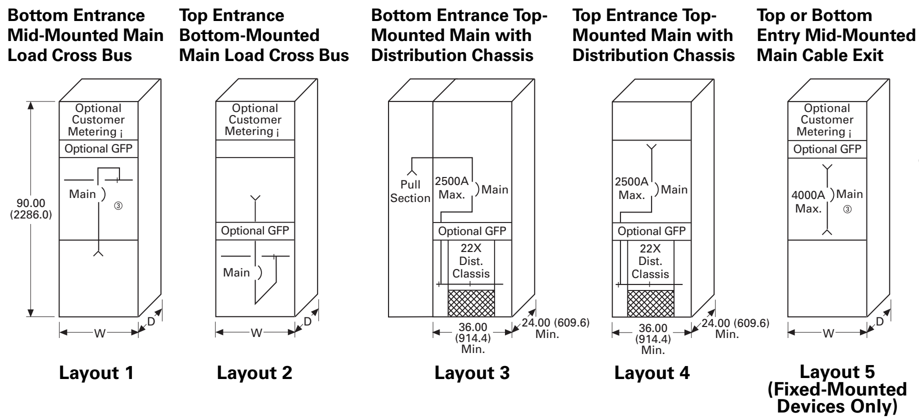
Main Device	Max. Amp. Rating	Width (W)	Depth (D)	Pull Section Width (W1)
Fixed-Mounted Devices				
100% Rated Manual Bolted Pressure Switches Not Available with Ground Fault Protection				
QA-800	800	36	30	30
QA-1200	1200	36	30	30
QA-1600	1600	36	30	30
QA-2000	2000	36	30	30
QA-2500	2500	45	36	30
QA-3000	3000	45	36	30
QA-4000	4000	45	36	30
Drawout-Mounted Devices				
100% Rated Insulated Case Circuit Breakers Available with Optional Integral GFP				
Magnum SB, DS ④	800	36	48	30
	1600	36	48	30
	2000	36	48	30
	3000	45	48	30
	4000	45	48	30
100% Rated Power Circuit Breakers Available with Optional Integral GFP				
Magnum SB, DS ④	800	36	48	30
	1600	36	48	30
	2000	36	48	30
	3000	45	48	30
	4000	45	48	30

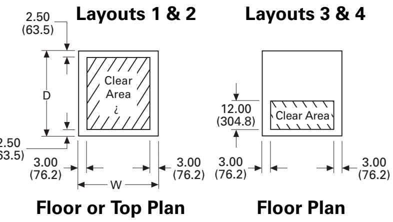
④ Magnum DS power circuit breakers used as feeder devices have been qualified by Eaton and third-party witness tested for 30-cycle withstand. 30-cycle withstand is not recognized by UL 891.

Dimensions for estimating purposes only. For metric conversion: inches x 25.4 = mm.

Layout Dimensions—Pow-R-Line C, Front-Access, Group-Mounted Top Feed

Incoming Structure—With Customer Metering and/or Main Device





Ampere Rating		Dimensions in Inches (mm) Width	Height
Pull Section Minimum Dimensions	400–800	30 (762.0)	—
	1200–2000	30 (762.0)	—
	2500	30 (762.0)	—
Top Pull Box Minimum Dimensions	400–800	—	12 (304.8)
	1200–2000	—	18 (457.2)
	2500	—	24 (609.6)

Figure 21.1-5. Main Structure Layouts—Dimensions in Inches (mm)

① Clear area assumes no floor channels used under bottom frame.
② Customer metering with IQ meter requires 30.00-inch (762.0 mm) minimum width.
③ Not available with bottom fed TRI-PAC×breaker.

Table 21.1-8. Main Device Structure Size for Figure 21.1-5 Layouts

Main Device	Max. Amp. Rating	Width (W) Zero Seq. GFP	Width (W) No GFP or With Integral GFP	Depth (D)
Fixed-Mounted Devices				
Molded Case Breakers Available with Optional Integral GFP				
KD, HKD, KDC	400	30	30	24
LGS, LGH,	600	30	30	24
LGC, LGU	600	30	30	24
LD, HLD, LDC	600	30	30	24
MDL, HMDL	800	30	30	24
NG, NGH	1200	30	30	24
RG, RGC	1600	30	30	30
RG, RGC	2000	30	30	30
RG, RGC	2500	30	30	30
100% Rated Molded Case Breakers Available with Optional Integral GFP				
CKD, CHKD	400	30	30	18
CLD, HCLD,	600	30	30	18
CLDC	600	30	30	18
CMDL,CHML	800	30	30	24
NG, NGH	1200	30	30	24
NGC	1200	30	30	24
RG, RGC	1600	36	30	30
RG, RGC	2000	36	30	30
TRI-PAC Fuse Type Current Limiting Breakers				
LA-P	400	30	26	18
NB-P	800	30	26	18
PB-P	1600	30	26	24

Note: See **Pages 21.1-11** to **21.1-14** for layout of distribution sections. See **Pages 21.4-1** and **21.4-2** for outdoor rainproof enclosures.

Note: Top-mounted pull boxes are available with heights of 12.00, 18.00, 24.00 and 30.00 inches (304.8, 457.2, 609.6 and 762.0 mm).

Main Device	Max. Amp. Rating	Width (W)	Depth (D)
Fixed-Mounted Devices			
100% Rated Insulated Case Circuit Breakers Available with Optional Integral GFP			
Magnum SB, DS ⑦	800	36	30
	1600	36	30
	2000	36	30
	3000	36	30
	4000	36	36
	5000	45	36
100% Rated Power Circuit Breakers Available with Optional Integral GFP			
Magnum DSX	800	36	30
	1600	36	30
	2000	36	30
	3000	45	30
	4000	45	36
	5000	45	48
Fusible Switches			
400	400	30	18
600	600	30	18
800	800	30	18
1200	1200	30	18
100% Rated Electric Trip Bolted Pressure Switches Available with Optional GFP ④			
CBC-800	800	36	30
CBC-1200	1200	36	30
CBC-1600	1600	36	30
CBC-2000	2000	36	30
CBC-2500	2500	45	36
CBC-3000	3000	45	36
CBC-4000	4000	45	36
CBC-5000 ⑤	5000	⑥	

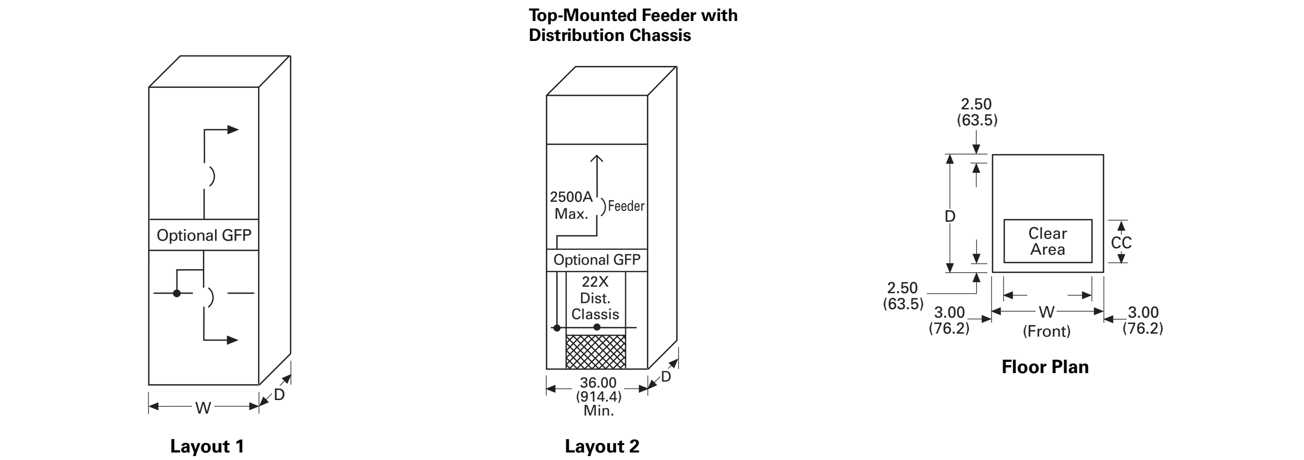
Note: Dimensions for Layouts 1, 2 and 5—shown above. Dimensions for Layouts 3 and 4—use larger allowable dimension of main (shown above) or distribution mounted devices (see **Pages 21.1-9** to **21.1-15**).

Main Device	Max. Amp. Rating	Width (W)	Depth (D)
Fixed-Mounted Devices			
100% Rated Manual Bolted Pressure Switches *Not Available with Ground Fault Protection* ④			
QA-800	800	30	30
QA-1200	1200	30	30
QA-1600	1600	30	30
QA-2000	2000	30	30
QA-2500	2500	36	30
QA-3000	3000	45	36
QA-4000	4000	45	36
QA-5000 ⑤	5000	⑥	
Drawout-Mounted Devices			
100% Rated Insulated Case Circuit Breakers Available with Optional Integral GFP			
Magnum SB, DS ⑦	800	36	48
	1600	36	48
	2000	36	48
	3000	36	48
	4000	45	48
	5000	45	48
100% Rated Power Circuit Breakers Available with Optional Integral GFP			
Magnum DSX	800	36	48
	1600	36	48
	2000	36	48
	3000	45	48
	4000	45	48
	5000	45	48

④ Bottom feed switch structure depth per Figure 1 is 36.00-inch (914.4 mm) minimum.
⑤ Not UL listed.
⑥ Refer to Eaton.
⑦ Magnum DS power circuit breakers used as feeder devices have been qualified by Eaton and third-party witness tested for 30-cycle withstand. 30-cycle withstand is not recognized by UL 891.

Dimensions for estimating purposes only. For metric conversion: inches x 25.4 = mm.

Individually Mounted Distribution Devices



Note: Switchboards designed using these distribution structures require front access for cable terminations.

Figure 21.1-6. Individually Mounted Distribution Layouts

① Clear area assumes no floor channels used under front or rear frame members.

Note: Individually mounted distribution devices are not compartmentalized.

Table 21.1-9. Stacked Individually Mounted Distribution Structure Sizes for Figure 21.1-6 Layout 1 Only—Dimensions in Inches (mm) ②

Feeder Device	Max. Amp. Rating	Zero Sequence GFP		No GFP or with Integral GFP		Minimum Cable Space CC
		Minimum		Minimum		
		Width (W)	Depth (D)	Width (W)	Depth (D)	
Fixed-Mounted Devices						
Molded Case Breakers						
RG, RGC	1600	45 (1143.0)	36 (914.4)	45 (1143.0)	36 (914.4)	12 (304.8)
RG, RGC	2000	45 (1143.0)	36 (914.4)	45 (1143.0)	36 (914.4)	12 (304.8)
RG, RGC	2500	45 (1143.0)	36 (914.4)	45 (1143.0)	36 (914.4)	12 (304.8)
100% Rated Power Circuit Breaker						
Magnum	800	45 (1143.0)	36 (914.4)	45 (1143.0)	36 (914.4)	12 (304.8)
DS ③, SB,	1600	45 (1143.0)	36 (914.4)	45 (1143.0)	36 (914.4)	12 (304.8)
DSX	2000	45 (1143.0)	36 (914.4)	45 (1143.0)	36 (914.4)	12 (304.8)

② Structure size to be determined by device requiring the largest structure width and depth.

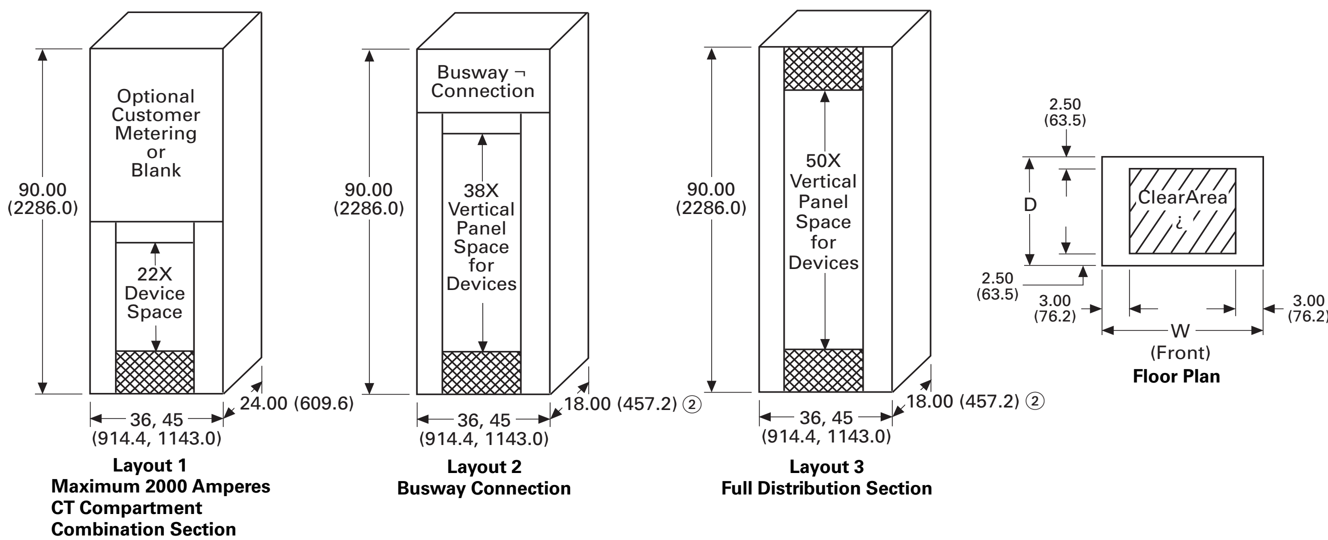
③ Magnum DS power circuit breakers used as feeder devices have been qualified by Eaton and third-party witness tested for 30-cycle withstand. 30-cycle withstand is not recognized by UL 891.

Table 21.1-10. Top Feeder with Group-Mounted Distribution Chassis (Layout 2 Only)—Dimensions in Inches (mm)

Feeder Device	Maximum Ampere Rating	Width (W)	Depth (D)
RG, RGC	2500	36 (914.4)	30 (762.0)
Magnum SB	2500	36 (914.4)	30 (762.0)
Magnum DS ③	2500	36 (914.4)	30 (762.0)
Manually Operated Bolted Pressure Contact Switch	2500	36 (914.4)	30 (762.0)

Note: Top-mounted pull boxes are available with heights of 12.00, 18.00, 24.00 and 30.00 inches (304.8, 457.2, 609.6 and 762.0 mm).

Distribution Sections—Group-Mounted Devices



Note: See Distribution Layout Guides for structure width and for feeder device "X" requirements on **Pages 21.1-12** and **21.1-14**.

Figure 21.1-7. Distribution Section Layouts—Dimensions in Inches (mm)

① Clear area assumes no floor channels used under bottom frame.
② For panels rated above 2000 A, minimum depth is 24.00 inches (609.6 mm).
③ Busway connection can be either incoming service or exiting load from a feeder breaker. Increased depth will be required.

Main Lug Distribution Sizing

Most switchboard layouts feed the distribution section(s) from adjacent main breaker sections; however, a single distribution section may have a set of incoming main lugs only.

Main lugs may be positioned in two ways.

1. Main lugs on distribution panel using space requirements in **Table 21.1-11**.
2. With a bussed auxiliary structure for incoming cable per **Figure 21.1-8**.

Table 21.1-11. Main Lug Only Space Requirements—Dimensions in Inches (mm)

Amperes	Lug ④ Range (kcmil)	"X" Space Required 50X Chassis	"X" Space Required 38X Chassis ⑤
400 & 600	2–#2–500 2–#250–750	10 (254.0) 16 (406.4)	10 (254.0) 10 (254.0)
800	3–#2–500 3–#250–750	10 (254.0) 16 (406.4)	10 (254.0) 10 (254.0)
1200	4–#2–500 4–#250–750	12 (304.8) 16 (406.4)	12 (304.8) 12 (304.8)
1600	5–#2–500 5–#250–750	12 (304.8) 16 (406.4)	12 (304.8) 12 (304.8)
2000	6–#2–500 6–#250–750	12 (304.8) 16 (406.4)	12 (304.8) 12 (304.8)

④ For compression lugs, use #250–750 kcmil lug dimensions.
⑤ Dimensions shown are for top entry on 38X Chassis only. For bottom entry, use 50X Chassis space requirements.

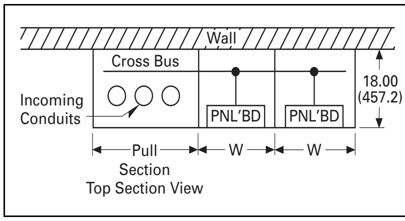


Figure 21.1-8. Section Plan View

For 3000–4000 A: Incoming cable or busway enters top or bottom of pull section, terminating in cross bus extension. For pull section dimensions, refer to **Page 21.1-8**.

Dimensions for estimating purposes only.

Distribution Layout Guide—Molded Case Breakers

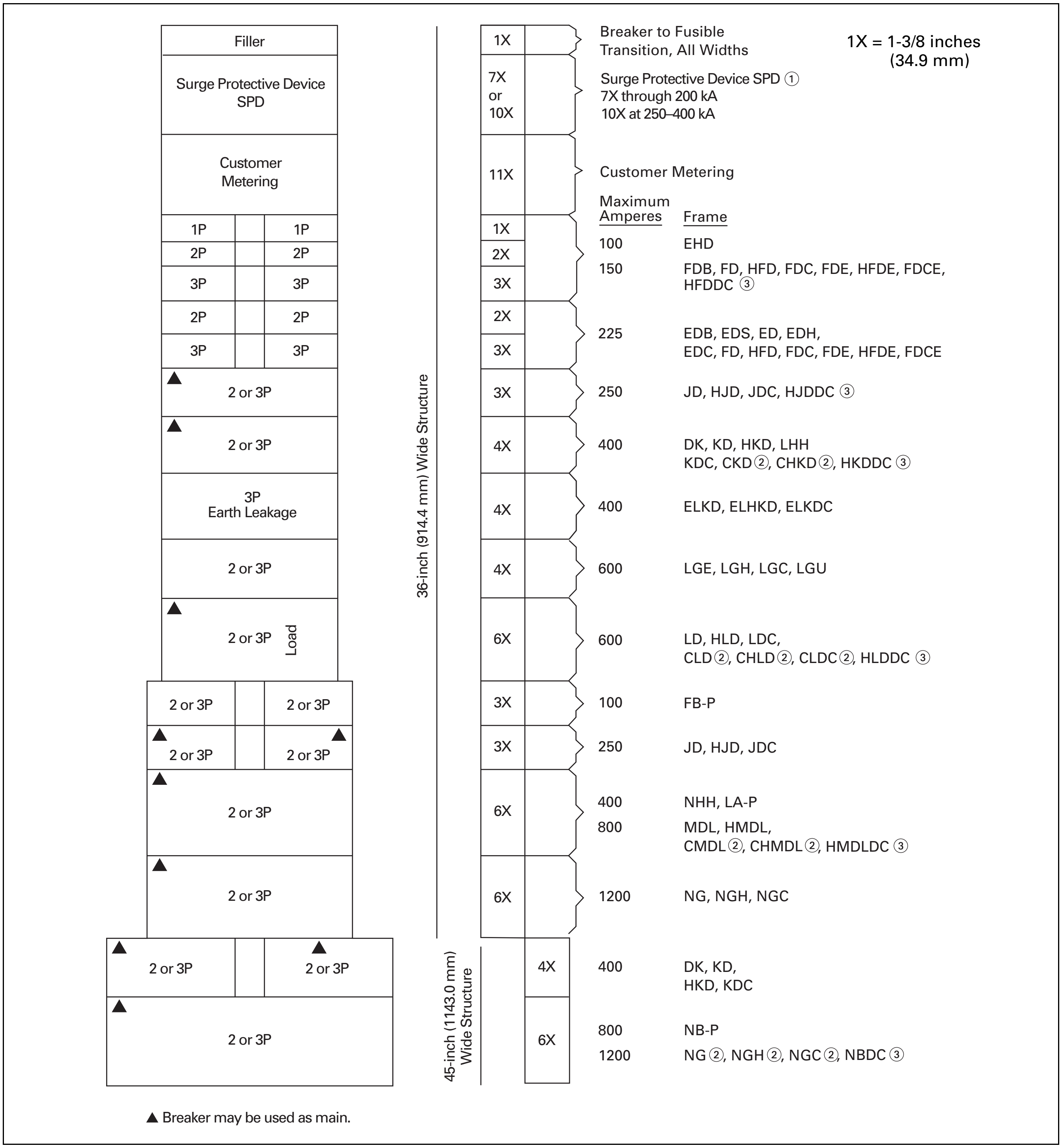


Figure 21.1-9. Circuit Breaker "X" Space Requirements—Dimensions in Inches (mm)

① Preferred location of SPD is mounted at the top of first distribution section. See **Tab 34** for further information.
② 100% rated breakers.
③ For use on direct current (DC) systems only.

Note: For breaker interrupting rating and terminal data, see **Tab 26**.

Distribution Layout Guide—Group-Mounted Drawout

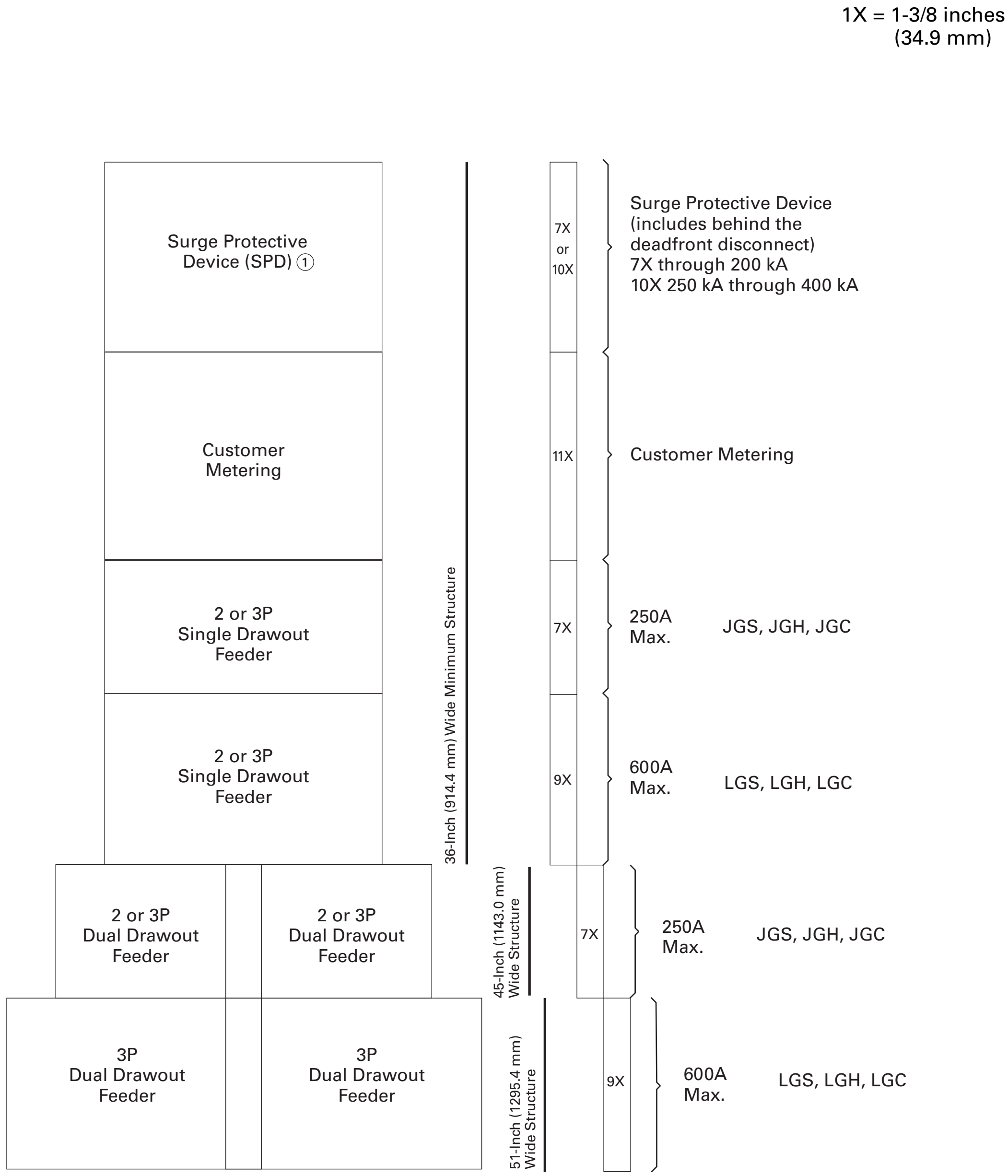


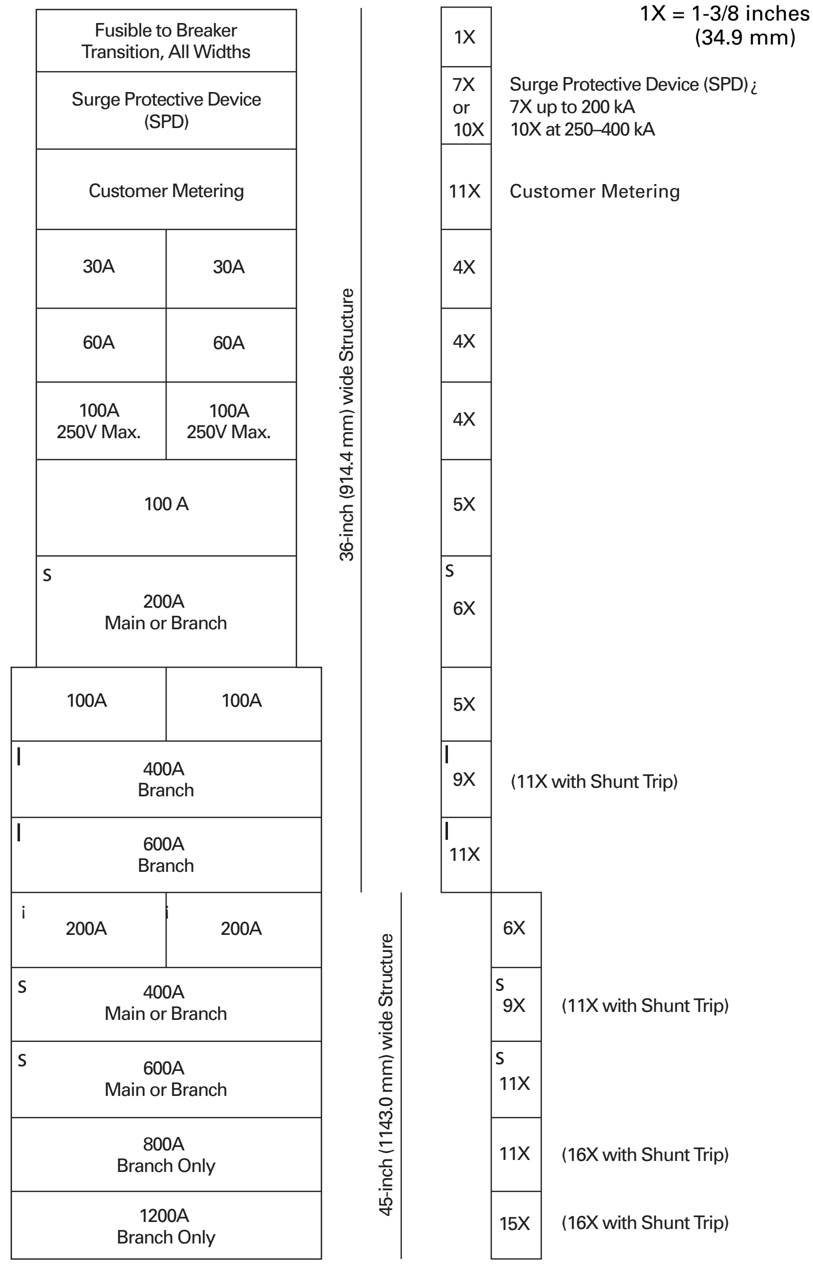
Figure 21.1-10. Circuit Breaker “X” Space Requirements—Dimensions in Inches (mm)

① Preferred location of SPD is mounted at the top of first distribution section. See **Tab 34** for further information.

Note: Determine the structure width by the group-mounted drawout MCCB feeder devices above. The width of the structure is determined by the maximum structure size shown for each device.

Layout Dimensions—Pow-R-Line C, Front-Access, Group-Mounted Feeders

Distribution Layout Guide—Fusible Switches



S Fusible switch may be used as horizontally main.

l 400 and 600A horizontally mounted feeder switches in 36- or 45-inch (914.4 or 1143.0 mm) wide structure. 400 and 600A horizontally mounted main switches only in 45-inch (1143.0 mm) wide structure.

Figure 21.1-11. Fusible Switch "X" Space Requirements—Dimensions in Inches (mm)

① Preferred location of SPD is mounted at the top of first distribution section. See **Tab 34** for further information.

② Twin 200 A switches requires the use of "J" or "T" fuses at 480 V.

Note: Ground fault applications for 800 and 1200 A switches require a shunt trip.

Individually Mounted Feeder Devices

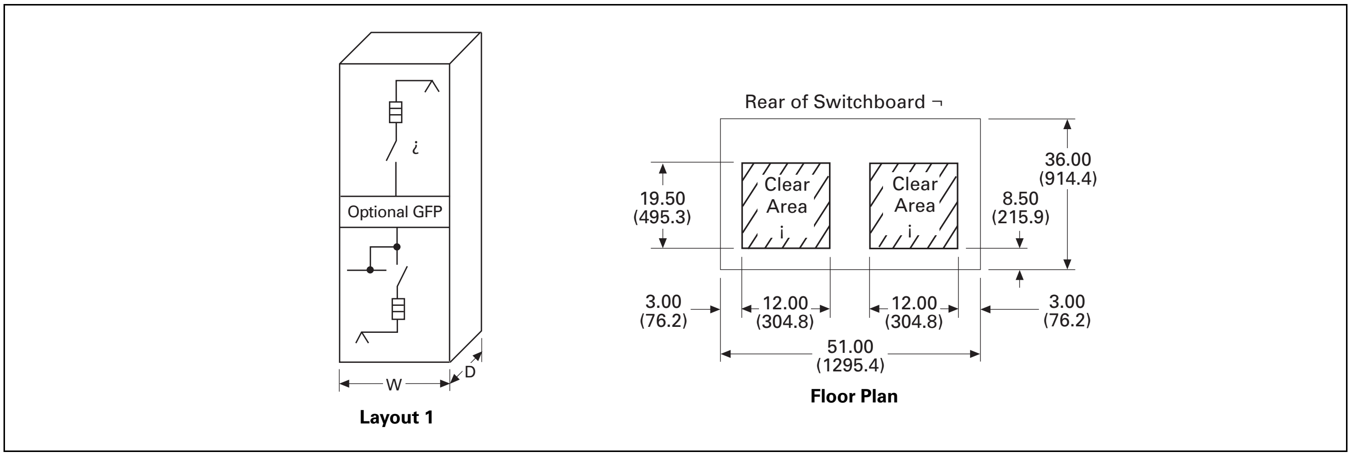


Figure 21.1-12. Individually Mounted Feeder Layout—Dimensions in Inches (mm)

① Verify acceptance with code authorities.
② Clear area assumes no floor channels used under front or rear frame members.
③ Clearance from walls (on boards that are not rear accessible) should be a minimum of 0.50-inch (12.7 mm) for indoor boards. For boards used in outdoor or wet locations the clearance should be no less than 6.00 inches (152.4 mm).

Note: Top-mounted pull boxes are available with heights of 12.00, 18.00, 24.00 and 30.00 inches (304.8, 457.2, 609.6 and 762.0 mm).

Table 21.1-12. Dimensions for Figure 21.1-12 Layout—Dimensions in Inches (mm)

Feeder Device	Maximum Ampere Rating	Zero Sequence GFP		No GFP or with Integral GFP	
		Minimum		Minimum	
		Width (W)	Depth (D)	Width (W)	Depth (D)
Fixed-Mounted Devices					
100% Rated Electric Trip Bolted Pressure Switches					
CBC-800	800	51 (1295.4)	36 (914.4)	51 (1295.4)	36 (914.4)
CBC-1200	1200	51 (1295.4)	36 (914.4)	51 (1295.4)	36 (914.4)
CBC-1600	1600	51 (1295.4)	36 (914.4)	51 (1295.4)	36 (914.4)
100% Rated Manual Bolted Pressure Switches Not Available with Ground Fault Protection					
QA-800	800	—	—	51 (1295.4)	36 (914.4)
QA-1200	1200	—	—	51 (1295.4)	36 (914.4)
QA-1600	1600	—	—	51 (1295.4)	36 (914.4)

Dimensions for estimating purposes only.

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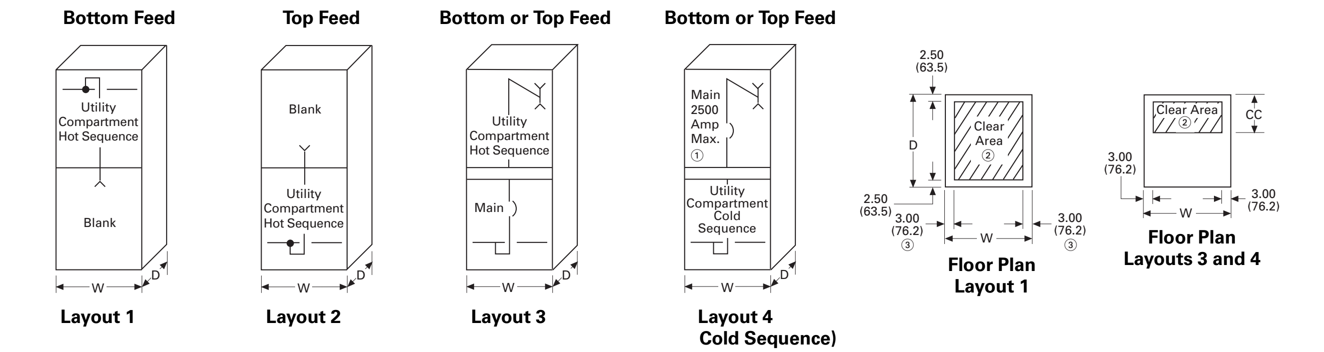
Incoming Utility Compartments and/or Main Devices



Note: Switchboards designed using these main structures require rear access for cable terminations. Refer to NEC Article 110-26 for requirements.

Figure 21.2-1. Utility Compartment Layouts—Dimensions in Inches (mm)

① Cold Sequence: 3000 or 4000 A main device must be mounted in separate structure. Refer to **Page 21.2-8**, Layouts 1 and 2 in **Figure 21.2-5**. The utility compartment will then be housed in the second structure. Branch devices or customer metering can then be mounted in remaining half of utility compartment structure.
② Clear area assumes no floor channels used under bottom frame.
③ If floor channels are present, this dimension is 6.00 (152.4).

Table 21.2-1. Dimensions for Figure 21.2-1 Layouts—Dimensions in Inches (mm)

Power Company Compartments Ampere Ratings	Metering Sequence		Rear-Access					
			Layout 1	Layout 2	Layout 3		Layout 4	
		Width (W)	Depth (D)	Depth (D)	Depth (D)	CC	Depth (D)	CC
Atlantic City Electric	Hot							
800 1200 1600–2000 2500–4000		36 (914.4) 36 (914.4) 45 (1143.0) 45 (1143.0)	36 (914.4) 48 (1219.2) 48 (1219.2) 48 (1219.2)	36 (914.4) 48 (1219.2) 48 (1219.2) 48 (1219.2)	36 (914.4) 48 (1219.2) 48 (1219.2) 48 (1219.2)	6 (152.4) 6 (152.4) 12 (304.8) 12 (304.8)	N/A N/A N/A N/A	— — — —
BGE (Baltimore Gas and Electric) ④	Hot							
800 1200–2500 3000–4000		36 (914.4)/ 36 (914.4)/ 45 (1143.0) ⑥	36 (914.4)/ 36 (914.4)/ 36 (914.4) ⑥	36 (914.4)/ 36 (914.4)/ 36 (914.4) ⑥	⑤ ⑤ ⑤	⑤ ⑤ ⑤	N/A N/A N/A	— — —
NSTAR (Boston Edison, Cambridge Electric, Commonwealth Electric)	Cold							
800–1600 2000–2500 3000–4000		36 (914.4) 36 (914.4) 45 (1143.0) ⑦	N/A N/A N/A	N/A N/A N/A	N/A N/A N/A	— — —	48 (1219.2) 48 (1219.2) 48 (1219.2)	18 (457.2) 12 (304.8) 12 (304.8) ⑦
CH Energy Group (Central Hudson Gas and Electric)	Hot ④/Cold	⑧	⑧	⑧	⑧	⑧	N/A	—
Central Vermont Public Service	Hot	⑧	⑧	⑧	⑧	⑧	N/A	N/A
Cinergy/CG&E (Cincinnati Gas and Electric)	Hot							
800 1200–2000 2500–4000		36 (914.4) 45 (1143.0) 45 (1143.0)	30 (762.0) 36 (914.4) 36 (914.4)	30 (762.0) 36 (914.4) 36 (914.4)	36 (914.4) 48 (1219.2) 48 (1219.2)	6 (152.4) 12 (304.8) 12 (304.8)	N/A N/A N/A	— — —
Exelon/ComEd (Commonwealth Edison)	Hot							
400–1000 1200–2000 2500–4000		36 (914.4) 36 (914.4) 36 (914.4)	36 (914.4) 48 (1219.2) 48 (1219.2)	36 (914.4) 48 (1219.2) 48 (1219.2)	36 (914.4) 48 (1219.2) 48 (1219.2)	6 (152.4) 12 (304.8) 12 (304.8)	N/A N/A N/A	— — —

④ For special applications approved by the utility.
⑤ Refer to Eaton.
⑥ For BG&E, the utility compartment is mounted in the bottom for Layout 1 and top for Layout 2. For bottom feed (Layout 1); up to 2500 A, the main is mounted in top. For 3000 and 4000 A bottom feed, the main is in a separate structure. For top feed (Layout 2), maximum amperes is 4000 A and the main is mounted in the bottom.
⑦ Cold Sequence: 3000 or 4000 A main device must be mounted in separate structure. Refer to **Page 21.2-8**, Layouts 1 and 2 in **Figure 21.2-5**. The utility compartment will then be housed in the second structure. Branch devices or customer metering can then be mounted in remaining half of utility compartment structure.
⑧ Dimensions are the same as standard NEMA utility compartments, refer to **Page 21.2-7**.

