Power-Style® QED-2
Low Voltage Switchboards

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Power-Style® QED-2 Low Voltage Switchboards
General and Application Information

Features

• Sections rated to 5,000 A horizontal, 3,000 A vertical
• Single mains to 5,000 A
• Six subdivision mains to 4,000 A
• Individually mounted feeders to 4,000 A
• Suitable for service entrance or distribution
• NEMA Type 1 or Type 3R enclosures
• Front or front and rear accessible
• 91.5 in. (2,324 mm) high with base channels
• Section widths available: 12 in. (305 mm), 24 in. (610 mm),
  30 in. (762 mm), 36 in. (914 mm), 42 in. (1,067 mm), 48 in. (1,219 mm),
  or 54 in. (1,372 mm) wide
• Frame depths available: 24 in. (610 mm), 36 in. (914 mm),
  48 in. (1,219 mm), 54 in. (1,372 mm), or 60 in. (1,524 mm)
• Voltage to 600 Vac or 250 Vdc
• Factory assembled
• Hot or cold sequence utility metering
• Customer metering
• Surge protective devices (SPD)

Power-Style® QED-2 switchboards provide a convenient and economical
means of distributing electric power. These enclosed, free-standing
structures contain circuit breaker or fusible overcurrent protection for
services rated up to 5,000 A with a maximum voltage of 600 Vac.
Power-Style QED-2 switchboards are custom-made for use as service
entrance equipment or as distribution centers in commercial, institutional,
and industrial applications.

An auxiliary section is also available for cable or bus transition or to provide
additional space for connecting the service conductors to the line side of the
main. The auxiliary section is a full-height section with a depth to match that
of the adjacent section. It can contain customer metering or through bus and
incoming lug pads.

The QED-2 frame allows various special components to be mounted in the
switchboard. These components include automatic throwover systems,
transfer switches, and special metering systems. This flexibility means the
QED-2 switchboard can meet customer requirements on the most
complicated applications.
Structures

The QED-2 switchboard frame has been designed to provide a sturdy platform on which to build Schneider Electric switchboard products. Individual switchboard sections are built from formed steel channels and angles, then secured together with thread-rolling screws. These thread-rolling screws, when compared with regular self-tapping screws, provide superior torque and strip-out resistant qualities.

Section dimensions are determined by the type, size, quantity, and arrangement of the components and devices being installed.

Each section features a removable one-piece top plate, which makes locating the top conduit entry simple. When extra height is required, Schneider Electric can supply a 12 in. (305 mm) or 24 in. (610 mm) high pullbox. (The pullbox is not available with NEMA Type 3R enclosures.)

All covers, doors, and frames are made of formed steel for extra rigidity. A deep front corner channel and side plate covers the sides. The back is covered with removable plates that have formed edges. All covers are secured with slot/hex head thread rolling screws which greatly minimize the chances of thread strip-out.

The standard paint finish on all Power-Style QED-2 switchboards is an ANSI #49 medium light gray baked enamel over an iron phosphate pretreatment. Non-standard finishes are an available option when specified.

QED-2 switchboards are available in either NEMA Type 1 indoor or Type 3R outdoor enclosures.

Each QED-2 section 3,000 A or less has removable lifting bars and is clearly labeled with handling procedures. The sections are shipped separately to allow the installer extra flexibility when moving the sections to the desired location. Once in place, the sections are secured together, linking the strength of each frame. Optional multiple-section shipments do not have lifting bars.
Bussing

Through Bus

The heart of a switchboard is the horizontal through bus which connects the individual section bussing. The through bus is available in ratings from 1,200–5,000 A. Power-Style QED-2 through bus uses aluminum or copper rectangular 0.25 in. x 1.5 in. (6 mm x 38 mm) or 0.25 in. x 2 in. (6 mm x 51 mm) bus bars. Through bus rated 4,000 A has eight bus bars per phase. Connections are made by using an “E” connector assembly.

Bus ampacity ratings have been determined from UL 891 heat rise testing. This method is the most accurate, since actual tests are used for determining optimal bus sizes.

A 100% neutral bus is provided on 3-phase, 4-wire (3PH4W) and 1-phase, 3-wire (1PH3W) systems. Ground bus is standard and matches the type of through bus. Optional, increased-size ground bus is available.

“E” Connector Assembly

The “E” connector assembly eliminates the alignment problems associated with conventional bus bar connections. The “E” connector assembly, consisting of an “E” connector, carriage bolt, conical washer, and hex nut, requires only one wrench to tighten. This assembly is used on splice connections and connections to through bus from the panel bus. By providing more uniform pressure over the contact surface, a highly efficient and cooler connection is obtained.

Captive Splice Bars

Captive splice bars are provided on through bus connections through 2,500 A. They provide easy installation and reduce the chances of losing parts during installation. Splice connections are made up of splice bars and the “E” connector assembly. For splicing convenience, customers can access the through bus bars in QED-2 main and distribution sections from the front of the switchboard. Slots are provided in the splice bus for ease of assembly. For addition of future sections, through bus is extended to the sides as standard in all sections.
Main Sections

The main devices for overcurrent/short circuit protection and disconnect purposes are available as circuit breakers or fusible switches in Power-Style QED-2 switchboards. These individually mounted main disconnect sections can contain PowerPact® M-, P-, and R-frame molded case circuit breakers to a maximum of 2,500 A. The Masterpact® NW (stored energy) circuit breaker is available to a maximum of 5,000 A and Bolt-Loc® fusible switches are available to a maximum of 4,000 A. Ground fault protection is available through Micrologic® trip units on the PowerPact P- and R-frame and Masterpact NW circuit breakers. Ground fault protection is available on Bolt-Loc switches with the Type GC ground fault system. Section width varies with mains and options. The Masterpact NW circuit breaker is available in fixed or drawout construction.

Available Features

- 5,000 A maximum disconnects
- 600 Vac maximum
- Individually mounted mains
  - PowerPact MG, MJ (800 A max.)
  - PowerPact PG, PJ, PK, PL (1,200 A max.)
  - PowerPact RG, RK, RJ, RL (2,500 A max.)
  - Masterpact NW (5,000 A max.)
  - Bolt-Loc (electric or manual trip) (5,000 A max.)
- Top or bottom feed
- Busway connection available
- Suitable for use as service entrance
- Ground fault protection (not available on PowerPact M-frame)
  - Micrologic trip unit (residual)
  - Bolt-Loc Ground-Censor Type GC (zero sequence)
- Customer metering
  - PowerLogic circuit monitor (communications available)
  - PowerLogic power meter (communications available)
  - ION meter (communications available)
- Utility compartment (hot or cold sequence metering)
- Surge protective device in instrument compartment

Six subdivision mains are available as individually mounted devices up to a rating of 4,000 A. The multiple mains are available as either PowerPact M-, P-, or R-frame circuit breakers, Masterpact NW circuit breakers, or Bolt-Loc fusible switches. All six subdivision mains are connected to the through bus, which is available in ratings up to 5,000 A.
**Product Description**

**Group-Mounted Distribution Sections**

Power-Style QED-2 switchboard distribution sections are available with either an I-Line or QMB group-mounted distribution panel. Each of these interiors mounts to the frame front corner channels with horizontal mounting rails. Connectors secured to the through bus with the “E” connector assembly bring power into the center of each interior bus. The vertical bus feeds power to each branch disconnect. When a neutral is required, it is located at the side of the QMB vertical bus assembly or at the side of the I-Line circuit breaker mounting pan. This convenient neutral location provides for front accessible neutral connections. Ample wireway space is provided for the load side cabling of branch disconnects.

Schneider Electric molded case circuit breakers are available in I-Line plug-on group construction. In this construction, the line end of the circuit breaker plugs directly onto the I-Line panel bus assembly. Branch circuit breakers can be quickly and efficiently installed and wired from the front of the switchboard. I-Line circuit breakers are keyed to mounting slots in the support pan to provide automatic alignment and reduced installation time. The circuit breakers are then secured to the pan with screws. I-Line switchboard sections are available in single row or double row construction. Single row permits mounting of circuit breakers only on one side of the I-Line bus, while double row construction provides for circuit breaker mounting on both sides of the I-Line bus assembly. Different circuit breakers on double row construction can be mounted opposite each other.

QMB fusible switches are group mounted in QED-2 switchboards. The QMB switches are mounted to steel rails and electrically connected by plug-on jaws to the vertical bus. QMB switches through 600 A come standard with Class H fuse clips or with Class R, J, or T clips available as an option. Class L fuse clips are standard on 800 A and 1,200 A QMB switches.

QMJ fusible switches are also available and offer a space saving design. These switches come standard with Class J fuse clips.

**Large Feeders**

Power-Style QED-2 switchboard distribution sections are also available in individually mounted construction. This type of construction allows for larger feeder ampacities up to 4,000 A. The individually mounted feeder devices can contain PowerPact M-, P-, and R-frame and Masterpact NW circuit breakers, or Bolt-Loc fusible switches to a maximum of 4,000 A. Ground fault protection is available through Micrologic trip units on PowerPact M-, P-, and R-frame and Masterpact NW circuit breakers. Ground fault protection is available on Bolt-Loc switches with the Type GC ground fault system. Zone interlocking is available as an option between the feeders and main.

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**I-Line Distribution Section**

- 3,000 A maximum plated copper vertical bus
- 1,600 A maximum plated aluminum vertical bus
- 63 in. (1,600 mm) panel height to 2,000 A
- 72 in. (1,829 mm) for 3,000 A
- 72 in. (1,829 mm) maximum single row circuit breaker mounting space
- 117 in. (2,972 mm) maximum double row circuit breaker mounting space
- 1,200 A maximum circuit breaker

**QMB Distribution Section with Neutral**

- 3,000 A maximum vertical bus
- Plated aluminum or copper vertical bus
- 72 in. (1,829 mm) of switch mounting space
- 30–400 A QMB switches mount in 36 in. (914 mm) wide section
- 30–1,200 A QMB switches mount in 42 in. (1,067 mm) wide section
Layout Instructions

All dimensions and arrangements shown in this manual are for estimating purposes only and may change without notice due to changes in equipment design. Certified drawings showing the arrangement and dimensions of any switchboard can be supplied by Schneider Electric upon request.

All section depths shown are considered minimum for most switchboard arrangements. However, due to complicated equipment or bussing arrangements, it is sometimes necessary to increase the switchboard depth beyond that indicated in this manual.

Schneider Electric cannot supply switchboards with smaller dimensions than those considered by the company to be the minimum necessary to (1) obtain satisfactory operation or (2) permit ease of installation of the switchboard with reasonable effort by the customer.

For quick layout drawings, see pages 23–26.

Layout Selection Procedure

When determining a layout for Power-Style switchboards, use the following procedure:

1. Determine the physical location of the switchboard and the connected loads it is to supply.
2. Make a single-line diagram of the components.
3. Determine the bus rating required and the minimum ratings for the switchboard (based on voltage, available short circuit current, and load).
4. If equipment is a service entrance switchboard, coordinate with the power company regarding feeder equipment and metering provisions.
5. Determine method of incoming power (I-Line busway, cable, etc.), and select the main device.
6. Determine utility and/or customer metering, if necessary.
7. Decide on branch devices to use; select from branch device section.
8. Determine any special cubicle or bussing features.
9. Sketch a front elevation, including single-line locations.
10. Write specifications or ordering information.
11. Provide cable lug details and conduit entry/exit location for mains and feeders.
Incoming Connections

**Line-side lug connections** are available for single main devices, bussed auxiliary sections, utility compartments, I-Line distribution sections, and quick connect generator switchboards. Lugs or studs can be provided as required.

**Transformer connections** are available for Power-Dry II™, Power-Cast II™, Uni-Cast II™, and liquid-filled transformers. These connections require a switchboard depth of 54 or 60 in. (1,372 or 1,524 mm). For more information on dimensions and equipment alignment, see catalog # 6020CT9401, **Power-Zone® Load Center Unit Substations**.