Note: "W" or "D" of structure is determined by the dimensions of the utility compartment or main device—whichever is greater. For main device dimensions, see **Page 21.2-8**. N/A = Not Applicable.

Dimensions for estimating purposes only.

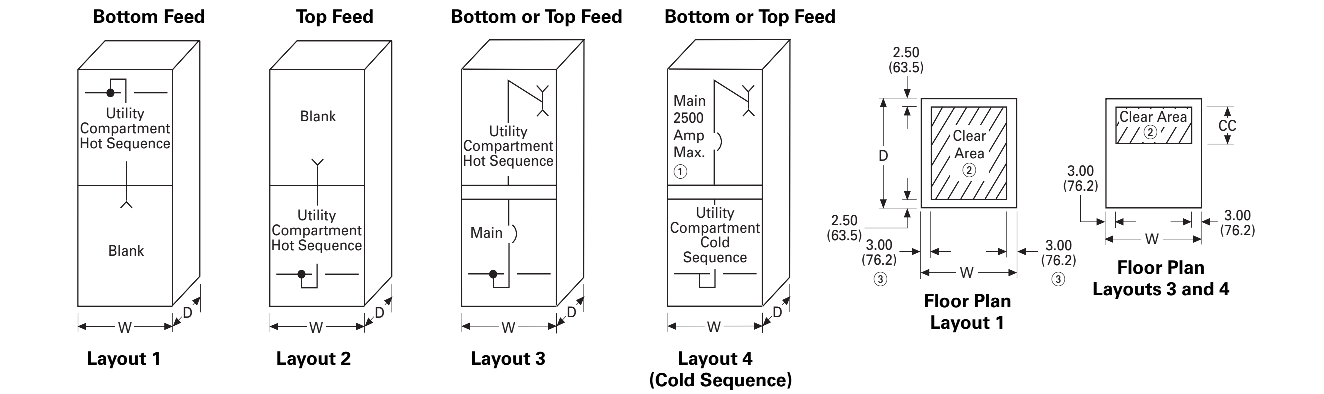
Layout Dimensions—Pow-R-Line C, Rear-Access and Pow-R-Line *i* Feeders

Table 21.2-1. Dimensions for Figure 21.2-1 Layouts—Dimensions in Inches (mm) (Continued)

Power Company Compartments Ampere Ratings	Metering Sequence		Rear-Access					
			Layout 1	Layout 2	Layout 3		Layout 4	
		Width (W)	Depth (D)	Depth (D)	Depth (D)	CC	Depth (D)	CC
Connecticut Light and Power (Northeast Utilities)	Hot ①/Cold							
800–1200 1600–2000 2500–4000		② 36 (914.4) 36 (914.4)/ 45 (1143.0)	② 36 (914.4) 48 (1219.2)	② 36 (914.4) 48 (1219.2)	② 36 (914.4) 48 (1219.2)	② N/A N/A	② 48 (1219.2) 48 (1219.2) ③	② 12 (304.8) 12 (304.8) ③
ConEdison (Consolidated Edison)	Hot							
800–1200 (Spec. 298) 1200–4000 (Spec. 377)		38 (965.2) 45 (1143.0)	36 (914.4) 48 (1219.2)	36 (914.4) 48 (1219.2)	36 (914.4) 48 (1219.2)	6 (152.4) 12 (304.8)	N/A N/A	— —
DTE Energy (Detroit Edison)	Hot							
800 1200–2500 3000–4000		36 (914.4) 36 (914.4) 45 (1143.0)	36 (914.4) 36 (914.4) 48 (1219.2)	36 (914.4) 36 (914.4) 48 (1219.2)	36 (914.4) 36 (914.4) 48 (1219.2)	6 (152.4) 6 (152.4) 12 (304.8)	N/A N/A N/A	— — —
Florida Power and Light	Hot	②	②	②	②	②	N/A	—
Georgia Power Co.	Hot	②	②	②	②	②	N/A	—
IPL (Indianapolis Power Co.)	Hot/Cold ①							
800 1200–2000 2500–4000		36 (914.4) 36 (914.4) 36 (914.4)	36 (914.4) 36 (914.4) 36 (914.4)	36 (914.4) 36 (914.4) 36 (914.4)	48 (1219.2) 48 (1219.2) 48 (1219.2)	12 (304.8) 12 (304.8) 12 (304.8)	48 (1219.2) 48 (1219.2) 48 (1219.2) ③	12 (304.8) 12 (304.8) 12 (304.8) ③
Jersey Central Power (First Energy)	Hot ①/Cold							
800 1200–2000 2500–4000		② 45 (1143.0) 45 (1143.0)	② 48 (1219.2) 48 (1219.2)	② 48 (1219.2) 48 (1219.2)	② 48 (1219.2) 48 (1219.2)	② 12 (304.8) 12 (304.8)	② 48 (1219.2) 48 (1219.2) ③	② 12 (304.8) 12 (304.8) ③
Kansas City Power and Light	Hot	②	②	②	②	②	N/A	—
PSEGLI (Public Service Electric-Long Island)	Hot							
800–1200 1600–2000 2500–4000		38 (965.2) 45 (1143.0) 45 (1143.0)	36 (914.4) 48 (1219.2) 48 (1219.2)	36 (914.4) 48 (1219.2) 48 (1219.2)	36 (914.4) 48 (1219.2) 48 (1219.2)	6 (152.4) 12 (304.8) 12 (304.8)	N/A N/A N/A	— — —
LG&E Energy (Louisville Gas and Electric)	Hot							
800 1200–2000 2500–3000		36 (914.4) 45 (1143.0) 45 (1143.0)	48 (1219.2) 48 (1219.2) 48 (1219.2)	48 (1219.2) 48 (1219.2) 48 (1219.2)	48 (1219.2) 48 (1219.2) 48 (1219.2)	6 (152.4) 12 (304.8) 12 (304.8)	N/A N/A N/A	— — —
Madison Gas and Electric	Cold							
800–1200 1600–2000 2500–3000		36 (914.4) 36 (914.4) 45 (1143.0)	N/A N/A N/A	N/A N/A N/A	N/A N/A N/A	— — —	36 (914.4) 36 (914.4) 48 (1219.2) ③	6 (152.4) 6 (152.4) 12 (304.8) ③
Massachusetts Electric (National Grid)	Hot							
800 1200–2000 2500–4000		② 36 (914.4) 36 (914.4)/	② 36 (914.4) 36 (914.4)	② 36 (914.4) 36 (914.4)	② 36 (914.4) 48 (1219.2)	② 6 (152.4) 12 (304.8)	N/A N/A N/A	— — —
Metropolitan Edison (First Energy)	Hot	②	②	②	②	②	N/A	—
Monongahela Power	Hot	45 (1143.0)	48 (1219.2)	48 (1219.2)	48 (1219.2)	②	N/A	—
Naperville	Hot	②	②	②	②	②	N/A	—
Narragansett (National Grid)	Hot							
800 1200–2000 2500–4000		② 36 (914.4) 36 (914.4)/	② 36 (914.4) 36 (914.4)	② 36 (914.4) 36 (914.4)	② 36 (914.4) 48 (1219.2)	② 6 (152.4) 12 (304.8)	N/A N/A N/A	— — —

① For special applications approved by the utility.
② Dimensions are the same as standard NEMA utility compartments, refer to **Page 21.2-7**.
③ Cold Sequence: 3000 or 4000 A main device must be mounted in separate structure. Refer to **Page 21.2-8**, Layouts 1 and 2 in **Figure 21.2-5**. The utility compartment will then be housed in the second structure. Branch devices or customer metering can then be mounted in remaining half of utility compartment structure.
④ Refer to Eaton.
Note: "W" or "D" of structure is determined by the dimensions of the utility compartment or main device—whichever is greater. For main device dimension, see **Page 21.2-8**. N/A = Not Applicable.

Incoming Utility Compartments and/or Main Devices (Continued)



Note: Switchboards designed using these main structures require rear access for cable terminations. Refer to NEC Article 110-26 for requirements.

Figure 21.2-2. Utility Compartment Layouts—Dimensions in Inches (mm)

[1] Dimensions are the same as standard NEMA utility compartments, refer to **Page 21.2-7**.
[2] Clear area assumes no floor channels used under bottom frame.
[3] If floor channels are present, this dimension is 6.00 (152.4).

Table 21.2-1. Dimensions for Figure 21.2-2 Layouts—Dimensions in Inches (mm) (Continued)

Power Company Compartments Ampere Ratings	Metering Sequence	Width (W)	Rear-Access Layout 1 Depth (D)	Layout 2 Depth (D)	Layout 3 Depth (D)	Layout 3 CC	Layout 4 Depth (D)	Layout 4 CC
New York State Electric and Gas	Cold							
800–1200 1600–2000 2500–4000		36 (914.4) 36 (914.4) 36 (914.4)	N/A N/A N/A	N/A N/A N/A	N/A N/A N/A	— — —	36 (914.4) 48 (1219.2) 48 (1219.2) [4]	6 (152.4) 6 (152.4) 6 (152.4) [4]
Niagara Mohawk (National Grid)	Cold							
800–1200 1600–2000 2500–4000		[5] 36 (914.4) 36 (914.4)	N/A N/A N/A	N/A N/A N/A	N/A N/A N/A	— — —	[5] 36 (914.4) 36 (914.4) [4]	[5] 6 (152.4) 6 (152.4) [4]
Northeast Utilities	Hot [6]/Cold							
800–1200 1600–2000 2500–4000		[5] 36 (914.4) 36 (914.4)	[5] 36 (914.4) 48 (1219.2)	[5] 36 (914.4) 48 (1219.2)	[5] 48 (1219.2) 48 (1219.2)	[5] 12 (304.8) 12 (304.8)	[5] 48 (1219.2) 48 (1219.2) [4]	[5] 12 (304.8) 12 (304.8) [4]
XCEL (Northern States Power)	Hot							
800–1200 1600–2500 3000–4000		36 (914.4) 36 (914.4) 45 (1143.0)	36 (914.4) 36 (914.4) 48 (1219.2)	— — 36 (914.4)	36 (914.4) 36 (914.4) 48 (1219.2)	6 (152.4) 6 (152.4) 12 (304.8)	N/A N/A N/A	— — —
Orange and Rockland	Hot	[5]	[5]	[5]	[5]	[5]	N/A	—
PPL (Pennsylvania Power and Light)	Hot							
800–4000 [7]		45 (1143.0)	48 (1219.2) [8]	48 (1219.2) [9]	54 (1371.6)	6 (152.4)	N/A	—
Exelon/PECO (Philadelphia Electric Company)	Hot	[5]	[5]	[5]	[5]	[5]	N/A	—

[4] Cold Sequence: 3000 or 4000 A main device must be mounted in separate structure. Refer to **Page 21.2-8**, Layouts 1 and 2 in **Figure 21.2-5**. The utility compartment will then be housed in the second structure. Branch devices or customer metering can then be mounted in remaining half of utility compartment structure.
[5] Dimensions are the same as standard NEMA utility compartments, refer to **Page 21.2-7**.
[6] For special applications approved by the utility.
[7] Refer to Eaton.
[8] For limiter lugs or more than six mechanical lugs per phase, a separate pull section is required.
[9] For limiter lugs or more than six mechanical lugs per phase, a 12.00-inch (304.8 mm) pull box is required.

Note: "W" or "D" of structure is determined by the dimensions of the utility compartment or main device—whichever is greater. For main device dimensions, see **Page 21.2-8**. N/A = Not Applicable.

Dimensions for estimating purposes only.

Layout Dimensions—Pow-R-Line C, Rear-Access, Group-Mounted Feeders and Pow-R-Line *i*

Table 21.2-1. Dimensions for Figure 21.2-2 Layouts—Dimensions in Inches (mm) (Continued)

Power Company Compartments Ampere Ratings	Metering Sequence		Rear-Access					
			Layout 1	Layout 2	Layout 3		Layout 4	
		Width (W)	Depth (D)	Depth (D)	Depth (D)	CC	Depth (D)	CC
PEPCO (Potomac Electric Power Company)	Hot							
800–2000 2500–4000 800–3000 4000		36 (914.4) 36 (914.4) 36 (914.4) 36 (914.4)	30 (762.0) 36 (914.4) N/A N/A	N/A N/A 36 (914.4) 48 (1219.2)	N/A N/A N/A N/A	— — — —	N/A N/A N/A N/A	— — — —
XCEL Energy of Colorado	Hot							
800 1200–2500 3000–4000		① 36 (914.4) 45 (1143.0)	① 36 (914.4) 48 (1219.2)	① 36 (914.4) 48 (1219.2)	① 36 (914.4) 48 (1219.2)	① 6 (152.4) 12 (304.8)	N/A N/A N/A	— — —
PSEG (Public Service Electric and Gas)	Hot							
800 1200–2000 2500 3000–4000		36 (914.4) 45 (1143.0) 45 (1143.0) 45 (1143.0)	36 (914.4) 48 (1219.2) 48 (1219.2) 48 (1219.2)	36 (914.4) 48 (1219.2) 48 (1219.2) 48 (1219.2)	36 (914.4) 48 (1219.2) 48 (1219.2) 48 (1219.2)	6 (152.4) 12 (304.8) 12 (304.8) 12 (304.8)	N/A N/A N/A N/A	— — — —
Public Service of New Hampshire	Hot/Cold ②	①	①	①	①	①	N/A	—
First Energy Toledo Edison	Cold	①	①	①	①	①	N/A	—
Ameren (Union Electric)	Hot							
800–4000		①	①	①	①	①	N/A	N/A
Dominion (Virginia Power Company)	Hot							
800–1200 1600–2000 2500–4000		36 (914.4) 45 (1143.0) 45 (1143.0)	36 (914.4) 36 (914.4) 48 (1219.2)	36 (914.4) 36 (914.4) 48 (1219.2)	36 (914.4) 48 (1219.2) 48 (1219.2)	6 (152.4) 12 (304.8) 12 (304.8)	N/A N/A N/A	— — —
We Energies (Wisconsin Electric Power Co.)	Hot							
800–1200 1600–3000 4000		36 (914.4) 36 (914.4) 45 (1143.0)	36 (914.4) 48 (1219.2) 48 (1219.2)	36 (914.4) 48 (1219.2) 48 (1219.2)	36 (914.4) 48 (1219.2) 48 (1219.2)	6 (152.4) 12 (304.8) 12 (304.8)	N/A N/A N/A	— — —
Alliant Energy (Wisconsin Power and Light)	Hot							
800–1200 1600–2000 2500–3000		36 (914.4) 36 (914.4) 45 (1143.0)	36 (914.4) 48 (1219.2) 48 (1219.2)	36 (914.4) 48 (1219.2) 48 (1219.2)	48 (1219.2) 48 (1219.2) 48 (1219.2)	12 (304.8) 12 (304.8) 12 (304.8)	N/A N/A N/A	— — —
Wisconsin Public Service Corp.	Hot							
1000–4000		45 (1143.0)	36 (914.4)	36 (914.4)	N/A	—	N/A	—

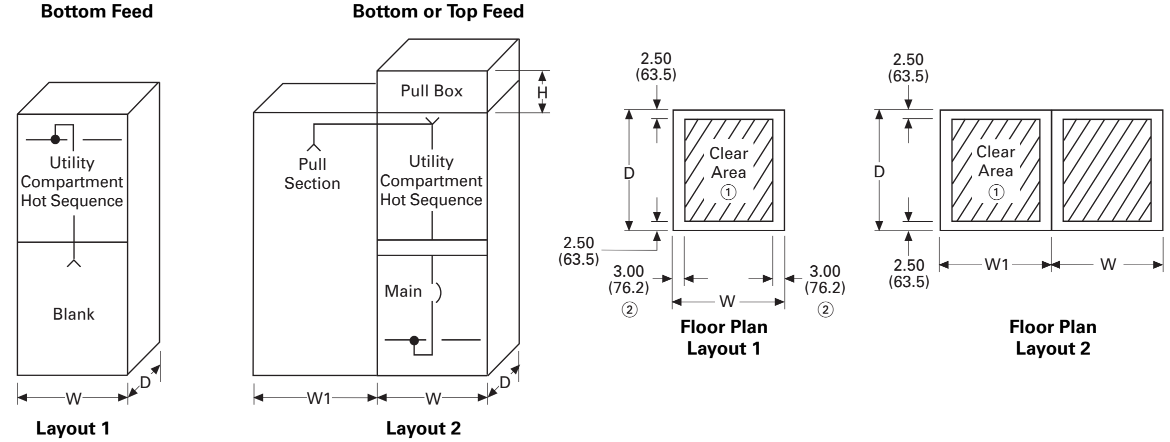
① Dimensions are the same as standard NEMA utility compartments, refer to **Page 21.2-7**.
② For special applications approved by the utility.

Note: "W" or "D" of structure is determined by the dimensions of the utility compartment or main device—whichever is greater. For main device dimensions, see **Page 21.2-8**. N/A = Not Applicable.

Note: The following utilities have standardized on the National Electrical Manufacturers Association (NEMA) utility metering compartment standard. Refer to **Page 21.1-8** for specific sizing and requirements. American Electric Power, Central Hudson Gas and Electric, Central Vermont, Consumers Power Company, Delmarva Power and Light, Georgia Power Company, Kansas City Power And Light, Orange and Rockland, Philadelphia Electric Company, Allegheny Power, Toledo Edison, Union Electric, Columbus Southern Power, Pennsylvania Electric Co. and Southern Maryland Electric Coop.

Dimensions for estimating purposes only.

Incoming West Coast Utility CT Compartments and/or Main Devices



Note: Switchboards designed using these main structures require rear access for cable terminations. Refer to NEC Article 110-26 for requirements.

Figure 21.2-3. West Coast Utility Layouts—Dimensions in Inches (mm)

① Clear area assumes no floor channels used under bottom frame.
② If floor channels are present, this dimension is 6.00 (152.4).

Table 21.2-2. Dimensions for Figure 21.2-3 Layouts—Dimensions in Inches (mm)

Power Company Compartments Ampere Ratings	Front- and Rear-Access					
	Layout 1		Layout 2		(Top Feed) Top-Mounted Pull Box	(Bottom Feed) Pull Section
	Width (W)	Depth (D)	Width (W)	Depth (D)	Height (H)	Width (W1)
West Coast Utilities E.U.S.E.R.C.						
400–800	36 (914.4)	24 (609.6)	36 (914.4)	24 (609.6)	N/R	30 (762.0)
1000	36 (914.4)	24 (609.6)	36 (914.4)	24 (609.6)	30 (762.0)	36 (914.4)
1200	38 (965.2)	30 (762.0)	38 (965.2)	30 (762.0)	36 (914.4)	36 (914.4)
1600	45 (1143.0)	30 (762.0)	38 (965.2)	30 (762.0)	36 (914.4)	45 (1143.0)
2000	45 (1143.0)	30 (762.0)	38 (965.2)	30 (762.0)	36 (914.4)	45 (1143.0)
2500	51 (1295.4)	36 (914.4)	38 (965.2)	30 (762.0)	36 (914.4)	51 (1295.4)
3000	51 (1295.4)	36 (914.4)	38 (965.2)	30 (762.0)	36 (914.4)	51 (1295.4)
4000	51 (1295.4)	36 (914.4)	51 (1295.4)	36 (914.4)	36 (914.4)	51 (1295.4)
Southern California Edison (S.C.E.)						
400	36 (914.4)	24 (609.6)	36 (914.4)	24 (609.6)	N/R	30 (762.0)
600–800	36 (914.4)	24 (609.6)	36 (914.4)	24 (609.6)	N/R	30 (762.0)
1000	36 (914.4)	24 (609.6)	36 (914.4)	24 (609.6)	30 (762.0)	36 (914.4)
1200	38 (965.2)	30 (762.0)	38 (965.2)	30 (762.0)	36 (914.4)	36 (914.4)
1600	45 (1143.0)	30 (762.0)	38 (965.2)	30 (762.0)	36 (914.4)	45 (1143.0)
2000	45 (1143.0)	30 (762.0)	38 (965.2)	30 (762.0)	36 (914.4)	45 (1143.0)
2500	—	—	38 (965.2)	30 (762.0)	36 (914.4)	51 (1295.4)
3000	—	—	38 (965.2)	30 (762.0)	36 (914.4)	51 (1295.4)
4000	—	—	51 (1295.4)	36 (914.4)	36 (914.4)	51 (1295.4)
Los Angeles Department of Water and Power (L.A.D.W.P.)						
400	36 (914.4)	24 (609.6)	36 (914.4)	24 (609.6)	③	30 (762.0)
600–800	36 (914.4)	24 (609.6)	36 (914.4)	24 (609.6)	③	30 (762.0)
1000	36 (914.4)	24 (609.6)	36 (914.4)	24 (609.6)	③	36 (914.4)
1200	38 (965.2)	30 (762.0)	38 (965.2)	30 (762.0)	③	36 (914.4)
1600	45 (1143.0)	30 (762.0)	38 (965.2)	30 (762.0)	③	45 (1143.0)
2000	45 (1143.0)	30 (762.0)	38 (965.2)	30 (762.0)	③	45 (1143.0)
2500	—	—	38 (965.2)	30 (762.0)	③	51 (1295.4)
3000	—	—	38 (965.2)	30 (762.0)	③	51 (1295.4)
4000	—	—	51 (1295.4)	36 (914.4)	③	51 (1295.4)

③ Refer to Eaton.

Note: "W" or "D" of structure is determined by the dimensions of the utility compartment or main device—whichever is greater. For main device dimensions, see **Page 21.2-8**. N/R = Not Required.

Dimensions for estimating purposes only.

Layout Dimensions—Pow-R-Line C, Rear-Access, Group-Mounted Feeders and Pow-R-Line *i*

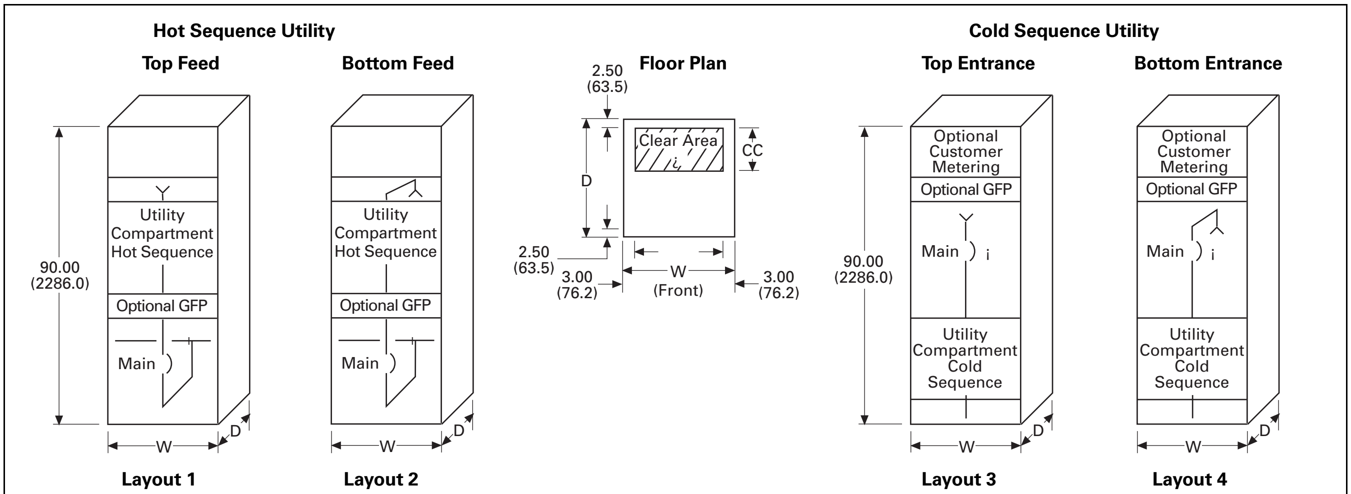
Table 21.2-2. Dimensions for Figure 21.2-3 Layouts—Dimensions in Inches (mm) (Continued)

Power Company Compartments Ampere Ratings	Front- and Rear-Access					
	Layout 1		Layout 2		(Top Feed) Top-Mounted Pull Box	(Bottom Feed) Pull Section
	Width (W)	Depth (D)	Width (W)	Depth (D)	Height (H)	Width (W1)
West Coast Utilities						
Pacific Gas and Electric (P.G. and E.)						
400–800	36 (914.4)	24 (609.6)	36 (914.4)	24 (609.6)	N/R	30 (762.0)
1000	36 (914.4)	24 (609.6)	36 (914.4)	24 (609.6)	30 (762.0)	36 (914.4)
1200	38 (965.2)	30 (762.0)	38 (965.2)	30 (762.0)	36 (914.4)	36 (914.4)
1600	45 (1143.0)	30 (762.0)	38 (965.2)	30 (762.0)	36 (914.4)	45 (1143.0)
2000	45 (1143.0)	30 (762.0)	38 (965.2)	30 (762.0)	36 (914.4)	45 (1143.0)
2500	—	—	38 (965.2)	36 (914.4)	36 (914.4)	51 (1295.4)
3000	—	—	38 (965.2)	36 (914.4)	36 (914.4)	51 (1295.4)
4000	—	—	51 (1295.4)	36 (914.4)	36 (914.4)	51 (1295.4)
San Diego Gas and Electric (S.D.G. and E.)						
400–800	36 (914.4)	24 (609.6)	36 (914.4)	24 (609.6)	N/R	30 (762.0)
1000	36 (914.4)	24 (609.6)	36 (914.4)	24 (609.6)	30 (762.0)	36 (914.4)
1200	38 (965.2)	30 (762.0)	38 (965.2)	30 (762.0)	36 (914.4)	36 (914.4)
1600	45 (1143.0)	30 (762.0)	38 (965.2)	30 (762.0)	36 (914.4)	45 (1143.0)
2000	45 (1143.0)	30 (762.0)	38 (965.2)	30 (762.0)	36 (914.4)	45 (1143.0)
2500	—	—	38 (965.2)	30 (762.0)	36 (914.4)	51 (1295.4)
3000	—	—	38 (965.2)	30 (762.0)	36 (914.4)	51 (1295.4)
4000	—	—	51 (1295.4)	36 (914.4)	36 (914.4)	51 (1295.4)

Note: "W" or "D" of structure is determined by the dimensions of the utility compartment or main device—whichever is greater. For main device dimensions, see **Page 21.2-8**. N/R = Not Required.

Dimensions for estimating purposes only.

Incoming Standard (NEMA) Utility CT Compartment and/or Main Device



Note: Switchboards designed using these main structures require rear access for cable terminations. Refer to NEC Article 110-26 for requirements.

Figure 21.2-4. NEMA Utility Compartment Layouts—Dimensions in Inches (mm)

① Clear area assumes no floor channels used under front or rear frame members.
② IQ meter can be mounted to disconnect door as an alternate location for molded case circuit breakers and fixed-mounted power circuit breakers.

Table 21.2-3. Main Device Structure Size for Figure 21.2-4 Layouts

Main Device	Max. Amp. Rating	Width (W)	Depth (D)	Min. Cable Space CC
Fixed-Mounted Devices				
Molded Case Breakers Available With Optional Integral GFP				
KD, HKD, KDC	400	36	48	12
LGS, LGH, LGC, LGU	600	36	48	12
LD, HLD, LDC	600	36	48	12
MDL, HMDL	800	36	48	12
NG, NGH	1200	36	48	12
NGC	2000	36	48	12
RG, RGC	2500	36	48	12
100% Rated Molded Case Breakers Available with Optional Integral GFP				
CKD, CHKD	400	36	48	12
CLD, HCLD,	600	36	48	12
CLDC	600	36	48	12
CMDL, CHMDL	800	36	48	12
NG, NGH	1200	36	48	12
NGC	1200	36	48	12
RG, RGC	1600	36	48	12
RG, RGC	2000	36	48	12
TRI-PAC Fuse Type Current Limiting Breakers				
LA-P	400	36	48	12
NB-P	800	36	48	12
PB-P	1600	36	48	12

Note: Refer to **Pages 21.1-15** to **21.6-6** for dimensions on special utility CT compartments.

Note: See **Pages 21.2-12** to **21.2-15** for layout of distribution sections. See **Pages 21.4-1** and **21.4-2** for outdoor rainproof enclosures.

Main Device	Max. Amp. Rating	Width (W)	Depth (D)	Min. Cable Space CC
Fixed-Mounted Devices				
100% Rated Insulated Case Circuit Breakers Available with Optional Integral GFP				
Magnum SB, DS ④	800	36	48	12
	1600	36	48	12
	2000	36	48	12
	3000 ③	45	48	12
	4000 ③	45	48	12
100% Rated Power Circuit Breakers Available with Optional Integral GFP				
Magnum DSX	800	36	48	12
	1600	36	48	12
	2000	36	48	12
	3000 ③	45	48	12
	4000 ③	45	48	12
Fusible Switches				
400	400	36	48	12
600	600	36	48	12
800	800	36	48	12
1200	1200	36	48	12
100% Rated Electric Trip Bolted Pressure Switches Available with Optional GFP				
CBC-800	800	36	48	12
CBC-1200	1200	36	48	12
CBC-1600	1600	36	48	12
CBC-2000	2000	36	48	12
CBC-2500	2500	45	48	12
CBC-3000	3000 ③	45	48	12
CBC-4000	4000 ③	45	48	12

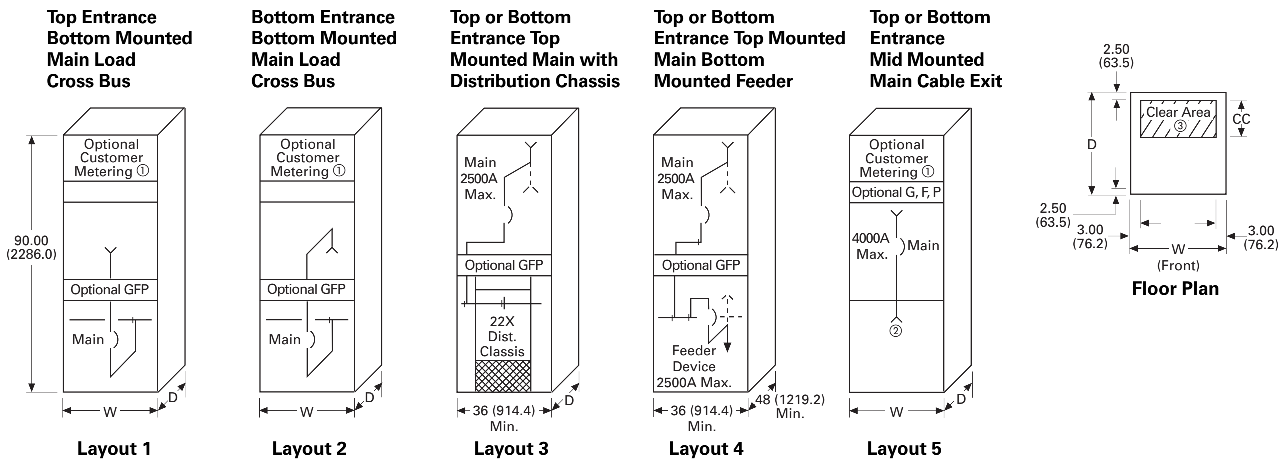
Note: Top-mounted pull boxes are available with heights of 12.00, 18.00, 24.00 and 30.00 inches (304.8, 457.2, 609.6 and 762.0 mm).

Main Device	Max. Amp. Rating	Width (W)	Depth (D)	Min. Cable Space CC
Fixed-Mounted Devices				
100% Rated Manual Bolted Pressure Switches Not Available with Ground Fault Protection				
QA-800	800	36	48	12
QA-1200	1200	36	48	12
QA-1600	1600	36	48	12
QA-2000	2000	36	48	12
QA-2500	2500	45	48	12
QA-3000	3000 ③	45	48	12
QA-4000	4000 ③	45	48	12
Drawout-Mounted Devices				
100% Rated Insulated Case Circuit Breakers Available with Optional Integral GFP				
Magnum SB, DS ④	800	36	54	6
	1600	36	54	6
	2000	36	54	6
	3000 ③	45	66	18
	4000 ③	45	66	18
100% Rated Power Circuit Breakers Available with Optional Integral GFP				
Magnum DSX	800	36	54	6
	1600	36	54	6
	2000	36	54	6
	3000 ③	45	66	18
	4000 ③	45	66	18

③ Layout 1.
④ Magnum DS power circuit breakers used as feeder devices have been qualified by Eaton and third-party witness tested for 30-cycle withstand. 30-cycle withstand is not recognized by UL 891.

Dimensions for estimating purposes only. For metric conversion: inches x 25.4 = mm.

Main Structure—With Customer Metering and/or Main Device



Note: Switchboards designed using these main structures require rear access for cable terminations. Refer to NEC Article 110-26 for requirements.

Figure 21.2-5. Main Section Layouts—Dimensions in Inches (mm)

① Customer metering with IQ Meter requires 30.00-inch (762.0 mm) minimum width.
② Not available with bottom fed TRI-PAC breaker.
③ Clear area assumes no floor channels used under front or rear frame members.

Table 21.2-4. Main Device Structure Size for Figure 21.2-5 Layouts

Main Device	Max Amp Rating	Min. Width (W) Zero Seq. GFP	Min. Width (W) Integral GFP or W/ No GFP	Min. Depth (D)	Min. Cable Space CC
Fixed-Mounted Devices					
Molded Case Breakers Available with Optional Integral GFP					
KD, HKD, KDC	400	30	26	30	12
LGS, LGH, LGC, LGU	600	30		30	12
LD, HLD, LDC	600	30	26	30	12
MDL, HMDL	800	30	26	30	12
NG, NGH, NGC	1200	30	26	30	12
RG, RGC	1600	36	26	48	18
RG, RGC	2000	36	26	48	18
RG, RGC	2500	36	26	48	18
100% Rated Molded Case Breakers Available with Optional Integral GFP					
CKD, CHKD	400	30	26	30	12
CLD, HCLD, CLDC	600	30	26	30	12
CMDL, CHMDL	800	30	26	30	12
NG, NGH	1200	30	26	30	12
RG, RGC, NGC RG, RGC	1600 2000	30 30	26 26	48 48	18 18
TRI-PAC Fuse Type Current Limiting Breakers					
LA-P	400	30	26	30	12
NB-P	800	30	26	30	12
PB-P	1600	30	26	36	18

Main Device	Max. Amp. Rating	Min. Width (W)	Min. Depth (D)	Min. Cable Space CC
Fixed-Mounted Devices				
100% Rated Insulated Case Circuit Breakers Available with Optional Integral GFP				
Magnum DS, SB ⑦	800	36	36	6
	1600	36	48	18
	2000	36	48	18
	3000	36	48	18
	4000	36	48	12
	5000	45	48	—
100% Rated Power Circuit Breakers Available with Optional Integral GFP				
Magnum DSX	800	36	36	6
	1600	36	48	18
	2000	36	48	18
	3000	45	48	18
	4000	45	48	12
	5000	45	48	—
Fusible Switches				
400	400	30	30	12
600	600	30	30	12
800	800	30	30	12
1200	1200	30	30	12
100% Rated Electric Trip Bolted Pressure Switches Available with Optional GFP				
CBC-800	800	36	36 ⑤	12
CBC-1200	1200	36	36 ⑤	12
CBC-1600	1600	36	36 ⑤	12
CBC-2000	2000	36	36 ⑤	12
CBC-2500	2500	45	48	18
CBC-3000	3000	45	48	18
CBC-4000	4000	45	48	12
CBC-5000 ⑥	5000	Refer to Eaton		

Note: See **Pages 21.2-12** to **21.2-15** for layout of distribution sections. See **Pages 21.4-1** and **21.4-2** for outdoor rainproof enclosures.

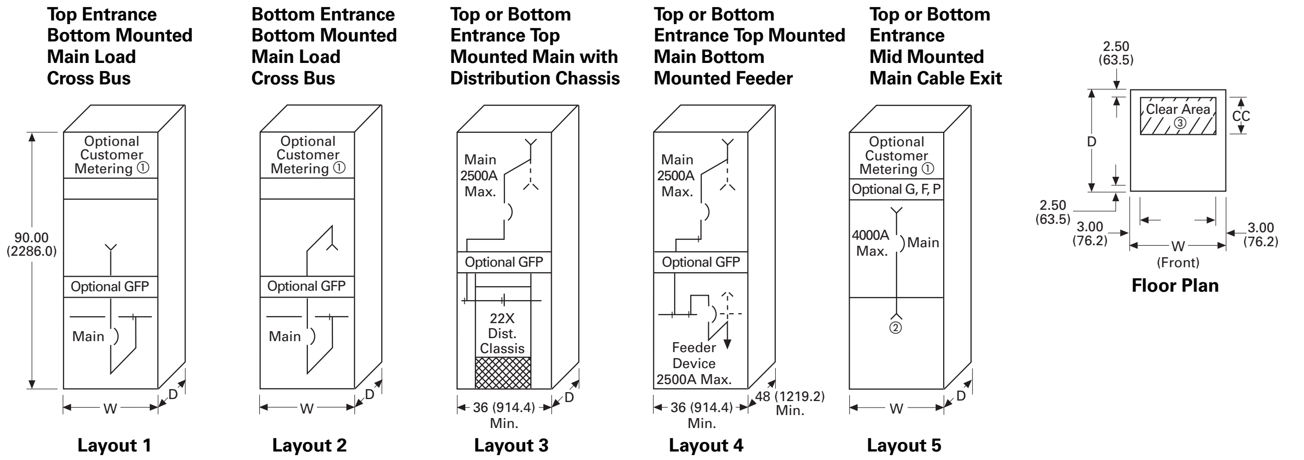
Note: Top-mounted pull boxes are available with heights of 12.00, 18.00, 24.00 and 30.00 inches (304.8, 457.2, 609.6 and 762.0 mm).

Main Device	Max. Amp. Rating	Min. Width (W)	Min. Depth (D)	Min. Cable Space CC
Fixed-Mounted Devices				
100% Rated Manual Bolted Pressure Switches Not Available with Ground Fault Protection				
QA-800	800	30	36	12
QA-1200	1200	30	36	12
QA-1600	1600	30	36	12
QA-2000	2000	30	36	12
QA-2500	2500	36	48	18
QA-3000	3000	45	48	18
QA-4000	4000	45	48	12
QA-5000 ⑥	5000	Refer to Eaton		
Drawout-Mounted Devices				
100% Rated Insulated Case Circuit Breakers Available with Optional Integral GFP				
Magnum DS, SB ⑦	800	36	54	6
	1600	36	54	6
	2000	36	54	6
	3000	36	66	18
	4000	36	66	18
	5000	45	—	—
100% Rated Power Circuit Breakers Available with Optional Integral GFP				
Magnum DSX	800	36	54	6
	1600	36	54	6
	2000	36	54	6
	3000	45	66	18
	4000	45	66	18
	5000	45	—	—

④ Refer to Eaton.
⑤ Bottom feed switch structure is 48.00 inches (1219.2 mm) minimum.
⑥ Not UL listed.
⑦ Magnum DS power circuit breakers used as feeder devices have been qualified by Eaton and third-party witness tested for 30-cycle withstand. 30-cycle withstand is not recognized by UL 891.

Dimensions for estimating purposes only. For metric conversion: inches x 25.4 = mm.

Main Structure—With Customer Metering and/or Main Device



Note: Switchboards designed using these main structures require rear access for cable terminations. Refer to NEC Article 110-26 for requirements.

Figure 21.2-6. Main Section Layouts—Dimensions in Inches (mm)

① Customer metering with IQ Meter requires 30.00-inch (762.0 mm) minimum width.
② Not available with bottom fed TRI-PAC breaker.
③ Clear area assumes no floor channels used under front or rear frame members.

Table 21.2-5. Main Device Structure Size for Figure 21.2-5 Layouts

Main Device	Max Amp Rat-ing	Min. Width (W) Zero Seq. GFP	Min. Width (W) Inte-gral GFP or W/ No GFP	Min. Depth (D)	Min. Cable Space CC
Fixed-Mounted Devices					
Molded Case Breakers Available with Optional Integral GFP					
KD, HKD, KDC	400	30	26	48	30
LGS, LGH, LGC, LGU	600	30		48	30
LD, HLD, LDC	600	30	26	48	30
MDL, HMDL	800	30	26	48	30
NG, NGH	1200	30	26	48	30
RG, RGC	1600	36	26	48	18
RG, RGC	2000	36	26	48	18
RG, RGC	2500	36	26	48	18
100% Rated Molded Case Breakers Available with Optional Integral GFP					
CKD, CHKD	400	30	26	48	30
CLD, HCLD, CLDC	600	30	26	48	30
CMDL, CHMDL	800	30	26	48	30
NG, NGH	1200	30	26	30	12
RG, RGC	1600	30	26	48	18
RG, RGC	2000	30	26	48	18
TRI-PAC Fuse Type Current Limiting Breakers					
LA-P	400	30	26	30	12
NB-P	800	30	26	30	12
PB-P	1600	30	26	36	18

Main Device	Max. Amp. Rating	Min. Width (W)	Min. Depth (D)	Min. Cable Space CC
Fixed-Mounted Devices				
100% Rated Insulated Case Circuit Breakers Available with Optional Integral GFP				
Magnum DS, SB	800	36	48	18
	1600	36	48	18
	2000	36	48	18
	3000	36	48	18
	4000	36	48	12
	5000	45	48	—
100% Rated Power Circuit Breakers Available with Optional Integral GFP				
Magnum DSX	800	36	48	18
	1600	36	48	18
	2000	36	48	18
	3000	45	48	18
	4000	45	48	12
	5000	45	48	—
Fusible Switches				
400	400	30	48	30
600	600	30	48	30
800	800	30	48	30
1200	1200	30	48	30
100% Rated Electric Trip Bolted Pressure Switches Available with Optional GFP				
CBC-800	800	36	48 ⑤	24
CBC-1200	1200	36	48 ⑤	24
CBC-1600	1600	36	48 ⑤	24
CBC-2000	2000	36	48 ⑤	24
CBC-2500	2500	45	48	12
CBC-3000	3000	45	48	12
CBC-4000	4000	45	48	12
CBC-5000 ⑥	5000	Refer to Eaton		

Note: See **Pages 21.2-12** to **21.2-15** for layout of distribution sections. See **Pages 21.4-1** and **21.4-2** for outdoor rainproof enclosures.

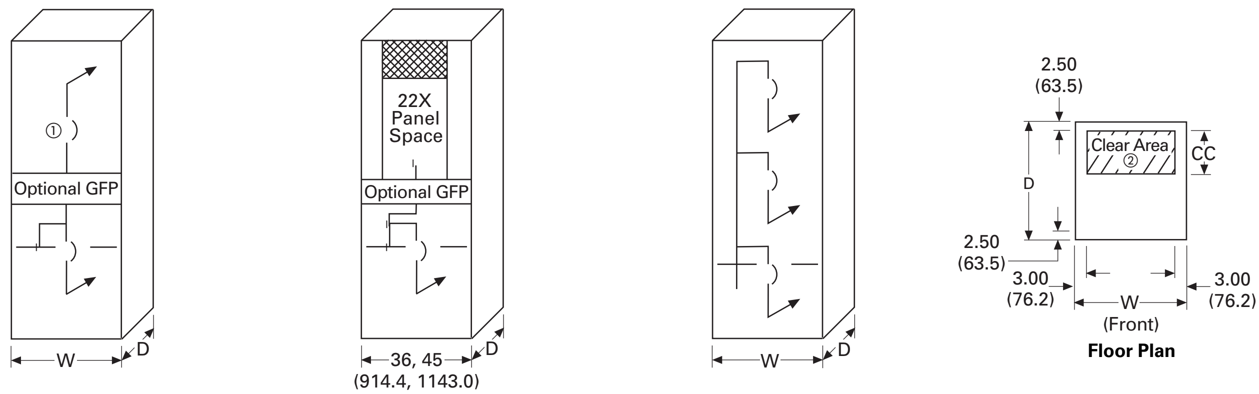
Note: Top-mounted pull boxes are available with heights of 12.00, 18.00, 24.00 and 30.00 inches (304.8, 457.2, 609.6 and 762.0 mm).

Main Device	Max. Amp. Rating	Min. Width (W)	Min. Depth (D)	Min. Cable Space CC
Fixed-Mounted Devices				
100% Rated Manual Bolted Pressure Switches Not Available with Ground Fault Protection				
QA-800	800	30	48	24
QA-1200	1200	30	48	24
QA-1600	1600	30	48	24
QA-2000	2000	30	48	24
QA-2500	2500	36	48	12
QA-3000	3000	45	48	12
QA-4000	4000	45	48	12
QA-5000 ⑥	5000	Refer to Eaton		
Drawout-Mounted Devices				
100% Rated Insulated Case Circuit Breakers Available with Optional Integral GFP				
Magnum DS, SB ⑦	800	36	54	6
	1600	36	54	6
	2000	36	54	6
	3000	36	66	18
	4000	36	66	18
	5000	45	—	—
100% Rated Power Circuit Breakers Available with Optional Integral GFP				
Magnum DSX	800	36	54	6
	1600	36	54	6
	2000	36	54	6
	3000	45	66	18
	4000	45	66	18
	5000	45	—	—

④ Refer to Eaton.
⑤ Bottom feed switch structure is 48.00 inches (1219.2 mm) minimum.
⑥ Not UL listed.
⑦ Magnum DS power circuit breakers used as feeder devices have been qualified by Eaton and third-party witness tested for 30-cycle withstand. 30-cycle withstand is not recognized by UL 891.

Dimensions for estimating purposes only. For metric conversion: inches x 25.4 = mm.

Individually Mounted Feeder Devices



Layout 1 | Layout 2 | Layout 3

Note: Switchboards designed using these distribution structures require rear access for cable terminations. Refer to NEC Article 110-26 for requirements.

Figure 21.2-7. Individually Mounted Feeder Layouts—Dimensions in Inches (mm)

① When using top-mounted (bottom feed) inverted bolted switches, verify acceptance with code authorities.

② For **Layout 2,** width will be 36.00 or 45.00 inches (914.4 or 1143.0 mm) depending on size of panel mounting devices. Refer to **Page 21.2-12**.

Table 21.2-6. Stacked Distribution Structure Sizes for Figure 21.2-7 Layouts 1 and 2—Dimensions in Inches (mm) ③

Feeder Device	Max. Amp. Rating	Zero Sequence GFP Minimum Width (W)	Zero Sequence GFP Minimum Depth (D)	No GFP or with Integral GFP Minimum Width (W)	No GFP or with Integral GFP Minimum Depth (D)	Minimum Cable Space CC
Fixed-Mounted Devices						
Molded Case Breakers						
RG, RGC	1600	30 (762.0)	48 (1219.2)	26 (660.4)	48 (1219.2)	12 (304.8)
RG, RGC	2000	30 (762.0)	48 (1219.2)	26 (660.4)	48 (1219.2)	12 (304.8)
RG, RGC	2500	30 (762.0)	54 (1371.6)	26 (660.4)	48 (1219.2)	12 (304.8)
100% Rated Insulated Case Circuit Breakers Available with Optional Integral GFP						
Magnum SB, DS ④	800	36 (914.4)	48 (1219.2)	36 (914.4)	48 (1219.2)	18 (457.2)
	1600	36 (914.4)	48 (1219.2)	36 (914.4)	48 (1219.2)	18 (457.2)
	2000	36 (914.4)	48 (1219.2)	36 (914.4)	48 (1219.2)	18 (457.2)
100% Rated Insulated Case Circuit Breakers Available with Optional Integral GFP						
Magnum DSX	800	36 (914.4)	48 (1219.2)	36 (914.4)	48 (1219.2)	18 (457.2)
	1600	36 (914.4)	48 (1219.2)	36 (914.4)	48 (1219.2)	18 (457.2)
	2000	36 (914.4)	48 (1219.2)	36 (914.4)	48 (1219.2)	18 (457.2)
100% Rated Electric Trip Bolted Pressure Switches						
CBC-800	800	36 (914.4)	48 (1219.2)	36 (914.4)	48 (1219.2)	12 (304.8)
CBC-1200	1200	36 (914.4)	48 (1219.2)	36 (914.4)	48 (1219.2)	12 (304.8)
CBC-1600	1600	36 (914.4)	48 (1219.2)	36 (914.4)	48 (1219.2)	12 (304.8)
CBC-2000	2000	36 (914.4)	48 (1219.2)	36 (914.4)	48 (1219.2)	12 (304.8)
CBC-2500	2500	45 (1143.0)	48 (1219.2)	36 (914.4)	48 (1219.2)	12 (304.8)
100% Rated Manual Bolted Pressure Switches Not Available with Ground Fault Protection						
QA-800	800	—	—	30 (762.0)	48 (1219.2)	12 (304.8)
QA-1200	1200	—	—	30 (762.0)	48 (1219.2)	12 (304.8)
QA-1600	1600	—	—	30 (762.0)	48 (1219.2)	12 (304.8)
QA-2000	2000	—	—	30 (762.0)	48 (1219.2)	12 (304.8)
QA-2500	2500	—	—	36 (914.4)	48 (1219.2)	12 (304.8)

③ Structure size determined by device requiring largest width and depth.

④ Magnum DS power circuit breakers used as feeder devices have been qualified by Eaton and third-party witness tested for 30-cycle withstand. 30-cycle withstand is not recognized by UL 891.

Table 21.2-7. Stacked Distribution Structure Sizes for Figure 21.2-7 Layout 3 Only—Dimensions in Inches (mm)

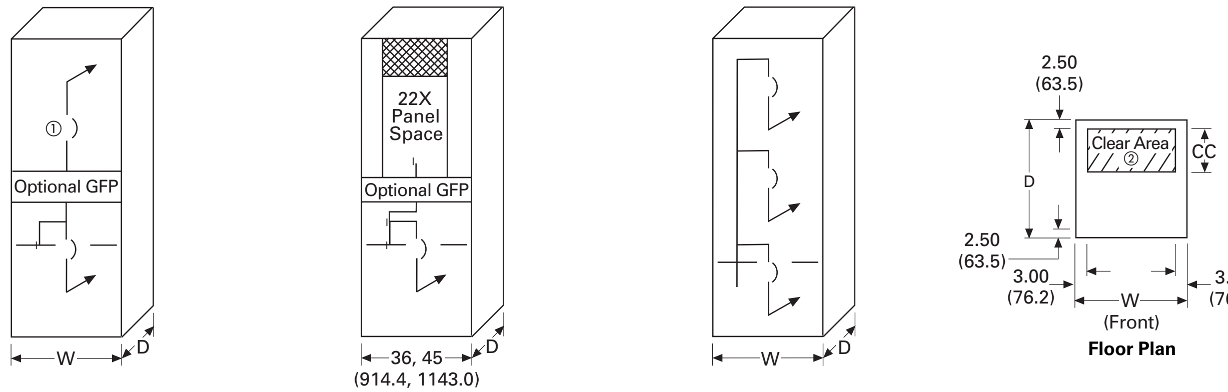
Feeder Device	Maximum Ampere Rating	No GFP or with Integral GFP Minimum Width (W)	No GFP or with Integral GFP Minimum Depth (D)	Minimum Cable Space CC
Fixed-Mounted Devices				
100% Rated Insulated Case Circuit Breakers Available with Optional Integral GFP				
Magnum SB, DS ④	800	36 (914.4)	36 (914.4)	6 (152.4)
100% Rated Insulated Case Circuit Breakers Available with Optional Integral GFP				
Magnum DSX	800	36 (914.4)	36 (914.4)	6 (152.4)
100% Rated Manual Bolted Pressure Switches Not Available with Ground Fault Protection				
QA-800	800	30 (762.0)	48 (1219.2)	12 (304.8)

⑤ Magnum DS power circuit breakers used as feeder devices have been qualified by Eaton and third-party witness tested for 30-cycle withstand. 30-cycle withstand is not recognized by UL 891.

Note: See **Pages 21.2-12** to **21.2-15** for layout of distribution sections. See **Pages 21.4-1** and **21.4-2** for outdoor rainproof enclosures.

Note: Top-mounted pull boxes are available with heights of 12, 18, 24 and 30 inches (304.8, 457.2, 609.6 and 762.0 mm).

Individually Mounted Feeder Devices



Layout 1 **Layout 2** **Layout 3**

Note: Switchboards designed using these distribution structures require rear access for cable terminations. Refer to NEC Article 110-26 for requirements.

Figure 21.2-8. Individually Mounted Feeder Layouts—Dimensions in Inches (mm)

① When using top-mounted (bottom feed) inverted bolted switches, verify acceptance with code authorities.
② For **Layout 2,** width will be 36.00 or 45.00 inches (914.4 or 1143.0 mm) depending on size of panel mounting devices. Refer to **Page 21.2-12**.

Table 21.2-8. Stacked Distribution Structure Sizes for Figure 21.2-7 Layouts 1 and 2—Dimensions in Inches (mm) ③

Feeder Device	Max. Amp. Rating	Zero Sequence GFP Minimum Width (W)	Zero Sequence GFP Minimum Depth (D)	No GFP or with Integral GFP Minimum Width (W)	No GFP or with Integral GFP Minimum Depth (D)	Minimum Cable Space CC
Fixed-Mounted Devices						
Molded Case Breakers						
RG	1600	30 (762.0)	48 (1219.2)	26 (660.4)	48 (1219.2)	12 (304.8)
RG	2000	30 (762.0)	48 (1219.2)	26 (660.4)	48 (1219.2)	12 (304.8)
RG	2500	30 (762.0)	54 (1371.6)	26 (660.4)	48 (1219.2)	12 (304.8)
100% Rated Insulated Case Circuit Breakers Available						
Magnum SB	800	30 (762.0)	48 (1219.2)	26 (660.4)	48 (1219.2)	12 (304.8)
	1600	30 (762.0)	48 (1219.2)	26 (660.4)	48 (1219.2)	12 (304.8)
	2000	30 (762.0)	48 (1219.2)	26 (660.4)	48 (1219.2)	12 (304.8)
100% Rated Power Circuit Breaker						
Magnum DS ④	800	30 (762.0)	48 (1219.2)	26 (660.4)	48 (1219.2)	12 (304.8)
	1600	30 (762.0)	48 (1219.2)	26 (660.4)	48 (1219.2)	12 (304.8)
	2000	30 (762.0)	48 (1219.2)	26 (660.4)	48 (1219.2)	12 (304.8)
100% Rated Electric Trip Bolted Pressure Switches						
CBC-800	800	36 (914.4)	48 (1219.2)	36 (914.4)	48 (1219.2)	12 (304.8)
CBC-1200	1200	36 (914.4)	48 (1219.2)	36 (914.4)	48 (1219.2)	12 (304.8)
CBC-1600	1600	36 (914.4)	48 (1219.2)	36 (914.4)	48 (1219.2)	12 (304.8)
CBC-2000	2000	36 (914.4)	48 (1219.2)	36 (914.4)	48 (1219.2)	12 (304.8)
CBC-2500	2500	45 (1143.0)	48 (1219.2)	36 (914.4)	48 (1219.2)	12 (304.8)
100% Rated Manual Bolted Pressure Switches Not Available with Ground Fault Protection						
QA-800	800	—	—	30 (762.0)	48 (1219.2)	12 (304.8)
QA-1200	1200	—	—	30 (762.0)	48 (1219.2)	12 (304.8)
QA-1600	1600	—	—	30 (762.0)	48 (1219.2)	12 (304.8)
QA-2000	2000	—	—	30 (762.0)	48 (1219.2)	12 (304.8)
QA-2500	2500	—	—	36 (914.4)	48 (1219.2)	12 (304.8)

③ Structure size determined by device requiring largest width and depth.
④ Magnum DS power circuit breakers used as feeder devices have been qualified by Eaton and third-party witness tested for 30-cycle withstand. 30-cycle withstand is not recognized by UL 891.

Table 21.2-9. Stacked Distribution Structure Sizes for Figure 21.2-7 Layout 3 Only—Dimensions in Inches (mm)

Feeder Device	Maximum Ampere Rating	No GFP or with Integral GFP Minimum Width (W)	No GFP or with Integral GFP Minimum Depth (D)	Minimum Cable Space CC
Fixed-Mounted Devices				
100% Rated Insulated Case Circuit Breakers Available with Optional Integral GFP				
Magnum SB	800	30 (762.0)	48 (1219.2)	12 (304.8)
100% Rated Insulated Case Circuit Breakers Available with Optional Integral GFP				
Magnum DS ④	800	30 (762.0)	48 (1219.2)	12 (304.8)
100% Rated Manual Bolted Pressure Switches Not Available with Ground Fault Protection				
QA-800	800	30 (762.0)	48 (1219.2)	12 (304.8)

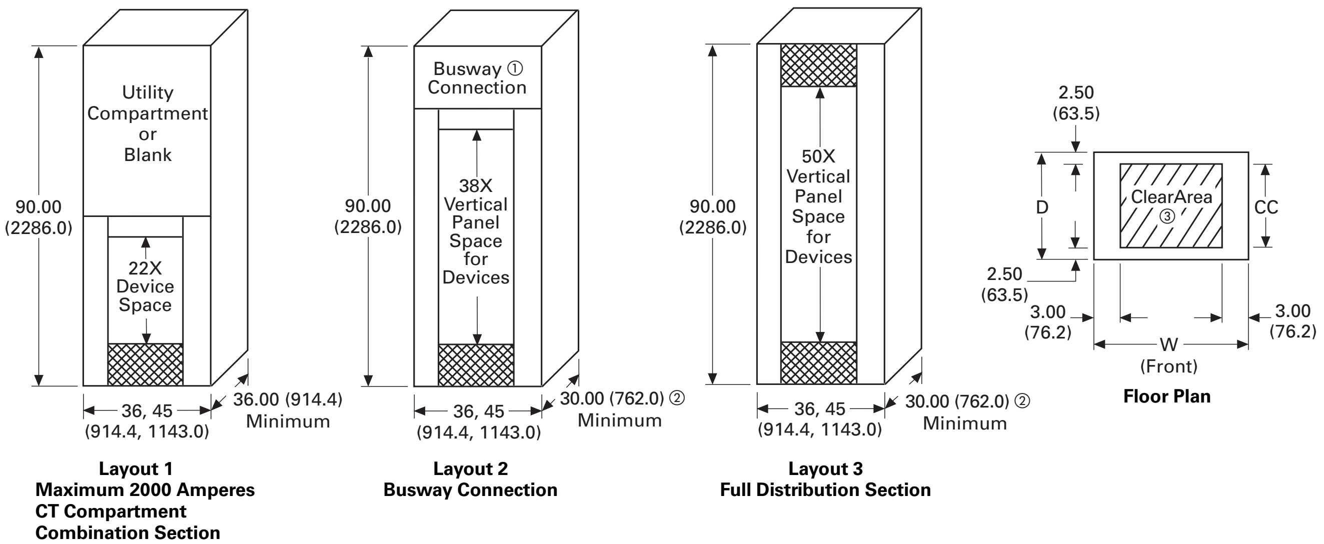
⑤ Magnum DS power circuit breakers used as feeder devices have been qualified by Eaton and third-party witness tested for 30-cycle withstand. 30-cycle withstand is not recognized by UL 891.

Note: See **Pages 21.2-12** to **21.2-15** for layout of distribution sections. See **Pages 21.4-1** and **21.4-2** for outdoor rainproof enclosures.

Note: Top-mounted pull boxes are available with heights of 12, 18, 24 and 30 inches (304.8, 457.2, 609.6 and 762.0 mm).

Dimensions for estimating purposes only.

Distribution Sections—Group-Mounted Devices



See Distribution Layout Guides for structure width and for feeder device "X" requirements on **Pages 21.2-14** and **21.2-15**.

Figure 21.2-9. Distribution Section Layout—Dimensions in Inches (mm)

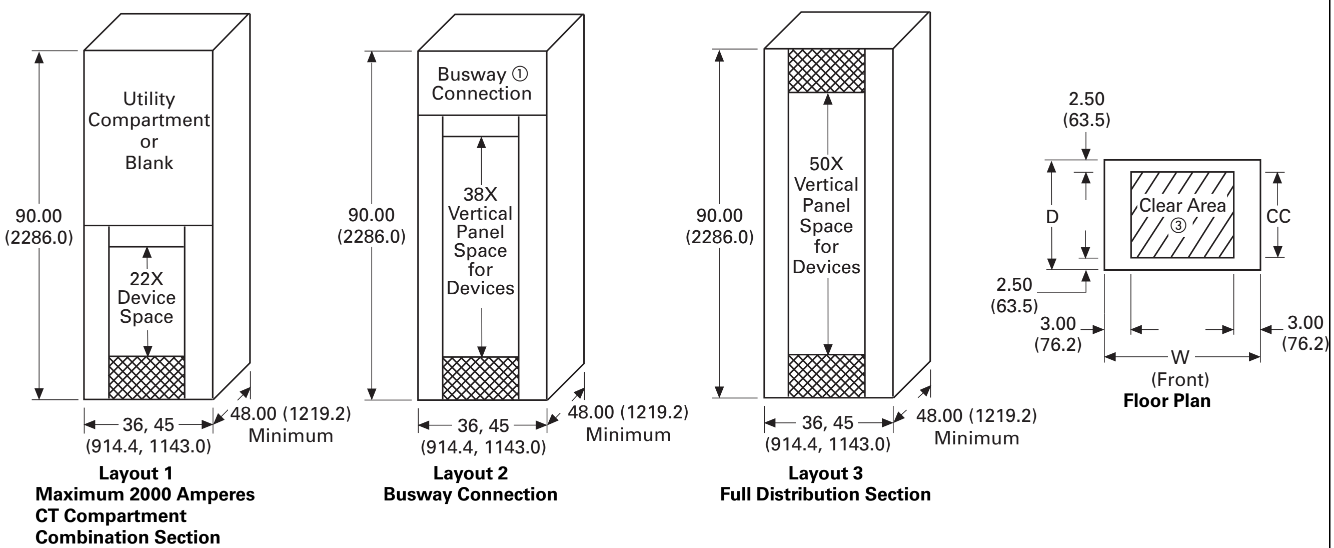
① Busway connection can be either incoming service to structure or exiting load from a feeder breaker. Increased depth will be required.
② For panels rated above 2000 A, minimum depth is 24.00 inches (609.6 mm).
③ Clear area assumes no floor channels used under bottom frame.

Table 21.2-10. Pow-R-Line C

Minimum Depth D)	2000 A or Less	Above 2000 A
	Minimum Cable Space CC	Minimum Cable Space CC
30 (762.0)	10 (254.0)	4 (101.6)
36 (914.4)	16 (406.4)	10 (254.0)
48 (1219.2)	28 (711.2)	22 (558.8)
54 (1371.6)	34 (863.6)	28 (711.2)
66 (1676.4)	46 (1168.4)	40 (1016.0)

Dimensions for estimating purposes only.

Distribution Sections—Group-Mounted Devices



See Distribution Layout Guides for structure width and for feeder device "X" requirements on **Pages 21.2-14** and **21.2-15**.

Figure 21.2-10. Distribution Section Layout—Dimensions in Inches (mm)

① Busway connection can be either incoming service to structure or exiting load from a feeder breaker. Increased depth will be required.
② For panels rated above 2000 A, minimum depth is 24.00 inches (609.6 mm).
③ Clear area assumes no floor channels used under bottom frame.

Table 21.2-11. Pow-R-Line *i*

Minimum Depth D)	4000 A Maximum Minimum Cable Space CC
48 (1219.2)	18 (457.2)
54 (1371.6)	54 (1371.6)
66 (1676.4)	66 (1676.4)

Dimensions for estimating purposes only.

Distribution Layout Guide—Molded Case Breakers

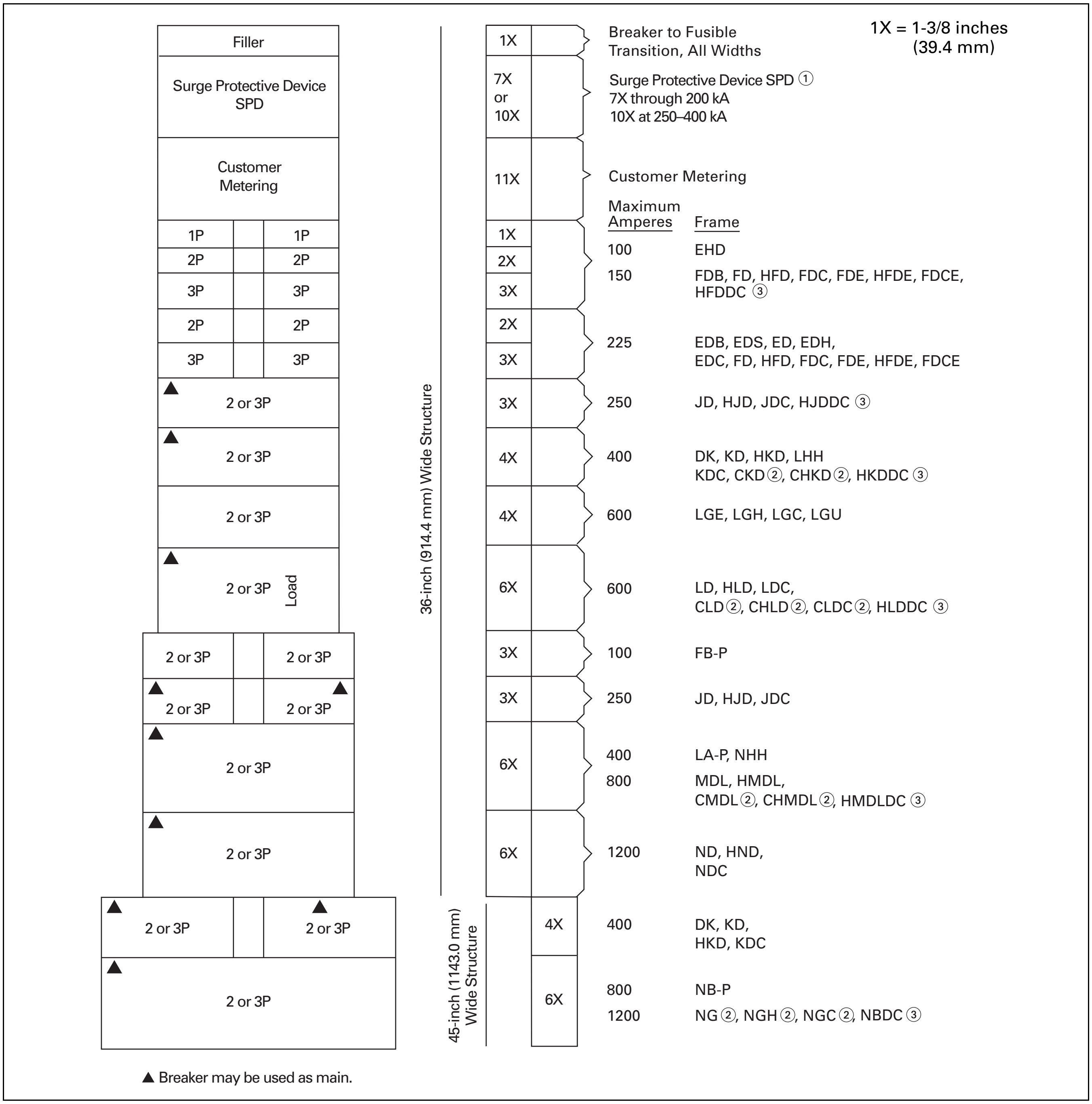
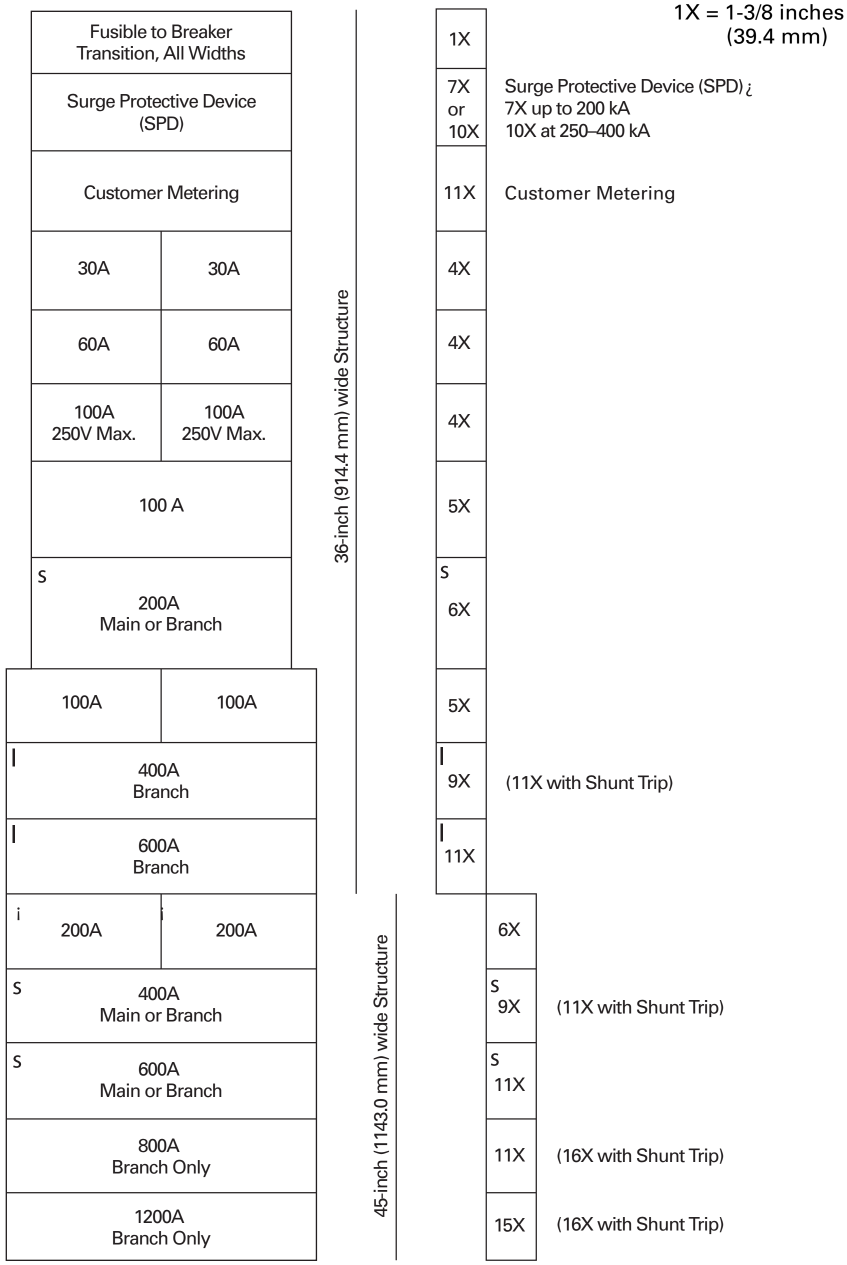


Figure 21.2-11. Circuit Breaker "X" Space Requirement—Dimensions in Inches (mm)

① Preferred location of SPD is mounted at top of first distribution section.
② 100% rated breakers.
③ For use on direct current (DC) systems only.

Note: For breaker interrupting ratings and terminal data, see **Tab 26**.

Distribution Layout Guide—Fusible Switches



S Fusible switch may be used as horizontally main.
I 400 and 600A horizontally mounted feeder switches in 36- or 45-inch (914.4 or 1143.0 mm) wide structure.
400 and 600A horizontally mounted main switches only in 45-inch (1143.0 mm) wide structure.

Figure 21.2-12. Fusible Switch "X" Space Requirement—Dimensions in Inches (mm)

① Preferred location of SPD is mounted at top of first distribution section. See **Tab 34** for more information.
② Twin 200 A switches requires the use of "J" or "T" fuses at 480 V.

Note: Ground fault applications for 800 and 1200 A switches require a shunt trip.

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Distribution Layout Guide—Circuit Breakers

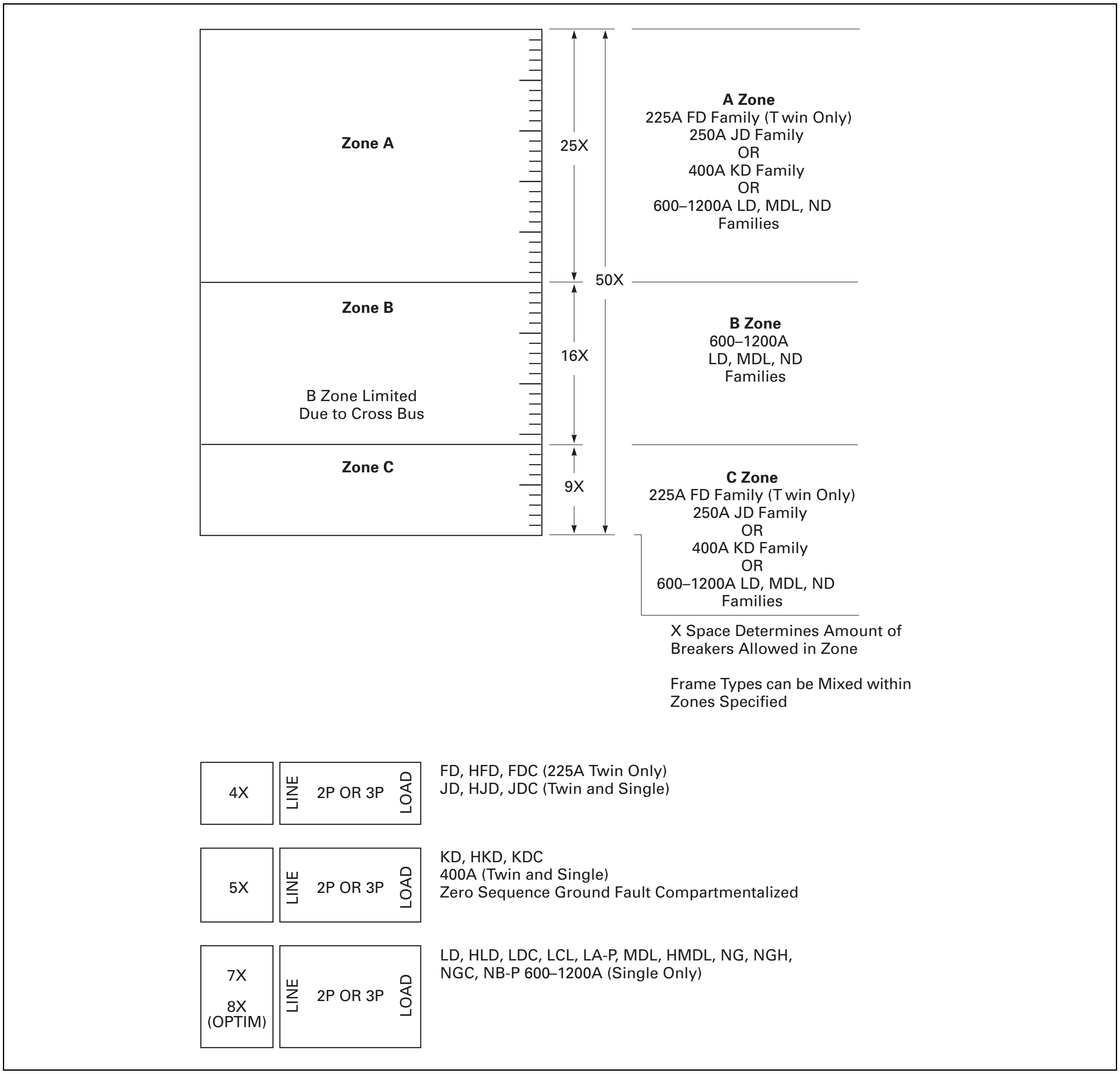


Figure 21.3-1. Individually Compartmentalized Feeder Layout 36.00-Inch (914.4 mm) Wide Section 50X Structure Only (4000 A Maximum)

① Unused bus space to be located in Zone A when possible.
② For breakers with OPTIM trip units, the compartment height is 8X.