**Busway connections** are available with a flanged collar (Qwik Flange™) or flanged end. Qwik Flange is available for NEMA Type 1, top feed only. They are available for aluminum bus from 800–4,000 A and for copper bus from 800–5,000 A. For more details on busway, see catalog # 5600CT9101, **Busway Systems**.

**Connect to existing**—To add a section to an existing switchboard, the following is required:
- Factory order number from the nameplate of the existing switchboard
- Location of the through bus for the adjacent section: top, middle, or bottom
- Bus bar size if 2,000 A or smaller: 1.5 or 2.0 in. (38 or 51 mm)
- Depth of through bus from the front of the switchboard: 19.5, 27.5, or 36.0 in. (495, 699, or 914 mm)

**Special connections** are available for Model 6 motor control centers. Contact your local Schneider Electric representative for more information.

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### Auxiliary Section information

<table>
<thead>
<tr>
<th>Ampacity (A)</th>
<th>Width</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>800–2,000</td>
<td>24 in. (610 mm)</td>
<td>24 in. (610 mm)</td>
</tr>
<tr>
<td>2,500</td>
<td>30 in. (762 mm)</td>
<td>36 in. (914 mm)</td>
</tr>
<tr>
<td>3,000</td>
<td>36 in. (914 mm)</td>
<td>36 in. (914 mm)</td>
</tr>
<tr>
<td>4,000</td>
<td>42 in. (1,067 mm)</td>
<td>48 in. (1,219 mm)</td>
</tr>
<tr>
<td>5,000</td>
<td>48 in. (1,219 mm)</td>
<td>48 in. (1,219 mm)</td>
</tr>
</tbody>
</table>

**NOTE:** Requires an auxiliary section.

### Fire Pump Lugs

<table>
<thead>
<tr>
<th>Options</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>#10-2/0 per phase and neutral</td>
<td></td>
</tr>
<tr>
<td>#6-350 kcmil per phase and neutral</td>
<td></td>
</tr>
</tbody>
</table>

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**Structure Modifications**

- Auxiliary section—bussed or unbussed
- Barriers between sections (steel or non-conductive)
- Bottom closure plate
- Corner sections (≤ 2,500 A), loadside wireway section and rear wireway (for LTM only)
- Corrosion resistant base channels (standard for NEMA Type 3R)
- Drip hood (NEMA Type 1; not available for NEMA Type 3R)
- Hinged rear doors (must have rear access)
- Increased depth and width (for increased wire bending space)
- Interior lights and GFI receptacle for NEMA Type 3R enclosure
- Mimic nameplate (anodized aluminum or plastic)
- Paint—ANSI 49 (standard), ANSI 61, or special (contact your local Schneider Electric representative)
- Pullbox (NEMA Type 1 enclosure only)
- Reduced height sections—76.5 in. (requires longer lead time)
- Rodent barrier (standard on NEMA Type 3R)
- SIS control wire
- Strip heater and thermostat
- Surge arrestor

For additional options, please contact your local Schneider Electric representative.
Customer Metering

PowerLogic® Power Monitoring and Control

NOTE: Please refer to www.powerlogic.com for a complete and up-to-date list of feature availability. Some features are optional.

For available configurations/placement options for power meters, circuit monitors, and ION meters, see page 12. For additional clarification, contact your local Schneider Electric representative.

Power Meter

<table>
<thead>
<tr>
<th>Class</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3020</td>
<td>PM-820</td>
<td>Power meter module with display 0.25% accuracy with logging, alarms, I/O modules</td>
</tr>
<tr>
<td></td>
<td>PM-850</td>
<td>Same as PM-820 plus trending/forecasting, steady state waveform capture</td>
</tr>
<tr>
<td></td>
<td>PM-870</td>
<td>Same as PM-850 plus disturbance waveform capture, sag/swell metering</td>
</tr>
</tbody>
</table>

Circuit Monitors

<table>
<thead>
<tr>
<th>Class</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3020</td>
<td>CMDLC</td>
<td>Liquid crystal display used for both circuit monitors</td>
</tr>
<tr>
<td></td>
<td>CMDVF</td>
<td>Upgrade to vacuum fluorescent display with infrared port</td>
</tr>
<tr>
<td></td>
<td>CM4250</td>
<td>Multi-function, digital instrumentation, data acquisition, control device, cycle-by-cycle event recording</td>
</tr>
<tr>
<td></td>
<td>CM4000T</td>
<td>Same as CM4250 plus transient voltage monitoring, flicker IEC 61000-4-15</td>
</tr>
</tbody>
</table>

ION 7550/7650 Meters

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S7550A0C0B6A0A0A</td>
<td>Basic unit: Integrated display, instrumentation, power quality, waveform capture, one RS232/RS485 port, one RS-485 jack, one Type 2 optical port, eight digital inputs, four digital outputs, and three onboard relays</td>
</tr>
<tr>
<td>S7550A0C0B6E0A0A</td>
<td>Basic unit plus Ethernet</td>
</tr>
<tr>
<td>S7650A0C0B6A0A0A</td>
<td>Basic unit plus additional ION7650 features</td>
</tr>
<tr>
<td>S7650A0C0B6E0A0A</td>
<td>Basic unit plus Ethernet and additional ION7650 features</td>
</tr>
<tr>
<td>S7650A0C0B6C1A0A</td>
<td>Basic unit plus Ethernet, internal modem, and additional ION7650 features</td>
</tr>
<tr>
<td>S7650B1C0B6C1A0A</td>
<td>Basic unit plus Ethernet, 1,024 samples/cycle instead of 512, 10 MB of logging instead of 5 MB, internal modem, and additional ION7650 features</td>
</tr>
</tbody>
</table>

Input/Output Modules

<table>
<thead>
<tr>
<th>Class</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3020</td>
<td>IOC44</td>
<td>I/O card with 4 status in, 3 relay out, and 1 KYZ out</td>
</tr>
<tr>
<td></td>
<td>IOX2411</td>
<td>I/O extender module with 4 DC status inputs, 2 DC digital outputs, and 1 analog output</td>
</tr>
<tr>
<td></td>
<td>IOX0404</td>
<td>I/O extender module with 4 status inputs and 4 analog inputs</td>
</tr>
<tr>
<td></td>
<td>IOX08</td>
<td>I/O extender module with 8 status inputs (120 Vac)</td>
</tr>
<tr>
<td></td>
<td>IOX</td>
<td>I/O extender module only, no installed I/O</td>
</tr>
<tr>
<td></td>
<td>PM8-ECC</td>
<td>Ethernet communications card with HTML capabilities for PM8 family</td>
</tr>
<tr>
<td></td>
<td>ECC21</td>
<td>Ethernet communications card with HTML capabilities, for CM3/4 family</td>
</tr>
<tr>
<td>Not applicable</td>
<td>PM8M2222</td>
<td>2 digital outputs, 2 digital inputs, 2 analog outputs, and 2 analog inputs</td>
</tr>
<tr>
<td></td>
<td>PM8M26</td>
<td>2 digital outputs and 6 digital inputs</td>
</tr>
<tr>
<td></td>
<td>PM822</td>
<td>2 digital outputs and 2 digital inputs</td>
</tr>
</tbody>
</table>

Instrument Transformer Requirements ¹

<table>
<thead>
<tr>
<th>Device</th>
<th>1PH3W 120/240 V</th>
<th>3PH3W Delta</th>
<th>3PH4W Wye</th>
<th>3PH4W Delta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit monitor</td>
<td>2 CTs, 1 CPT</td>
<td>3 CTs</td>
<td>3 CTs</td>
<td>3 CTs</td>
</tr>
<tr>
<td>Power meter</td>
<td>2 CTs, 1 CPT</td>
<td>3 CTs</td>
<td>3 CTs</td>
<td>3 CTs</td>
</tr>
<tr>
<td>Ion meter ²</td>
<td>2 CTs, 2 PTs</td>
<td>3 CTs</td>
<td>3 CTs</td>
<td>3 CTs</td>
</tr>
</tbody>
</table>

¹ Drawout circuit breakers require three CTs for all voltages.
² CPT is not required for 240 V Delta.
³ PTs are necessary only when Canadian Standards Association (CSA) certification is required.
Transparent Ready® Equipment (TRe)

Network Communications

One or more “intelligent devices” such as circuit monitors, circuit breakers, or relays are wired in an RS-485 daisy-chain network as a basis for all Transparent Ready Equipment (TRe). In some cases, the web server is external or reserved for the future. In this case, the RS-485 communications are wired to a terminal block for the end user.

In TRe-1 and TRe-2, HTML web pages designed specifically for the power equipment lineup are loaded into the equipment at the factory. In the past, this type of functionality required the development of “custom” HTML pages by an integrator or an HTML-savvy end user. Today, Schneider Electric pre-defines the most popular web pages and provides these “custom” HTML web pages as part of our standard offer.

TRe-1 (with ECC)

Some TRe-1 applications require the use of a PowerLogic® circuit monitor, Series 3000 or 4000, and an Ethernet communications card (ECC) that slides into an option slot of the circuit monitor. CM3000 and CM4000 circuit monitors with ECC have been available in most Square D® brand power equipment since July 2002.

Other TRe-1 applications require the use of a Series 800 PowerLogic power meter and an ECC (PM8ECC). PM800 power meters with PM8ECC have been available in most Square D brand power equipment since January 2008.

TRe-1 and TRe-2 (with EGX)

Some TRe-1 and all TRe-2 use a PowerLogic EGX (Ethernet communications gateway) to provide real-time power equipment lineup data. Ethernet gateways have been available in Square D brand power equipment since 1995.
Power-Style® QED-2 Low Voltage Switchboards
General and Application Information

Customer Metering

Metering Configurations (mains shown are non-EUSERC)

- Masterpact NW with Circuit Monitor
- Masterpact NW with Power Meter
- PowerPact R-frame with Circuit Monitor
- PowerPact R-frame with Power Meter
- Power Meter for I-Line Circuit Breakers in 24 in. (610 mm) Wide Auxiliary Section

Circuit monitors and ION meters require an instrument compartment. Power meters can be mounted with the main.

The I-Line mounting assembly for a PowerLogic power meter requires 7.5 in. (191 mm) of mounting space. (The mounting assembly does not connect to the bus stack.)

A CPT also requires 7.5 in. (191 mm) of mounting space.

Parts List

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9 in. SKRU bottom shelf</td>
</tr>
<tr>
<td>2</td>
<td>7.5 in. door assembly</td>
</tr>
<tr>
<td>3</td>
<td>I-Line 7.5 in. back pan</td>
</tr>
<tr>
<td>4</td>
<td>Bottom shelf</td>
</tr>
<tr>
<td>5</td>
<td>Barrier</td>
</tr>
<tr>
<td>6</td>
<td>Mounting bracket (not visible because of barrier)</td>
</tr>
</tbody>
</table>
Electronic Trip Systems

M-frame circuit breakers are available with the ET 1.0 electronic trip system. P-frame and R-frame circuit breakers are available with either the ET1.0I basic electronic trip system or the Micrologic electronic trip system. The Masterpact NW (stored energy) circuit breakers are available with the Micrologic electronic trip system. The sensing system responds to the flow of current through the circuit breaker.

Thermal Imaging

The thermal imaging function protects the cables or bus bars from overheating in case of low amplitude repetitive faults. Such overheating can be due to repetitive motor starting, fluctuating load, intermittent ground faults, or subsequent closing after a fault. Traditional electronic protection does not protect against repetitive faults because the duration of each overload above the pickup setting is too short to achieve effective tripping. Nevertheless, each overload involves a temperature rise in the installation, the cumulative effect of which could lead to overheating of the system.

The thermal imaging function remembers and integrates the thermal heating caused by each pickup setting overrun. Before tripping, the integrated heating value reduces the associated time delay and, therefore, the reaction of the trip unit is closer to the real heating of the power network system. After tripping, the function will also reduce the time delay when closing the circuit breaker on an overload.

True RMS Current Sensing

The sensing system responds to the flow of current through the circuit breaker. The trip unit samples the current waveform to provide true RMS protection through the 15th harmonic. This true RMS sensing gives accurate values for the magnitude of a non-sinusoidal waveform. Therefore, the heating effects of harmonically distorted waveforms are accurately evaluated.