Layout Dimensions—Pow-R-Line *i*, Rear-Access, Compartmentalized Feeders

Distribution Layout Guide—Fusible Switches

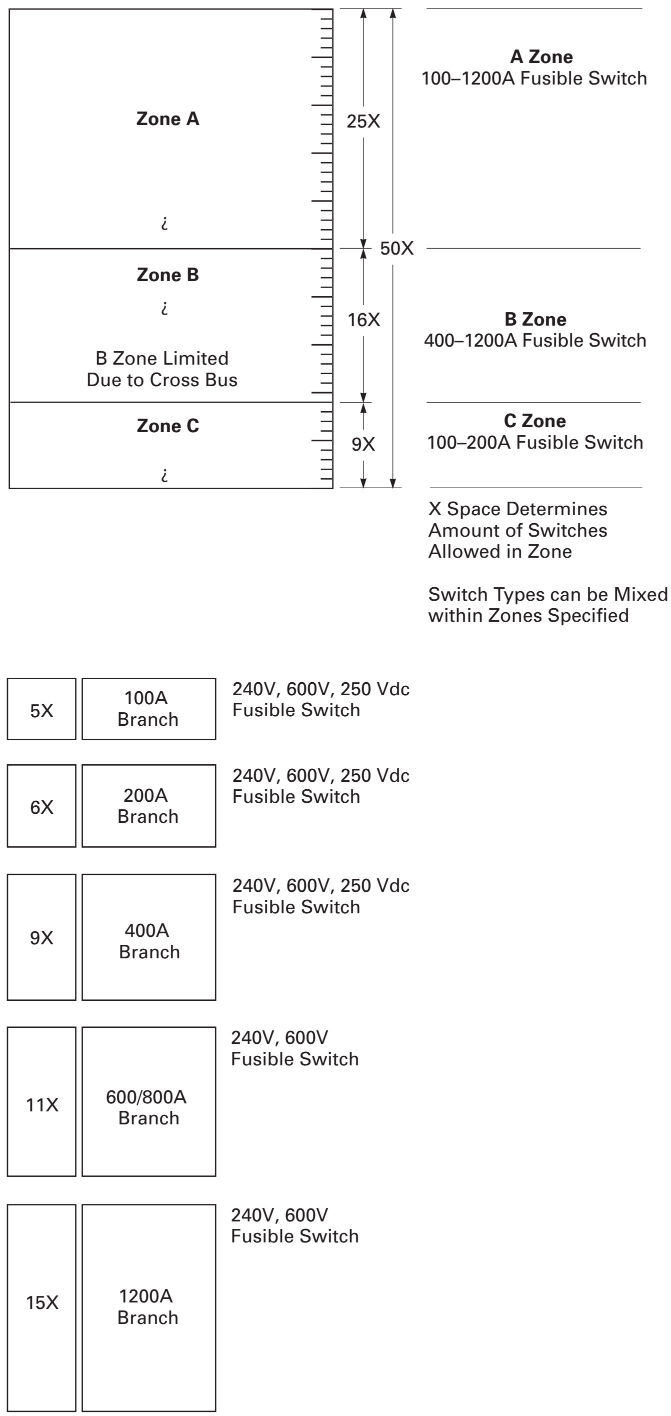


Figure 21.3-2. Individually Compartmentalized Feeder Layout 36.00-Inch (914.4 mm) Wide Section 50X Structure Only (4000 A Maximum)

① Unused bus space to be located in Zone A when possible.

Non-Walk-in with Flat Roof

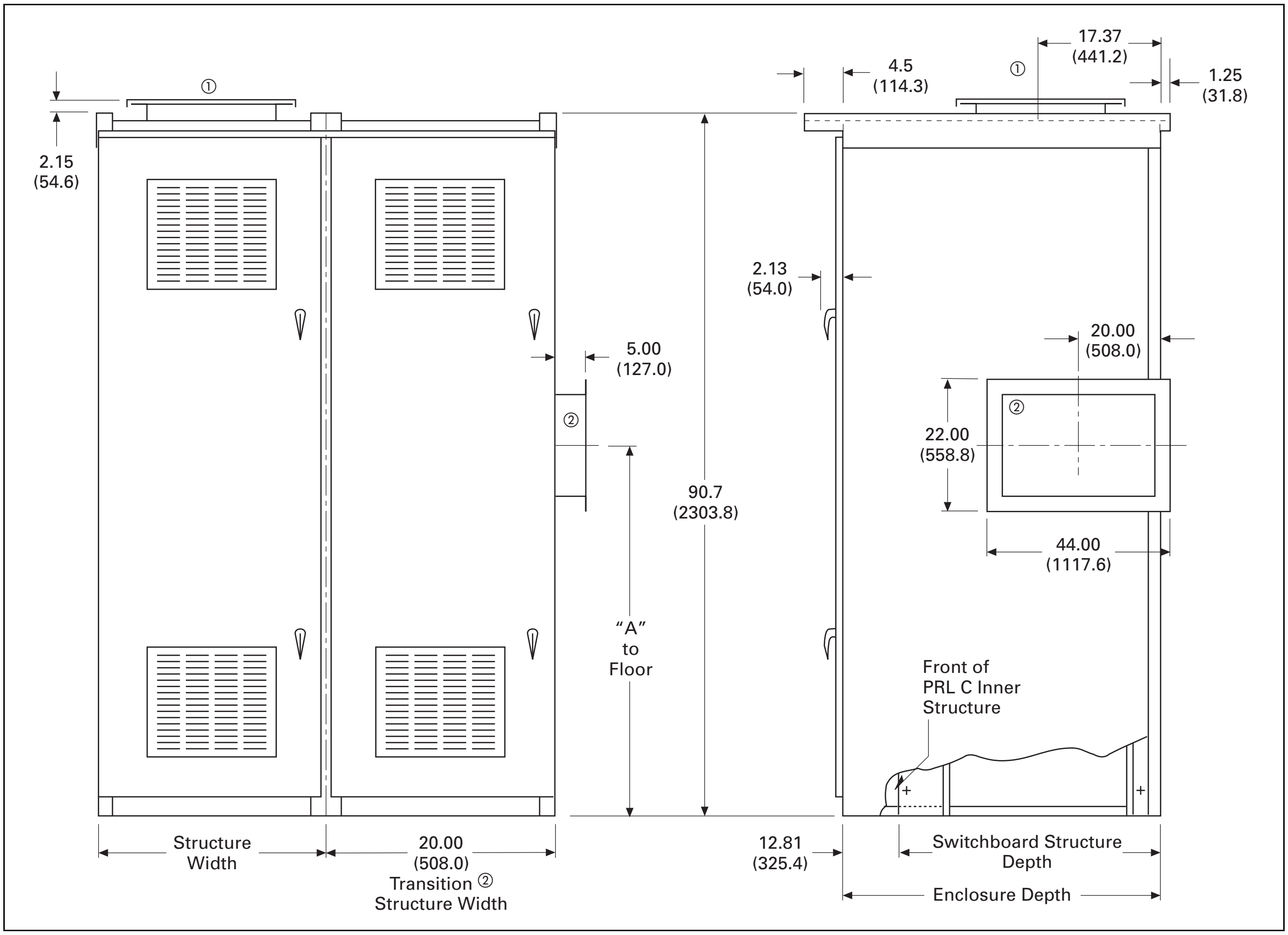


Figure 21.4-1. Front-Access—Non-Walk-In with Flat Roof—Dimensions in Inches (mm)

① Standard busway entry/exit location, 36.00-inch (914.4 mm) deep minimum.
② 20.00-inch (508.0 mm) wide structure always required when throat connecting to other equipment. Standard transformer throat connection, 48.00-inch (1219.2 mm) deep structure only.

Table 21.4-1. Switchboard Depths—Dimensions in Inches (mm)

Switchboard Indoor Structure Depth	Non-Walk-in Enclosure Depth
24 (609.6)—not available for transformer connection	37 (939.8)
30 (762.0)—not available for transformer connection	43 (1092.2)
36 (914.4)—not available for transformer connection	49 (1244.6)
48 (1219.2)—minimum for transformer connection	61 (1549.4)

Table 21.4-2. Transformer Throat Location—Dimensions in Inches (mm)

Transformer	Dimension "A"
0–2500 kVA	55 (1397.0)
2501–5000 kVA	61 (1549.4)

Dimensions for estimating purposes only.

Non-Walk-in with Sloped Roof

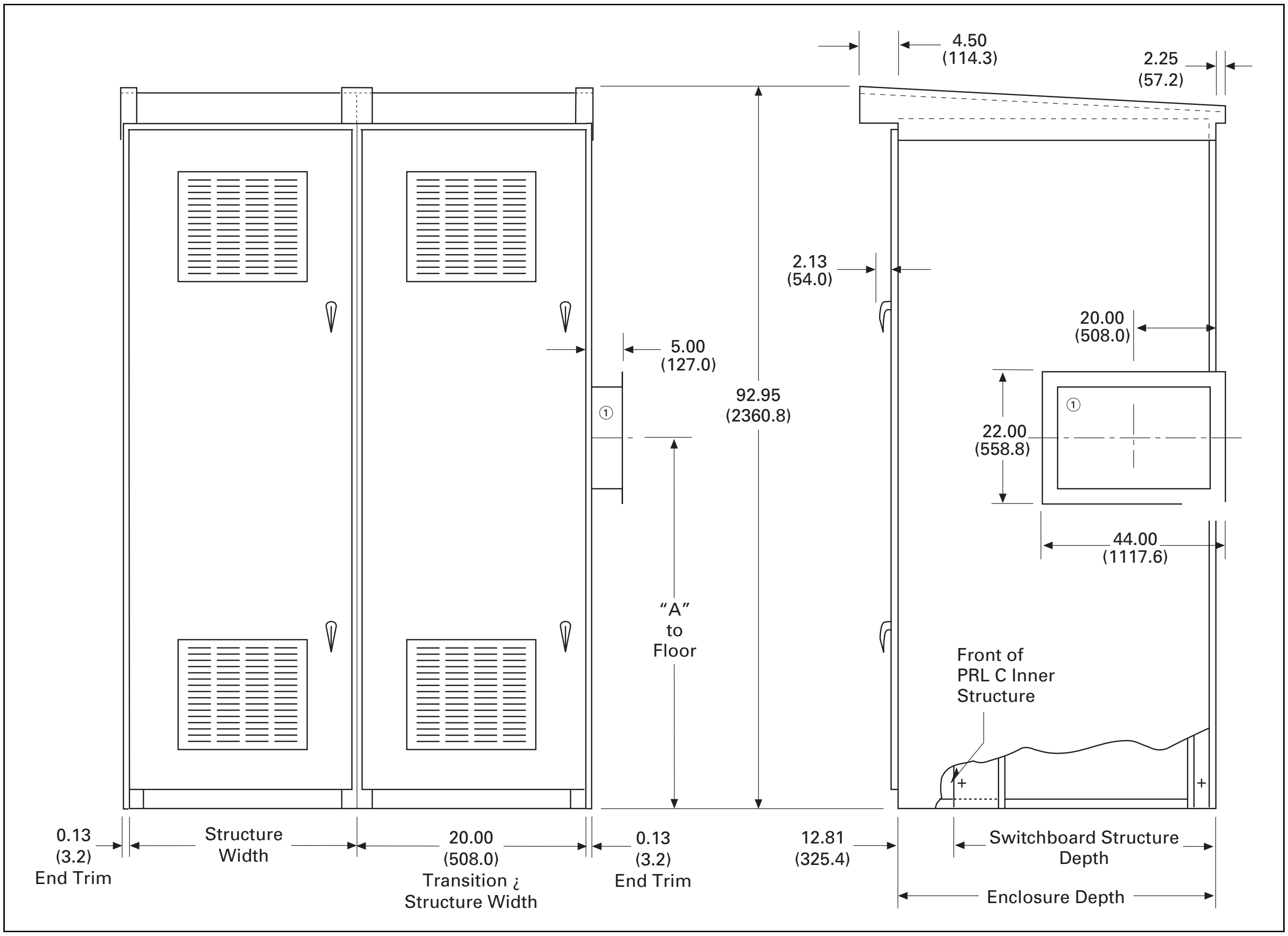


Figure 21.4-2. Front-Access—Non-Walk-In with Sloped Roof—Dimensions in Inches (mm)

① 20.00-inch (508.0 mm) wide structure always required when throat connecting to other equipment. Standard transformer throat connection, 48.00-inch (1219.2 mm) deep structure minimum.

Table 21.4-3. Switchboard Depths—Dimensions in Inches (mm)

Switchboard Indoor Structure Depth	Non-Walk-in Enclosure Depth
24 (609.6)—not available for transformer connection	37 (939.8)
30 (762.0)—not available for transformer connection	43 (1092.2)
36 (914.4)—not available for transformer connection	49 (1244.6)
48 (1219.2)—minimum for transformer connection	61 (1549.4)
54 (1371.6)	67 (1701.8)
66 (1676.4)	79 (2006.6)

Table 21.4-4. Transformer Throat Location—Dimensions in Inches (mm)

Transformer	Dimension "A"
0–2500 kVA	55 (1397.0)
2501–5000 kVA	61 (1549.4)

Dimensions for estimating purposes only.

Drawout Magnum SB Switchboard

Eaton's drawout Magnum SB switchboard has been designed for the power user that desires the configurations and features of low voltage switchgear, but does not require the full selectivity and robustness that low voltage metal-enclosed switchgear provides.

The drawout Magnum SB switchboard is designed and built using many of the same techniques and parts of the Magnum DS switchgear platform. The design has been optimized for the differences between the UL 891 standard and the more rigorous UL 1558 standard.

Refer to **Tab 20, Section 20.1** Magnum DS switchgear structure features, ratings and layout guides. Differences in these ratings are covered on the following pages.

Magnum SB is a low voltage insulated case circuit breaker family designed for the performance and economic requirements of UL 891 switchboards.

- Magnum SB insulated case circuit breakers have interruption ratings up to 100 kA at 635 Vac with continuous current ratings up to 6000 A
- Magnum SB insulated case circuit breakers have lighter-duty short time withstand ratings and fixed internal instantaneous trips on most ratings, which is characteristic of UL 489 molded case breakers commonly used in UL 891 switchboards. This provides for greater economy and excellent coordination and selectivity for most commercial applications
- Fixed internal instantaneous trips on all SB insulated case circuit breakers rated 3200 A and below will provide an extra safety factor by reducing the energy let-through to downstream circuits at the maximum instantaneous trip point and facilitate feeder circuit breaker protection in UL 891 switchboards with 3-cycle bus bracing
- Magnum SBSE current limiting power circuit breakers have 150 kA interrupting ratings at 480 Vac with continuous current ratings up to 5000 A. The short-time withstand rating is 30 kA for standard frame and 50 kA for double frame breakers

Magnum SB Switchboard

Magnum SB breakers meet or exceed the applicable ANSI, NEMA, UL and CSA standards, including:

- ANSI C37.13 (low voltage AC power circuit breakers used in enclosures)
- ANSI C37.16 (preferred ratings, related requirements and application recommendations for low voltage power circuit breakers and AC power circuit breakers)
- ANSI C37.17 (trip devices for AC and general purpose DC low voltage power circuit breakers)
- ANSI C37.50 (test procedures for low voltage AC power circuit breakers used in enclosures)
- UL 1066 (standard for low voltage AC and DC power circuit breakers used in enclosures)

Drawout Magnum SB switchboards conform to the following standards:

- CSA
- UL Standard 891
- American Bureau of Shipping (ABS)
- Built in an ISO® certified facility

Maximum ratings for Magnum SB switchboards are 600 Vac, 10,000 A continuous cross bus and 200 kA short-circuit capacity.

Magnum SB Switchboard Class UL 1066 Insulated Case

Magnum SB Low Voltage Insulated Case Circuit Breaker Family UL Rated for Switchboard Applications

Table 21.5-1. Magnum SB Switchboard Class Insulated Case Low Voltage Air Circuit Breakers

Frame Amperes	Breaker Type Catalog Position 1–6	Frame Type	rms Symmetrical Current Ratings kA 50/60 Hz ①					Available Current Sensor and Rating Plugs for Digitrip RMS Trip Unit (Establishes Breaker I_n Rating)
			Interrupting at 254 Vac	Interrupting at 508 Vac	Interrupting at 635 Vac	Short-Time Withstand Rating	Fixed Internal Instantaneous Trip	
800	SBN-508	Narrow	50	50	35	20	②	200, 250, 300, 400, 600, 800
	SBN-608	Narrow	65	65	42	20	②	
	SBN-C08	Narrow	100	100	65	20	18 x I_n	
	SBS-608	Standard	65	65	65	20	②	
	SBS-C08	Standard	100	100	85	20	②	
	SBS-E08 ④	Standard	200	150	③	30	30	
1200	SBN-512	Narrow	50	50	35	25	②	200, 250, 300, 400, 600, 800, 1000, 1200
	SBN-612	Narrow	65	65	42	25	②	
	SBN-C12	Narrow	100	100	65	25	18 x I_n	
	SBS-612	Standard	65	65	65	25	②	
	SBS-C12	Standard	100	100	85	25	②	
	SBS-E12 ④	Standard	200	150	③	30	30	
1600	SBN-516	Narrow	50	50	35	30	②	200, 250, 300, 400, 600, 800, 1000, 1200, 1600
	SBN-616	Narrow	65	65	42	30	②	
	SBN-C16	Narrow	100	100	65	30	18 x I_n	
	SBS-616	Standard	65	65	65	30	②	
	SBS-C16	Standard	100	100	85	30	②	
	SBS-E16 ④	Standard	200	150	③	30	30	
2000	SBN-620	Narrow	65	65	65	35	②	200, 250, 300, 400, 600, 800, 1000, 1200, 1600, 2000
	SBN-C20	Narrow	100	100	65	35	18 x I_n	
	SBS-620	Standard	65	65	65	35	②	
	SBS-C20	Standard	100	100	85	35	②	
	SBS-E20 ④	Standard	200	150	③	30	30	
2500	SBS-625	Standard	65	65	65	45	②	200, 250, 300, 400, 600, 800, 1000, 1200, 1600, 2000, 2500
	SBS-C25	Standard	100	100	85	45	②	
	SBS-E25 ④	Double	200	150	③	50	50	
3000	SBS-630	Standard	65	65	65	50	②	200, 250, 300, 400, 600, 800, 1000, 1200, 1600, 2000, 2500, 3000
	SBS-C30	Standard	100	100	85	50	②	
	SBS-E30 ④	Double	200	150	③	50	50	
4000	SBS-840	Double	85	85	85	85	—	2000, 2500, 3000, 4000
	SBS-C40	Double	100	100	100	100	—	
	SBS-E40 ④	Double	200	150	③	50	50	
5000	SBS-850	Double	85	85	85	85	—	2500, 3000, 4000, 5000
	SBS-C50	Double	100	100	100	100	—	
	SBS-E50 ④⑤	Double	200	150	③	50	50	
6000	SBS-C60 ⑤	Double	100	100	100	100	—	3000, 4000, 5000, 6000

① Interrupting ratings shown based on breaker equipped with integral Digitrip RMS Trip Unit. Interruption ratings for non-automatic breakers are equal to the published short-time withstand rating. These interruption ratings are based on the standard duty cycle consisting of an open operation, a 15-second interval and a close-open operation, in succession, with delayed tripping in case of short-delay devices.
The standard duty cycle for short-time ratings consists of maintaining the rated current for two periods of 1/2 seconds each, with a 15-second interval of zero current between the two periods.

② Fixed internal instantaneous trip set at approximately 18 x I_n symmetrical will be phased into the product.

③ Product to be tested. Contact Eaton for product rating.

④ Magnum SBSE Current Limiting Power Circuit Breaker with fast opening contacts.

⑤ Breaker applied in a tested fan-cooled enclosure.

Note: Magnum SB is UL 1066 listed.

Layout Guide—Drawout Magnum SB Rear-Access Switchboard

Table 21.5-2. Layout Guide

Rear-Connected Switchgear						
Breaker Type	**Ampacity Available**		**Structure Widths—Allowable Breaker Placements—Inches (mm)**			
	<=100 kAIC	**150 kAIC**	**18 (457.2)**	**22 (558.8)**	**30 (762.0)**	**44 (117.6)**
Narrow (SBN)	800–2000 SBN5- SBN6- SBNC-	—	Feeder—A, B, C, D Tie—B Main—B, C, D	Feeder—A, B, C, D Main—B, C, D Tie—B, C	—	Feeder—A, B, C, D, E, F, G, H
Standard (SBS)	800–2000 SBS6- SBSC-	800–1600 SBSE	—	Feeder—A, B, C, D Tie—B, C Main—B, C, D	Feeder—A, B, C, D Tie—B or C Main—B, C, D	Feeder—A, B, C, D, E, F, G, H
Standard (SBS)	2500–3000 SBS6- SBSC-	2000 SBSE	—	Feeder—B, C, D Tie—B, C Main—B, C, D	Feeder —B, C, D Tie—B, C Main—B, C, D	Feeder—contact Eaton
Double (SBS)	4000–5000 SBS8- SBSC-	3200–4000 SBSE	—	—	—	Feeder—B/F or C/G or D/H Tie—B/F, C/G Main—B/F, C/G, D/H
Double w/ Fans (SBS)	6000 SBSC-	5000 SBSE	—	—	—	Feeder—BC/FG or CD/GH Tie—BC/FG, CD/GH Main—BC/FG, CD/GH
Instrument compartment (SPD, HRG, metering, controls, panelboard, etc.)	—	—	All positions	All positions	All positions	All positions

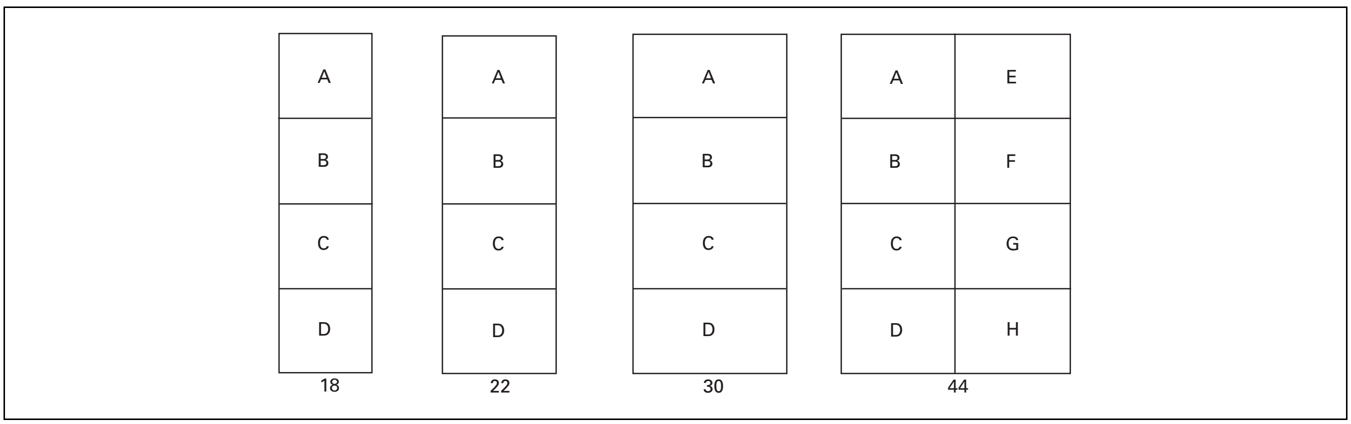


Figure 21.5-1. Breaker Structures

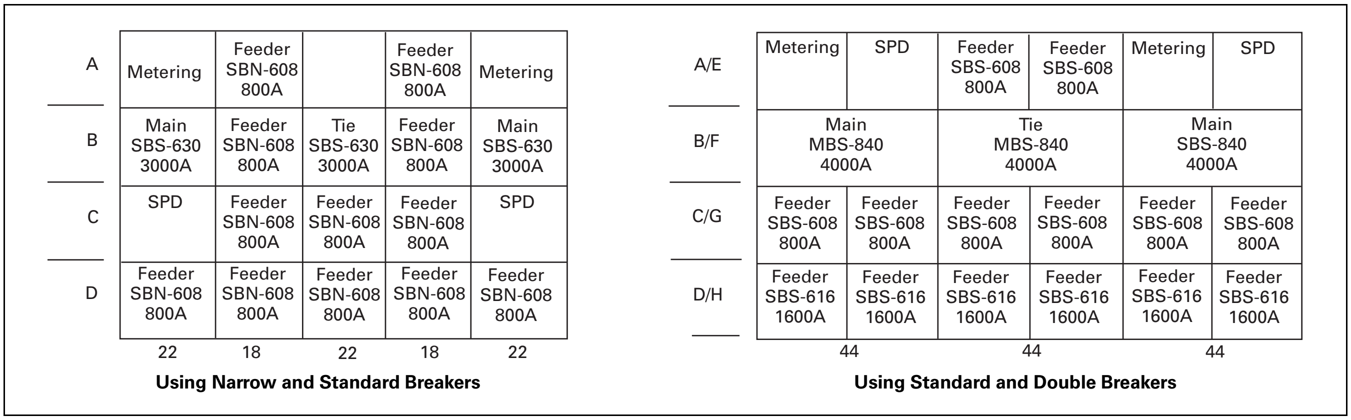
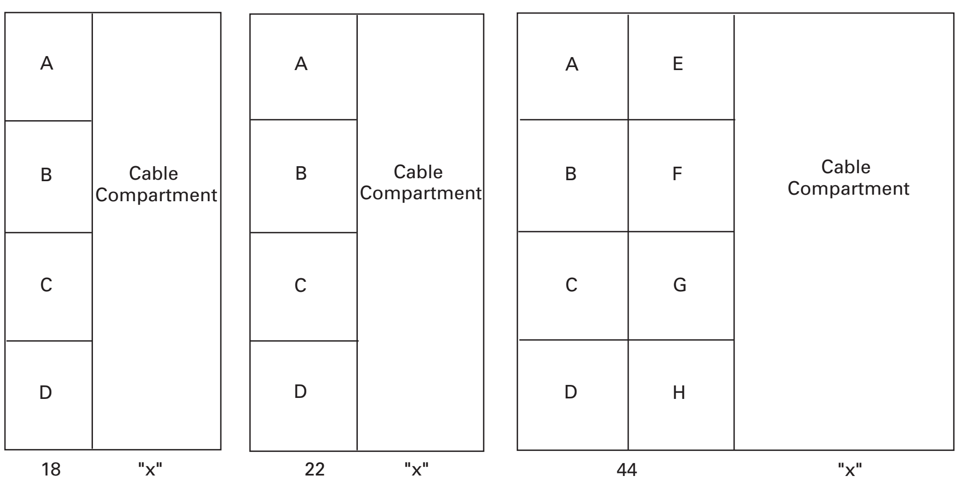


Figure 21.5-2. Main-Tie-Main Typical Layouts

Layout Guide—Drawout Magnum SB Front-Access Switchboard

Table 21.5-3. Layout Guide

Front-Connected Switchgear				
Breaker Type	**Ampacity Available <=100 kAIC**	**Structure Widths—Inches (mm)**		
		18 + X (457.2 + X)	**22 + X (558.8 + X)**	**44 + X (1117.6 + X)**
Narrow (SBN)	800–2000 SBN5- SBN6- SBNC-	Feeder—A, B, C, D Tie—B Main—B, C, D	Feeder—A, B, C, D Tie—B, C Main—B, C, D	—
Standard (SBS)	800–3000 SBS6- SBSC-	—	Feeder—B Tie—B Main—B	—
Double (SBS)	4000–5000 SBS8- SBSC-	—	—	Feeder—B/F Tie—B/F Main—B/F
Double w/ Fans (SBS)	6000 SBSC-	—	—	Feeder—BC/EF Tie—BC/EF Main —BC/EF
Instrument compartment (SPD, HRG, metering, controls, panelboard, etc.)	—	All positions	All positions	All positions



Note:

18" Breaker Sections:
Cable Compartment can ONLY be on the right.

22" and 44" Breaker Sections:
Cable Compartment can be on the right or left.

Shipping splits are not allowed between 18" Breaker structure and its cable compartment.

Shipping splits must be adjacent to a cable compartment.

Figure 21.5-3. Breaker Structures

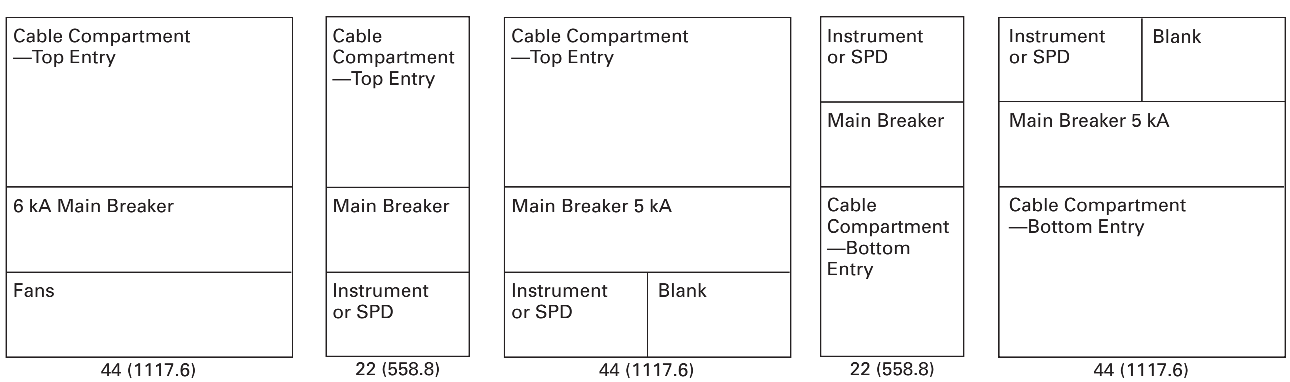


Figure 21.5-4. Front-Access Main Sections

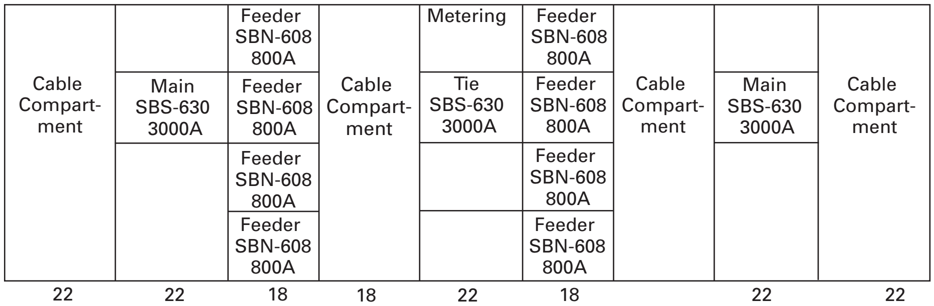


Figure 21.5-5. Standard and Narrow Breakers—Typical Main-Tie-Main Layout

Magnum SB Rear-Accessible Switchboard with NRX Feeders

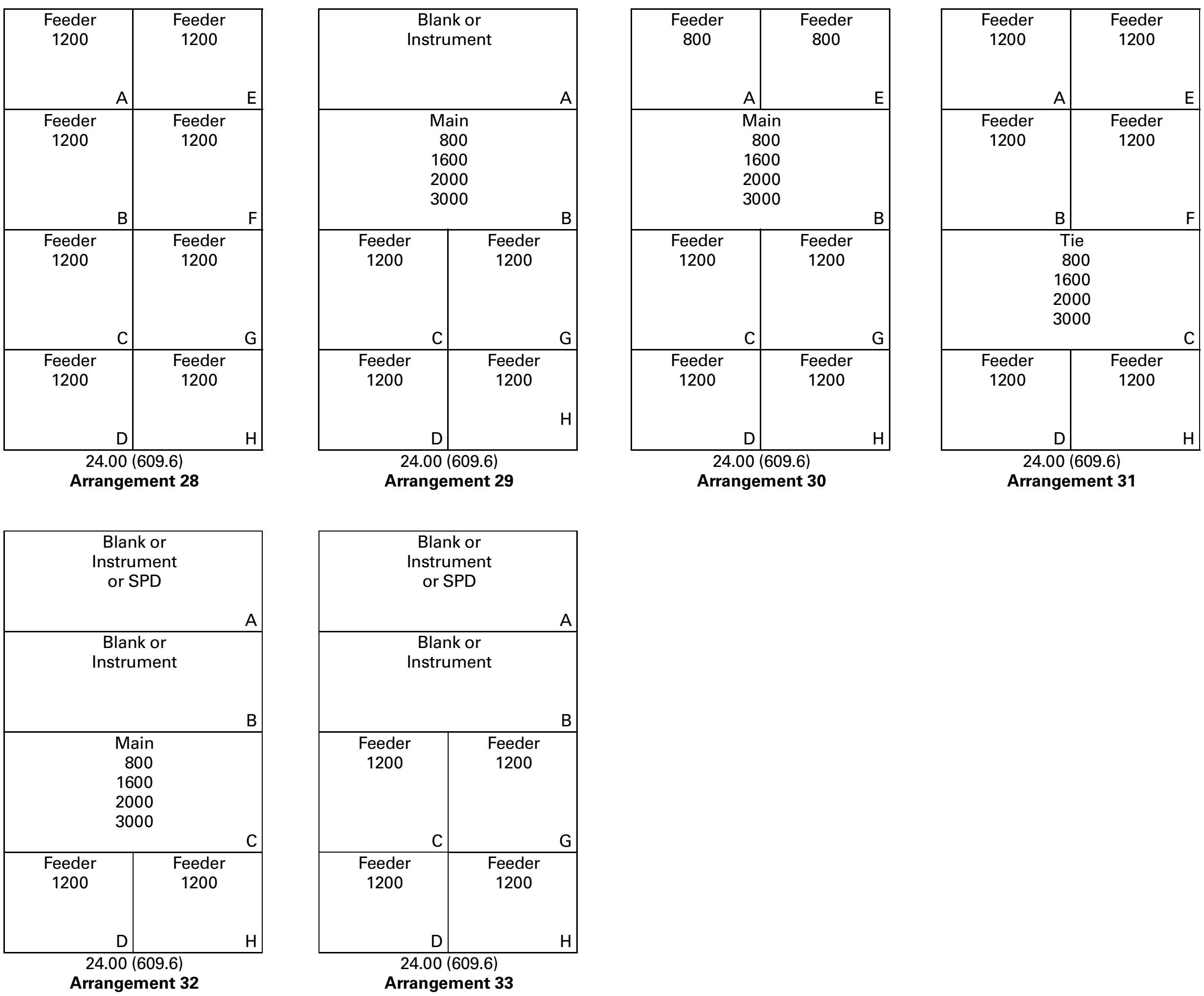


Figure 21.5-6. Typical Structure and Breaker Arrangements (Continued)—Magnum SB Mains and Ties, and Series NRX Feeder Breakers—Dimensions in Inches (mm)

Notes: Breaker and cell utilization should keep load amperes below rating of MAIN due to vertical bus limitations.
Cable used in the conduit areas are limited to 75 °C ampacity values per the NEC for ampacity calculations.
Any cell not used as a feeder breaker may be a blank, or a feeder breaker provision for future breakers, or SPD surge.

Layout Guide—Magnum SB Front-Accessible Switchboard with NRX Feeders

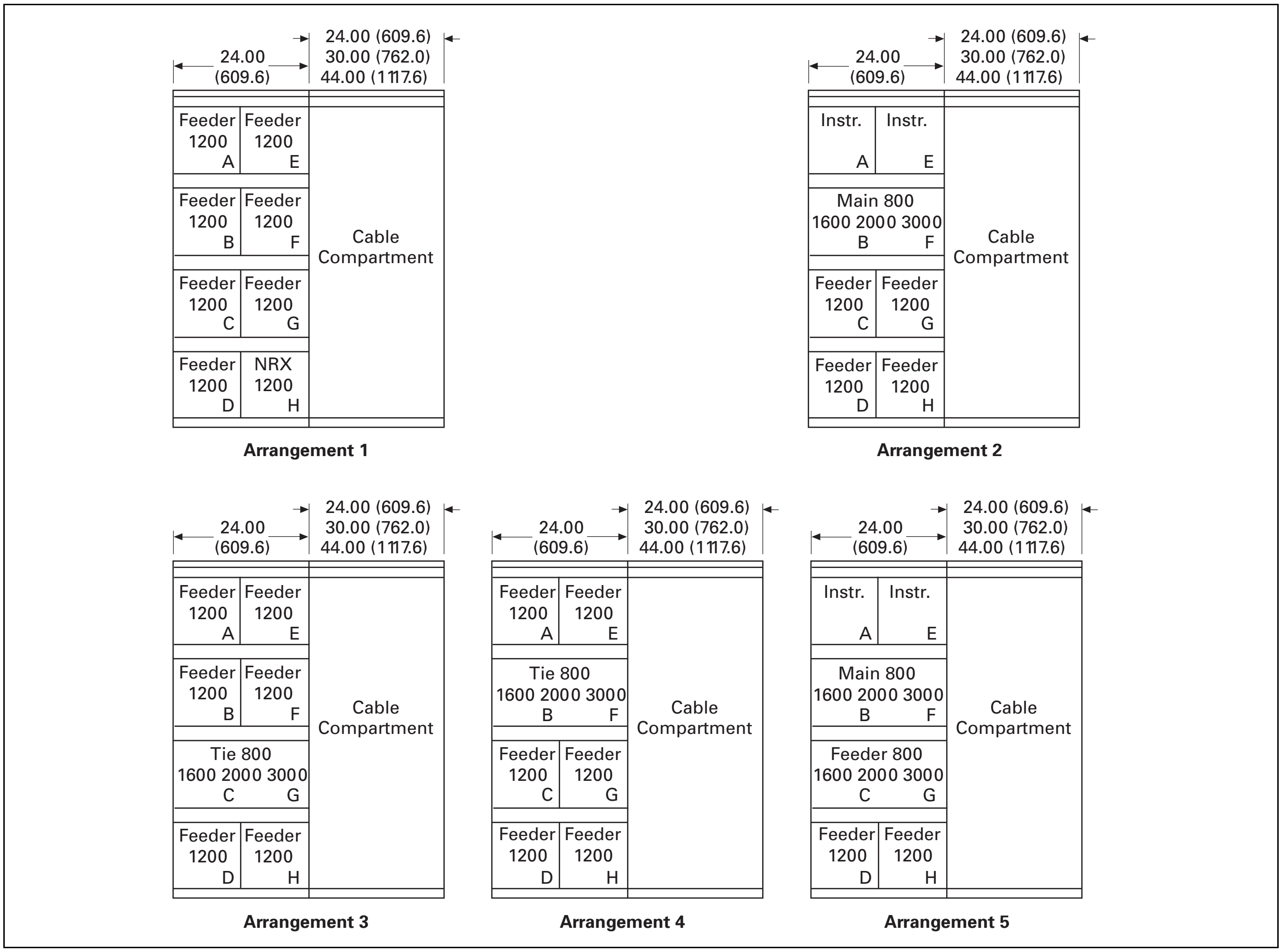


Figure 21.5-7. Typical Structure and Breaker Arrangements—Series NRX and Magnum SB Breakers

Notes: Breaker and cell utilization should keep load amperes below rating of MAIN due to vertical bus limitations.
Cable used in the conduit areas are limited to 75 °C ampacity values per the NEC for ampacity calculations.
Any cell not used as a feeder breaker may be a blank, or a feeder breaker provision for future breakers, or SPD surge.
Cable compartment must be at least as wide as the breaker compartment.
Cable sections must be on the right-hand side of the breaker sections when facing the front.

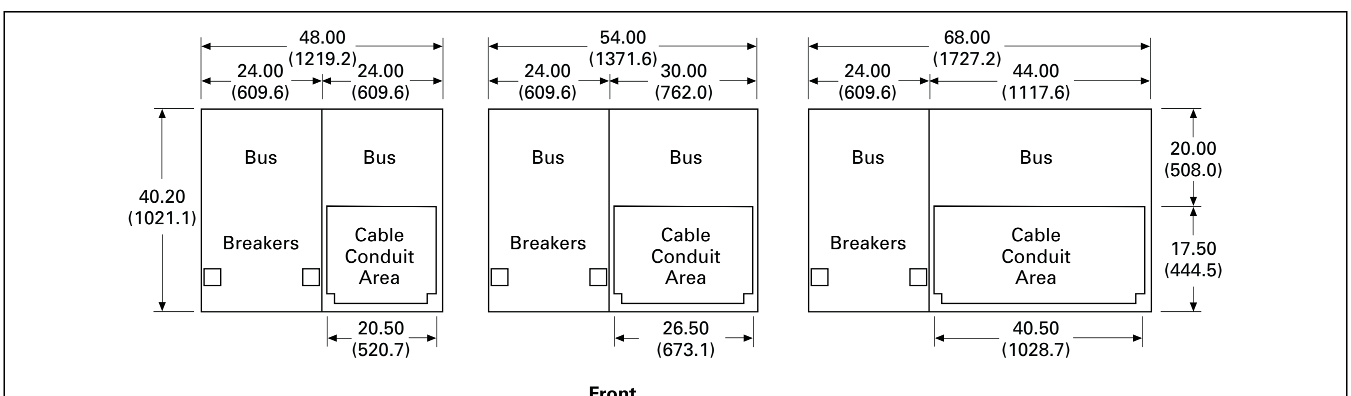


Figure 21.5-8. Floor Plans and Available Conduit Space in Inches (mm)—Front-Access Structures

Table 21.5-4. Magnum SB Breaker Weights—Lbs (kg)

Breaker	Drawout
SBN-800 SBN-1600 SBN-2000	110 (50)
SBS-800 SBS-1600 SBS-2000	145 (66)
SBSE-800 SBSE-1600 SBSE-2000	190 (86)
SBS-2500, SBS-3000	175 (80)
SBS-4000 SBS-5000 SBS-6000	310 (141)
SBSE-3000 SBSE-4000 SBSE-5000	340 (154)

Note: Manually or electrically operated. For approximate impact weight, add 50% of breaker weight.

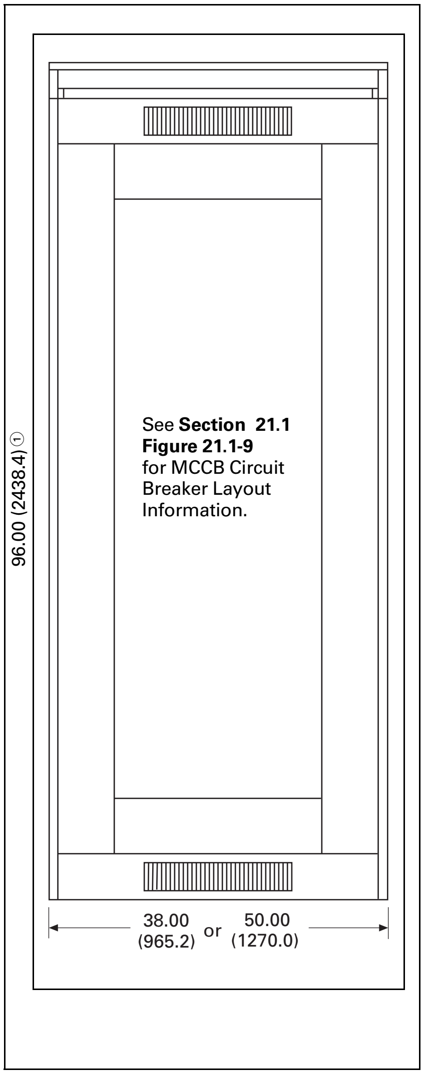


Figure 21.5-9. Group-Mounted Molded Case Circuit Breaker Switchboard

① When a top-of-gear breaker lifter is used, height is 99.00 inches (2514.6 mm) total.

Note: Structures using molded case breakers for distribution will be UL 891 rated with 30-cycle bus bracing.

Layout

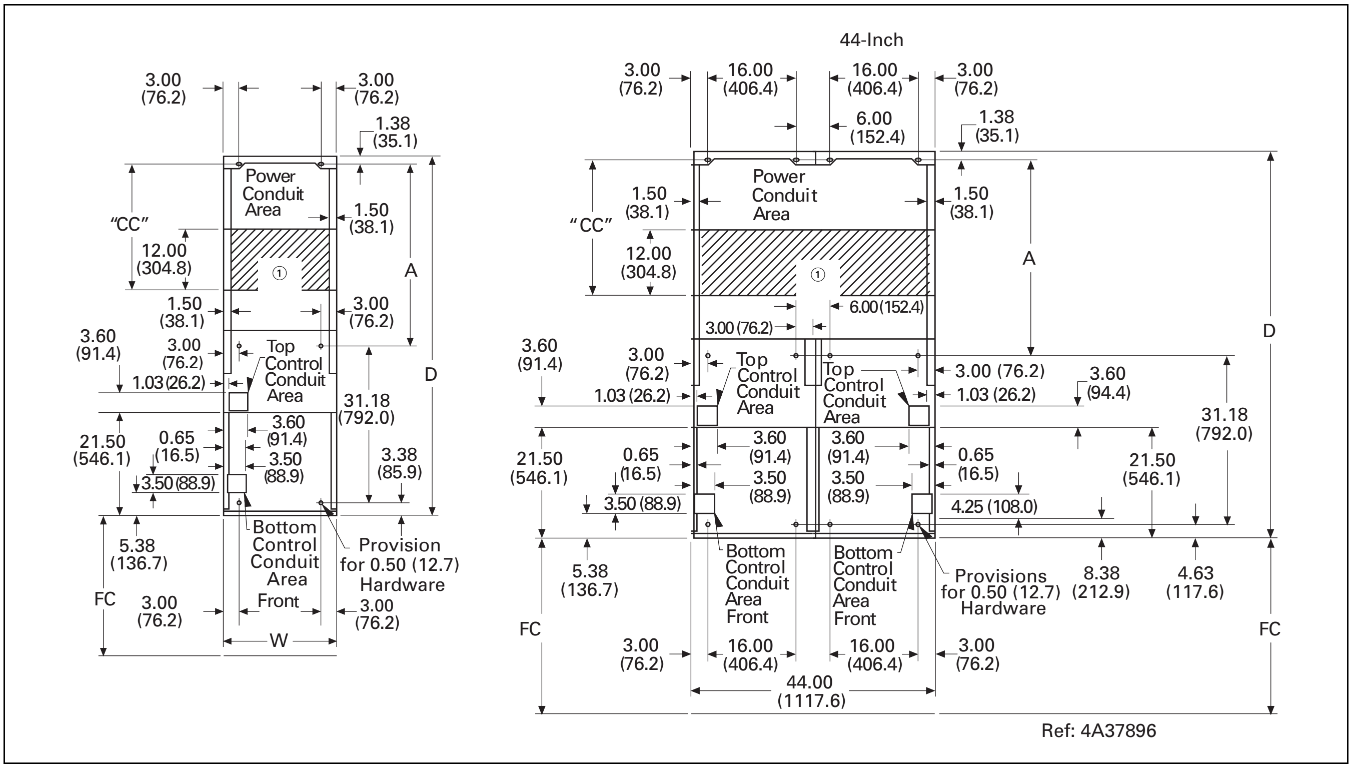


Figure 21.5-10. Floor Plans and Available Conduit Space in Inches (mm)—18.00, 22.00, 30.00, 44.00-Inch (457.2, 558.8, 762.0, 1117.6 mm) Wide Rear-Access Structures

① This dimension is reduced by 12.00 inches (304.8 mm) when vertical section is close coupled to a dry-type transformer due to secondary bus connections.

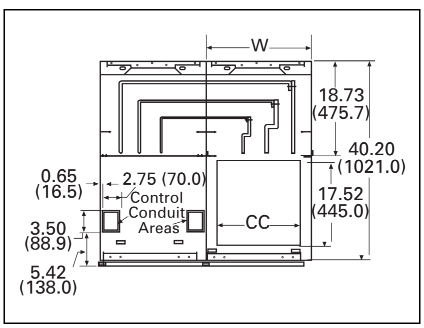


Figure 21.5-11. Front- Access Structures

Layout Dimensions

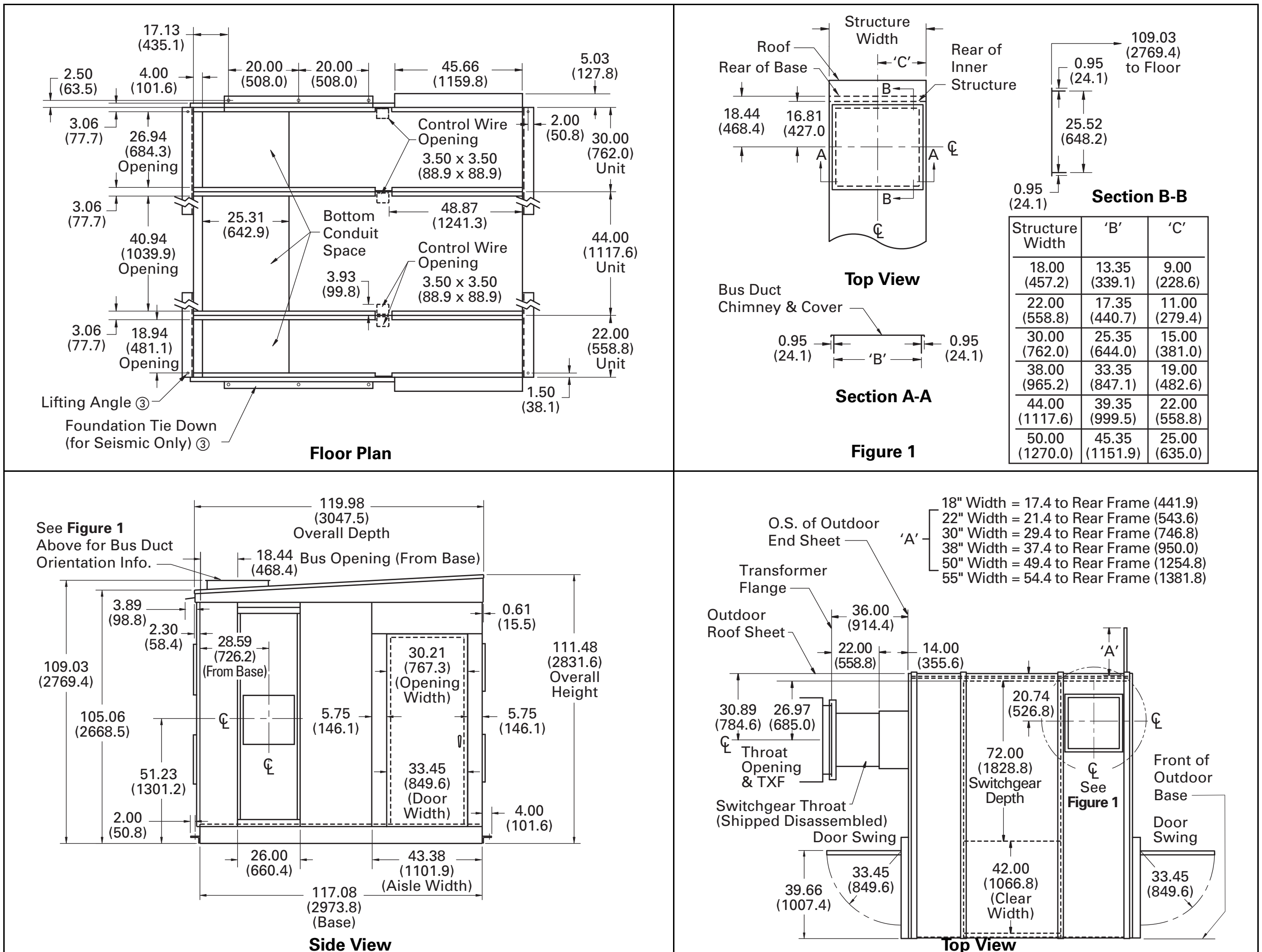
Table 21.5-5. Rear-Access Structure Dimensions in Inches (mm)

W	D	A	CC	Recommended Number	
				3.50 Inch (88.9 mm)	4.00 Inch (101.6 mm)
18.00 (457.2)	54.00 (1371.6)	18.00 (457.2)	7.30 (185.4)	2	2
	60.00 (1524.0)	24.00 (609.6)	13.30 (337.8)	4	4
	66.00 (1676.4)	30.00 (762.0)	19.30 (490.2)	6	6
	72.00 (1828.8)	36.00 (914.4)	25.30 (642.6)	8	8
	78.00 (1981.2)	42.00 (1066.8)	31.30 (795.0)	12	10
	84.00 (2133.6)	48.00 (1219.2)	37.30 (947.4)	14	12
	90.00 (2286.0)	54.00 (1371.6)	43.30 (1099.8)	16	16
22.00 (558.8)	54.00 (1371.6)	18.00 (457.2)	7.30 (185.4)	3	3
	60.00 (1524.0)	24.00 (609.6)	13.30 (337.8)	6	6
	66.00 (1676.4)	30.00 (762.0)	19.30 (490.2)	9	9
	72.00 (1828.8)	36.00 (914.4)	25.30 (642.6)	12	12
	78.00 (1981.2)	42.00 (1066.8)	31.30 (795.0)	15	15
	84.00 (2133.6)	48.00 (1219.2)	37.30 (947.4)	18	18
	90.00 (2286.0)	54.00 (1371.6)	43.30 (1099.8)	21	21
24.00 (609.6)	60.00 (1524.0)	24.00 (609.6)	9.08 (230.6)	5	5
	66.00 (1676.4)	30.00 (762.0)	15.08 (383.0)	9	8
	72.00 (1828.8)	36.00 (914.4)	21.08 (535.4)	12	12
	78.00 (1981.2)	42.00 (1066.8)	27.08 (687.8)	15	15
	84.00 (2133.6)	48.00 (1219.2)	33.08 (840.2)	18	18
	90.00 (2286.0)	54.00 (1371.6)	39.08 (992.6)	21	21
30.00 (762.0)	54.00 (1371.6)	18.00 (457.2)	7.30 (185.4)	4	4
	60.00 (1524.0)	24.00 (609.6)	13.30 (337.8)	8	8
	66.00 (1676.4)	30.00 (762.0)	19.30 (490.2)	12	12
	72.00 (1828.8)	36.00 (914.4)	25.30 (642.6)	16	16
	78.00 (1981.2)	42.00 (1066.8)	31.30 (795.0)	20	20
	84.00 (2133.6)	48.00 (1219.2)	37.30 (947.4)	24	24
	90.00 (2286.0)	54.00 (1371.6)	43.30 (1099.8)	28	28
44.00 (1117.6)	54.00 (1371.6)	18.00 (457.2)	7.30 (185.4)	7	7
	60.00 (1524.0)	24.00 (609.6)	13.30 (337.8)	14	14
	66.00 (1676.4)	30.00 (762.0)	19.30 (490.2)	21	21
	72.00 (1828.8)	36.00 (914.4)	25.30 (642.6)	28	28
	78.00 (1981.2)	42.00 (1066.8)	31.30 (795.0)	35	35
	84.00 (2133.6)	48.00 (1219.2)	37.30 (947.4)	42	42
	90.00 (2286.0)	54.00 (1371.6)	43.30 (1099.8)	49	49
60.00 (1524.0)	54.00 (1371.6)	18.00 (457.2)	7.30 (185.4)	8	8
	60.00 (1524.0)	24.00 (609.6)	13.30 (337.8)	16	16
	66.00 (1676.4)	30.00 (762.0)	19.30 (490.2)	24	24
	72.00 (1828.8)	36.00 (914.4)	25.30 (642.6)	32	32
	78.00 (1981.2)	42.00 (1066.8)	31.30 (795.0)	40	40
	84.00 (2133.6)	48.00 (1219.2)	37.30 (947.4)	48	48
	90.00 (2286.0)	54.00 (1371.6)	43.30 (1099.8)	56	56

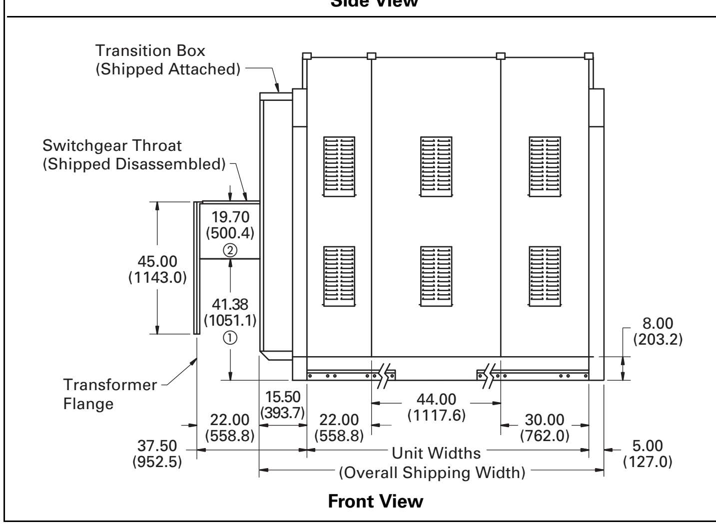
Table 21.5-6. Front-Access Structure Dimensions in Inches (mm)

W	CC	Recommended Number	
		3.50 Inch (88.9 mm)	4.00 Inch (101.6 mm)
18.00 (457.2)	13.89 (352.8)	6	6
22.00 (558.8)	17.89 454.4)	8	8
30.00 (762.0)	25.89 (657.6)	11	11
44.00 (1117.6)	39.89 (1013.2)	16	16

Layout—Outdoor Walk-in Switchboard



Structure Width	'B'	'C'
18.00 (457.2)	13.35 (339.1)	9.00 (228.6)
22.00 (558.8)	17.35 (440.7)	11.00 (279.4)
30.00 (762.0)	25.35 (644.0)	15.00 (381.0)
38.00 (965.2)	33.35 (847.1)	19.00 (482.6)
44.00 (1117.6)	39.35 (999.5)	22.00 (558.8)
50.00 (1270.0)	45.35 (1151.9)	25.00 (635.0)



Weights of Outdoor Structures (without breakers)

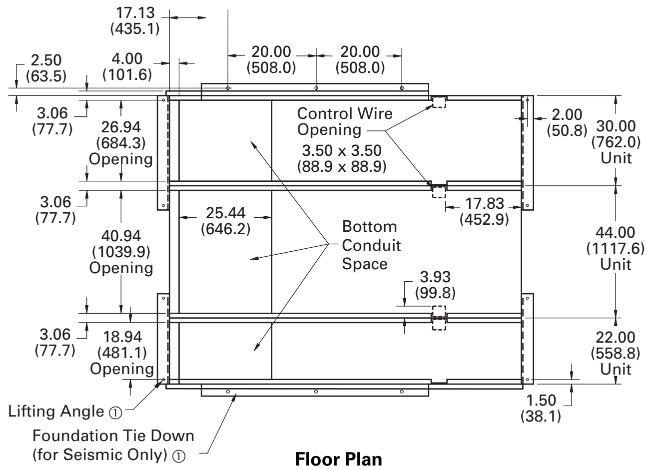
Structure	Weight Lbs (kg)
End Trims One set per lineup)	1500 (681)
18.00-inch (457.2) wide breaker structure	2500 (1135)
22.00-inch (558.8 mm) wide breaker structure	2600 (1180)
30.00-inch (762.0 mm) wide breaker structure	2700 (1226)
44.00-inch (1117.6 mm) wide breaker structure	5200 (2361)
22.00-inch (558.8 mm) wide auxiliary structure	2300 (1044)
22.00-inch (558.8 mm) wide transition structure	2300 (1044)
38.00-inch (965.2 mm) wide utility structure	2700 (1226)
50.00-inch (1270.0 mm) wide utility structure	3200 (1453)
Transformer throat	150 (68)

Reference Drawing: 9255C25

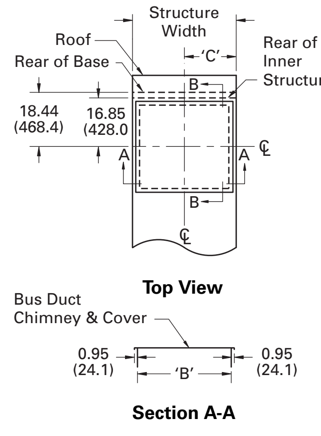
Figure 21.5-12. Outdoor Walk-in Enclosure Dimensions in Inches (mm)

① 46.63 (1184.4) = 55.00-inch (1397.0 mm) throat (44.00-inch [1117.6 mm] wide transition box); 52.63 (1336.8) = 61.00-inch (1549.4 mm) throat (44.00-inch [1117.6 mm] wide transition box).
② 18.70 (475.0) = 44.00-inch (1117.6 mm) wide transition box.
③ 0.75-inch (19.1 mm) hardware recommended in all tie down locations.

Layout—Outdoor Non-Walk-in Switchboard

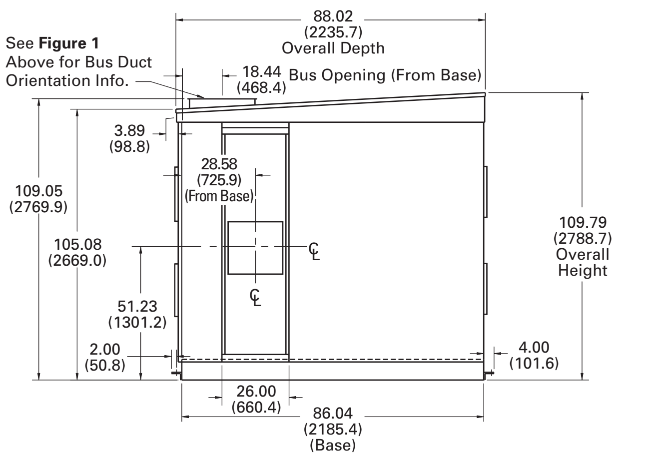


Floor Plan

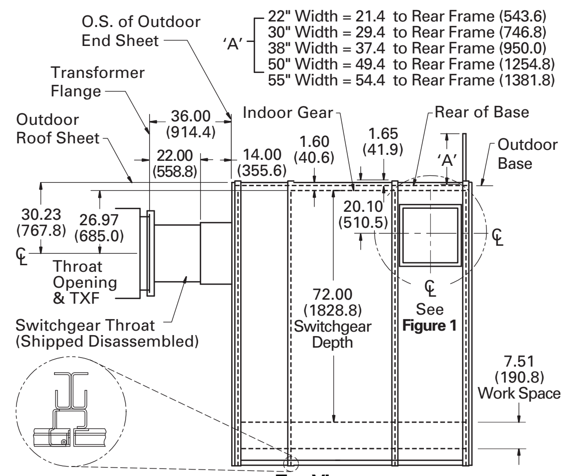


Structure Width	'B'	'C'
18.00 (457.2)	13.35 (339.1)	9.00 (228.6)
22.00 (558.8)	17.35 (440.7)	11.00 (279.4)
30.00 (762.0)	25.35 (644.0)	15.00 (381.0)
38.00 (965.2)	33.35 (847.1)	19.00 (482.6)
44.00 (1117.6)	39.35 (999.5)	22.00 (558.8)
50.00 (1270.0)	45.35 (1151.9)	25.00 (635.0)

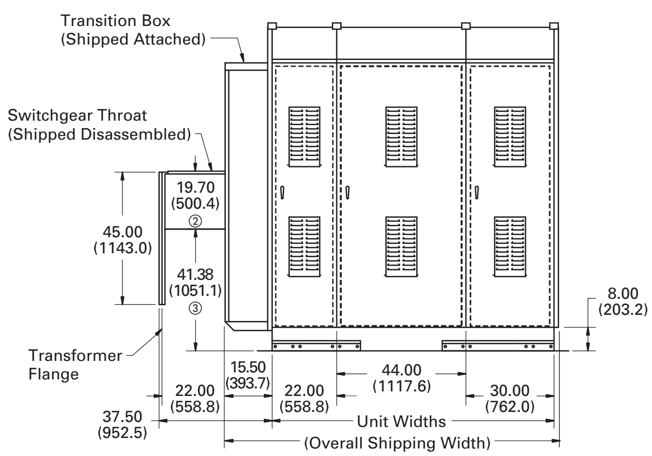
Figure 1



Side View



Top View



Front View

Weights of Outdoor Structures (without breakers)

Structure	Weight Lbs (kg)
End Trims One set per lineup)	1500 (681)
18.00-inch (457.2 mm) wide breaker structure	2400 (1090)
22.00-inch (558.8 mm) wide breaker structure	2600 (1180)
30.00-inch (762.0 mm) wide breaker structure	2700 (1226)
44.00-inch (1117.6 mm) wide breaker structure	5200 (2361)
22.00-inch (558.8 mm) wide auxiliary structure	2300 (1044)
22.00-inch (558.8 mm) wide transition structure	2300 (1044)
38.00-inch (965.2 mm) wide utility structure	2700 (1226)
50.00-inch (1270.0 mm) wide utility structure	3200 (1453)
Transformer throat	150 (68)

Reference Drawing: 9255C35

Figure 21.5-13. Outdoor Non-Walk-in Enclosure Dimensions in Inches (mm)

① 0.75-inch (19.1 mm) hardware recommended in all tie down locations.
② 18.70 (475.0) = 4.004-inch (1117.6 mm) wide transition box.
Note: 46.63 (1184.4) = 55.00-inch (1397.0 mm) throat (44.00-inch [1117.6 mm] wide transition box); 52.63 (1336.8) = 61.00-inch (1549.4 mm) throat (44.00-inch [1117.6 mm] wide transition box).

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Integrated Facility System Switchboards

Integrated Facility System Switchboards

General Description

Eaton's Integrated Facility System Switchboard product is a simple concept. This technology integrates standard panelboards, dry-type distribution transformers, contactors and other electrical equipment into free-standing, front-access switchboards.

Integrated Facility System Switchboard Benefits

- Space savings up to 50% or more
- Factory wired and pre-tested
- Assembled and ready to install
- Significantly reduces installation time and materials
- Significantly reduces materials associated with panel installation
- Frees up additional space at no charge to the owner
- Installed cost is typically less than with traditional products
- Sustainability and LEED® compliant

Available Options

- Automatic transfer switches
- UPS (Uninterrupted Power Supplies)
- SPD (surge protective devices)
- HVAC control
- Lighting control
- Power factor correction
- Metering
- Generator Quick Connect
- Customer metering
- Lighting power reduction products

Standards

- Meets NEMA Standard PB-2 and UL 891
- Used with Type 1 Pow-R-Line C switchboard sections
- Select main, branch feeder, customer and utility metering from **Section 21.1**
- Factory wired panelboards and dry-type distribution transformers meet NEMA Standard PB-2, UL 891 and the National Electrical Code

Integrated Facility System Switchboard Sections and Selection

- From the following pages select the appropriate section "Type"
- Select from panelboards, blank steel backpans and dry-type distribution transformers by "cell"
- Layout IFS sections near standard distribution sections
- Indicate on drawings and one-line diagrams the connections from feeder devices to the appropriate cell

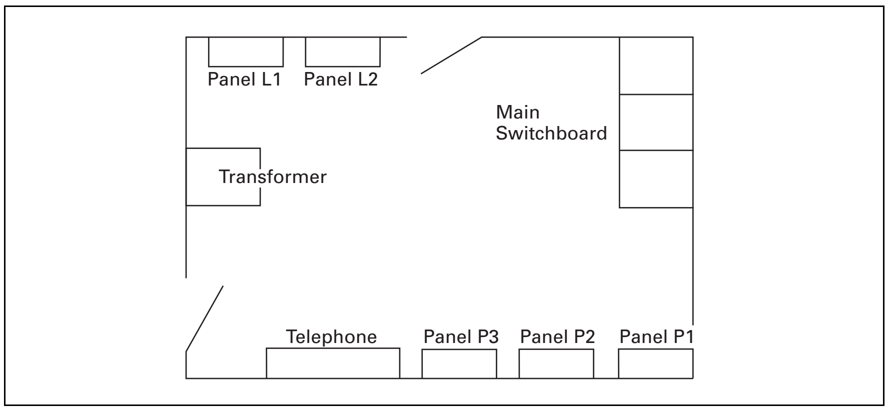


Figure 21.6-1. Traditional Electrical Room—Plan View

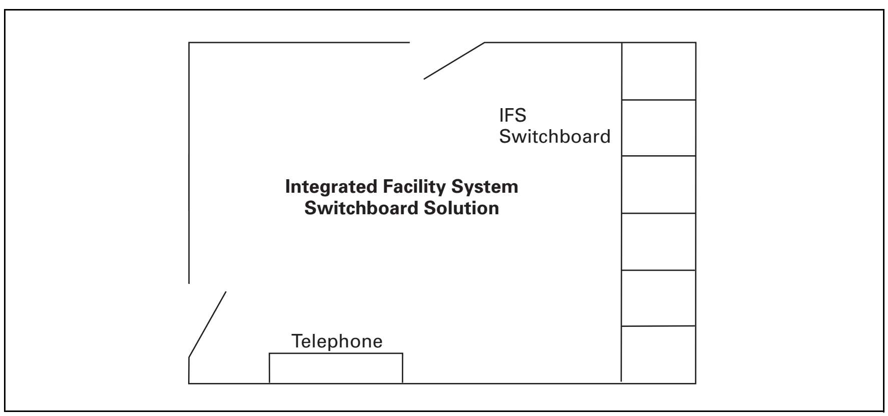


Figure 21.6-2. IFS Electrical Room—Plan View

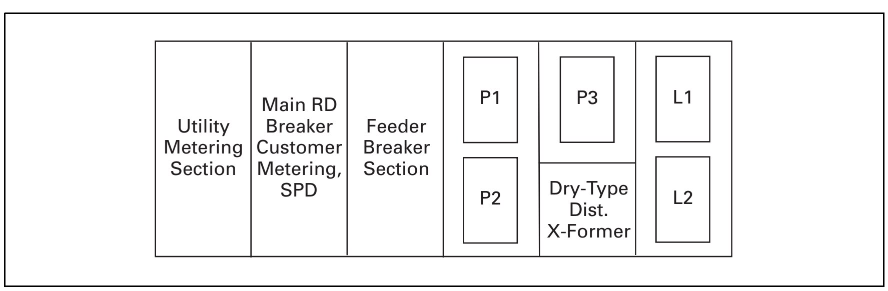


Figure 21.6-3. Optimized IFS Layout—Front View

Integrated Facility System Switchboards Distribution Section Layout

Eaton's Pow-R-Line panelboard integration—factory wired from feeder device in adjacent section(s) to panelboards. Standard features include lockable trim doors and factory-mounted overcurrent devices.

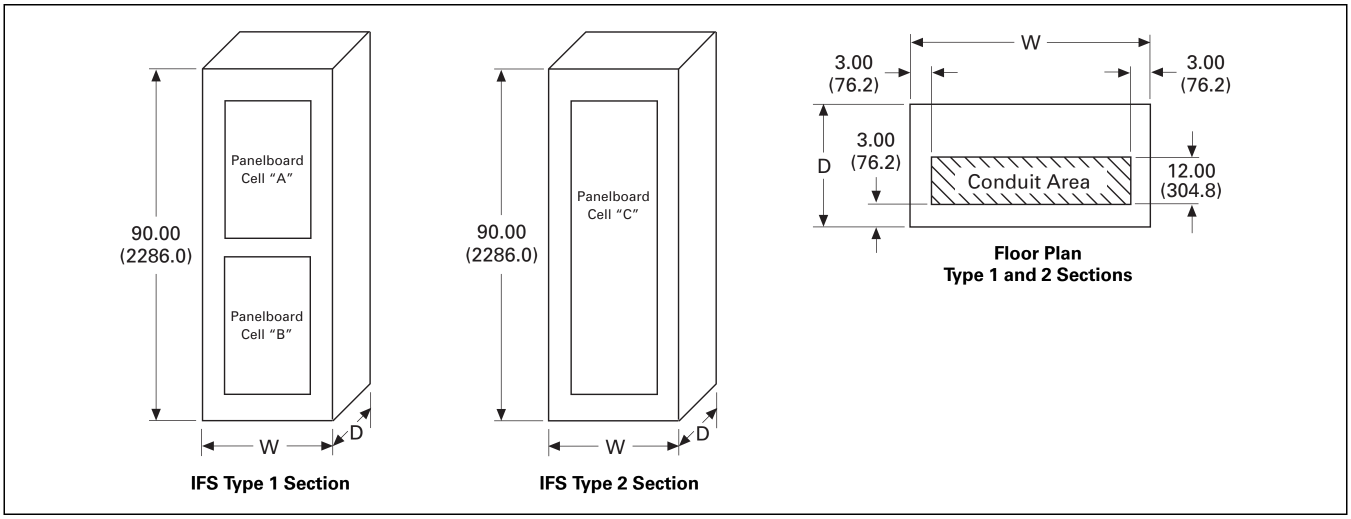


Figure 21.6-4. Type 1 and 2 Integrated Facility System Switchboards Distribution Section Layout—Dimensions in Inches (mm)

Table 21.6-1. IFS Type 1 Allowable Configurations (Select One "Panelboard Type" per Panelboard "Cell")—Dimensions in Inches (mm)

Panel Cell	Panelboard Type	Reference Catalog Section	Maximum Voltage Rating AC	Main Device Type	Maximum Main Rating Amperes	Branch Circuits Ampere Range	Allowable Panelboard Modifications	Width Dimensions (W) Standard	Width Dimensions (W) Optional	Depth Dimensions (D) Standard	Depth Dimensions (D) Optional	Section Height
IFS Type 1 Section												
A or B ①	Pow-R-Line 1a ②	**27**	240	MLO	400	15–100	③④⑤	26 (660.4)	30 (762.0)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)
				Breaker	225			20 (508.0)	26 (660.4) 30 (762.0)			
	Pow-R-Line 2a ②	**27**	480Y/277	MLO	400	15–100	③④⑤	26 (660.4)	30 (762.0)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)
				Breaker	225			20 (508.0)	26 (660.4) 30 (762.0)			
	Pow-R-Command ②	**28**	240 480Y/277	MLO	225	15–100	③④⑤	26 (660.4)	30 (762.0) 36 (914.4)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)

① Pow-R-line 3E available. Contact Eaton for details.
② 42 branch circuits maximum.
③ Bus density, compression main lugs through 225 A, copper main lugs, copper bus, silver-plated copper bus, tin-plated copper bus, ground bar circuit breaker handle lockoff devices, increased bus rating, nameplates, 200% rated neutral through 225 A, permanent circuit numbers, directory frames, Panduit type loadside wireway, shunt trip breakers, through-feed lugs to panel immediately above or below, switch neutral breakers, service entrance label and surge protective device (SPD).
④ If panel sizing main is 48.00 inches (1219.2 mm) or less, the panel will fit in a half section. If it is 72.00 inches (1828.8 mm), you must use a full section. If it is 60.00 inches (1524.0 mm), contact Eaton for structure dimensions.
⑤ Optional hinged panelboard door available on 26.00-inch (660.4 mm) wide structures.