The Micrologic H trip unit provides additional sampling of the waveforms to measure and provide waveform capture of harmonic distortion to the 31st harmonic.

ET Trip System

ET trip units are available with M-, P-, and R-frame UL/IEC circuit breakers. The trip units are not field-interchangeable and do not accept any communications or other trip unit accessories. The trip system uses a set of current transformers (called CTs or sensors) to sense current, a trip unit to evaluate the current, and a tripping solenoid to trip the circuit breaker.

ET1.0 (M-Frame only)

The ET1.0 trip system is available on M-frame circuit breakers and is equipped with fixed long-time and adjustable instantaneous (LI) tripping functions only. The long-time pickup is 1.0 x sensor rating (In), while the instantaneous pickup is adjustable (dial settings from 2–10 x In) with no intentional time delay.

ET1.0I (P-Frame and R-Frame only)

The ET1.0I trip system is available on both P-frame and R-frame circuit breakers and is equipped with fixed long-time and adjustable instantaneous (LI) tripping functions only. The long-time pickup is 1.0 x sensor rating (In), while the instantaneous pickup is adjustable (dial settings from 1.5–12 x In) with no intentional time delay.

ET1.0M (P-Frame only)

The ET1.0M trip system is only available on P-frame motor circuit protectors and provides protection for short circuit conditions only. The trip unit has a single adjustment for instantaneous pickup that, if exceeded, trips the circuit breaker with no intentional delay. Instantaneous trip dial settings are 2–16 x In for 600 A circuit breakers and 1.5–12 x In for 800–1,200 A circuit breakers.
Micrologic® Electronic Trip Systems

All Masterpact NW circuit breakers are equipped with the Micrologic trip system as standard. The P-frame and R-frame electronic trip circuit breakers can be equipped with the optional Micrologic trip systems listed in the following table.

### Micrologic Trip Systems

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Micrologic Basic Trip Unit</td>
<td>3.0</td>
<td>5.0</td>
<td>—</td>
</tr>
<tr>
<td>Micrologic A Trip Unit</td>
<td>3.0A</td>
<td>5.0A</td>
<td>6.0A</td>
</tr>
<tr>
<td>Micrologic P Trip Unit</td>
<td>—</td>
<td>5.0P</td>
<td>6.0P</td>
</tr>
<tr>
<td>Micrologic H Trip Unit</td>
<td>—</td>
<td>5.0H</td>
<td>6.0H</td>
</tr>
</tbody>
</table>

Trip units are designed to protect power circuits and loads. Micrologic trip systems use a set of current transformers (called CTs or sensors) to sense current, a trip unit to evaluate the current, and a tripping solenoid to trip the circuit breaker. Adjustable rotary switches on the trip unit allow the user to set the proper overcurrent or equipment ground-fault current protection required in the electrical system. If current exceeds a set value for longer than its set time delay, the trip system opens the circuit breaker. Alarms can be programmed for remote indications. Measurements of current, voltage, frequency, power, and power quality optimize continuity of service and energy management.

Integration of protection functions in the Application Specific Integrated Circuit (ASIC) electronic component used in all Micrologic trip units guarantees a high degree of reliability and immunity to conducted or radiated disturbances. On Micrologic P and H trip units, an independent microprocessor manages the advanced functions.

Circuit breakers are shipped with the trip unit long-time pickup switch set at 1.0 and all other trip unit adjustments set at their lowest settings. A qualified consultant or plant engineer must determine the actual settings required for a specific application. A coordination study is recommended to provide coordination between all circuit breakers in the distribution system.
## Micrologic Trip Unit Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Micrologic Trip Unit (X = Standard Feature O = Available Option)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard</td>
</tr>
<tr>
<td></td>
<td>3.0</td>
</tr>
<tr>
<td>Field-Installable</td>
<td>X</td>
</tr>
<tr>
<td>LI</td>
<td>X</td>
</tr>
<tr>
<td>LSIG</td>
<td>X</td>
</tr>
<tr>
<td>LSIG/Ground-Fault Trip</td>
<td>X</td>
</tr>
<tr>
<td>Ground-Fault Alarm/No Trip</td>
<td>X</td>
</tr>
<tr>
<td>Ground-Fault Alarm and Trip</td>
<td>X</td>
</tr>
<tr>
<td>Adjustable Rating Plugs</td>
<td>X</td>
</tr>
<tr>
<td>True RMS Sensing</td>
<td>X</td>
</tr>
<tr>
<td>UL Listed</td>
<td>X</td>
</tr>
<tr>
<td>Thermal Imaging</td>
<td>X</td>
</tr>
<tr>
<td>Phase-Loading Bar Graph</td>
<td>X</td>
</tr>
<tr>
<td>LED for Long-Time Pick-Up</td>
<td>X</td>
</tr>
<tr>
<td>LED for Trip Indication</td>
<td>X</td>
</tr>
<tr>
<td>Digital Ammeter</td>
<td>X</td>
</tr>
<tr>
<td>Zone-Selective Interlocking</td>
<td>X</td>
</tr>
<tr>
<td>Communications</td>
<td>O</td>
</tr>
<tr>
<td>LCD Dot Matrix Display</td>
<td>X</td>
</tr>
<tr>
<td>Advanced User Interface</td>
<td>X</td>
</tr>
<tr>
<td>Protective Relay Functions</td>
<td>X</td>
</tr>
<tr>
<td>Neutral Protection</td>
<td>X</td>
</tr>
<tr>
<td>Contact Wear Indication</td>
<td>X</td>
</tr>
<tr>
<td>Incremental Fine Tuning of Settings</td>
<td>X</td>
</tr>
<tr>
<td>Selectable Long-Time Delay Bands</td>
<td>X</td>
</tr>
<tr>
<td>Power Measurement</td>
<td>X</td>
</tr>
<tr>
<td>Power Quality Measurements</td>
<td>X</td>
</tr>
<tr>
<td>Waveform Capture</td>
<td>X</td>
</tr>
</tbody>
</table>

1 Requires neutral current transformer on 3-phase, 4-wire circuits.
2 Requires M6C Programmable Contact Module.
3 Not available for 2.0A trip unit as upstream devices.

## Rating Plugs for Micrologic 3.0, 5.0, 6.0, 7.0 A/P/H Trip Units

<table>
<thead>
<tr>
<th>Standard</th>
<th>Option</th>
<th>Settings (Tolerance 1.05-1.2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL/ANSI</td>
<td>Plug A</td>
<td>0.40 - 0.45 - 0.50 - 0.60 - 0.63 - 0.67 - 0.70 - 0.80 - 0.90 - 1.0</td>
</tr>
<tr>
<td></td>
<td>Plug B</td>
<td>0.40 - 0.44 - 0.50 - 0.56 - 0.63 - 0.70 - 0.75 - 0.88 - 0.95 - 1.0</td>
</tr>
<tr>
<td></td>
<td>Plug C</td>
<td>0.42 - 0.50 - 0.53 - 0.58 - 0.67 - 0.75 - 0.83 - 0.95 - 1.0</td>
</tr>
<tr>
<td></td>
<td>Plug D</td>
<td>0.40 - 0.48 - 0.64 - 0.70 - 0.80 - 0.90 - 0.93 - 0.95 - 1.0</td>
</tr>
<tr>
<td></td>
<td>Plug E</td>
<td>0.60 - 0.70 - 0.75 - 0.80 - 0.85 - 0.90 - 0.93 - 0.95 - 1.0</td>
</tr>
<tr>
<td></td>
<td>Plug F</td>
<td>0.84 - 0.86 - 0.88 - 0.90 - 0.92 - 0.94 - 0.96 - 0.98 - 1.0</td>
</tr>
<tr>
<td></td>
<td>Plug G</td>
<td>0.66 - 0.68 - 0.70 - 0.72 - 0.74 - 0.76 - 0.78 - 0.80 - 0.82</td>
</tr>
<tr>
<td></td>
<td>Plug H</td>
<td>0.48 - 0.50 - 0.52 - 0.54 - 0.56 - 0.58 - 0.60 - 0.62 - 0.64</td>
</tr>
</tbody>
</table>
Individually Mounted Circuit Breakers

Main or Branch Circuit Breaker Selection

Individually Mounted Mains

Electronic Trip Molded Case Circuit Breakers
- MG, MJ, PG, PK, PJ, PL

Micrologic Electronic Trip Molded Case Circuit Breakers

For more information, see catalog # 0612CT0101, *PowerPact M-frame, P-frame, R-frame and NS630b-NS3200 Electronic Trip Circuit Breakers.*

Individually Mounted Circuit Breakers

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>% rated</th>
<th>Frame Size</th>
<th>Ampacity Range (A)</th>
<th>SCCR (x 1,000)</th>
<th>Dimensions</th>
<th>Line/Load Lug Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>240 V</td>
<td>480 V</td>
<td>600 V</td>
<td>Width (W)</td>
</tr>
<tr>
<td>MG</td>
<td>80%</td>
<td>800</td>
<td>400–800</td>
<td>65</td>
<td>35</td>
<td>18</td>
</tr>
<tr>
<td>MJ</td>
<td></td>
<td>65</td>
<td>100</td>
<td>65</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>PG</td>
<td>100%</td>
<td>1,200</td>
<td>500–1,200</td>
<td>65</td>
<td>35</td>
<td>18</td>
</tr>
<tr>
<td>PG-C</td>
<td></td>
<td></td>
<td>100</td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>PK</td>
<td>80%</td>
<td></td>
<td></td>
<td>100</td>
<td>65</td>
<td>25</td>
</tr>
<tr>
<td>PK-C</td>
<td>100%</td>
<td></td>
<td></td>
<td>125</td>
<td>100</td>
<td>25</td>
</tr>
<tr>
<td>PJ</td>
<td>80%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PJ-C</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PL</td>
<td>80%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PL-C</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RG</td>
<td>80%</td>
<td>2,500</td>
<td>500–2,500</td>
<td>65</td>
<td>35</td>
<td>18</td>
</tr>
<tr>
<td>RG-C</td>
<td>100%</td>
<td></td>
<td></td>
<td>65</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>RK</td>
<td>80%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RK-C</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RJ</td>
<td>80%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RJ-C</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RL</td>
<td>80%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RL-C</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Optional lugs may be available. Contact your local Schneider Electric or distributor representative for more information.
2. "D" represents the NEMA Type 1 dimension. For NEMA Type 3R construction, add 11.50 in. (292 mm) to the depth in front and 0.50 in. (13 mm) to the depth in rear. Increased depth is required for lug in/lug out on the same side. For PowerPact M- and P-frame circuit breakers, the depth increases to 48 in. (1,219 mm); for PowerPact R-frame, the depth increases to 60 in. (1,524 mm).

Available Accessories/Options
- Shunt trip
- Undervoltage trip
- Control power transformer (if 120 V control source is not available)
- Auxiliary switches
- Alarm switch
- Key interlock
- Cylinder lock
- Electrical operator (for MG, MJ, PG, PK, PJ, PL)
- Phase failure with capacitor trip
- Padlock attachment

Additional Accessories and Trip Unit Options for Micrologic Trip Circuit Breakers
- Universal test set
- Ground fault push-to-test feature, factory wired for 120 Vac
- Zone selective interlocking interface
- 24 Vdc power supply
  (Powers the trip unit. Required for harmonic trip unit; recommended for ammeter and power trip unit.)

Trip Unit Options
- LI, LS, LSI, LIG, LSG, LSIG


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17/2009

Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com
Individually Mounted Mains and Feeders

Masterpact NW (Stored Energy) Circuit Breakers

For more information, see catalog # 0613CT0001, Masterpact NT/NW Universal Power Circuit Breakers.