Layout Dimensions

Table 21.6-1. IFS Type 2 Allowable Configurations (Select One "Panelboard Type" per Panelboard "Cell")—Dimensions in Inches (mm) (Continued)

Panel Cell	Panelboard Type	Reference Catalog Section	Maximum Voltage Rating AC	Main Device Type	Maximum Main Rating Amperes	Branch Circuits Ampere Range	Allowable Panelboard Modifications	Width Dimensions (W)		Depth Dimensions (D)		Section Height
								Standard	Optional	Standard	Optional	
IFS Type 2 Section												
C ①	Pow-R-Line 1a ②	**27**	240	Breaker	400	15–100	③④	26 (660.4)	30 (762.0)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)
	Pow-R-Line 2a ②	**27**	480Y/277	Breaker	400	15–100	③④	26 (660.4)	30 (762.0)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)
	Pow-R-Command ②	**28**	480Y/277	MLO Breaker	400 225	15–100	③④	26 (660.4)	30 (762.0) 36 (914.4)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)
	Pow-R-Line 3a	**27**	480Y/277	MLO Breaker	600 600	15–225	③④	26 (660.4)	30 (762.0) 36 (914.4)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)
				MLO	800	15–225	③④	30 (762.0)	36 (914.4)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)

① Pow-R-Line 3E available. Contact Eaton for details.
② 42 branch circuits maximum.
③ Bus density, compression main lugs through 225 A, copper main lugs, copper bus, silver-plated copper bus, tin-plated copper bus, ground bar circuit breaker handle lockoff devices, increased bus rating, nameplates, 200% rated neutral through 225 A, permanent circuit numbers, directory frames, Panduit type loadside wireway, shunt trip breakers, through-feed lugs to panel immediately above or below, switch neutral breakers, service equipment label and surge protective device (SPD).
④ If panel sizing with non-interchange main is 48.00 inches (1219.2 mm) or less, the panel will fit in a half section. If it is 72.00 inches (1828.8 mm), you must use a full section. If it is 60.00 inches (1524.0 mm), contact Eaton for cell height.

Integrated Facility System Switchboards Distribution Section Layout

Eaton's Pow-R-Line panelboard and transformer integration—factory wired from feeder device in adjacent sections. Standard features include lockable trim doors and factory-mounted overcurrent devices.

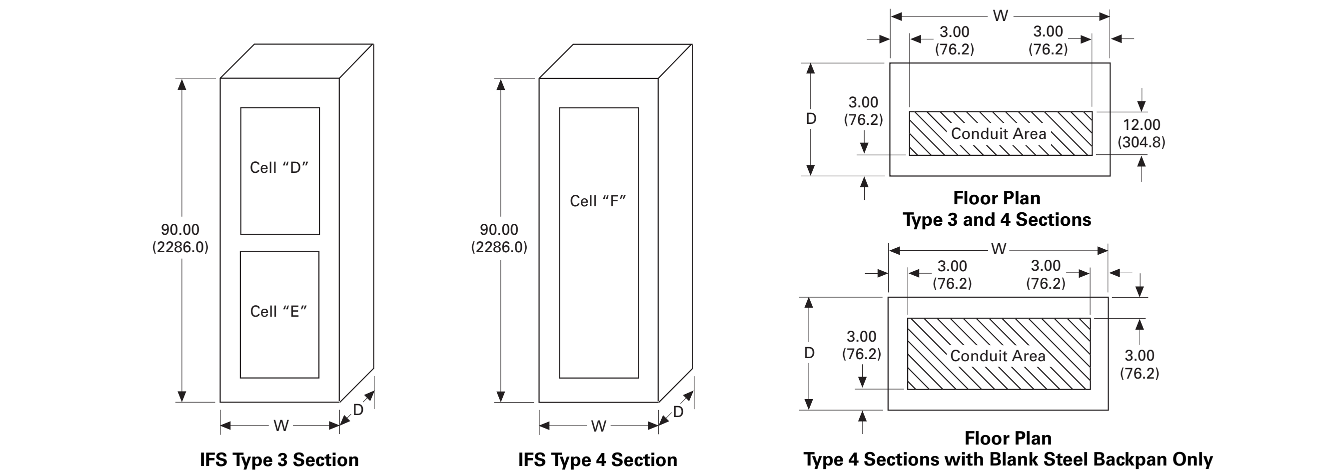


Figure 21.6-5. Type 3 and 4 Integrated Facility System Switchboards Distribution Section Layout—Dimensions in Inches (mm)

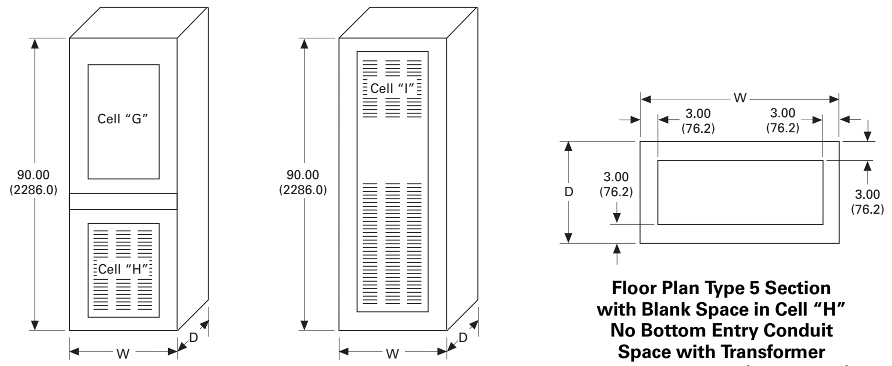
Table 21.6-2. IFS Type 3 and 4 Allowable Configurations (Select One "Panelboard Type" per Panelboard "Cell")—Dimensions in Inches (mm)

Panel Cell	Panelboard Type	Reference Catalog Section	Maximum Voltage Rating AC	Main Device Type	Maximum Main Rating Amperes	Branch Circuits Ampere Range	Allowable Panelboard Modifications	Width Dimensions (W)		Depth Dimensions (D)		Section Height
								Standard	Optional	Standard	Optional	
IFS Type 3 Section												
D or E ①	Pow-R-Line 1a ②	**27**	240	MLO	400	15–100	②④⑤⑥	26 (660.4)	30 (762.0)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)
				Breaker	225			20 (508.0)	26 (660.4) 30 (762.0)			
	Pow-R-Line 2a ②	**27**	480Y/277	MLO	400	15–100	②④⑤⑥	26 (660.4)	30 (762.0)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)
				Breaker	225			20 (508.0)	26 (660.4) 30 (762.0)			
	Blank Steel Backpan ③	—	—	None	—	—	⑦	20 (508.0)	30 (762.0) 26 (660.4) 30 (762.0)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)
IFS Type 4 Section												
F	Blank Steel Backpan ③	—	—	None	—	—	⑦	20 (508.0)	26 (660.4) 30 (762.0)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)

① Pow-R-Line 3E panelboard available. Contact Eaton for details.
② 42 branch circuits maximum.
③ Possible uses: HVAC, dimming and contactors. Contact Eaton for details.
④ Bus density, compression main lugs through 225 A, copper main lugs, copper bus, silver-plated copper bus, tin-plated copper bus, ground bar circuit breaker handle lockoff devices, increased bus rating, nameplates, 200% rated neutral through 225 A, permanent circuit numbers, directory frames, Panduit type loadside wireway, shunt trip breakers, through-feed lugs to panel immediately above or below, switch neutral breakers, service equipment label and surge protective device (SPD).
⑤ If panel sizing is 48.00 inches (1219.2 mm) or less, the panel will fit in a half section. If it is 72.00 inches (1828.8 mm), you must use a full section. If it is 60.00 inches (1524.0 mm), contact Eaton for cell height.
⑥ Optional hinged panelboard door available on 26.00-inch (660.4 mm) wide structures.
⑦ Galvanized steel backpan provided for customer specified equipment. Contact Eaton for requirements and details.

Integrated Facility System Switchboards Distribution Section Layout

Eaton's Pow-R-Line panelboard and transformer integration—factory wired from feeder device in adjacent sections. Standard features include lockable trim doors and factory-mounted overcurrent devices.



IFS Type 5 Section

IFS Type 6 Section

Floor Plan Type 5 Section with Blank Space in Cell "H" No Bottom Entry Conduit Space with Transformer in Cell "H" or "I" (Type 5 or 6)

Figure 21.6-6. Type 5 and 6 Integrated Facility System Switchboards Distribution Section Layout—Dimensions in Inches (mm)

Table 21.6-3. IFS Type 5 Allowable Configurations (Select One "Panelboard Type" per Panelboard "Cell")—Dimensions in Inches (mm)

Panel Cell	Panelboard Type	Reference Catalog Section	Maximum Voltage Rating AC	Main Device Type	Maximum Main Rating Amperes	Branch Circuits Ampere Range	Allowable Panelboard Modifications	Width Dimensions (W)		Depth Dimensions (D)		Section Height
								Standard	Optional	Standard	Optional	
IFS Type 5 Section												
G ①	Pow-R-Line 1a ②	**27**	240	MLO	400	15–100	④	26 (660.4)	30 (762.0)	24 (609.6)	30 (762.0) 36 (914.4)	90 (2286.0)
				Breaker	225							
	Pow-R-Line 2a ②	**27**	480Y/277	MLO	400	15–100	④	26 (660.4)	30 (762.0)	24 (609.6)	30 (762.0) 36 (914.4)	90 (2286.0)
				Breaker	225							
	Blank Steel Backpan ③	—	—	None	—	—	③	26 (660.4)	30 (762.0)	24 (609.6)	30 (762.0) 36 (914.4)	90 (2286.0)
	Pow-R-Command ②	28	240, 480Y/277	MLO	225	15–100	③④	26 (660.4)	30 (762.0) 36 (914.4)	24 (609.6)	30 (762.0) 36 (914.4)	90 (2286.0)

① Pow-R-Line 3E panelboard available. Contact Eaton for details.
② 42 branch circuits maximum.
③ Galvanized steel backpan provided for customer specified equipment. Contact Eaton for requirements and details.
④ Bus density, compression main lugs through 225 A, copper main lugs, copper bus, silver-plated copper bus, tin-plated copper bus, ground bar circuit breaker handle lockoff devices, increased bus rating, nameplates, 200% rated neutral through 225 A, permanent circuit numbers, directory frames, Panduit type loadside wireway, shunt trip breakers, through-feed lugs to panel immediately above or below, switch neutral breakers, hinged panelboard door on 26.00-inch (660.4 mm) wide sections, service entrance label and surge protective device (SPD).

Note: Select one "Panelboard Type" or one "Blank Steel Backpan" and either one "Transformer" or one "Blank Space" per "Cell."

Table 21.6-4. IFS Type 5 and 6 General Purpose Dry-Type Distribution Transformers—Dimensions in Inches (mm)

Panel Cell	Panelboard Type	Reference Catalog Section	Temper-ature Rise	Windings	kVA Range	Full Cap Taps		Allowable Modifications	Width Dimensions (W)		Depth Dimensions (D)		Section Height
						FCAN	FCBN		Standard	Optional	Standard	Optional	
IFS Type 5 Section													
H ⑤⑥	DT-3 Transformer ⑦ TP1, 480: 208Y/ 120 Vac	**19**	150°C Only ⑧	Aluminum	15–45	4–2.5%	2–2.5%	⑤	26 (660.4)	30 (762.0)	24 (609.6)	30 (762.0) 36 (914.4)	90 (2286.0)
					75	4–2.5%	2–2.5%	⑤	30 (762.0)	N/A			
					112.5	4–2.5%	2–2.5%	⑤	36 (914.4)	N/A	30 (762.0)	36 (914.4)	90 (2286.0)
					150	4–2.5%	2–2.5%	⑤	36 (914.4)	N/A	30 (762.0)	36 (914.4)	90 (2286.0)
	Blank Steel Backpan ⑦	—	—		None	—	—	⑤	26 (660.4)	30 (762.0)	24 (609.6)	30 (762.0) 36 (914.4)	90 (2286.0)
IFS Type 6 Section													
I ⑥	DT-3 Transformer TP1, 480: 208Y/ 120 Vac	**19**	150°C ⑧	Aluminum	225	4–2.5%	2–2.5%	⑤	36 (914.4)	N/A	30 (762.0)	N/A	90 (2286.0)
					300	4–2.5%	2–2.5%	⑤	45 (1143.0)	N/A	36 (914.4)		

⑤ Copper windings, 115 °C, 80 °C, K-Factor, low sound are available options but may change dimensions.
⑥ Either one F-Frame or K-Frame circuit breaker can be included in any transformer section to be used as a disconnect.
⑦ Galvanized steel backpan provided for customer specified equipment. Contact Eaton for requirements and details.
⑧ Contact Eaton for other Temperature Rise Transformers and Specials.

Note: 480:208Y/120 Vac three-phase or 480:120/240 Vac single-phase.

Integrated Facility System Switchboards Distribution Section Layout

Eaton’s Pow-R-Line panelboard integration—factory wired from feeder device in adjacent section(s) to Panelboard Cell “J.” Distribution Chassis in Cell “K” may be field wired or wired from an adjacent section. Standard features include lockable trim doors and factory-mounted overcurrent devices.

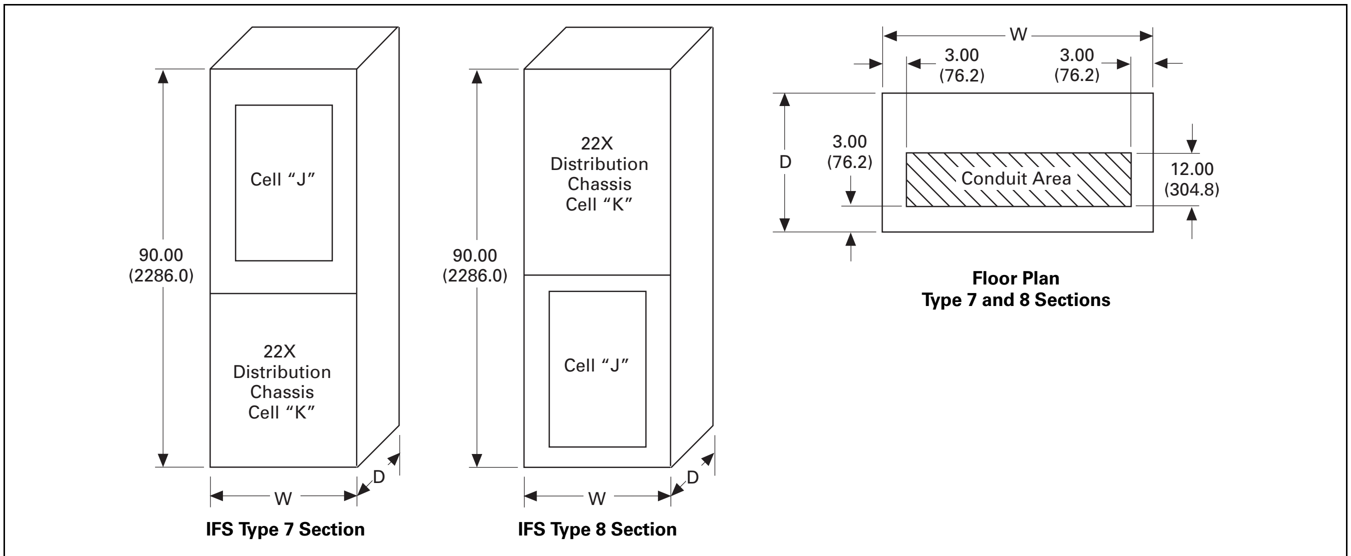


Figure 21.6-7. Type 7 and 8 Integrated Facility System Switchboards Distribution Section Layout—Dimensions in Inches (mm)

Table 21.6-5. IFS Type 7 and 8 Sections Allowable Configurations (Select One “Panelboard Type” per Panelboard “Cell”)—Dimensions in Inches (mm)

Panel Cell	Panelboard Type	Reference Catalog Section	Maximum Voltage Rating AC	Main Device Type	Maximum Main Rating Amperes	Branch Circuits Ampere Range	Allowable Panelboard Modifications	Width Dimensions (W) Standard	Width Dimensions (W) Optional	Depth Dimensions (D) Standard	Depth Dimensions (D) Optional	Section Height
IFS Types 7 and 8 Sections												
J ⑤	Pow-R-Line 1a ①	**27**	240	MLO Breaker	400 225	15–100	②③	26 (660.4)	30 (762.0) 36 (914.4)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)
	Pow-R-Line 2a ①	**27**	480Y/277	MLO Breaker	400 225	15–100	②③	26 (660.4)	30 (762.0) 36 (914.4)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)
	Pow-R-Command ①	28	240, 480Y/277	MLO	225	15–100	②③	26 (660.4)	30 (762.0) 36 (914.4)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)
K	Pow-R-Line C Switchboard Chassis ①	—	480Y/277	MLO Breaker	800 600	15–600	④	26 (660.4)	36 (914.4) 30 (762.0)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)
				MLO or Breaker	1200	15–600	④	36 (914.4)	45 (1143.0)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)

① 42 branch circuits maximum.
② Bus density, compression main lugs through 225 A, copper main lugs, copper bus, silver-plated copper bus, tin-plated copper bus, ground bar circuit breaker handle lockoff devices, increased bus rating, nameplates, 200% rated neutral through 225 A, permanent circuit numbers, directory frames, Panduit type loadside wireway, shunt trip breakers, through-feed lugs, switch neutral breakers, hinged panelboard door on 26.00-inch (660.4 mm) wide sections, service entrance label and surge protective device (SPD).
③ If panel sizing main is 48.00 inches (1219.2 mm) or less, the panel will fit in a half section. If it is 72.00 inches (1828.8 mm), you must use a full section. If it is 60.00 inches (1524.0 mm), contact Eaton to see if it will fit.
④ Reference **Page 21.1-11** for selection criteria.
⑤ Pow-R-Line 3E available. Contact Eaton for details.

Integrated Facility System Switchboards Distribution Section Layout

Eaton’s Pow-R-Line panelboard integration—factory wired from feeder device in adjacent section(s). Standard features include lockable trim doors and factory-mounted overcurrent devices.

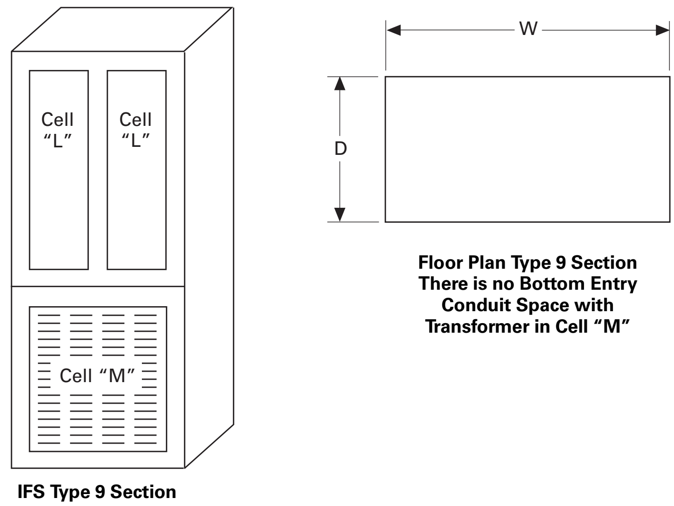


Figure 21.6-8. Type 9 Integrated Facility System Switchboards Distribution Section Layout—Dimensions in Inches (mm)

Table 21.6-6. IFS Type 9 Section Panelboard Over Dry-Type Transformer (Select One “Panelboard Type” per Panelboard “Cell”)—Dimensions in Inches (mm)

Panel Cell	Panelboard Type	Reference Catalog Section	Maximum Voltage Rating AC	Main Device Type	Maximum Main Rating Amperes	Branch Circuits Ampere Range	Allowable Panelboard Modifications	Width Dimensions (W)		Depth Dimensions (D)		Section Height
								Standard	Optional	Standard	Optional	
IFS Type 9 Section												
L ①	Pow-R-Line 1a ②	**27**	240	MLO	225	15–100	③	36 (914.4)	45 (1143.0)	24 (609.6)	30 (762.0) 36 (914.4)	90 (2286.0)
				Breaker	400			45 (1143.0)	—			
	Pow-R-Line 2a ②	**27**	480Y/277	MLO	225	15–100	③	36 (914.4)	45 (1143.0)	24 (609.6)	30 (762.0) 36 (914.4)	90 (2286.0)
				Breaker	400			45 (1143.0)	—			
	Pow-R-Command ②	27	240, 480Y/277	MLO	225	15–100	③	26 (660.4)	30 (762.0) 36 (914.4)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)

① Pow-R-Line 3E panelboard available. Contact Eaton for details.
② 42 branch circuits maximum.
③ Bus density, compression main lugs through 225 A, copper main lugs, copper bus, silver-plated copper bus, tin-plated copper bus, ground bar circuit breaker handle lockoff devices, increased bus rating, nameplates, 200% rated neutral through 100 A, permanent circuit numbers, directory frames, Panduit type loadside wireway, shunt trip breakers, through-feed lugs, switch neutral breakers.

Table 21.6-7. IFS Type 9 Section General Purpose Dry-Type Distribution Transformers—Dimensions in Inches (mm)

Panel Cell	Transformer Type	Reference Catalog Section	Temperature Rise	Windings	kVA Range	Full Cap Taps		Allowable Modifications	Width Dimensions (W)		Depth Dimensions (D)		Section Height
						FCAN	FCBN		Standard	Optional	Standard	Optional	
IFS Type 9 Section													
M	DT-3 Transformer TP-1 480: 208Y/ 120 Vac	**19**	150°C Only ④	Aluminum	15–75	4–2.5%	2–2.5%	⑤	36 (914.4)	45 (1143.0)	24 (609.6)	30 (762.0) 36 (914.4)	90 (2286.0)
					112.5	4–2.5%	2–2.5%	⑤	36 (914.4)	45 (1143.0)	36 (914.4)	—	90 (2286.0)

④ Contact Eaton for other Temperature Rise Transformers and Specials.
⑤ Copper windings, 115 °C, 80 °C, K-Factor, and low sound TP-1 are available options but may change dimensions.

Layout Dimensions

Integrated Facility System Switchboards Distribution Section Layout

Eaton's Pow-R-Line panelboard integration—factory wired from feeder device in adjacent section(s) to Panelboard Cell "J." Distribution Chassis in Cell "K" may be field wired or wired from an adjacent section. Standard features include lockable trim doors and factory-mounted overcurrent devices.

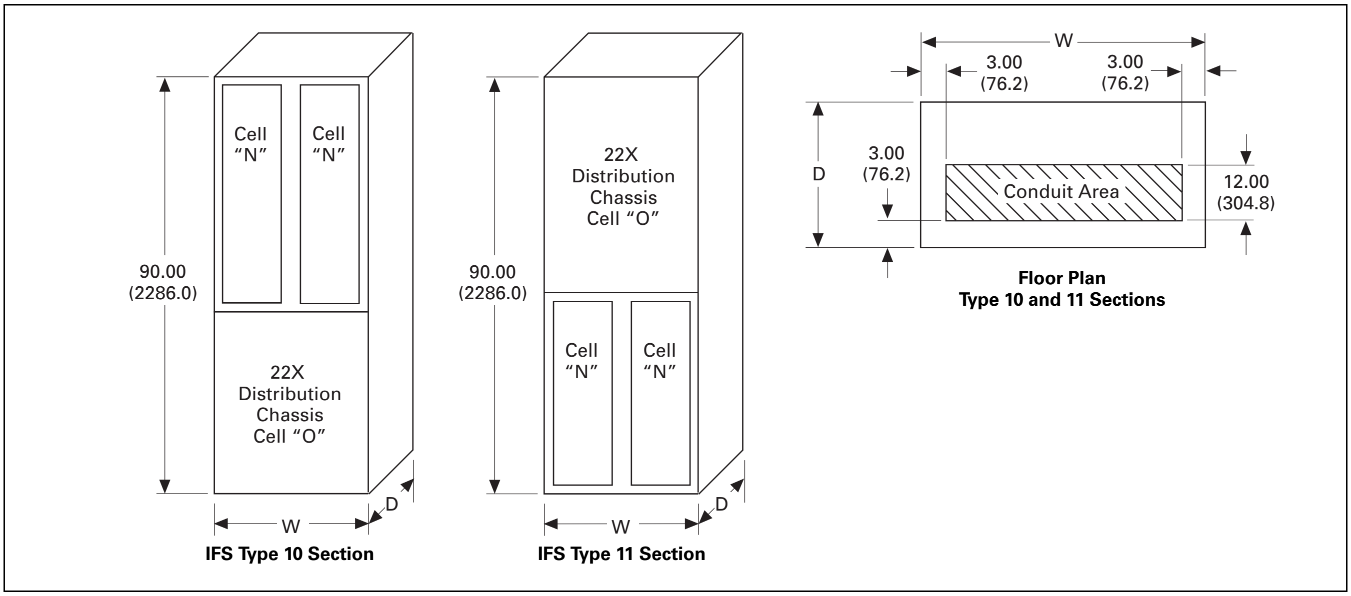


Figure 21.6-9. Type 10 and 11 Integrated Facility System Switchboards Distribution Section Layout—Dimensions in Inches (mm)

Table 21.6-8. IFS Type 10 and 11 Sections Allowable Configurations (Select One "Panelboard Type" per Panelboard "Cell")—Dimensions in Inches (mm)

Panel Cell	Panelboard Type	Reference Catalog Section	Maximum Voltage Rating AC	Main Device Type	Maximum Main Rating Amperes	Branch Circuits Ampere Range	Allowable Panelboard Modifications	Width Dimensions (W)		Depth Dimensions (D)		Section Height
								Standard	Optional	Standard	Optional	
IFS Types 10 and 11 Sections												
N ①	Pow-R-Line 1a ②	**27**	240	MLO	400	15–100	③④	45 (1143.0)	—	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)
				Breaker	225			36 (914.4)	45 (1143.0)			
	Pow-R-Line 2a ②	**27**	480Y/277	MLO	400	15–100	③④	45 (1143.0)	—	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)
				Breaker	225			36 (914.4)	45 (1143.0)			
	Pow-R-Command ②	28	240, 480Y/277	MLO	225	15–100	③④	45 (1143.0)	36 (914.4)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)
O	Pow-R-Line C Switchboard Chassis	—	480Y/277	MLO	800	15–600	⑤	36 (914.4)	45 (1143.0)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)
				Breaker	600							
				MLO or Breaker	1200	15–600	⑤	36 (914.4)	45 (1143.0)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)

① Pow-R-Line 3E available. Contact Eaton when applicable.
② 42 branch circuits maximum.
③ Bus density, compression main lugs through 225 A, copper main lugs, copper bus, silver-plated copper bus, tin-plated copper bus, ground bar circuit breaker handle lockoff devices, increased bus rating, nameplates, 200% rated neutral through 225 A, permanent circuit numbers, directory frames, Panduit type loadside wireway, shunt trip breakers, through-feed lugs, switch neutral breakers, hinged trim, service entrance label and surge protective device (SPD).
④ If panel sizing is 48.00 inches (1219.2 mm) or less, the panel will fit in a half section. If it is 72.00 inches (1828.8 mm), you must use a full section. If it is 60.00 inches (1524.0 mm), contact Eaton to see if it will fit.
⑤ See Page **Page 21.1-11** reference information in **Tab 21**.

Integrated Facility System Switchboards Distribution Section Layout

Eaton's Pow-R-Line panelboard integration—factory wired from feeder device in adjacent section(s). Standard features include lockable trim doors and factory-mounted overcurrent devices.

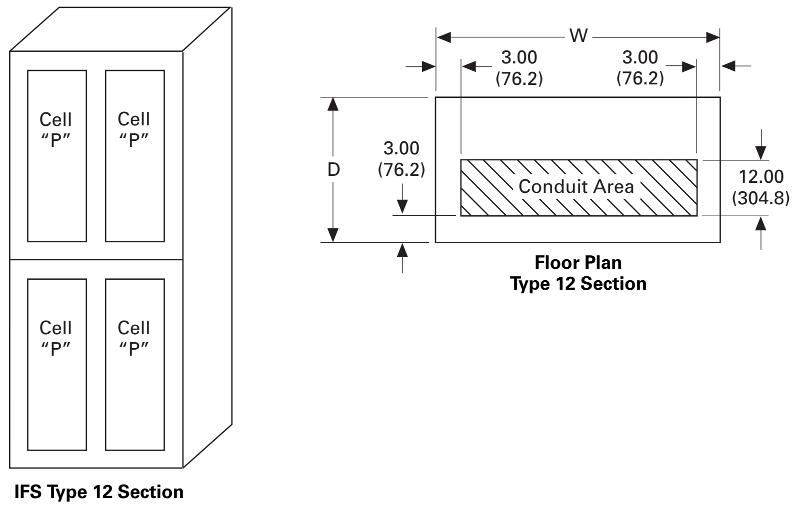


Figure 21.6-10. Type 12 Integrated Facility System Switchboards Distribution Section Layout—Dimensions in Inches (mm)

Table 21.6-9. IFS Type 12 Section Allowable Configurations (Select One "Panelboard Type" per Panelboard "Cell")—Dimensions in Inches (mm)

Panel Cell	Panelboard Type	Reference Catalog Section	Maximum Voltage Rating AC	Main Device Type	Maximum Main Rating Amperes	Branch Circuits Ampere Range	Allowable Panelboard Modifications	Width Dimensions (W) Standard	Width Dimensions (W) Optional	Depth Dimensions (D) Standard	Depth Dimensions (D) Optional	Section Height
IFS Types 12 Section												
P ①	Pow-R-Line 1a ②	**27**	240	MLO	400	15–100	③④⑤	45 (1143.0)	—	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)
				Breaker	225			36 (914.4)	45 (1143.0)			
	Pow-R-Line 2a ②	**27**	480Y/277	MLO	400	15–100	③④⑤	45 (1143.0)	—	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)
				Breaker	225			36 (914.4)	45 (1143.0)			
	Pow-R-Command ②	28	240, 480Y/277	MLO	225	15–100	③④⑤	45 (1143.0)	36 (914.4)	18 (457.2)	13 (330.2) 24 (609.6) 30 (762.0) 36 (914.4)	90 (2286.0)

① Pow-R-Line 3E available. Reference Section 27. Contact Eaton when applicable.
② 42 branch circuits maximum.
③ Bus density, compression main lugs through 225 A, copper main lugs, copper bus, silver-plated copper bus, tin-plated copper bus, ground bar circuit breaker handle lockoff devices, increased bus rating, nameplates, 200% rated neutral through 225 A, permanent circuit numbers, directory frames, Panduit type loadside wireway, shunt trip breakers, through-feed lugs, switch neutral breakers, hinged trim, service entrance label and surge protective device (SPD).
④ If panel sizing is 48.00 inches (1219.2 mm) or less, the panel will fit in a half section. If it is 72.00 inches (1828.8 mm), you must use a full section. If it is 60.00 inches (1524.0 mm), contact Eaton for structure dimensions.
⑤ If any single-phase is selected as 400 A or PRC, section minimum width is 45.00 inches (1143.0 mm).

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Generator Quick Connect Switchboard

Generator Quick Connect Switchboard Section

General Description

Eaton's Generator Quick Connect switchboard is an engineered switchboard assembly designed to allow easy and quick connection of a standby generator to your facility's service entrance switchboard.

Through inclusion of cam-type receptacles, standard mechanical lugs, a dedicated generator service disconnect and a key interlock transfer scheme, a facility can quickly be switched to generator power. By including the Generator Quick Connect switchboard, a facility can be on backup power without waiting on the utility to disconnect service.

Product Benefits

- **Decrease utility dependency**: In power outages, especially those that are widespread, the utility company may take hours before they are available to disconnect service from a facility. By use of the Generator Quick Connect switchboard, a facility is equipped with a means that allows switching between utility feed and a generator feed, without waiting for the utility to disconnect service
- **Decrease chance of spoilage**: For those facilities that house perishable goods that require controlled environmental conditions such as refrigeration, prolonged power outages can cost hundreds of thousands of dollars in spoilage. By use of the Generator Quick Connect switchboard, a facility ensures that they can be back on sustained power before spoilage occurs, and without the necessity of calling in expensive specialty equipment. In addition to direct loss of product, the result of spoilage can have a negative affect on a facility's insurance, which can result in additional long-term costs
- **Decrease chance of lost revenue**: Without a constant supply of electricity, a facility's revenue generation capability grinds to a halt. By use of the Generator Quick Connect switchboard, a facility's operations can be sustained and downtime can be reduced
- **Decrease chance of liability**: Among the risks to a facility during a power outage is the injury of patrons due to loss of lighting. By use of the Generator Quick Connect switchboard, a facility's lighting can be sustained, allowing for the safety of patrons
- **Decrease chance of loss and damage**: During a sustained power outage, a facility may become susceptible to loss due to theft, damage and other malicious acts. By use of the Generator Quick Connect Switchboard, a facility can better protect itself from these losses and damages.
- **Quick and readily available connection**: In facilities that are not equipped for a backup generator, connection can demand field modification of existing switchboard structures, and/or even modification of the facility's physical structure. By use of the Generator Quick Connect Switchboard, the time required for these connections can be greatly reduced.

Construction Specifications

Eaton's Generator Quick Connect switchboard is built to UL 891 listed Pow-R-Line C switchboard standards. As such, the sizing rules of standard switchboards apply, and all modifications for Pow-R-Line C switchboards are available.

For sizing information and available modifications, consult Eaton.

Application Description

As the Generator Quick Connect switchboard is based on the brand Pow-R-Line C switchboard, it can be applied in both new and retrofit applications.

Significant Components and Assemblies

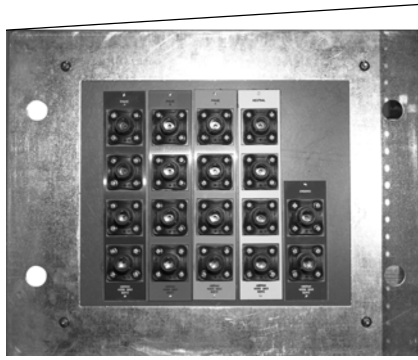
The Generator Quick Connect switchboard is based on the Pow-R-Line C switchboard construction. However, as part of the larger assembly, there are several sub-assemblies that provide greater function and benefit to facilities. These components are described in the following and are illustrated in the photos to the right.

- **Generator disconnect:** The generator service disconnect is a UL listed circuit breaker with a key interlock in combination with one mounted on the main service disconnect. It can include ground fault protection, shunt trips, alarms, single-phase protection and auxiliary contacts
- **Cam-type receptacle sub-assembly**: This sub-assembly is designed to work with the quick connects that are commonly found on portable generator cables. This sub-assembly additionally includes color coding to industry standards for proper and easy phase identification, assuming proper installation
- **Permanent operation instructions**: Affixed to each Generator Quick Connect switchboard is a set of simple instructions for operation. With these instructions, any generator technicians can operate the mechanisms included in the assembly
- **Standard mechanical lugs**: In addition to the cam-type receptacles, a set of standard mechanical lugs is provided with the Generator Quick Connect switchboard to allow an alternate method of connecting generator cables
- **Bus connection sub-assembly**: All connection methods described previously are connected together using only factory stamped and bent bus. Bus connection, as opposed to cable, provides a more robust and smaller construction

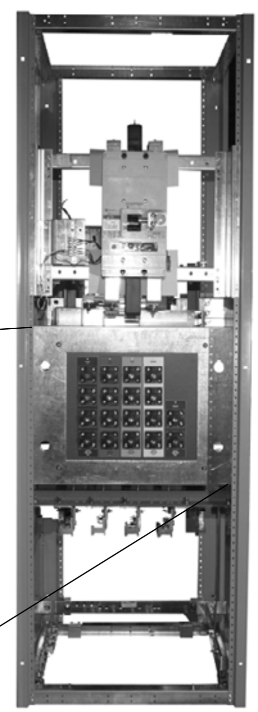
Table 21.7-1. Generator Quick Connect Dimensions and kW Ratings (Rated up to 480 V) ①

Ampere Rating ②	Number of Structures	Dimensions in Inches (mm)			kW (Max.) Rating ④			
					80% Rated Generator Disconnect Breaker		100% Rated Generator Disconnect Breaker	
		Depth ③	Structure Width	Total Width	480 V	208 V	480 V	208 V
400	1	30.00 (762.0)	30.00 (762.0)	30.00 (762.0)	213	92	266	115
600	1	30.00 (762.0)	30.00 (762.0)	30.00 (762.0)	319	138	399	173
800	1	30.00 (762.0)	30.00 (762.0)	30.00 (762.0)	425	184	531	230
1200	1	30.00 (762.0)	30.00 (762.0)	30.00 (762.0)	638	276	797	345
1600	1	30.00 (762.0)	30.00 (762.0)	30.00 (762.0)	850	368	1063	461
2000	1	30.00 (762.0)	30.00 (762.0)	30.00 (762.0)	1063	461	1329	576
2500	2	30.00 (762.0)	30.00 & 30.00 (762.0 & 762.0)	60.00 (1524.0)	1329	576	1661	720
3000	2	30.00 (762.0)	30.00 & 30.00 (914.4 & 914.4)	72.00 (1828.8)	N/A	N/A	1993	864

① 65 kAIC standard bus bracing.
② Type 3R enclosures shall be equipped with a 13.00-inch (330.2 mm) front structure extension.
③ Calculated using the following: kW (max.) = [(V*A*1.73*PF)/1000]*(Breaker Rating) with PF (power factor) equalling 0.8.
④ For applications above 3000 A, contact Eaton.