UL489 and UL 1066 (ANSI Rated)—100% Rated Stationary or Drawout Mounted

<table>
<thead>
<tr>
<th>Frame Size</th>
<th>Dimensions</th>
<th>Line/Load Lug Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Width (W)</td>
<td>Depth (D)¹</td>
</tr>
<tr>
<td>800</td>
<td></td>
<td>36 in. (914 mm)</td>
</tr>
<tr>
<td>1,600</td>
<td></td>
<td>36 in. (914 mm)</td>
</tr>
<tr>
<td>2,000</td>
<td></td>
<td>36 in. (914 mm)</td>
</tr>
<tr>
<td>2,500</td>
<td></td>
<td>42 in. (1,067 mm)</td>
</tr>
<tr>
<td>3,000</td>
<td></td>
<td>42 in. (1,067 mm)</td>
</tr>
<tr>
<td>4,000 ²</td>
<td></td>
<td>42 in. (1,067 mm)</td>
</tr>
<tr>
<td>5,000 ²</td>
<td></td>
<td>42 in. (1,067 mm)</td>
</tr>
</tbody>
</table>

¹ “D” represents the NEMA Type 1 dimension. For NEMA Type 3R construction, add 11.50 in. (292 mm) to the depth in front and 0.50 in. (13 mm) to the depth in rear.
² Use ANSI type for fixed-mounted 4,000 A and 5,000 A NW.

Available Accessories ¹

- Additional auxiliary switches—up to 12
- Spring charging motor
- Shunt trip
- Shunt close
- Undervoltage trip with or without time delay
- Key interlock
- Padlock attachment
- Phase failure with capacitor trip
- Communications—wired or unwired
- Operations counter
- Transparent breaker cover
- Electric reset
- Programmable contact module—2 or 6 contacts
- Open/Close push-button lock
- Drawout breaker shutter
- Shutter padlock
- Shutter position indicator
- Cradle cell key interlock
- Masterpact test kit
- Circuit breaker lifting and transport truck

¹ Contact your local Schneider Electric representative for additional accessories.

UL 489 Breaker Ratings for Masterpact NW

<table>
<thead>
<tr>
<th>Breaker Type ¹</th>
<th>RMS Sym. Amperes (in thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>240 V</td>
</tr>
<tr>
<td>WL1, YL1</td>
<td>66</td>
</tr>
<tr>
<td>WL3, YL3</td>
<td>85</td>
</tr>
<tr>
<td>WL7, YL7 ²</td>
<td>200</td>
</tr>
</tbody>
</table>

¹ WL1, WL3, WL7: 800–3,000 A
YL1, YL3, YL7: 4,000–5,000 A
² WL7 and YL7 are only available in drawout construction.

UL 1066 (ANSI Rated) Breaker Ratings for Masterpact NW

<table>
<thead>
<tr>
<th>Breaker Type ¹</th>
<th>RMS Sym. Amperes (in thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>240 V</td>
</tr>
<tr>
<td>WA2</td>
<td>42</td>
</tr>
<tr>
<td>WA4, YA4</td>
<td>65</td>
</tr>
<tr>
<td>WA5, YA5</td>
<td>85</td>
</tr>
<tr>
<td>WA6, YA6</td>
<td>100</td>
</tr>
<tr>
<td>WA8, YA8 ²</td>
<td>200</td>
</tr>
</tbody>
</table>

¹ WA2, WA4, WA8: 800–3,200 A
WA5, WA6: 800–4,000 A
YA4, YA8: 4,000–5,000 A
YA5, YA6: 5,000 A
² WA8 and YA8 are not available in stationary mount.

See pages 13-15 for details on Electronic Trip Systems for Masterpact NW circuit breakers.
Stacked Devices

<table>
<thead>
<tr>
<th>Device Type</th>
<th>Maximum System Ampacity (A)</th>
<th>Maximum C/B Rating (A)</th>
<th>Minimum Section Width (in.)</th>
<th>Minimum Section Depth (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MG, MJ, PG, PJ, PK, PL</td>
<td>2,500</td>
<td>1,200</td>
<td>1,200</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>3,000</td>
<td>3,000</td>
<td>3,000</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>4,000</td>
<td>4,000</td>
<td>4,000</td>
<td>48</td>
</tr>
<tr>
<td>RG, RJ, RK, RL</td>
<td>2,500</td>
<td>1,200</td>
<td>2,500</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>3,000</td>
<td>2,000</td>
<td>2,000</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>4,000</td>
<td>2,000</td>
<td>2,000</td>
<td>48</td>
</tr>
<tr>
<td>Masterpact NW (fixed mounted)</td>
<td>3,000</td>
<td></td>
<td></td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>4,000</td>
<td></td>
<td></td>
<td>48</td>
</tr>
<tr>
<td>Masterpact NW (drawout)</td>
<td>3,000</td>
<td></td>
<td></td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>4,000</td>
<td></td>
<td></td>
<td>48</td>
</tr>
</tbody>
</table>

1 Cannot stack different device types. For example, MG/PG is acceptable, but PG/RG is not. NWF and NWD cannot be stacked together.

Load Lug Information

<table>
<thead>
<tr>
<th>Circuit Breaker</th>
<th>Ampacity (A)</th>
<th>Quantity (per phase)</th>
<th>Lug Size (kcmil)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PowerPact M- and P-frame</td>
<td>800</td>
<td>3</td>
<td>3/0 - 500</td>
</tr>
<tr>
<td></td>
<td>1,200</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,200</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>PowerPact R-frame</td>
<td>1,600</td>
<td>5</td>
<td>3/0 - 600</td>
</tr>
<tr>
<td></td>
<td>2,000</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>800</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Masterpact NW</td>
<td>1,200</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,600</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2,000</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>
Underground Pull Sections (UGPS) and Main Sections

Underground Pull Sections

<table>
<thead>
<tr>
<th>Ampacity (A)</th>
<th>Dimensions</th>
<th>Main Lug Information¹</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Width (W)</td>
<td>Depth (D)²</td>
</tr>
<tr>
<td>400–800</td>
<td>30 in. (762 mm)</td>
<td>24 in. (610 mm)</td>
</tr>
<tr>
<td>1,000–1,200</td>
<td>36 in. (914 mm)</td>
<td>36 in. (914 mm)</td>
</tr>
<tr>
<td>1,600</td>
<td>42 in. (1,067 mm)</td>
<td>48 in. (1,219 mm)</td>
</tr>
<tr>
<td>2,000</td>
<td>48 in. (1,219 mm)</td>
<td>48 in. (1,219 mm)</td>
</tr>
<tr>
<td>2,500</td>
<td>48 in. (1,219 mm)</td>
<td>48 in. (1,219 mm)</td>
</tr>
<tr>
<td>3,000</td>
<td>48 in. (1,219 mm)</td>
<td>48 in. (1,219 mm)</td>
</tr>
<tr>
<td>4,000</td>
<td>48 in. (1,219 mm)</td>
<td>48 in. (1,219 mm)</td>
</tr>
</tbody>
</table>

¹ Lugs or studs are provided, based on utility requirements.
² “D” represents NEMA Type 1 dimension without rear wireway. For NEMA Type 3R construction, add 11.50 in. (292 mm) to depth in front, and 0.50 in. (13 mm) to depth in rear.

Main Sections (Split Bus)¹
For Reverse Feed Mains, see page 21.

<table>
<thead>
<tr>
<th>Type</th>
<th>Ampacity (A)</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Width (W)</td>
<td>Depth (D)</td>
</tr>
<tr>
<td>Circuit Breaker Mains</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>2,500</td>
<td>42 in. (1,067 mm)</td>
</tr>
<tr>
<td>NW</td>
<td>3,000</td>
<td>48 in. (1,219 mm)</td>
</tr>
<tr>
<td>Fusible Main Switches—Fuse Type L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BP</td>
<td>2,000–2,500</td>
<td>48 in. (1,219 mm)</td>
</tr>
<tr>
<td></td>
<td>3,000</td>
<td>48 in. (1,219 mm)</td>
</tr>
<tr>
<td></td>
<td>4,000</td>
<td>48 in. (1,219 mm)</td>
</tr>
</tbody>
</table>

¹ For split-bus mains < 2,000 A, contact your local Schneider Electric representative.

PowerPact R-frame Short Circuit Current Ratings (SCCR)

<table>
<thead>
<tr>
<th>Voltage</th>
<th>RG</th>
<th>RK</th>
<th>RJ</th>
<th>RL</th>
</tr>
</thead>
<tbody>
<tr>
<td>240 V</td>
<td>65 kA</td>
<td>65 kA</td>
<td>100 kA</td>
<td>100 kA</td>
</tr>
<tr>
<td>480 V</td>
<td>35 kA</td>
<td>65 kA</td>
<td>65 kA</td>
<td>100 kA</td>
</tr>
</tbody>
</table>
Individually Mounted Circuit Breakers

Main or Branch Circuit Breaker Selection (EUSERC)
EUSERC = Electric Utility Service Equipment Requirements Committee

Individually Mounted Mains

Electronic Trip Molded Case Circuit Breakers
- MG, MJ, PG, PK, PJ, PL

Micrologic Electronic Trip Molded Case Circuit Breakers

For more information, see catalog # 0612CT0101, PowerPact M-frame, P-frame, R-frame and NS630b-NS3200 Electronic Trip Circuit Breakers.

Reverse Feed Mains ¹

Breaker Type ² 
<table>
<thead>
<tr>
<th>Ampacity (A) ³</th>
<th>SCCR (kA)</th>
<th>Dimensions</th>
<th>Main Lug Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>MG 400–800</td>
<td>65</td>
<td>36 in. (914 mm)</td>
<td>1 (400 A) 2 (600 A) 3 (800 A)</td>
</tr>
<tr>
<td>MJ 100</td>
<td>65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PG 1,000–1,200</td>
<td>65</td>
<td>24 in. (610 mm)</td>
<td>4</td>
</tr>
<tr>
<td>PK 65</td>
<td>65</td>
<td>42 in. (1,067 mm)</td>
<td></td>
</tr>
<tr>
<td>PJ 125</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PL 125</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RG 1,600–2,000</td>
<td>65</td>
<td></td>
<td>5 (1,600 A) 6 (2,000 A)</td>
</tr>
<tr>
<td>RK 125</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RJ 125</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RL 125</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹ A power meter can be mounted with the main, but a circuit monitor or Surge Protective Device (SPD) requires a trailing auxiliary section.
² P- and R-frame circuit breakers are available with a 100% rating. To order, add -C to the end of the breaker type, for example, RK-C.
³ Salt River Project (SRP) and Imperial Irrigation District (IID) are limited to 1,000 A maximum for reverse feed.
⁴ “D” represents the NEMA Type 1 dimension. For NEMA Type 3R construction, add 11.50 in. (292 mm) to the depth in front and 0.50 in. (13 mm) to the depth in rear.

Available Accessories/Options
- Shunt trip
- Undervoltage trip
- Control power transformer (if 120 V control source is not available)
- Auxiliary switches
- Alarm switch
- Key interlock
- Cylinder lock
- Electrical operator (for MG, MJ, PG, PK, PJ, PL)
- Phase failure with capacitor trip
- Padlock attachment (standard on EUSERC applications)

Additional Accessories and Trip Unit Options for Micrologic Trip Circuit Breakers
- Universal test set
- Ground fault push-to-test feature, factory wired for 120 Vac
- Zone selective interlocking interface
- 24 Vdc power supply
  (Powers the trip unit. Required for harmonic trip unit; recommended for ammeter and power trip unit.)

Trip Unit Options
- LI, LS, LSI, LIG, LSG, LSIG

Group Mounted Main or Branch Circuit Breakers

Thermal Magnetic/Electronic Trip Molded Case Circuit Breakers

- FA, FH, HD, HG, HJ, HL, QB, QD, QG, QJ, JD, JG, JJ, JL, LA, LH, LC, LI
For more information, see catalog # 0601CT9101, Thermal-Magnetic / Magnetic Only Circuit Breakers.

Electronic Trip Molded Case Circuit Breakers

- MG, MJ, PG, PK, PJ, PL
For more information, see catalog # 0612CT0101, PowerPact M-frame, P-frame, R-frame and NS630b-NS3200 Electronic Trip Circuit Breakers.

Micrologic Electronic Trip Molded Case Circuit Breakers

For more information, see catalog # 0612CT0101, PowerPact M-frame, P-frame, R-frame and NS630b-NS3200 Electronic Trip Circuit Breakers.

Group Mounted I-Line Circuit Breakers

<table>
<thead>
<tr>
<th>Breaker Type</th>
<th>% rated</th>
<th>Frame Size</th>
<th>Ampacity Range (A)</th>
<th>SCCR (x 1,000)</th>
<th>Mounting Height (inches)</th>
<th>Load Lug Information ¹</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>240 V</td>
<td>480 V</td>
<td>600 V</td>
<td>3P</td>
<td>2P</td>
</tr>
<tr>
<td>FA (240 V)</td>
<td>80%</td>
<td>100</td>
<td>15–100</td>
<td>10</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>FA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25</td>
<td>18</td>
</tr>
<tr>
<td>FH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>65</td>
<td>25</td>
</tr>
<tr>
<td>HD</td>
<td></td>
<td>150</td>
<td>15–150</td>
<td>25</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>HG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>85</td>
<td>35</td>
</tr>
<tr>
<td>HJ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100</td>
<td>65</td>
</tr>
<tr>
<td>HL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>125</td>
<td>100</td>
</tr>
<tr>
<td>QB</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>QD</td>
<td></td>
<td>225</td>
<td>70–225</td>
<td>25</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>QG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>QJ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>JD</td>
<td></td>
<td>250</td>
<td>150–250</td>
<td>25</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>JG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>85</td>
<td>35</td>
</tr>
<tr>
<td>JJ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100</td>
<td>65</td>
</tr>
<tr>
<td>JL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>125</td>
<td>100</td>
</tr>
<tr>
<td>LA</td>
<td></td>
<td>400</td>
<td>125–400</td>
<td>42</td>
<td>30</td>
<td>22</td>
</tr>
<tr>
<td>LH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>65</td>
<td>35</td>
</tr>
<tr>
<td>LC</td>
<td></td>
<td>600</td>
<td>300–600</td>
<td>100</td>
<td>65</td>
<td>35</td>
</tr>
<tr>
<td>LI</td>
<td></td>
<td>800</td>
<td>300–800</td>
<td>85</td>
<td>35</td>
<td>18</td>
</tr>
<tr>
<td>MG</td>
<td></td>
<td>1,200</td>
<td>100–1,200</td>
<td>65</td>
<td>35</td>
<td>18</td>
</tr>
<tr>
<td>MJ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100</td>
<td>65</td>
</tr>
<tr>
<td>PG</td>
<td></td>
<td>2,500</td>
<td>240–1,200</td>
<td>65</td>
<td>35</td>
<td>18</td>
</tr>
<tr>
<td>PK</td>
<td>100%*</td>
<td></td>
<td></td>
<td></td>
<td>100</td>
<td>65</td>
</tr>
<tr>
<td>PK-C</td>
<td>100%*</td>
<td></td>
<td></td>
<td></td>
<td>100</td>
<td>65</td>
</tr>
<tr>
<td>PJ</td>
<td>100%*</td>
<td></td>
<td></td>
<td></td>
<td>125</td>
<td>100</td>
</tr>
<tr>
<td>PJ-C</td>
<td>100%*</td>
<td></td>
<td></td>
<td></td>
<td>125</td>
<td>100</td>
</tr>
<tr>
<td>PL</td>
<td>100%*</td>
<td></td>
<td></td>
<td></td>
<td>100</td>
<td>65</td>
</tr>
<tr>
<td>PL-C</td>
<td>100%*</td>
<td></td>
<td></td>
<td></td>
<td>100</td>
<td>65</td>
</tr>
<tr>
<td>RG-C</td>
<td>100%*</td>
<td></td>
<td></td>
<td></td>
<td>125</td>
<td>100</td>
</tr>
<tr>
<td>RK-C</td>
<td>100%*</td>
<td></td>
<td></td>
<td></td>
<td>125</td>
<td>100</td>
</tr>
<tr>
<td>RJ-C</td>
<td>100%*</td>
<td></td>
<td></td>
<td></td>
<td>125</td>
<td>100</td>
</tr>
<tr>
<td>RL-C</td>
<td>100%*</td>
<td></td>
<td></td>
<td></td>
<td>125</td>
<td>100</td>
</tr>
</tbody>
</table>

¹ Optional lugs are available. Contact your local Schneider Electric representative.
² Can't group mount 100% rated 1,000 A and 1,200 A PowerPact P- and R-frame circuit breakers.

For I-Line interior selection and section dimensions, see page 23.

Group-Mounted Interiors (all sections have a minimum depth of 24 in. unless noted)

Full-Height I-Line Distribution Sections (For conduit area, see page 40.)

<table>
<thead>
<tr>
<th>Width (W)</th>
<th>Max. C/B Frame (A)</th>
<th>Max. C/B Frame (A)</th>
<th>Max. C/B Frame (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>36 in.</td>
<td>Q: 250 F: 100</td>
<td>R: 1,200</td>
<td>R: 1,200</td>
</tr>
<tr>
<td>42 in.</td>
<td>L: 600 J,Q: 250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>48 in.</td>
<td>R: 1,200 J,Q: 250</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mounting space: L = 54 in.  R = 63 in.  Mounting space = 54 in.

Combination Main or UCT and I-Line Distribution Sections *

<table>
<thead>
<tr>
<th>Width (W)</th>
<th>Max. C/B Frame (A)</th>
<th>Max. C/B Frame (A)</th>
<th>Max. C/B Frame (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>36 in.</td>
<td>J,Q: 250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42 in.</td>
<td>L: 600 J,Q: 250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>48 in.</td>
<td>R: 1,200 J,Q: 250</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mounting space = 36 in.  Mounting space = 36 in.  Mounting space = 63 in.

* With unknown loading, the minimum ampacity of the interior bus is as follows per UL 891: 1 device = 100% of rating; 2–3 devices = 80% of sum of ratings; 4–6 devices = 70% of sum of ratings; 7–12 devices = 60% of sum of ratings; over 12 devices = 50% of sum of ratings.

** The main can be on top or bottom, depending on the feed direction. The distribution is at the opposite end.
## Auxiliary Sections, NEMA Utility, and Individually Mounted Mains

### Bussed Auxiliary Sections

<table>
<thead>
<tr>
<th>Ampacity (A)</th>
<th>Width (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>800–2,000</td>
<td>24 in.</td>
</tr>
<tr>
<td>2,500</td>
<td>36 in.</td>
</tr>
<tr>
<td>3,000–4,000</td>
<td>42 in.</td>
</tr>
<tr>
<td>5,000</td>
<td>48 in.</td>
</tr>
</tbody>
</table>

### NEMA Full Height Utility Compartment

<table>
<thead>
<tr>
<th>Ampacity (A)</th>
<th>Width (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>400–1,200</td>
<td>36 in.</td>
</tr>
<tr>
<td>1,600–4,000</td>
<td>42 in.</td>
</tr>
</tbody>
</table>

### PowerPact M, P, and R

<table>
<thead>
<tr>
<th>Type</th>
<th>Ampacity (A)</th>
<th>Width (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>800</td>
<td>30 in.</td>
</tr>
<tr>
<td>P</td>
<td>1,200</td>
<td>42 in.</td>
</tr>
<tr>
<td>R</td>
<td>2,500</td>
<td>48 in.</td>
</tr>
</tbody>
</table>

### Individually Mounted Mains

<table>
<thead>
<tr>
<th>Ampacity (A)</th>
<th>Width (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>800–2,000</td>
<td>36 in.</td>
</tr>
<tr>
<td>4,000–5,000</td>
<td>48 in.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ampacity (A)</th>
<th>Depth (D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>800–2,000</td>
<td>36 in.</td>
</tr>
<tr>
<td>2,500–3,000</td>
<td>42 in.</td>
</tr>
</tbody>
</table>

### Masterpact NW

<table>
<thead>
<tr>
<th>Ampacity (A)</th>
<th>Width (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,200</td>
<td>30 in.</td>
</tr>
<tr>
<td>2,000</td>
<td>36 in.</td>
</tr>
</tbody>
</table>

### BP Switch

<table>
<thead>
<tr>
<th>Ampacity (A)</th>
<th>Width (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,200</td>
<td>42 in.</td>
</tr>
</tbody>
</table>

**NOTE:** All drawout NW circuit breakers are 48 in. (1,219 mm) deep.

## Stacked Mains

### PowerPact M and P

<table>
<thead>
<tr>
<th>Max. C/B Rating (A)</th>
<th>Width (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top 1,200</td>
<td>30 in. (762 mm)</td>
</tr>
<tr>
<td>Bottom 1,200</td>
<td></td>
</tr>
</tbody>
</table>

### PowerPact R

<table>
<thead>
<tr>
<th>Max. C/B Rating (A)</th>
<th>Width (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top 1,200</td>
<td>36 in. (914 mm)</td>
</tr>
<tr>
<td>Bottom 2,500</td>
<td></td>
</tr>
</tbody>
</table>

### Masterpact NW

<table>
<thead>
<tr>
<th>Max. C/B Rating (A)</th>
<th>Width (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top 2,000</td>
<td>36 in. (914 mm)</td>
</tr>
<tr>
<td>Bottom 2,000</td>
<td></td>
</tr>
</tbody>
</table>

### BP Switch

<table>
<thead>
<tr>
<th>Max. Fusible Rating (A)</th>
<th>Top</th>
<th>Bottom</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,000</td>
<td></td>
<td>1,600</td>
</tr>
</tbody>
</table>

## Depth Dimensions

<table>
<thead>
<tr>
<th>System Ampacity (A)</th>
<th>Depth ¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>400–2,500</td>
<td>24 in. (610 mm)</td>
</tr>
<tr>
<td>3,000</td>
<td>36 in. (914 mm)</td>
</tr>
<tr>
<td>4,000–5,000</td>
<td>48 in. (1,219 mm)</td>
</tr>
</tbody>
</table>

For NEMA Type 3R (outdoor) construction, add 11.50 in. (292 mm) to depth in front and 0.50 in. (13 mm) to depth in rear.

¹ For NEMA Type 3R (outdoor) construction, add 11.50 in. (292 mm) to depth in front and 0.50 in. (13 mm) to depth in rear.
Quick Layout Guide

Power-Style® QED-2 Low Voltage Switchboards
General and Application Information

Tie Devices

Masterpact NW and PowerPact R Tie
PowerPact P Tie
BP Switch Tie

Depth Dimensions

<table>
<thead>
<tr>
<th>System Ampacity (A)</th>
<th>Depth ¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>400–2,500</td>
<td>24 in. (610 mm)</td>
</tr>
<tr>
<td>3,000</td>
<td>36 in. (914 mm)</td>
</tr>
<tr>
<td>4,000–5,000</td>
<td>48 in. (1,219 mm)</td>
</tr>
</tbody>
</table>

Close-Coupled to Transformer

<table>
<thead>
<tr>
<th>Ampacity (A)</th>
<th>Depth ¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 4,000</td>
<td>54 in. (1,372 mm)</td>
</tr>
<tr>
<td>5,000</td>
<td>60 in. (1,524 mm)</td>
</tr>
</tbody>
</table>

¹ For NEMA Type 3R (outdoor) construction, add 11.50 in. (292 mm) to depth in front and 0.50 in. (13 mm) to depth in rear.