Cam-Type Receptacle Sub-Assembly



Typical (1200 A) Generator Quick Connect Switchboard

Significant Components an Assemblies (Typical)

Construction and Application Considerations

Eaton's Roll-Up Generator Termination Boxes (RUGTB) are designed as an intermediate termination cabinet between a temporary, portable, roll-up generator and the facility being served by the portable generator. The RUGTB is designed for permanent installation and is secured to a concrete pad with bolts.

The RUGTB includes line terminations for the temporary connection of the portable generator and permanent connections on the load side to the secondary disconnect in the facility which is interlocked with the main overcurrent device in a manner that ensures that only one, either the service main or the generator main, can be energized at any one time. The conductors and conduits must be sized and suitable for carrying the load ratings marked on the equipment per the National Electrical Code.

Standards and Ratings

- UL 1773—termination boxes
- 600 Vac maximum
- Ampere ratings: 800, 1200, 1600, 2000 and 2500
- Assembly short-circuit rating: 35,000 A rms symmetrical
- Marked "Suitable for use on the line side of service equipment" per UL 1773

Standard Features

- Type 3R enclosure standard
- Line and load side mechanical alloy set screw lugs
- Hinged bottom trap door for line conductors
- 36.00-inch (914.4 mm) width [45.00 inches (1143.0 mm) wide with 2 hole compression lugs]

Optional Features

- Compression lugs (line and load)
  - 1 hole Anderson
  - 2 hole Burndy (requires 45.00-inch (1143.0 mm) wide enclosure)
- Compression lug provisions line and load [0.50-inch (12.7 mm) bolt, 1.75-inch (44.5 mm) spacing]
- Optional 45.00-inch (1143.0 mm) width

Enclosure

The enclosure is free-standing with feet on the bottom providing access to the cable connections for temporary roll-up generator terminations. The enclosure is made from code gauge steel and suitable for either outdoor or indoor installation (Type 3R construction). The enclosure is powder coat painted ANSI 61 grey. Each enclosure houses line and load phase and neutral connections. Access is provided at the bottom of the enclosure for both the temporary connections to the roll-up generator and permanent connections to the facility's generator overcurrent disconnecting means. The permanent connection section at the bottom of the enclosure contains a fixed mounting plate. The temporary generator connection to the RUGTB contains a cover that allows the enclosure to be sealed once the temporary connections have been removed.

The enclosure uses feet that raise the termination compartment off the finished grade by 18 inches. Enclosure feet have provisions for anchoring. Anchor bolts used to secure the RUGTB shall be encased in a concrete pad by the installer in a manner that is suitable as a permanent base for the RUGTB. A template for anchor bolt installation is available from the manufacturer.

The enclosure contains a sturdy, lockable, hinged door for access to the termination compartment by qualified personnel as described in NFPA 70E and the National Electrical Code.

Feeder conductor entry is provided in the bottom of the enclosure for the line side (generator). Removable bottom plate for connections to the line side (connection from the generator) is available on either the right or left side and must be specified on order. The permanent load connections (feeding generator disconnect inside the facility) may exit the enclosure either from the bottom or the back of the enclosure.

RUGTB Free-Standing Enclosure

Technical Data

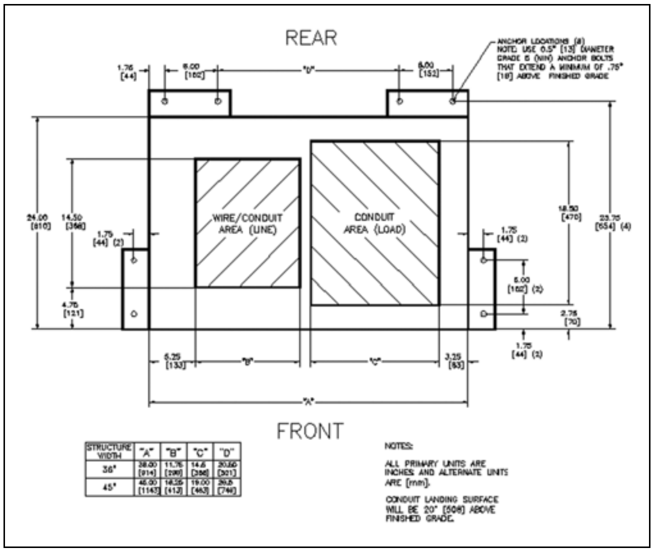


Figure 21.8-1. Bottom View Left Line (Generator) Connection

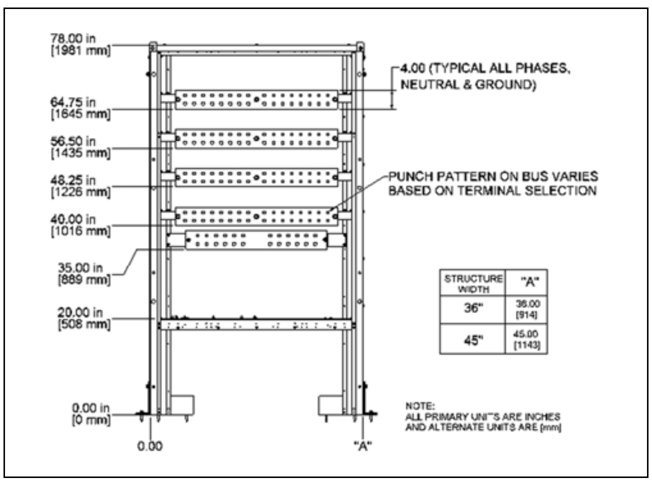


Figure 21.8-2. Front Bus Arrangement

Table 21.8-1. Roll-Up Generator Termination Box Available Lugs

Ampere Rating	Available Line and Load Connections Select One Line and One Load by Ampacity
Al/Cu Mechanical Lugs	
800	(3) 4/0–500 kcmil or (2) 3/0–750 kcmil
1200	(4) 4/0–500 kcmil or (3) 3/0–750 kcmil
1600	(5) 4/0–500 kcmil or (4) 3/0–750 kcmil
2000	(6) 4/0–500 kcmil or (5) 3/0–750 kcmil
2500	(8) 4/0–500 kcmil or (7) 3/0–750 kcmil
2 Hole Cu Only Compression Lugs Brundy Only—Factory Installed	
800	(3) 350 kcmil or (3) 400 kcmil
1200	(4) 500 kcmil or (4) 600 kcmil or (3) 750 kcmil
1600	(6) 500 kcmil or (5) 600 kcmil or (5) 750 kcmil
2000	(7) 500 kcmil or (6) 600 kcmil or (6) 750 kcmil
2500	(9) 500 kcmil or (8) 600 kcmil or (7) 750 kcmil
1 Hole Compression Provisions Only (Lugs Supplied by Others)	
800	3–provisions / phase
1200	4–provisions / phase
1600	5–provisions / phase
2000	6–provisions / phase
2500	7–provisions / phase
2 Hole Compression Provisions Only (Lugs Supplied by Others)	
800	3–provisions / phase
1200	4–provisions / phase
1600	5–provisions / phase
2000	6–provisions / phase
2500	7–provisions / phase

① Provisions only. Compression/crimp lugs supplied by installer.

Note: Wire bending space provided based on the Roll-up Generator Termination Box size and number of conductors and meets requirements of UL and the National Electrical Code.

Terminations

All Roll-up Generator Termination Boxes contain a termination/lug landing for three phases and neutral suitable for copper or aluminum conductors. Mechanical box lugs are supplied standard. The number and size of mechanical box lug connectors are determined by the ampacity of the RUGTB ordered. Optional lug offering includes a compression lug pad (compression lugs supplied by others).

Power Xpert Multipoint Metering Switchboard

Power Xpert Multipoint Metering Switchboard

General Description

Allocation of energy consumption in a residential or commercial application is a tremendous task for a property owner, management firm or electrical energy manager. Eaton's Power Xpert Multipoint Meter low-cost solution can assist in allocation or direct billing of consumed energy. The Power Xpert Multipoint Meter provides a cost-effective energy tabulation system for residential or commercial metering installations, including:

- High-rise buildings
- Universities and campuses
- Office buildings
- Apartment and condominium complexes
- Shopping malls
- Airports

Eaton's Power Xpert Multipoint Meter can provide accurate information of consumed energy for monthly involving statements. Using the Power Xpert Multipoint Meter for utility allocation maximizes revenue by effectively measuring, allocating and recovering utility expenditures. The Power Xpert Multipoint Meter solution can interface with a third-party utility allocation service and offers the following advantages:

- Purchase energy at bulk rates while charging consumer rates
- Capitalize on naturally variable tenant loads by purchasing energy at a lower coinciding load
- Capture and allocate common area maintenance cost
- Promote tenant retention with accurate and defensible billing
- Eliminate subsidization of other tenants

Product Description

Using Eaton's Power Xpert Multipoint Metering Switchboard design, multiple tenant submetering has never been easier. The Power Xpert Multipoint Metering Switchboard combines the Power Xpert Multi-Point Meter and Eaton's PRL4, PRLC or Integrated Facility System™ (IFS™) to provide a space-saving, cost-effective energy tabulation system for residential or commercial metering installations.

Application Description

With energy cost on the rise, it is vital to proactively monitor and conserve electrical energy. Documentations of electrical energy usage can promote energy conservation for tenants or business departments. When the need for accurate energy consumption information for monthly tenant invoicing arises, use Eaton's Power Xpert Multipoint Metering Switchboard solution.

Using the Power Xpert Multipoint Meter for utility allocation maximizes revenue by effectively measuring, allocating and recovering utility expenditures. The Power Xpert Multipoint Meter, using Eaton's cost-allocation software or a third-party billing software, can generate single-rate or multi-rate billing.

Features, Benefits and Functions

The Power Xpert Multipoint Metering Switchboard offers the property owner or the property management firm the ability to:

- Capture and allocate common area maintenance cost
- Promote tenant retention with accurate billing
- Eliminate subsidization of other tenants

The Power Xpert Multipoint Meter's space-saving design reduces the need for multi-metering equipment for each tenant. Additionally, the Power Xpert Multipoint Meter can monitor loads up to 5000A for energy billing or cost allocation. The meter is rated per ANSI C12.20 for revenue metering grade accuracy. With built-in communications capabilities, the Power Xpert Multipoint Meter can be connected to a local PC or network. The Power Xpert Multipoint Meter can connect to a third-party billing service to provide monthly energy consumption charges used by tenants. Additionally, unit status and communication activity are provided by a display on the metering compartment front panel.

The Power Xpert Multipoint Meter device can measure up to 60 total poles in any combination of single-, two- or three-pole breakers. The meters and current sensors are factory mounted with the current sensors factory wired to the meter inside the host structure. The meter monitors power and energy including instantaneous (kW), demand and cumulative (kWh) measurements for each load. The meter provides the following:

- Interval energy data logging
- Time-of-use energy registers
- Coincident peak demand storage
- Schedule remote meter reading data in non-volatile memory
- Measure bus voltage
- Factory-wired system
- Saves floor space
- Lower installed cost
- Network compatible
- Tenant sub-billing

Standards and Certifications

- UL listed

Product Selection

For complete application and pricing information, contact your local Eaton sales office.

Options

- Energy Portal Module or Ethernet-based communications plus Modbus® TCP and BACnet/IP
- Pulse input module for WAGES inputs
- Digital output module for programmable alarm functions

Layout Guide

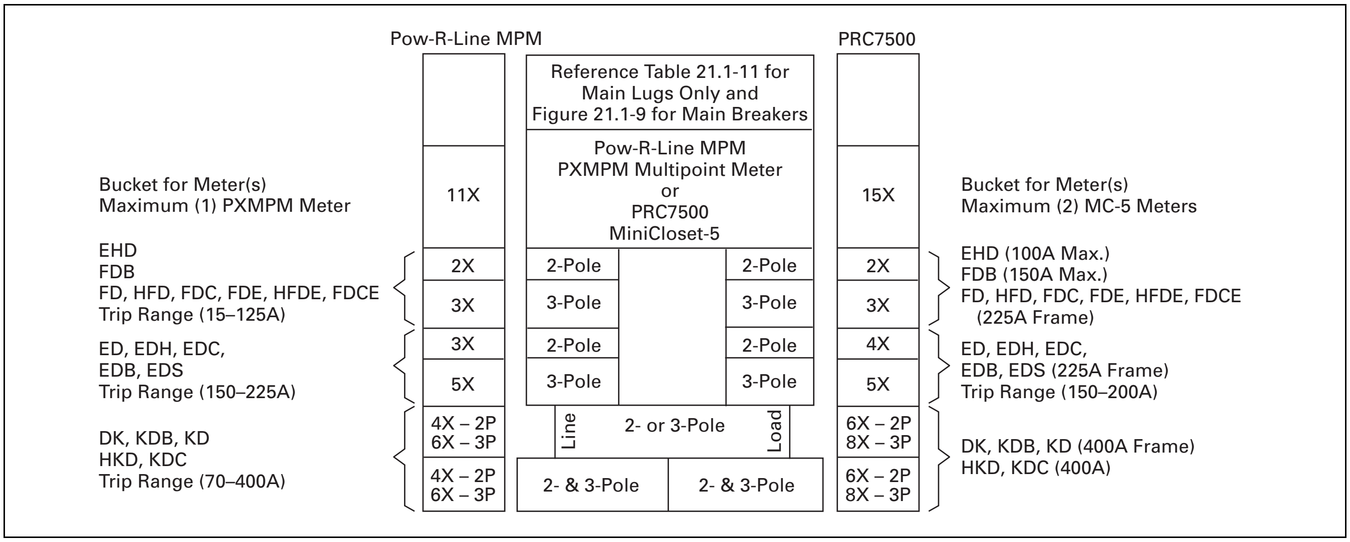


Figure 21.9-3. PRL MPM / PRC7500 Layout Guide for Current Sensor and Current Transformer Sizing—Standard Pow-R-Line C Switchboard Construction Applies

Note: For all other breaker frames and amperages, consult factory for "X" space sizing.

Note: Consult **Section 21.1** for Pow-R-Line C structure configuration.

Table 21.9-1. PRL MPM and PRC7500 Breaker Frames

Breaker Type	Maximum Trip Amperes	Number of Poles	Current Sensor (100 mA) I.D. in Inches	Pow-R-Line MPM "X" Space	Pow-R-Line MPM Minimum Structure Width in Inches (mm)		PRC7500 "X" Space	PRC7500 Minimum Structure Width in Inches (mm)	
EHD EHD	100 100	2 3	0.53	2X 3X	36.00 (914.4)		2X 3X	36.00 (914.4)	
FDB, FD, HFD, FDC FDB, FD, HFD, FDC, FDE, HFDE, FDCE	125 125	2 3	0.53	2X 3X	36.00 (914.4)		4X 5X	36.00 (914.4)	
EDB, EDS, ED, EDH, EDC, FD, HFD, FDC EDB, EDS, ED, EDH, EDC, FD, HFD, FDC, FDE, HFDE, FDCE	225 225	2 3	1.12	3X 5X	36.00 (914.4)		4X 5X	36.00 (914.4)	
DK, KD, HKD, KDC DK, KD, HKD, KDC	400 400	2 3	1.74	4X 6X	Single 36.00 (914.4)	Twin 51.00 (1295.4)	6X 8X	Single 36.00 (914.4)	Twin 51.00 (1295.4)

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Construction and Application Considerations

Eaton's Pow-R-Line C commercial metering switchboards incorporate design concepts to fit the needs for reliable multiple circuit distribution and metering in commercial applications while retaining maximum standardization, safety and convenience.

Type WWCMS metering switchboards provide incoming service and tenant metering arrangements that comply with EUSERC utility requirements.

Type WCMS metering switchboards meet the standard requirements for service and tenant metering arrangements for all utility locations other than EUSERC service areas. Type WCMS may be either hot or cold sequenced.

Utility Approved Termination Compartment

Enclosure

The commercial metering switchboards are made up of one or more sections bolted together to form a 90.00-inch (2286.0 mm) high, freestanding, front-access grounded enclosure. Each section uses conventional distribution switchboard construction consisting of formed vertical posts and angle cross members for a rigid self-supporting framework to support the bussing, devices and covers. Code gauge steel covers for the rear, side and front are formed and sectionalized for easy removal and handling. Covers on all unmetered compartments are provided with sealing screws or studs.

All exterior surfaces are finished inside and out with a durable powder coat ANSI 61 light gray finish over a rust resistant primer.

The switchboards are available in NEMA Type 1 construction for indoor use or NEMA Type 3R for outdoor applications.

Bus Bar System

The standard main bus in the service section and the horizontal cross bus is tin-plated aluminum with ratings from 400–4000 A. Both copper and silver-plated copper bus are available as options.

Main bus and sub-main buses meet UL and NEMA standards for temperature rise on all metering switchboards. Special bus densities can be provided to meet specific needs.

Service and cross buses are supported by high-strength glass-reinforced polyester insulating supports. Splice connections between sections are easily made with bus tie links.

Ground bus is provided as standard on all switchboards.

Short-Circuit Rating

Standard bus and connectors on all switchboards are rated for use on systems capable of producing up to 65,000 A rms symmetrical short-circuit current at the incoming terminals.

Increased bus short-circuit ratings equal to that of the connected switchboard devices, up to 200,000 A rms symmetrical, are available in all Pow-R-Line C switchboards. UL labeled switchboard sections are marked with their applicable short-circuit rating, taking into account the short-circuit capability of the power source to which they are to be connected.

Transitions

Transition structures are required for special switchboard configurations such as "L" or "U" shaped lineups. In some applications, an extra structure complete with connections is required; in others, where switchboard depth and space permit, only the connection conductors are required. (Refer to factory for these applications.)

Auxiliary Structures

These are normally mounted adjacent to service structures or distribution structures and used where incoming service or feeder conductors require additional space or facilities not included in the standard switchboard, such as the following two applications.

1. Mounted adjacent to a top-connected service structure and used as a cable pull structure where service conductors are brought underground. Auxiliary structures are the same depth and height as the service structure and are wide enough to accommodate the incoming cables.
2. Mounted adjacent to a service structure and used as a bus transition compartment for running riser bus from the line side of the service structure up to a top incoming busway connection. Auxiliary structures are the same depth and height as service structures.

   Busway connections to switchboard sections include cutout and drilling in the top of the switchboard with riser connections from the switchboard device or bus, up to the point where the busway enters the switchboard.

In addition to the above applications, auxiliary structures may be mounted adjacent to a distribution structure and used to route feeder cables out the top of the lineup.

General Description—Pow-R-Line C Types WWCMS (EUSERC Only) and WCMS

Switchboards Used as Service Equipment

Service equipment is the electrical equipment that constitutes the main control and means of power cutoff for the electric service (normally power company supply) brought into the building.

Where switchboards are to be used as service equipment, certain NEC and UL requirements apply that necessitate modifications not normally supplied in switchboards.

Following is a summary of the requirements that are pertinent to the ordering of a switchboard for service equipment:

A. A switchboard with main lugs only (no main disconnect) must be designed so that all circuits in the switchboard can be disconnected from the supply source by the operation of no more than six operating handles (breaker or switch).

   Switchboard equipped with main disconnect devices are not subject to the above six disconnect limitation, as the entire board can be de-energized with the main disconnect device.

   Ground fault protection of equipment shall be provided for solidly grounded wye electrical services of more than 150 V to ground, but not exceeding 600 V phase-to-phase for each service disconnecting means rated 1000 A or more.

B. For testing purposes, means are also required to disconnect the switchboard neutral bus from the ground service neutral conductor (single-phase three-wire, three-phase four-wire systems). To comply with this requirement, a removable link (solid bar) is provided in the switchboard neutral bus. This link is generally located near the point where the main feeders enter the switchboard or in the area of the main disconnect device where one is provided.

   To further comply with NEC and UL requirements, a separate bonding strap is connected from the neutral bus to the switchboard frame. This bonding connection is located on the line side of the removable neutral link, maintaining a service ground to the switchboard frame when the test link is removed.

Where switchboards are to be used for service equipment, it should be clearly indicated in requests for quotations, and noted on the order.

Underwriters Laboratories Requirements and Labeling

The basic requirement for obtaining an Underwriters Laboratories label on a switchboard, is that all the compartment devices (breakers, switches, and the like) in the switchboard assembly are UL listed. In addition, the switchboard must comply with all applicable provisions of UL 891.

Today's modern electrical systems require that switchboards offer a wide selection of electrical devices, many of which do not fall within the scope of UL listed devices. Therefore, the conditions under which a switchboard may be labeled are limited.

Listed below are several important guidelines for consideration when an Underwriters Laboratories label is specified:

1. Underwriters Laboratories nameplates, where applicable, are supplied for each vertical structure rather than one common nameplate for the complete switchboard lineup. Where all of the component devices in the switchboard are UL listed and all applicable provisions UL 891 are met, each of the vertical structures that make up the switchboard may be labeled.
2. Individual vertical structures of a switchboard may be labeled where they comply with Underwriters Laboratories requirements although other vertical structures in the same switchboard lineup may not meet the UL standards, and will not be labeled.
3. All Pow-R-Line C metering switchboards are UL labeled if all mounted devices are UL listed.

Incoming Service

The incoming service section is similar in design and arrangement to standard distribution switchboards. The incoming service can be located on either end of the lineup or in the center.

Main lugs only (400–4000 A) can be provided with an appropriate pull section for cable entry and termination. A variety of main service protective devices are also available. The standard devices include insulated case circuit breakers up to 4000 A, molded case circuit breakers (400–2500 A), fusible switches (400–1200 A) and bolted pressure switches (800–4000 A).

Ground fault protection is available to meet code requirements and a service entrance label can be provided when specified. Service sections can also include power company main service metering provisions, if required, and user instrumentation or monitoring devices.

Circuit Breakers

Circuit breakers rated 800 A and below have thermal-magnetic trip devices with optional electronic trip units. Breakers 1200 A and larger have electronic trip units as standard. Optional electronic trip units are available rated 800 A, offering increased short-time function adjustability and integral ground fault protection.

Fusible Switches

These switches incorporate a quick-make, quick-break mechanism housed in individual enclosures. The switches rated 400–1200 A are provided in single unit construction and applied as individually mounted main devices. Shunt trips are available for use with ground fault protection.

Switches rated 400 and 600 A are designed for use with Class R fuses. They can be provided with either Class J or T fuse provisions. The 800 and 1200 A units have provisions for Class L fuses.

Bolted Pressure Switches

Bolted pressure switches use a quick-acting stored energy mechanism with bolted pressure force on the contacts in the closed position.

Available in ratings of 800–4000 A, the switches can be provided as a manually operated device or with an electric trip mechanism for use with ground fault protection equipment.

All bolted pressure switches have provisions for Class L current limiting fuses. The units are 100% rated devices.

Tenant Metering Sections

Type WWCMS for EUSERC Service Areas

Tenant metering sections provide arrangements for grouping individual tenant feeder circuits rated 200 A or less. Each circuit consists of a utility approved meter socket and an appropriate disconnect device.

These sections contain chassis mounted, factory assembled and wired meter sockets and disconnects arranged for hot sequence metering (meter socket ahead of the tenant disconnect). The switchboards are shipped ready for connection of the tenant feeder cables and installation of the utility furnished watthour meter. Sealable covers are provided to comply with utility standard requirements.

The WWCMS hot sequence metering sections are constructed for bottom exit of the tenant feeder cables. If top exit of the cables is required, an optional rear barrier wireway can be provided in the back of the metering section or a load side cable pull section can be added to the lineup.

Meter Socket

The meter socket is a ring type device rated 200 A continuous for self-contained metering applications. The assembly includes a bypass test block in a fully bussed combination to meet EUSERC standard requirements.

Disconnect

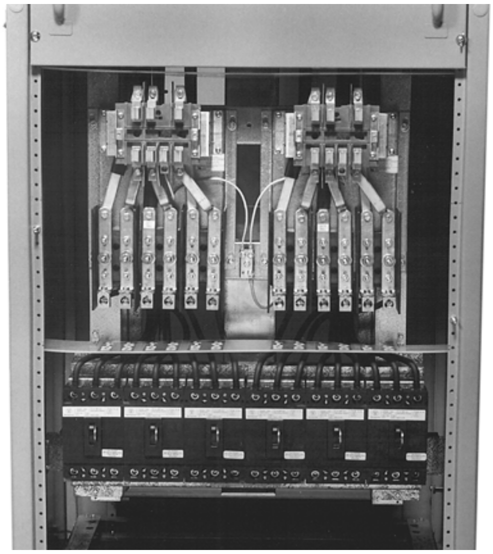
Tenant disconnects can be molded case circuit breakers, fusible pullout devices (for Class T fuses) or fusible switches arranged for Class R fusing. Short-circuit ratings of the disconnect/meter socket assembly are established based on UL peak let-through currents using self-contained meter sockets.

Circuits Over 200 A

Requirements for tenant metered circuits over 200 A can be met using separate sections with appropriate disconnect devices installed below a current transformer/metering compartment. The metering compartment constructed to EUSERC standards provides mounting provisions for the utility-furnished current transformers that can be connected to a transformer rated meter socket provided on the sealable compartment door.

Single disconnects can include molded case circuit breakers, fusible switches or bolted pressure switches. For multiple feeder applications, a 22X distribution chassis with breakers or fusible switches can be provided in combination with the metering compartment. The standard arrangement is for hot sequence metering.

Meter Socket Sealable Cover Arrangement



Assembly Includes Meter Socket and Test Block per EUSERC Requirements Prewired to Tenant Disconnect

Tenant Metering Sections

Type WCMS

Tenant metering sections provide arrangements for grouping individual tenant feeder circuits rated 200 A or less. Each circuit consists of a utility-approved meter socket and an appropriate disconnect device.

These sections contain factory assembled and wired meter sockets and disconnects that can be arranged for hot sequence metering (meter socket ahead of the tenant disconnect) or cold sequence metering (disconnect ahead of the meter socket). The switchboards are shipped ready for connection of the tenant feeder cables and installation of the utility-furnished watthour meter.

The WCMS metering sections are constructed for bottom exit of the tenant feeder cables. If top exit of the cables is required, an optional rear barriered wireway can be provided in the back of the metering section or a load side cable pull section can be added to the lineup.

Meter Socket

The meter socket is a ringless type device rated 200 A continuous for self-contained metering applications. All sockets include a manual lever bypass device. The standard meter socket is the heavy-duty Type HQ series. Type HB sockets are also available.

Each meter socket is provided with an individual screwless cover that includes a sealing bracket with provisions for barrel locks, sealing wire or sealing bands. Individual internal barriers are provided around each socket.

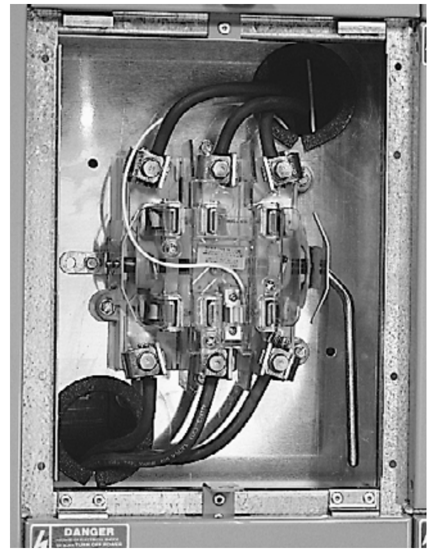
Disconnect

Tenant disconnects can be molded case circuit breakers, fusible pullout devices (for Class T fuses) or fusible switches arranged for Class R fusing. Short-circuit ratings of the disconnect/meter socket assembly are established based on UL peak let-through currents using self-contained meter sockets.

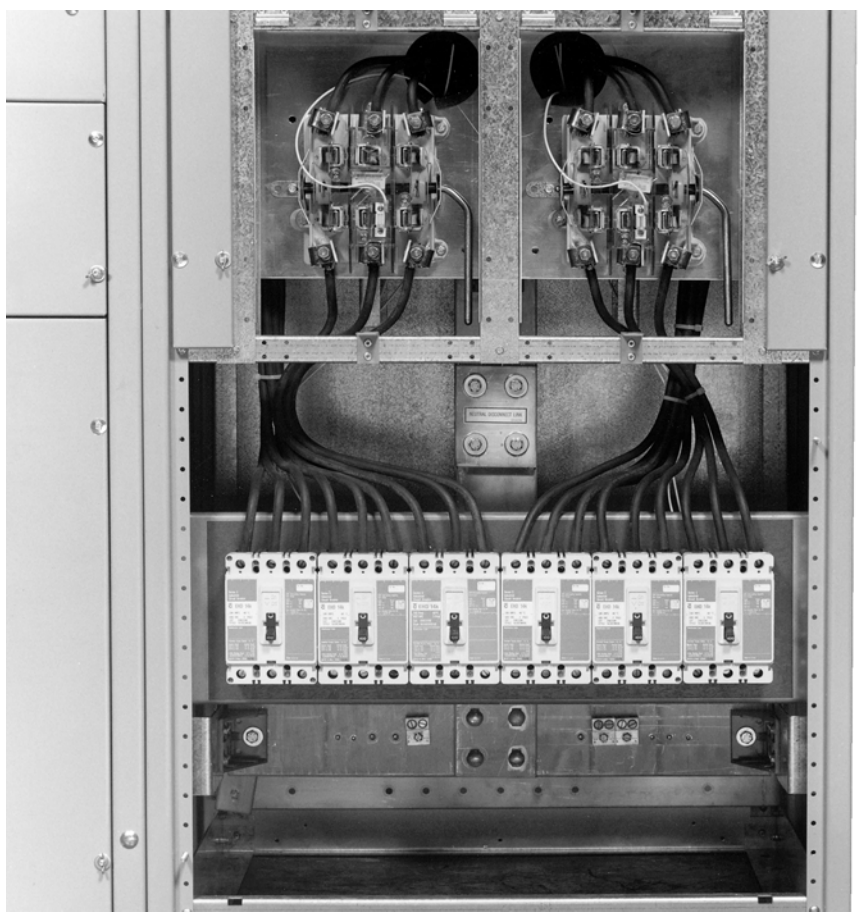
Circuits Over 200 A

Requirements for tenant metered circuits over 200 A can be met using separate sections with appropriate disconnect devices installed in combination with a current transformer/metering compartment. The utility-approved metering compartment provides mounting provisions for the utility or owner-furnished current transformers that can be connected to a transformer rated meter socket. The socket can optionally be provided on the switchboard or can be furnished and installed separately by others. Single disconnects can include molded case circuit breakers, fusible switches or bolted pressure switches, and can be arranged for hot or cold sequence metering. For multiple feeder applications, a 22X distribution chassis with breakers or fusible switches can be provided in combination with the metering compartment. The standard arrangement for multiple feeders is for hot sequence metering.

Two types of 400 A self-contained meter sockets are available. A single circuit 400 A (320 A continuous) rated self-contained meter socket with manual lever bypass is available with either a breaker or fusible switch tenant main. Also available is a 400 A continuous rated self-contained meter socket without bypass, which uses either a breaker or fusible switch tenant main.



Barriered Socket Construction with Manual Lever Bypass



Typical 200 A 7 Jaw Sockets with Manual Lever Bypass Connected to Circuit Breaker Disconnects in Hot Sequence Arrangement

Disconnect Selection and Ratings

Main and Large Feeder Disconnects

Table 21.10-1. Molded Case Circuit Breakers

Ampere Rating	Breaker Type	Interrupting Rating rms Symmetrical Amperes	
		240 V	480 V
400	KD	65,000	35,000
	HKD	100,000	65,000
	KDC	200,000	100,000
600	LGE	65,000	35,000
	LGH	100,000	65,000
	LD	65,000	35,000
	HLD	100,000	65,000
	LDC, LGC	200,000	100,000
800	MDL	65,000	50,000
800–1200	NG	65,000	35,000
	NGH	100,000	65,000
	NGC	200,000	100,000
1600–2500	RG	125,000	65,000

Table 21.10-2. Bolted Pressure Switches

Switch Rating Ampere	Fuse		
	UL Class	Description	Interrupting Rating rms Symmetrical Amperes
800–4000	L	Current Limiting	200,000

Table 21.10-3. Magnum SB Insulated Case Circuit Breaker—Main

Ampere Rating	Breaker Type	Interrupting Rating rms Symmetrical Amperes	
		240 V	480 V
800 1600 2000	SB SB SB	65,000 65,000 65,000	65,000 65,000 65,000
3000 4000	SB SB	65,000 130,000	65,000 85,000

Table 21.10-4. Fusible Switches

Switch Rating Ampere	Fuse		
	UL Class	Description	Interrupting Rating rms Symmetrical Amperes
400–600	R	Current Limiting	200,000
	J		200,000
800–1200	L		200,000

Meter Section Tenant Main Disconnects

Table 21.10-5. Molded Case Circuit Breakers

Maximum Voltage	Ampere Rating	Breaker Type	Short-Circuit Rating ① rms Symmetrical Amperes
240	50–100	EHD	18,000
		FD, FDE	25,000
		HFD, HFDE	65,000
	125–200	ED	65,000
	400	KDC ②	50,000
480Y/277	70–100	EHD	14,000
	70–200	HFD, HFDE	35,000
		FDC	50,000
	400	KDC ②	25,000

① Short-circuit rating based on peak let-through of 30,000 A using self-contained meter sockets per UL 414. Standard device short-circuit rating applies when used with transformer rated sockets.
② For use with 400 A self-contained socket in single section construction for Type WCMS lineups only.

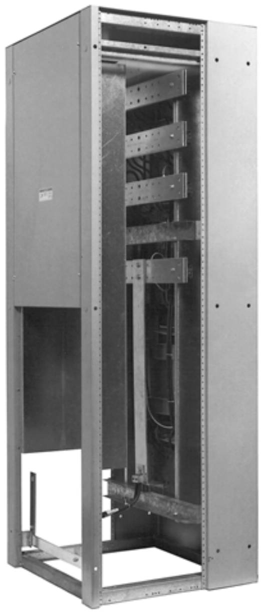
Table 21.10-6. Fusible Pullout Devices

Switch Rating Ampere	Fuse		
	UL Class	Description	Interrupting Rating rms Symmetrical Amperes
100 or 200	T	Current Limiting	200,000

Table 21.10-7. Fusible Switches

Switch Rating Ampere	Fuse		
	UL Class	Description	Interrupting Rating rms Symmetrical Amperes
100 or 200	R	Current Limiting	200,000

Wire and Cable Terminals



Optional Rear Barriered Wireway for Tenant Metering Sections Provides Access for Top Exit of Tenant Feeder Circuits

Standard Switchboard Terminals

Wire and cable terminals supplied on switchboard mounted devices for making up incoming or outgoing cable connections are of the mechanical screw clamp pressure type.

All standard terminals are suitable for use with either aluminum or copper cable except as noted in the table. Panel-mounted devices use the terminal provided as standard for and furnished with that device.

All terminal sizes are based on wire ampacities corresponding to those shown in NEC Table 310.16 under the 75 °C insulation columns (75 °C wire). The use of smaller size (in circular mills) regardless of insulation temperature rating is not permitted without voiding UL labels on devices and equipment.

Table 21.10-8. Standard Incoming Terminals (MLO)

Ampere Rating	Wire Range ①
400 600 800	(2) #2-500 kcmil (2) #2-500 kcmil (3) #2-500 kcmil
1200 1600 2000	(4) #2-500 kcmil (5) #2-500 kcmil (6) #2-500 kcmil
2500 3000 4000	(7) #2-500 kcmil (8) #2-500 kcmil (11) #2-500 kcmil

① All terminal sizes are based on wire ampacities corresponding to those shown in NEC Table 310.16 under the 75 °C insulation columns (75 °C wire). The use of smaller size (in circular mils) regardless of insulation temperature rating is not permitted without voiding UL labels on devices and equipment.

Table 21.10-9. Molded Case Circuit Breakers

Breaker Type	Ampere Rating	Wire Range ②
EDB, EDS, ED, EDH, EDC	125-225	#4-4/0 or #6-300 kcmil
EHD, FDB, FDE FD, HFD, HFDE FDC, FDCE	15-100 125-225	#14-1/0 #4-4/0 or #6-300 kcmil
KD, KDB, HKD, KDC	100-225 250-350 400	(1) #3-350 kcmil (1) 250-500 kcmil (2) 3/0-250 kcmil or (1) 3/0-500 kcmil
LGE, LGH, LD, HLD, LDC, LGC	300-500 600	(2) 250-300 kcmil (2) 400-500 kcmil
MDL	400-600 700-800	(2) #1-500 kcmil (2) 3/0-400 kcmil
NG, NGH NGC	800-1000 1200	(3) 3/0-400 kcmil (4) 4/0-500 kcmil
RG	1600 2000 2500	(5) #2-500 kcmil (6) #2-500 kcmil (7) #2-500 kcmil

② All terminal sizes are based on wire ampacities corresponding to those shown in NEC Table 310.16 under the 75 °C insulation columns (75 °C wire). The use of smaller size (in circular mils) regardless of insulation temperature rating is not permitted without voiding UL labels on devices and equipment.