Group Mounted Fusible and Lever Bypass CMM

QMB Distribution
BP Combo with QMB Distribution
Commercial Multi-Metering (CMM) Lever Bypass

Maximum Switch Ampacity (A) | Width (W) | Interior Ampacity (A) |
-----------------------------|-----------|----------------------|
400                          | 36 in. (914 mm) | 2,000                 |
1,200                        | 42 in. (1,067 mm) | 3,000                 |
(2) 1,200                    | 48 in. (1,219 mm) | 3,000                 |

2,000 A max.
(1,600 A max. if BP switch is at top)
### EUSERC Switchboards

#### UGPS and Utility/Main Combination Sections

**Reverse Feed Utility Compartment**

<table>
<thead>
<tr>
<th>Ampacity (A)</th>
<th>Width (W)</th>
<th>Ampacity (A)</th>
<th>Width (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000</td>
<td>36 in.</td>
<td>400–800</td>
<td>30 in.</td>
</tr>
<tr>
<td>1,200–2,000</td>
<td>42 in.</td>
<td>1,000–1,200</td>
<td>36 in.</td>
</tr>
<tr>
<td>2,500–3,000</td>
<td>48 in.</td>
<td>1,500–2,000</td>
<td>42 in.</td>
</tr>
<tr>
<td>4,000</td>
<td>54 in.</td>
<td>2,500–4,000</td>
<td>48 in.</td>
</tr>
</tbody>
</table>

*Requires bottom-feed, full-height UGPS.*

**Combination Utility Compartment / PowerPact M and P**

**Combination Utility Compartment / PowerPact R**

**Combination Utility Compartment / Masterpact NW**

**Combination Utility Compartment / BP Fusible Switch**

#### Reverse Feed Mains and CMM

**Individually Mounted, Reverse Feed Mains**

<table>
<thead>
<tr>
<th>Type</th>
<th>Maximum Ampacity (A)</th>
<th>Width (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>800</td>
<td>36 in.</td>
</tr>
<tr>
<td>P</td>
<td>1,200</td>
<td>42 in.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Maximum Ampacity (A)</th>
<th>Width (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>2,500</td>
<td>42 in.</td>
</tr>
</tbody>
</table>

**Commercial Multi-Metering (CMM)**

- **6-socket Section**
- **3-socket Section**

<table>
<thead>
<tr>
<th>Ampacity (A)</th>
<th>Width (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>800–1,600</td>
<td>42 in.</td>
</tr>
</tbody>
</table>
## Individually Mounted Fusible Switches

### Fusible Switch Selection (non-EUSERC)

#### BP Main and Branches

**Individually Mounted Bolt-Loc Type BP Switches (100% Rated)**

<table>
<thead>
<tr>
<th>Switch Type</th>
<th>Switch Rating (A)</th>
<th>Mounting Height</th>
<th>Section Dimensions</th>
<th>Main Lug Size (kcmil)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Middle</td>
<td>Top</td>
<td>Bottom</td>
</tr>
<tr>
<td><strong>Bolt-Loc Type BP</strong></td>
<td><strong>Rated 100 kA</strong></td>
<td></td>
<td>36 in. (914 mm)</td>
<td>36 in. (914 mm)</td>
</tr>
<tr>
<td>Fuse Type L</td>
<td>800–1,600</td>
<td>45 in. (1,144 mm)</td>
<td>N/A</td>
<td>45 in. (1,144 mm)</td>
</tr>
<tr>
<td>2,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2,500</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Stacked Devices

<table>
<thead>
<tr>
<th>Device Type</th>
<th>Maximum Switch Ampacity (A)</th>
<th>Section Width (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BP</td>
<td>2,000</td>
<td>36 in. (914 mm)</td>
</tr>
<tr>
<td></td>
<td>1,600</td>
<td></td>
</tr>
</tbody>
</table>

#### Load Lug Information

<table>
<thead>
<tr>
<th>Switch Ampacity (A)</th>
<th>Quantity (per phase)</th>
<th>Lug Size (kcmil)</th>
</tr>
</thead>
<tbody>
<tr>
<td>800</td>
<td>3</td>
<td>3/0 - 500</td>
</tr>
<tr>
<td>1,200</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>1,600</td>
<td>5</td>
<td>3/0 - 600</td>
</tr>
<tr>
<td>2,000</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

#### Depth Dimensions

<table>
<thead>
<tr>
<th>System Ampacity (A)</th>
<th>Depth 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>400–2,500</td>
<td>24 in. (610 mm)</td>
</tr>
<tr>
<td>3,000</td>
<td>36 in. (914 mm)</td>
</tr>
<tr>
<td>4,000</td>
<td>48 in. (1,219 mm)</td>
</tr>
</tbody>
</table>

1 For NEMA Type 3R (outdoor) construction, add 11.50 in. (292 mm) to depth in front, and 0.50 in. (13 mm) to depth in rear.

#### Fusible Switch Accessories
- Electric trip—requires CPT or 120 Vac external power
- Control power transformer
- Capacitor trip power supply
- Blown main fuse detector—requires electric trip and 120 Vac power source for tripping switch
- Phase monitor—for voltage imbalance, low voltage, or phase reversal
- Schneider Electric key interlock
- Unfused switch
- Auxiliary switch
- Zone selective interlocking interface
- Ground fault push-to-test interface
- Padlock attachment

#### Reverse Feed Fusible Mains

<table>
<thead>
<tr>
<th>Type</th>
<th>Ampacity (A)</th>
<th>Fuse Type</th>
<th>SCCR</th>
<th>Width (W)</th>
<th>Main Lug Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCS</td>
<td>400–800</td>
<td>J, T</td>
<td>240/480 V</td>
<td>36 in. (914 mm)</td>
<td>3 #3/0-750</td>
</tr>
<tr>
<td></td>
<td>800</td>
<td>L</td>
<td>100 kA</td>
<td>42 in. (1,067 mm)</td>
<td>4 #3/0-750</td>
</tr>
<tr>
<td>BP</td>
<td>800–1,600</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 MCS = molded case switch.

For additional information or clarification on Type BP fusible switches, see instruction bulletin # 9810-1, Bolt-Loc Type BP Switches, Series 2, or contact your local Schneider Electric representative.
QMB/QMJ Main and Branches

Short circuit rating of QMB/QMJ switches and panel is equal to the lowest fuse interrupting rating to be installed in the switches. Fuses are not included.

DC ratings available on 2-pole switches only. For dc short circuit current rating, contact the fuse manufacturer.

A twin fusible switch equipped with a blank cannot be equipped with a fusible switch in the future.

Section Options

- Full height single main with distribution. See the “Single Main Fusible Switch” table below for feeder mounting availability.
- Full height distribution: 72 in. of QMB/QMJ mounting.
- BP switch main in combination with partial height distribution (400 A maximum): 30 in. of QMB/QMJ mounting.
- Utility compartment in combination with group mounted multiple main QMB/QMJ switches (400 A maximum): 30 in. of QMB/QMJ mounting. See the “Utility Compartment with QMB/QMJ Switches” table below.
- See switch mounting requirements in the “Group Mounted Switches” table on page 29.

Single Main Fusible Switch—Up to 600 Vac or 250 Vdc Maximum

<table>
<thead>
<tr>
<th>Switch Type</th>
<th>Ampere Rating (A)</th>
<th>Class H, J, R, or L Fuse Provisions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>QMB Feeder Mounting (Inches)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Size (Inches) Top Feed Bottom Feed</td>
</tr>
<tr>
<td>Single switch</td>
<td>400</td>
<td>25.5 in. (648 mm) 46.5 in. (1,181 mm) 45 in. (1,143 mm)</td>
</tr>
<tr>
<td></td>
<td>600 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>800</td>
<td></td>
</tr>
</tbody>
</table>

1 100,000 A short circuit current rating with Class R fuses to 600 Vac.

Utility Compartment with QMB/QMJ Switches 1

<table>
<thead>
<tr>
<th>CT Comp. Maximum (A)</th>
<th>Mains Maximum 800 A</th>
<th>Total Mounting Space</th>
<th>Minimum Width (W)</th>
<th>Pull Section Left or Right Bottom Entry</th>
<th>Line Lug Information (per phase)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>QMB/QMJ</td>
<td>30 in. (762 mm)</td>
<td>36 in. (914 mm)</td>
<td>30 in. (762 mm) 36 in. (914 mm)</td>
<td>Quantity Size (kcmil)</td>
</tr>
<tr>
<td>400–600</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 #3/0 - 750</td>
</tr>
<tr>
<td>800</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>1,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

1 Not available with non-EUSERC utilities.
### Group Mounted Fusible Switches

#### Mounting Height (H)

<table>
<thead>
<tr>
<th>Ampere Rating (A)</th>
<th>240 Vac / 250 Vdc max</th>
<th>600 Vac / 250 Vdc max</th>
<th>Load Lug Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>QMB (per phase)</td>
<td>QMJ (per phase)</td>
<td>Quantity (per phase)</td>
</tr>
<tr>
<td>Twin switch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 - 30</td>
<td>4.5 in. (114 mm)</td>
<td>4.5 in. (114 mm)</td>
<td>QMB</td>
</tr>
<tr>
<td>30 - 60</td>
<td></td>
<td>6 in. (152 mm)</td>
<td>QMJ</td>
</tr>
<tr>
<td>30 - 100</td>
<td></td>
<td>7.5 in. (191 mm)</td>
<td>—</td>
</tr>
<tr>
<td>60 - 60</td>
<td>4.5 in. (114 mm)</td>
<td>6 in. (152 mm)</td>
<td>QMB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 - Blank</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 - 100</td>
<td></td>
<td>7.5 in. (191 mm)</td>
<td>QMJ</td>
</tr>
<tr>
<td>100 - 100</td>
<td>6 in. (152 mm)</td>
<td>6 in. (152 mm)</td>
<td>—</td>
</tr>
<tr>
<td>100 - Blank</td>
<td></td>
<td>7.5 in. (191 mm)</td>
<td>—</td>
</tr>
<tr>
<td>200 - 200</td>
<td>9 in. (229 mm)</td>
<td>7.5 in. (191 mm)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>QMB</td>
</tr>
<tr>
<td>Single switch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>9 in. (229 mm)</td>
<td>9 in. (229 mm)</td>
<td>—</td>
</tr>
<tr>
<td>400</td>
<td>15 in. (381 mm)</td>
<td>9 in. (229 mm)</td>
<td>—</td>
</tr>
<tr>
<td>600</td>
<td>15 in. (381 mm)</td>
<td>15 in. (381 mm)</td>
<td>—</td>
</tr>
<tr>
<td>800</td>
<td>15 in. (381 mm)</td>
<td>15 in. (381 mm)</td>
<td>—</td>
</tr>
<tr>
<td>1,200</td>
<td>24 in. (610 mm)</td>
<td>24 in. (610 mm)</td>
<td>—</td>
</tr>
</tbody>
</table>

1. Use 600 Vac size for QMB with Class J fuse provisions.
2. 100,000 A short circuit current rating with Class R fuses to 600 Vac.
3. 1,200 A is a branch switch or group mounted six disconnect main with Class L fuses. This switch is suitable for use on systems to 600 Vac maximum at 100,000 A rms. A single main switch 1,200 A must be a Bolt-Loc switch (see page 27).

---

**Group Mounted Switches**

<table>
<thead>
<tr>
<th>Width (W)</th>
<th>Max. Switch Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>36 in. (914 mm)</td>
<td>400 A</td>
</tr>
<tr>
<td>42 in. (1,067 mm)</td>
<td>1,200 A</td>
</tr>
<tr>
<td>48 in. (1,219 mm)</td>
<td>(2) 1,200 A</td>
</tr>
</tbody>
</table>
U.S. Utilities (Non-EUSERC)

The Utilities listed are the only ones for which Schneider Electric Design Engineering currently maintains records. They are available in full height or in combination with a PowerPact M-, P-, or R-frame main breaker, or BP fusible switch unless stated. Widths are shown for each group.

AEP Group—all 42 in. wide
- American Electric Power (OH)
- Appalachian Power Company (VA)
- Columbus Southern Power (OH)
- Holy Cross Energy (CO)
- Indiana and Michigan Power (IN)
- Kansas City Power & Light Company (MO)
- Kentucky Power Company (KY)
- Kingsport Power Company (TN)
- Ohio Power Company (OH)
- Wheeling Power Company (WV)

Full Height Only (no combo)—all 42 in. wide
- Indianapolis Power & Light Company (IN) ¹
- Louisville Gas and Electric Company (KY) ¹
- Virginia Electric Power Company (VA) ¹

Baltimore Gas & Electric ¹, ²—all 42 in. wide

CILCO Group—all 36 in. wide
- Central Illinois Light Company (IL)
- Commonwealth Edison Company (IL)
- Detroit Edison Company (MI)
- Metropolitan Edison Company (PA)
- Xcel Energy Inc (MN)

NEMA Group—36 in. wide up to 1,200 A, 42 in. wide over 1,200 A
- Cincinnati Gas & Electric (OH)
- Dayton Power & Light Company (OH)
- Fort Collins, City of (CO)
- NEMA Standard Design

Cold Sequence Utilities
- New York State Electric & Gas Corp. (NY)—all 42 in. wide
- Niagara Mohawk Power (NY)—all 42 in. wide
- Northeast Utilities (CT)—all 36 in. wide

Unlisted Utilities

There are two ways to have utility compartments built for utility companies that are not listed.