Table 21.10-10. Magnum SB Insulated Case Circuit Breakers

Breaker Type	Ampere Rating	Wire Range ③
SB SB SB	800 1600 2000	(3) #2-500 kcmil (5) #2-500 kcmil (6) #2-500 kcmil
SB SB	3000 4000	(8) #2-500 kcmil (11) #2-500 kcmil

③ All terminal sizes are based on wire ampacities corresponding to those shown in NEC Table 310.16 under the 75 °C insulation columns (75 °C wire). The use of smaller size (in circular mils) regardless of insulation temperature rating is not permitted without voiding UL labels on devices and equipment.

Table 21.10-11. Bolted Pressure Switches

Ampere Rating	Wire Range ④
800 1200 1600	(3) #2-500 kcmil (4) #2-500 kcmil (5) #2-500 kcmil
2000 2500 3000	(6) #2-500 kcmil (7) #2-500 kcmil (8) #2-500 kcmil
4000	(11) #2-500 kcmil

④ All terminal sizes are based on wire ampacities corresponding to those shown in NEC Table 310.16 under the 75 °C insulation columns (75 °C wire). The use of smaller size (in circular mils) regardless of insulation temperature rating is not permitted without voiding UL labels on devices and equipment.

Table 21.10-12. Fusible Switches

Ampere Rating	Wire Range ⑤
30 60 100	#4-#1/0 #4-#1/0 #4-#1/0
200 400 600	#4-300 kcmil #4-600 kcmil (2) #4-600 kcmil
800 1200	(3) #4-600 kcmil (4) #4-600 kcmil

⑤ All terminal sizes are based on wire ampacities corresponding to those shown in NEC Table 310.16 under the 75 °C insulation columns (75 °C wire). The use of smaller size (in circular mils) regardless of insulation temperature rating is not permitted without voiding UL labels on devices and equipment.

Main Switchboard Section—Layout and Dimensions in Inches (mm)

Note: All sections are standard 90.00 inches (2286.0 mm) high. Add 13.00 inches (330.2 mm) to depth shown for NEMA Type 3R outdoor enclosure.

Table 21.10-13. Bussed Pull Sections (With Lug Landings)

Main Ampere Rating	Figure 21.10-2	
	W	D ①
400 600 800	30 (762.0)	24 (609.6)
1200	36 (914.4)	24 (609.6)
1600 2000	45 (1143.0)	30 (762.0)
2500 3000	51 (1295.4)	30 (762.0)
4000	51 (1295.4)	48 (1219.2)

① If used with a main service section, depth will match the main device section.

Note: For main lug only applications.

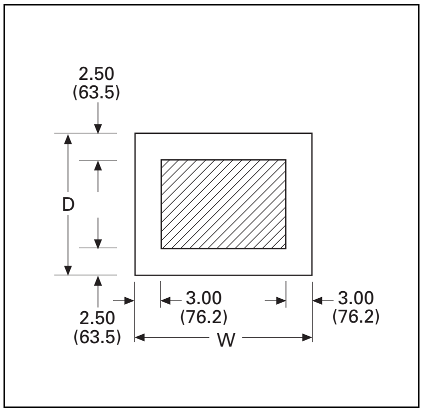


Figure 21.10-1. Typical Conduit Area—Figures 21.10-2, 21.10-3 and 21.10-4

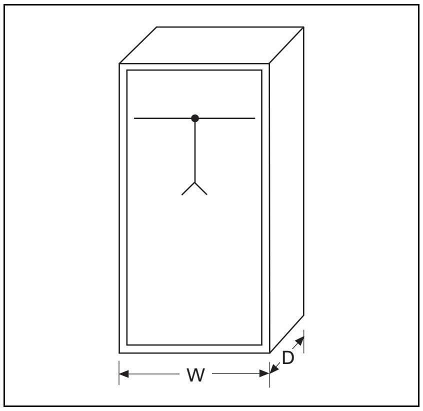


Figure 21.10-2. Main Lugs Only—Top or Bottom Feed

Table 21.10-14. Main Fusible Switch Service Sections

Switch Type	Ampere Rating	Figure 21.10-3		Figure 21.10-4		
		W	D	W1	W	D
Fusible Switch	400 600 800	36 (914.4)	24 (609.6)	30 (762.0)	36 (914.4)	30 (762.0)
	1200	36 (914.4)	24 (609.6)	36 (914.4)	36 (914.4)	36 (914.4)
Bolted Pressure Switch	800	36 (914.4)	30 (762.0)	30 (762.0)	36 (914.4)	36 (914.4)
	1200	36 (914.4)	30 (762.0)	36 (914.4)	36 (914.4)	36 (914.4)
	1600 2000	45 (1143.0)	30 (762.0)	45 (1143.0)	36 (914.4)	36 (914.4)
	2500 3000	51 (1295.4)	36 (914.4)	51 (1295.4)	45 (1143.0)	36 (914.4)
	4000	—	—	51 (1295.4)	45 (1143.0)	48 (1219.2)

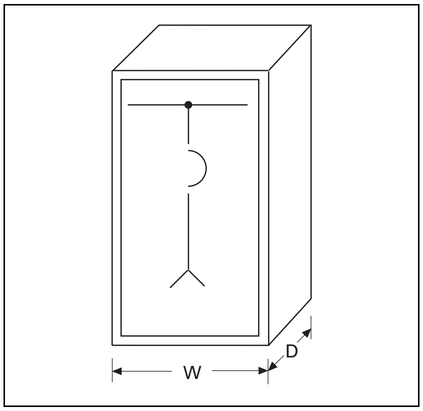


Figure 21.10-3. Main Device (Breaker or Switch)—Bottom Feed

Table 21.10-15. Main Circuit Breaker Service Sections

Breaker Type	Ampere Rating	Figure 21.10-3		Figure 21.10-4		
		W	D	W1	W	D
KD, HKD, KDC	400	30 (762.0)	24 (609.6)	30 (762.0)	30 (762.0)	24 (609.6)
LGE, LGH, LGC, LD, HLD, LDC	600					
MDL, ND	800					
NG, NGH, NGC	1200	36 (914.4)	24 (609.6)	36 (914.4)	36 (914.4)	36 (914.4)
RG	1600 2000	45 (1143.0) 45 (1143.0)	30 (762.0) 30 (762.0)	45 (1143.0) 45 (1143.0)	36 (914.4) 36 (914.4)	36 (914.4) 36 (914.4)
	2500	51 (1295.4)	30 (762.0)	51 (1295.4)	36 (914.4)	36 (914.4)
Magnum SB	3000	51 (1295.4)	36 (914.4)	51 (1295.4)	45 (1143.0)	36 (914.4)
	4000	51 (1295.4)	48 (1219.2)	51 (1295.4)	45 (1143.0)	48 (1219.2)

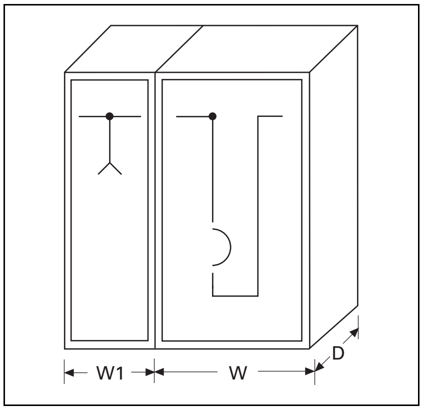


Figure 21.10-4. Main Device (Breaker or Switch)—Top or Bottom Feed

Tenant Meter and Disconnect Sections—200 A Maximum Circuit

Hot sequence metering sections incorporating 200 A (maximum) continuous rated self-contained meter sockets with test bypass/disconnect block in combination with tenant main disconnect device.

Standard arrangement provides for bottom exit of cables. Top exit of cables will require addition of load side pull section or rear barriered wireway for each metering section.

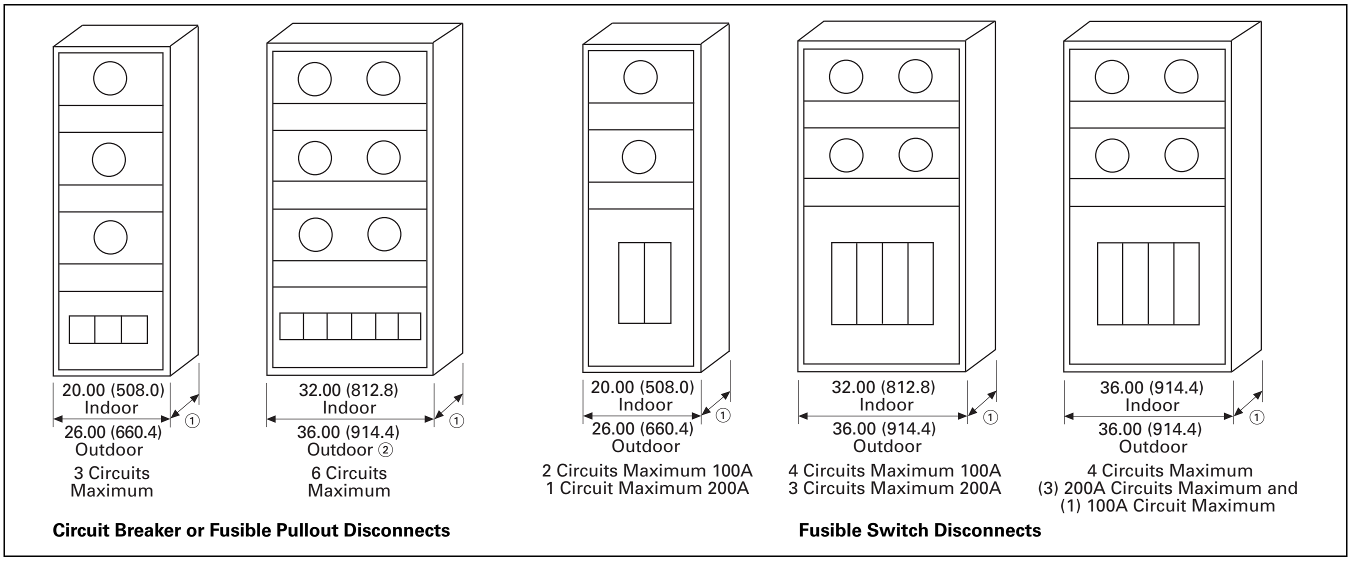


Figure 21.10-5. Tenant Meter and Disconnect Configurations

① Depth will match main device section.
② 3.00-inch (76.2 mm) additional clearance required by utility for clearance between meter and door posts for outdoor designs. Double door without center post available for two sections side-by-side.

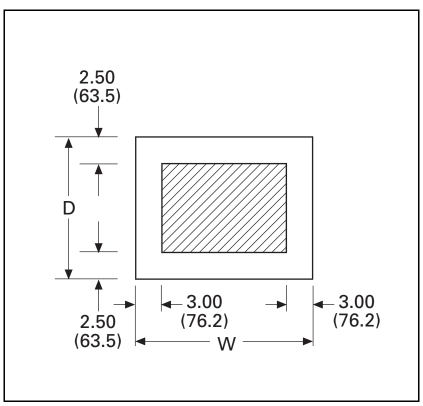


Figure 21.10-6. Typical Conduit Area

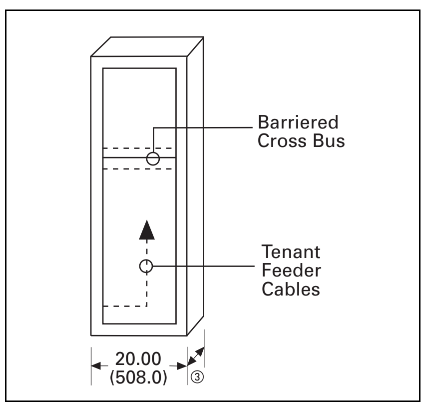


Figure 21.10-7. Load Side Pull Section with Barriered Cross Bus

③ Depth will match main device section.

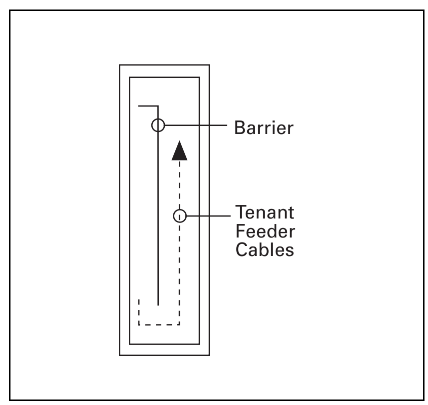


Figure 21.10-8. Rear Barriered Wireway Metering Section Side View

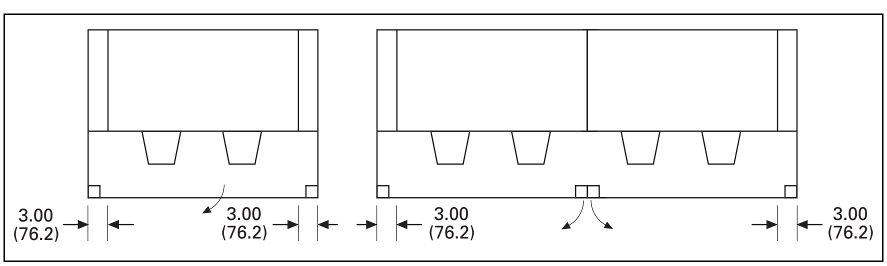


Figure 21.10-9. Outdoor Floor Plans

Main Switchboard Section—Layout and Dimensions in Inches (mm)

Note: All sections are standard 90.00 inches (2286.0 mm) high. Add 13.00 inches (330.2 mm) to depth shown for NEMA Type 3R outdoor enclosure.

Table 21.10-16. Bussed Pull Sections

Main Ampere Rating	Figure 21.10-10	
	W	D ①
800 or Less	20 (508.0)	30 (762.0)
1200–4000	30 (762.0)	30 (762.0)

① If used with a main service section, depth will match the main device section.

Note: For main lug only applications and installations requiring separate incoming pull section (top or bottom feed).

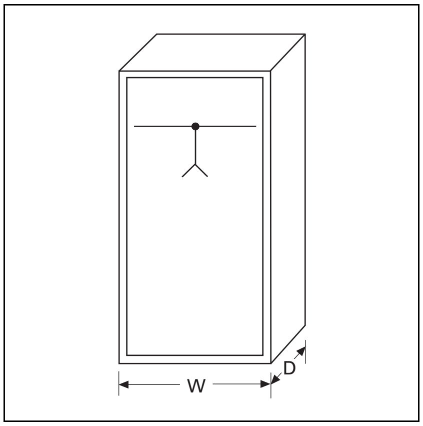


Figure 21.10-10. Main Lug Only—Top or Bottom Feed

Table 21.10-17. Main Fusible Switch Service Sections

Switch Type	Ampere Rating	Figure 21.10-11 or 21.10-12	
		W	D
Fusible switch	400 600 800 1200	30 (762.0)	30 (762.0)
Bolted pressure switch	800	30 (762.0)	30 (762.0)
	1200 1600 2000	36 (914.4)	36 (914.4)
	2500 3000 4000	45 (1143.0)	36 (914.4)

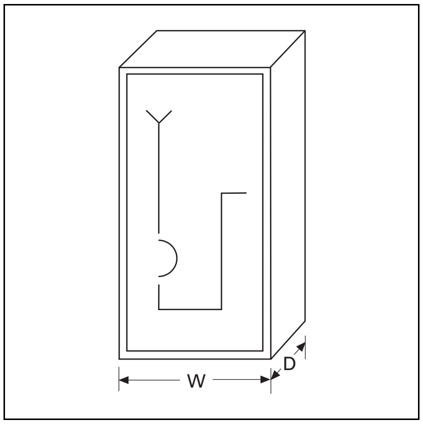


Figure 21.10-11. Main Device (Breaker or Switch)—Top Feed

Table 21.10-18. Main Circuit Breaker Service Sections

Breaker Type	Ampere Rating	Figure 21.10-11 or 21.10-12	
		W	D
KD, HKD, KDC	400	30 (762.0)	30 (762.0)
LGE, LGH, LD, HLD, LDC, LGC	600		
MDL, NG, NGH, NGC	800 1200		
RG	1600 2000 2500		

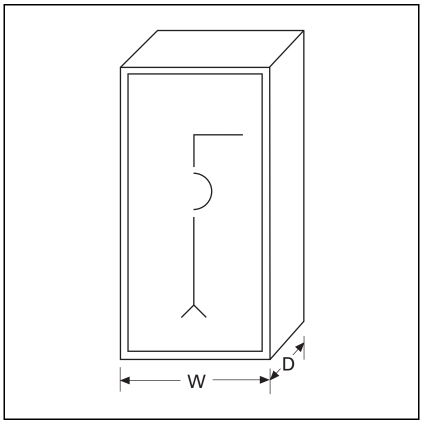


Figure 21.10-12. Main Device (Breaker or Switch)—Bottom Feed

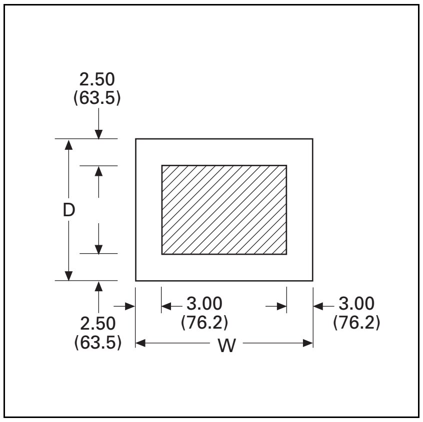


Figure 21.10-13. Typical Conduit Area—Figures 21.10-10, 21.10-11 and 21.10-12

Tenant Meter and Disconnect Sections

All sections are standard 90.00 inches (2286.0 mm) high. Hot or cold sequence metering sections incorporating 200 A (maximum) continuous rated self-contained meter sockets (ringless type with manual bypass) in combination with tenant main disconnect device.

Standard arrangement provides for bottom exit of cables. Alternate cable exit will require addition of load side pull section or rear barriered wireway for each section.

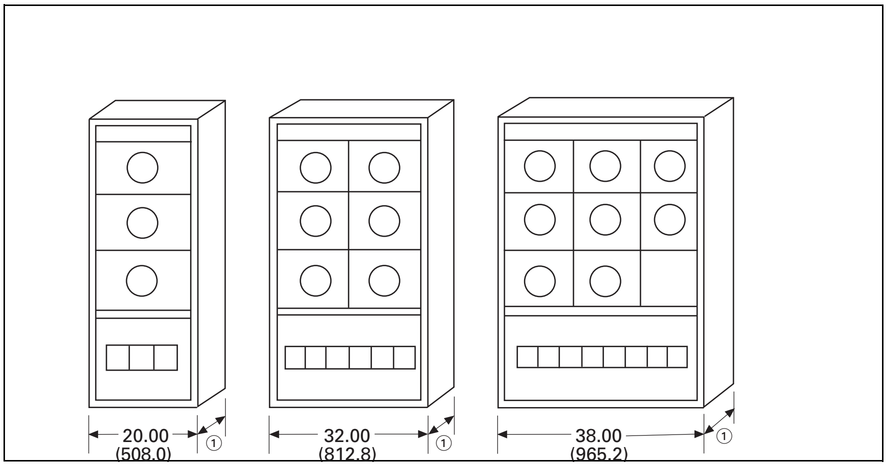


Figure 21.10-14. Circuit Breaker or Fusible Pullout Tenant Disconnects

① Standard depth is 30.00 inches (762.0 mm).

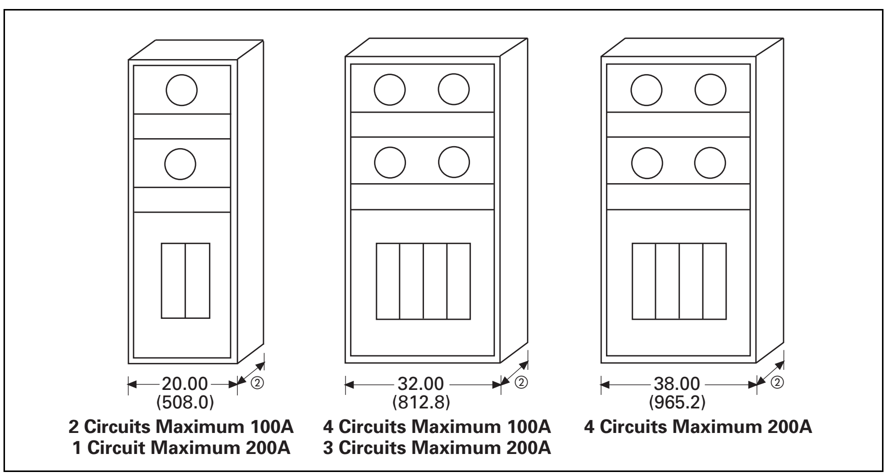


Figure 21.10-15. Fusible Switch Tenant Disconnects

② Standard depth is 30.00 inches (762.0 mm).

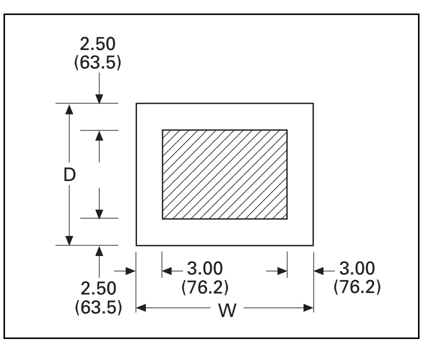


Figure 21.10-16. Typical Conduit Area—Figures 21.10-17, 21.10-18 and 21.10-19

For 400 A applications, select either 400 A (320 A continuous) with manual lever bypass or the 400 A continuous rated meter socket with 400 A frame Type KDC circuit breaker.

Can be arranged for hot sequence metering with bottom cable exit or cold sequence metering with top cable exit. Alternate cable exit will require addition of load side pull section or rear barriered wireway. See **Figures 21.10-19** and **21.10-20**.

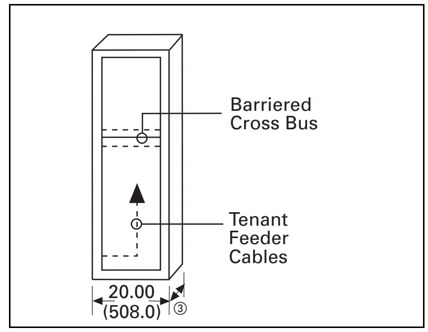


Figure 21.10-17. Load Side Pull Section with Barriered Cross Bus

③ Standard depth is 30.00 inches (762.0 mm).

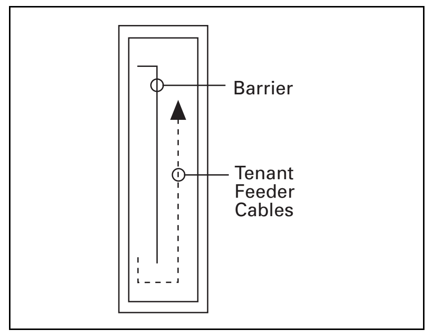


Figure 21.10-18. Rear Barriered Wireway Metering Section Side View

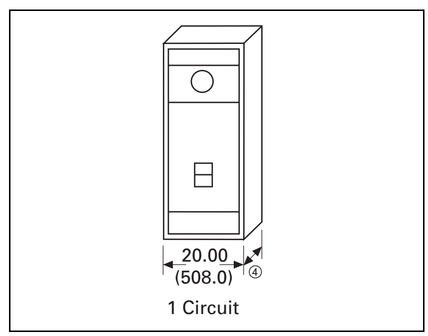


Figure 21.10-19. 400 A Tenant Section with Self-Contained Metering (Breaker)

④ Depth will match metering sections.

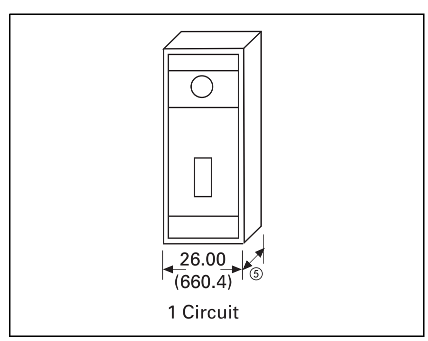


Figure 21.10-20. 400 A Tenant Section with Self-Contained Metering (Fusible Switch)

⑤ Depth will match metering sections.

Switchboard Section—Layout and Dimensions

All sections are standard 90.00 inches (2286.0 mm) high. Add 13.00 inches (330.2 mm) to depths shown for NEMA Type 3R outdoor enclosure. Add 9.00 inches (228.6 mm) for NEMA Type 3R on single section 36.00 inches (914.4 mm) wide only.

Tenant Sections Arranged for Transformer-Rated Metering

Includes utility-approved metering compartment with provisions for mounting current transformers for metering circuits rated 400 A and above.

Disconnect device can be either a single fusible switch or circuit breaker arranged for hot or cold sequence.

A 22X chassis for installation of multiple disconnects on one metered circuit is also available for hot sequence metering.

Standard cable exit is at the bottom. For top cable exit, add wireway barrier.

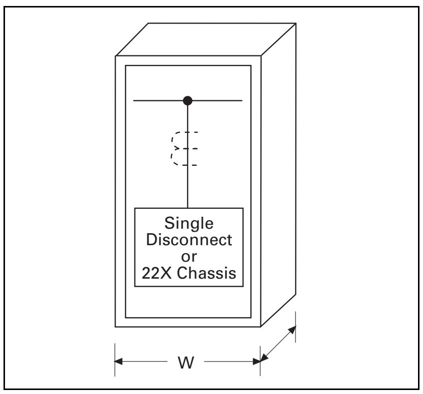


Figure 21.10-21. Multiple Disconnects (22X Chassis—See Figures Below)

① Depth (D) will match depth of main device section.

Note: Refer to panel layout guides.

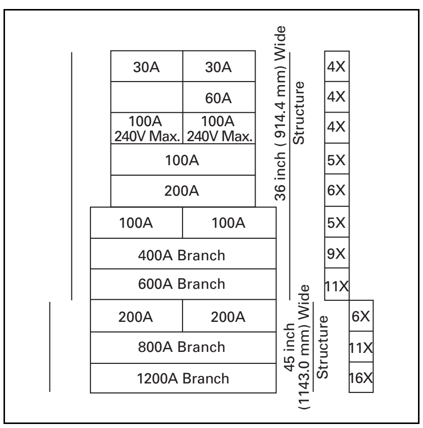


Figure 21.10-22. 22X Chassis Layout Guide—Fusible Switches

Table 21.10-19. Single Tenant Disconnect Service Sections—Dimensions in Inches (mm)

Type Disconnect	Ampere Rating	Type WWCMS (EUSERC)		Type WCMS	
		W	D ②	W	D ②
Fusible Switch—Disconnect					
Fusible switch	400 600 800	36 (914.4)	24 (609.6)	36 (914.4)	30 (762.0)
	1200	38 (965.2)	30 (762.0)		
Bolted pressure switch ③	800	36 (914.4)	30 (762.0)		
	1200 1600	38 (965.2)	30 (762.0)		
Circuit Breaker—Disconnect					
KD, HKD, KDC	400	36 (914.4)	24 (609.6)	36 (914.4)	30 (762.0)
LD, HLD, LDC	600				
MDL, NG	800				
NG, NGH, NGC ③	1200	36 (914.4)	30 (762.0)		
RG ③	1600				

② Depth (D) will match depth of main device section.
③ Also requires 20.00-inch (508.0 mm) wide pull section.

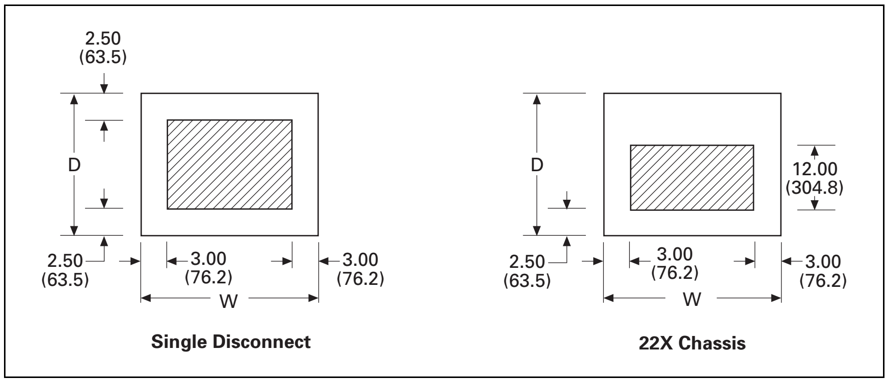


Figure 21.10-23. Typical Conduit Areas—Bottom Cable Exit

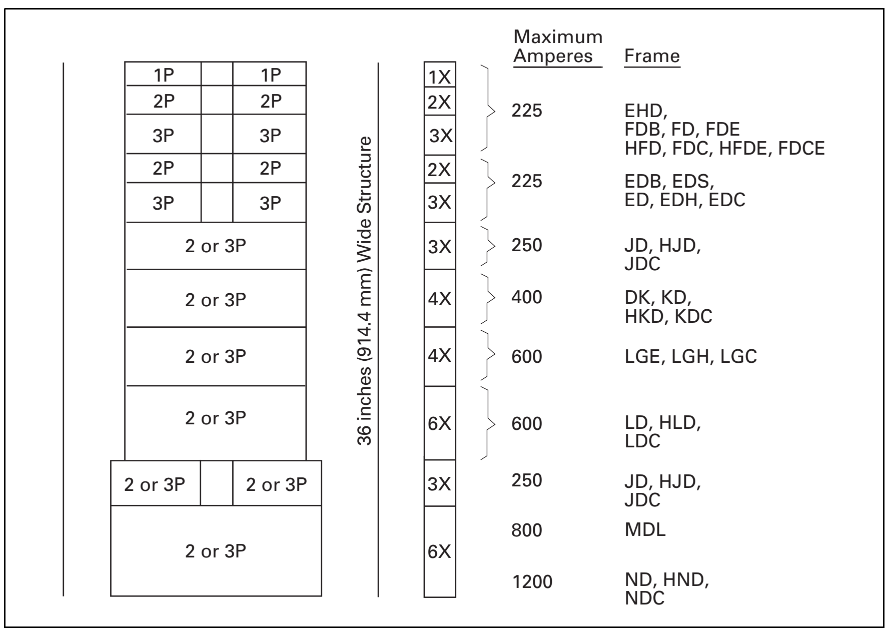


Figure 21.10-24. 22X Chassis Layout Guide—Circuit Breakers, 1X = 1.38 inches (34.9 mm)

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General Description

Eaton's Instant Switchboards are designed as distributor-stocked units to provide fast delivery to match the needs of the construction market.

Suitable for use as service entrance equipment, they combine utility metering provisions with a fused main switch in a single compact section that can also include a distribution panel for feeder and branch circuit breakers.

Typical applications for these versatile switchboards include small office buildings and factories, stores, supermarkets and shopping centers.

Construction

These switchboards are available in either indoor or outdoor enclosures manufactured of code gauge steel with a durable light gray finish. All units are completely enclosed with front, rear and side covers. Outdoor units include a front hinged door.

The service section includes:

- Main lugs mounted at the top (two #4–600 kcmil per phase) for overhead feed or for use with underground pull section
- A metering and CT compartment with bussing for utility bar type CTs and two 15.00-inch (381.0 mm) high meter compartment doors—one with meter socket provision, one blank
- A 400 or 600 A T-fused main switch or 800 A main circuit breaker with either load lugs (same as main lugs) or with connections to a factory-installed distribution panel

Underground pull sections are available with lug landing kits, providing studs for incoming cables per EUSERC requirements and two #4–600 kcmil lugs per phase for cable connection to the service section.

Distribution panels can be included for 240 Vac maximum (single-phase, three-wire, or three-phase, four-wire) or for 480Y/277 Vac (three-phase, four-wire). The 240 V panels have provisions for four two-pole or three-pole, 225 A frame circuit breakers; and 24 poles of 100 A frame circuit breakers. The 480Y/277 V panel has provisions for four two-pole or three-pole 225 A frame circuit breakers; and 24 poles of 100 A frame circuit breakers. Distribution panel for 800 A 240 Vac or 480Y/277 Vac can be included with provisions for six two- or three-pole, 225 A frame circuit breakers.

For applications that require the load circuit conductors to exit at the top, a loadside wireway compartment is available that bolts to the service section.

Standards

Instant Switchboards are UL 891 listed and comply with all applicable industry standards.

These switchboards meet EUSERC requirements.

Service Ratings

- 240 Vac, single-phase, three-wire, or three-phase, four-wire
- 480Y/277 Vac, three-phase, four-wire

Interrupting Ratings (Series Rating)

- 65,000 rms symmetrical amperes at 240 Vac, with 400 and 600 A fusible switch mains using 65,000 AIC ED 225 A frame or 10,000 AIC BAB 100 A frame branch breakers
- 65,000 rms symmetrical amperes at 480Y/277 Vac, with 400 and 600 A fusible switch mains using 35,000 AIC FD 225 A frame or 14,000 AIC GHB 100 A frame branch breakers
- 35,000 rms symmetrical at 480Y/277 Vac fully rated using 800 A main circuit breaker with FD 225 A frame branch breakers

Dimensions

- Indoor: 32.00 x 90.00 x 14.00 inches (812.8 x 2286.0 x 355.6 mm)
- Outdoor: 38.00 x 90.00 x 26.00 inches (965.2 x 2286.0 x660.4 mm)

Type 1 Indoor

Type 3R Outdoor

Table 21.11-1. Instant Switchboards

Service	Main Ampere Rating	Catalog Number NEMA 1—Indoor	Catalog Number NEMA 3R—Outdoor
240 Vac Maximum—Main Fused Switch Only			
Single-phase, 3 W	400 600	**MSB423** **MSB623**	**RMSB423** **RMSB623**
Three-phase, 4 W	400 600	**MSB424** **MSB624**	**RMSB424** **RMSB624**
240 Vac Maximum—Main Fused Switch with Distribution Panel			
Single-phase, 3 W	400 600	**MSBP423** **MSBP623**	**RMSBP423** **RMSBP623**
Three-phase, 4 W	400 600	**MSBP424** **MSBP624**	**RMSBP424** **RMSBP624**
240 Vac Maximum—Main Circuit Breaker Only			
Three-phase, 4 W	800	**MSB824**	**RMSB824**
240 Vac Maximum—Main Circuit Breaker Only with Distribution Panel			
Three-phase, 4 W	800	**MSBP824**	**RMSBP824**
480Y/277 Vac ①—Main Fused Switch Only			
Three-phase, 4 W	400 600	**MSB444** **MSB644**	**RMSB444** **RMSB644**
480Y/277 Vac ①—Main Fused Switch with Distribution Panel			
Three-phase, 4 W	400 600	**MSBP444** **MSBP644**	**RMSBP444** **RMSBP644**
480Y/277 Vac Maximum ①—Main Circuit Breaker Only			
Three-phase, 4 W	800	**MSB844**	**RMSB844**
480Y/277 Vac Maximum ①—Main Circuit Breaker Only with Distribution Panel			
Three-phase, 4 W	800	**MSBP844**	**RMSBP844**

① Not for use on 480 V three-phase three-wire delta systems.

Note: Standard switchboards include two 15.00-inch (381.0) high meter compartment doors: one with single meter socket provision and one blank. For other arrangements, use accessories.

General Description—Pow-R-Line C Instant Switchboards Meet EUSERC Requirements

Table 21.11-2. Meter Compartment Doors (Meter Sockets Not Included)

Door Size Inches (mm)	Drilling	Catalog Number
15.00 H x 32.00 W (381.0 x 812.2)	Blank 1 socket	**MD150** **MD151**
30.00 H x 32.00 W (762.0 x 812.2)	Blank 2 socket	**MD300** **MD302**

Table 21.11-3. Meter Sockets— For Field Installation (order separately)

Number of Jaws	Catalog Number
4 5 6	**M4** **M5** **M6**
8 13 15	**M8** **M13** **M15**

Table 21.11-4. Loadside Wireway— Same Depth as Switchboard

Section Width Inches (mm)	Catalog Number	
	NEMA 1— Indoor	NEMA 3R— Outdoor
12.00 (304.8)	**LSS12W**	**RLSS12W**

Table 21.11-5. Underground Pull Sections

Section Width Inches (mm)	Catalog Number	
	NEMA 1— Indoor	NEMA 3R— Outdoor
24.00 (609.6) 30.00 (762.0)	**UG24W** **UG30W**	**RUG24W** **RUG30W**

Note: Same depth as switchboard with provisions for lug landing kit.

Note: If pull section is to be installed separate from service section, add side closer plates. Cat No. UGCP.

Table 21.11-6. Lug Landing Kits for Underground Pull Sections

Maximum Ampere Rating	Service	Catalog Number
400	Single-phase, 3W Three-phase, 4W	**LL4003** **LL4004**
800	Single-phase, 3W Three-phase, 4W	**LL8003** **LL8004**

Table 21.11-7. Distribution Breakers

Ampere Rating	Type Breaker	Poles		
		1P	2P	3P
240 Vac				
15–60 70–100 125–225	BAB BAB ED	X — —	X X X	X X X
480Y/277 Vac				
15–100 70–225	GHB FD	X —	X X	X X