1. The unlisted utility company has no specific design, and just a bussed compartment in the service entrance equipment is required for installing CTs.

   For this application, select the listed utility company that best meets the unlisted utility requirements and provide the name of the unlisted utility company. Schneider Electric will build the utility compartment to the design standards of the listed utility selected. The “record” drawings will show the name of the unlisted utility.

2. The unlisted utility has a specific design and does not allow deviation.

   For this application, custom design and fabrication are required. The specific utility requirements will have to be provided for pricing and design.

Definitions

Cold Sequence Metering—In cold sequence metering, the main disconnecting device is placed ahead of (on the line side of) the current transformer compartment. In this arrangement, the current transformer compartment can be de-energized by switching the main circuit breaker to the OFF position.

Hot Sequence Metering—In hot sequence metering, the main disconnecting device is placed behind (on the load side of) the current transformer compartment. In this arrangement, the current transformer compartment is always energized.
EUSERC Utilities


Reverse Feed Utility Compartment

<table>
<thead>
<tr>
<th>Ampacity (A)</th>
<th>Width (W)</th>
<th>Depth (D)</th>
<th>Incoming Lug Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>400</td>
<td>36</td>
<td>24</td>
<td>1</td>
</tr>
<tr>
<td>600</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>800</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>1,000</td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>1,200</td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>1,600</td>
<td>42</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>2,000</td>
<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>2,500</td>
<td>48</td>
<td>36</td>
<td>9</td>
</tr>
<tr>
<td>3,000</td>
<td>54</td>
<td>48</td>
<td>12</td>
</tr>
<tr>
<td>4,000</td>
<td></td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

1 "D" represents the NEMA Type 1 dimension. For NEMA Type 3R construction, add 11.50 in. (292 mm) to the depth in front and 0.50 in. (13 mm) to the depth in rear.

2 Lugs or studs are provided based on utility requirements.

Utility/Main Combination Sections

1 Restrictions:
Lugs Out—Max 2,000 A circuit breaker or 1,200 A BP fusible switch
Through Bus Out—Up to 4,000 A for circuit breaker or BP fusible switch

2 Requires bottom-feed, full-height UGPS.
Large Tenant Mains > 400–2,000 A

Circuit Breaker Ratings and Section Dimensions

<table>
<thead>
<tr>
<th>Type 1</th>
<th>Ampacity (A)</th>
<th>SCCR</th>
<th>Dimensions</th>
<th>Load Lug Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>240 V</td>
<td>480 V</td>
<td>Width (W)</td>
</tr>
<tr>
<td>MG</td>
<td>400–800</td>
<td>65 kA</td>
<td>35 kA</td>
<td>30 in. (762 mm)</td>
</tr>
<tr>
<td>MJ</td>
<td></td>
<td>100 kA</td>
<td>65 kA</td>
<td></td>
</tr>
<tr>
<td>PG</td>
<td>1,000–1,200</td>
<td>65 kA</td>
<td>35 kA</td>
<td></td>
</tr>
<tr>
<td>PK</td>
<td></td>
<td>65 kA</td>
<td>50 kA</td>
<td></td>
</tr>
<tr>
<td>PJ</td>
<td></td>
<td>100 kA</td>
<td>65 kA</td>
<td></td>
</tr>
<tr>
<td>PL</td>
<td></td>
<td>100 kA</td>
<td>100 kA</td>
<td></td>
</tr>
<tr>
<td>RG</td>
<td>1,600–2,000</td>
<td>65 kA</td>
<td>35 kA</td>
<td></td>
</tr>
<tr>
<td>RK</td>
<td></td>
<td>65 kA</td>
<td>65 kA</td>
<td></td>
</tr>
<tr>
<td>RJ</td>
<td></td>
<td>100 kA</td>
<td>65 kA</td>
<td></td>
</tr>
<tr>
<td>RL</td>
<td></td>
<td>100 kA</td>
<td>100 kA</td>
<td></td>
</tr>
</tbody>
</table>

¹ P- and R-frame circuit breakers are available with a 100% rating. To order, add -C to the end of the breaker type, for example, RK-C.

² "D" represents NEMA Type 1 dimension without rear wireway. For rear wireway add 12 in. (305 mm) to depth. For NEMA Type 3R construction, add 11.50 in. (292 mm) to depth in front, and 0.50 in. (13 mm) to depth in rear.

Fusible Switch Ratings and Section Dimensions

<table>
<thead>
<tr>
<th>Type</th>
<th>Ampacity (A)</th>
<th>SCCR</th>
<th>Dimensions</th>
<th>Load Lug Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>240/480 V</td>
<td>Width (W)</td>
<td>Depth (D)¹</td>
</tr>
<tr>
<td></td>
<td></td>
<td>J, T</td>
<td>100 kA</td>
<td>30 in. (762 mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>L</td>
<td>800</td>
<td>36 in. (914 mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>800-1,600</td>
<td>36 in. (914 mm)</td>
<td></td>
</tr>
</tbody>
</table>

¹ "D" represents NEMA Type 1 dimension without rear wireway. For rear wireway add 12 in. (305 mm) to depth. For NEMA Type 3R construction, add 11.50 in. (292 mm) to depth in front, and 0.50 in. (13 mm) to depth in rear.

² MCS = molded case switch

³ Not available with load lugs, only available with load through bus.

Top Exit of Load Cables for Large Tenant Main (LTM)

A loadside wireway section with a minimum width of 12 in. (305 mm) can be used for top exit of load cables. A 12 in. (305 mm) wide section can only accommodate cables for one LTM. A minimum width of 24 in. (610 mm) is required between two LTMs and for NEMA Type 3R applications. Rear load wireway is only available for LTMs; it requires 12 in. (305 mm) of increased depth for other sections in the lineup.

For conduit area, see page 40.
EUSERC Meter Section—Tenant Mains ≤ 200 A (Hot Sequence)

### Circuit Breaker Ratings

<table>
<thead>
<tr>
<th>Type</th>
<th>Ampacity (A)</th>
<th>SCCR Information 1</th>
<th>Load Lug Information 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAL</td>
<td>60–100</td>
<td>22 kA 18 kA</td>
<td>#12 - 1/0 AWG Al or Cu</td>
</tr>
<tr>
<td>FHL</td>
<td>100–150</td>
<td>65 kA 65 kA</td>
<td>#4 - 3/0 kcmil Al or Cu</td>
</tr>
<tr>
<td>HJL</td>
<td>175–200</td>
<td>22 kA 18 kA</td>
<td>#4 - 300 kcmil Al or Cu</td>
</tr>
<tr>
<td>HGL</td>
<td>65–100</td>
<td>65 kA 35 kA</td>
<td></td>
</tr>
<tr>
<td>HLL</td>
<td>100–150</td>
<td>100 kA 100 kA</td>
<td></td>
</tr>
<tr>
<td>JDL</td>
<td>175–200</td>
<td>22 kA 18 kA</td>
<td>#4 - 300 kcmil Al or Cu</td>
</tr>
<tr>
<td>JGL</td>
<td>65–100</td>
<td>65 kA 35 kA</td>
<td></td>
</tr>
<tr>
<td>JLL</td>
<td>100–150</td>
<td>100 kA 100 kA</td>
<td></td>
</tr>
<tr>
<td>QDL</td>
<td>110–200</td>
<td>22 kA N/A</td>
<td></td>
</tr>
<tr>
<td>QGL</td>
<td>65–100</td>
<td>65 kA N/A</td>
<td></td>
</tr>
<tr>
<td>QJL</td>
<td>100–150</td>
<td>100 kA N/A</td>
<td></td>
</tr>
</tbody>
</table>

1 Neutral lug terminations are #6 - 350 kcmil.

2 A shunt trip is not available for PowerPact Q-frame circuit breakers.

### Fusible Pullout Ratings

<table>
<thead>
<tr>
<th>Type</th>
<th>Ampacity (A)</th>
<th>SCCR</th>
<th>Load Lug Information 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTL3100</td>
<td>100</td>
<td>100 kA N/A</td>
<td>#14 - 1/0 AWG</td>
</tr>
<tr>
<td>FTL3200</td>
<td>200</td>
<td>100 kA N/A</td>
<td>#4 - 250 kcmil</td>
</tr>
<tr>
<td>FTL43060</td>
<td>60</td>
<td>N/A</td>
<td>#14 - #2</td>
</tr>
<tr>
<td>FTL43100</td>
<td>100</td>
<td>100 kA N/A</td>
<td>#14 - 1/0 AWG</td>
</tr>
<tr>
<td>FTL43200</td>
<td>200</td>
<td>N/A</td>
<td>1/0 AWG - 300 kcmil</td>
</tr>
</tbody>
</table>

### Depth Dimensions

<table>
<thead>
<tr>
<th>System Ampacity (A)</th>
<th>Depth 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>400–2,500</td>
<td>24 in. (610 mm)</td>
</tr>
<tr>
<td>3,000</td>
<td>36 in. (914 mm)</td>
</tr>
<tr>
<td>4,000</td>
<td>48 in. (1,219 mm)</td>
</tr>
</tbody>
</table>

1 For NEMA Type 3R (outdoor) construction, add 11.50 in. (292 mm) to depth in front, and 0.50 in. (13 mm) to depth in rear.

### Top Exit of Load Cables

Tenant metering sections come standard with a front accessible loadside wireway in each section for routing of load cables for top exit. Rear load wireway is not required for top exit applications.
Lever Bypass Meter Section—Tenant Mains ≤ 200 A (Hot and Cold Sequence)

### Circuit Breaker Ratings

<table>
<thead>
<tr>
<th>Type</th>
<th>Ampacity (A)</th>
<th>240 V</th>
<th>480 V</th>
<th>Load Lug Information ¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAL</td>
<td>60–100</td>
<td>22 kA</td>
<td>18 kA</td>
<td>#12 - 1/0 AWG Al or Cu</td>
</tr>
<tr>
<td>FHL</td>
<td>100–200</td>
<td>65 kA</td>
<td>65 kA</td>
<td></td>
</tr>
<tr>
<td>HJL</td>
<td>110–150</td>
<td>100 kA</td>
<td>100 kA</td>
<td></td>
</tr>
<tr>
<td>HCL</td>
<td>175–200</td>
<td>65 kA</td>
<td>35 kA</td>
<td></td>
</tr>
<tr>
<td>JDL</td>
<td>22 kA</td>
<td>22 kA</td>
<td>18 kA</td>
<td></td>
</tr>
<tr>
<td>JGL</td>
<td>65 kA</td>
<td>65 kA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JLL</td>
<td>100 kA</td>
<td>100 kA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹ Neutral lug terminations are #6 - 350 kcmil.

### Fusible Pullout Ratings

<table>
<thead>
<tr>
<th>Type</th>
<th>Ampacity (A)</th>
<th>SCCR</th>
<th>Load Lug Information ¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTL43060</td>
<td>60</td>
<td>240 V</td>
<td>100 kA #14 - #2</td>
</tr>
<tr>
<td>FTL43100</td>
<td>100</td>
<td>480 V</td>
<td>100 kA #14 - 1/0 AWG</td>
</tr>
<tr>
<td>FTL43200</td>
<td>200</td>
<td>N/A</td>
<td>100 kA 1/0 AWG - 300 kcmil</td>
</tr>
</tbody>
</table>

### Depth Dimensions

<table>
<thead>
<tr>
<th>System Ampacity (A)</th>
<th>Depth ¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>400–2,500</td>
<td>24 in. (610 mm)</td>
</tr>
<tr>
<td>3,000</td>
<td>36 in. (914 mm)</td>
</tr>
<tr>
<td>4,000</td>
<td>48 in. (1,219 mm)</td>
</tr>
</tbody>
</table>

¹ For NEMA Type 3R (outdoor) construction, add 11.50 in. (292 mm) to depth in front, and 0.50 in. (13 mm) to depth in rear.

#### Top Exit of Load Cables

Tenant metering sections come standard with a front accessible loadside wireway in each section for routing of load cables for top exit. Rear load wireway is not required for top exit applications.
QED-2 Quick Connect Generator Switchboards

The Square D® brand Power-Style® QED-2 Quick Connect Generator Switchboard from Schneider Electric addresses the growing market need for switchboards with quick connect terminals to facilitate connecting generators for temporary back-up power. Common applications include facilities such as nursing homes, hospitals (supplemental equipment not fed by emergency power), and stores with perishable products, that are sensitive to power outages, but typically do not have or require backup power sources.

Customers have become more sensitive to the need for temporary back-up power to reduce the duration of disruptions due to hurricanes, tornadoes, snow storms, brownouts, and other circumstances that can result in prolonged power outages. In these situations, a mobile generator can be brought in to get a facility back on line quickly.

Specifications for Generator Circuit Breaker Section

<table>
<thead>
<tr>
<th>Ampacity (A)</th>
<th>SCCR (Max)</th>
<th>Number of Sections</th>
<th>Width (Inches)</th>
<th>Depth (Inches)</th>
<th>Incoming Generator Lugs Only</th>
<th>Incoming Generator Lugs and Plug-In Receptacles</th>
<th>Terminals Per Phase/Neutral (Lug or Plug-In Receptacle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,200</td>
<td>65 k</td>
<td>1</td>
<td>36</td>
<td>24 or 36</td>
<td>Yes</td>
<td>Yes</td>
<td>3</td>
</tr>
<tr>
<td>1,600</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>2,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>2,500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>3,000</td>
<td>50 k</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>4,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

1 1,200–2,500 A use PowerPact R-frame circuit breakers; 3,000 and 4,000 A use Masterpact NW circuit breakers.

Specifications for Terminal Section (without circuit breakers)

<table>
<thead>
<tr>
<th>Ampacity (A)</th>
<th>SCCR (Max)</th>
<th>Number of Sections</th>
<th>Width (Inches)</th>
<th>Depth (Inches)</th>
<th>Incoming Generator Lugs Only</th>
<th>Incoming Generator Lugs and Plug-In Receptacles</th>
<th>Terminals Per Phase/Neutral (Lug or Plug-In Receptacle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,200</td>
<td>65 k</td>
<td>1</td>
<td>36</td>
<td>24 or 36</td>
<td>Yes</td>
<td>Yes</td>
<td>3</td>
</tr>
<tr>
<td>1,600</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>2,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>2,500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>3,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>4,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>
Sequence of Operation

The nameplate on each Quick Connect Generator circuit breaker section provides complete Sequence of Operation instructions. A one-line diagram clearly shows the key interlock scheme for additional clarification. Both the diagram and instructions are written in English and French. An English version of the diagram and sample instructions are shown below.

Loss of Utility Power

1. Open all distribution breakers.
2. Open the main breaker and rotate the key A1 to lock the breaker in the open position; key is now removable.
3. Remove generator breaker receptacles cover or generator breaker lugs cover.
4. Connect generator cables to either the receptacles or to the generator breaker incoming lugs per the connection sequence label.
5. Verify proper phase and voltage connection.
6. Remove key from the lock and insert it into the lock on the generator breaker.
7. Rotate key A1 to unlock generator breaker; key is now held captive.
8. Start generator.
10. Close generator breaker, close appropriate distribution breakers.

Return of Utility Power

1. Open distribution breakers.
2. Open generator breaker and rotate the key A1 to lock the breaker in the open position; key is now removable.
3. Remove key from the lock and insert into the lock on the main breaker.
4. Shut down generator.
5. Disconnect generator cables per the connection sequence label.
6. Replace all covers.
7. Rotate key A1 to unlock the main breaker; key is now held captive.
8. Close main breaker, close all distribution breakers.

For more information, see data bulletin # 4620DB0701, Power-Style® QED-2 Quick Connect Generator Switchboard, or contact your local Schneider Electric representative.
Surge Protective Devices (SPD)

These devices help protect AC electrical circuits from the effect of lightning-induced currents, substation switching transients, and internally generated transients resulting from inductive or capacitive load switching. They are available in I-Line mount, QMB mount, or individual mount in the instrument compartment.

Common Features

- UL 1449 Recognized, 3rd edition
- Copper internal bus for the SPD
- Individually fused suppression modules
- On-Line diagnostics continuously monitor unit
- Thermal cut-out
- Solid state, bi-directional
- Front panel alarm with test/silence switch
- Front panel operational indicators (LEDs) to indicate loss of protection or circuit fully operational including N-G
- High energy parallel design for Category A, B, and C3 applications
- AC tracking filter with EMI/RFI filtering up to -50 dB from 100 kHz to 100 MHz
- Ratings available (per phase): 100 kA, 120 kA, 160 kA, 200 kA, 240 kA, 320 kA, 480 kA

**NOTE:** 320 kA and 480 kA devices can only be mounted in an instrument compartment. If you have a utility compartment, please contact your local Schneider Electric representative.

Options

- Surge Counter
- Remote Monitor

I-Line Mount SPD

- Comes with circuit breaker disconnect
- Requires 13.5 in. interior mounting space

QMB Mount SPD

- Comes with QMB unit disconnect
- Requires 9 in. of interior mounting space

Instrument Compartment SPD

- Comes with circuit breaker disconnect
- Requires a 19.5 in. instrument compartment

Reducing Impedance with Internal and Integral SPDs

Internal SPDs do not require the extra several feet of conductor used by externally mounted devices. This is key, because every foot of conductor can increase potentially damaging let-through voltage by as much as 160 V.

Integral SPDs are an internal installation where the suppression modules are mounted directly to the phase bus bars. The elimination of cables and their impedance in the SPD connection gives the lowest possible let-through voltage.
Automatic Throwover Systems

General Features

The following features are standard for a Square D® brand automatic throwover system. The standard system features a Modicon® microprocessor, plug-in technology for ease of retrofit/installation, and programmable capability.

Standard Features

<table>
<thead>
<tr>
<th>Description</th>
<th>Main-Tie-Main</th>
<th>Main-Main</th>
<th>Main-Generator</th>
<th>Main-Tie-Generator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic transfer to alternate source, automatic retransfer to normal source</td>
<td>✓</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Automatic transfer to alternate source, manual return normal source</td>
<td>—</td>
<td>✓</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Bypass of retransfer delay if emergency fails</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Electrically interlocked</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Manual circuit breaker close buttons inhibited</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Transition delay (2 seconds), open and closed transition</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Source loss delay (3 seconds), before transfer</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Source stabilization timer (10 seconds) before retransfer</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Undervoltage sensing on both sources, standard 100% nominal, 10% differential, adjustable</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Phase sequence sensing on both sources, 2 cycles</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Phase imbalance, 2%, adjustable</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Phase loss, 68% phase loss</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Auto/manual keyed switch w/ white light for auto and blue light for manual</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Control power transfer</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Full automatic mode with drawout breakers in the test position</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Open (green) / close (red) lighted push buttons</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Test switch—simulates loss of source</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Circuit breaker electrical trip lockout w/ amber light indication</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Uninterruptible power supply for 120 Vac control power</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>UPS bypass relay</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Sources available (white) lights</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Operator interface panel</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Wire labels</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Fused control circuits with individual blown fuse indication</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Over-voltage sensing on generator (59), Standard 125% of nominal, 15% differential, adjustable</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Frequency sensing on generator (81), standard 3 Hz differential, 0.1–3 Hz, adjustable</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Engine start contacts, 5 A @ 120 Vac</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Open transition</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Remote alarm contact wired (system inoperative), 5 A @ 120 Vac</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Generator exercising unloaded, 30 minutes, once per week</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Time delay for engine cool down, 15 minutes unloaded standard</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

NOTES: An automatic throwover system is not approved for use as a transfer switch per UL1008.

Both sources are paralleled during a closed transition. Short circuit contribution is additive from both sources.
## Optional Features

<table>
<thead>
<tr>
<th>Description</th>
<th>Main-Tie-Main</th>
<th>Main-Main</th>
<th>Main-Generator</th>
<th>Main-Tie-Generator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closed transition on retransfer</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Sync check (25), 2-seconds maximum paralleling when sources synchronized</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Voltage 10%–30% adjustable, phase relationship is 6° to 20° and frequency</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Generator exercise with load switch</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Preferred source selector (Left-Off-Right), Left is standard</td>
<td>✓</td>
<td>✓</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Automatic retransfer to normal switch</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Touchscreen HMI</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Remote alarm contact (system inoperative), 5 A @ 120 Vac</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Closed transition on retransfer</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Sync check (25), 2-seconds maximum paralleling when sources synchronized</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Voltage 10%–30% adjustable, phase relationship is 6° to 20° and frequency</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Generator exercise with load switch</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Preferred source selector (Left-Off-Right), Left is Standard</td>
<td>✓</td>
<td>✓</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Automatic retransfer to normal switch</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

The following circuit breaker accessories are required for automatic throwover system:

1. 120 Vac electrical operation (includes shunt close, shunt trip and electrical operator)
2. One set of auxiliary switches (one normally open and one normally closed)
3. Alarm switch (one normally open contact)
4. Cell position switch (one normally open required for drawout circuit breakers)

Automatic throwover systems are complex and can require adjustments during start-up.

## Automatic Transfer Switches

Ratings, standard widths, and depths are not available due to variations between manufacturers. Please contact your local Schneider Electric representative for detailed information.
Conduit Layout

These drawings are valid for all mains, feeders, and distribution sections based on depth and width. For mains and feeders, top conduit area is not available for bottom exit/entry nor is bottom conduit area available for top exit/entry.

Floor Plan

Width (W) 30 in. (762 mm) 36 in. (914 mm) 42 in. (1,087 mm) 48 in. (1,219 mm) 54 in. (1,372 mm)
Width (W1) 25 in. (635 mm) 31 in. (787 mm) 37 in. (940 mm) 43 in. (1,092 mm) 49 in. (1,245 mm)

Conduit area is based on a minimum of 10 in. (254 mm) to any obstruction.

Dimensions given in INCHES (millimeters).
Seismically Qualified Switchboards

Power-Style QED-2 Switchboards have been seismically qualified to meet the seismic provisions of the International Building Code (IBC), California Building Code (CBC) and ASCE/SEI 7 based on triaxial shake table testing following the code recognized test protocol ICC ES AC156. An independent test facility conducted all qualification shake table testing to verify compliance to an $I_p = 1.5$ by verifying post test equipment functionality as required by ASCE 7 for equipment which is part of a seismic designated system.

The shake table earthquake simulation subjected the Power-Style QED-2 test specimens to dynamic demands which can be more severe than the code design earthquake for most locations. A certificate of self certification is available on request from your local Schneider Electric representative. The certificate is based on site specific code defined seismic demand requirements for the installed location information supplied to Schneider Electric.

The qualified QED-2 equipment must be installed, anchored, and restrained in accordance with Schneider Electric installation guidelines (see factory supplied drawings and current instruction manual for additional technical information) and the engineer of record. Anchorage of equipment to the primary building structure is required to validate seismic certification of the equipment. The structural engineer or design engineer of record is responsible for design of the code compliant seismic restraint system for the building equipment. Schneider Electric is not responsible for the specification and performance of seismic restraint and anchorage systems.

Manufacturer’s Certification

As long as the seismic capacity of the equipment exceeds the site-specific demand, a certificate can be generated and issued.

Schneider Electric ensures that code compliance verification is as simple as supplying the job site address. Our certificate clearly states the code requirement and our equipment capability.

This simplicity eliminates the need for the design professional to translate code criteria into an equipment requirement, and then sort out less-than-clear manufacturers’ test results to verify compliance to the site-specific code requirement of the project.

For sample certificate and compliance notes, see pages 42 and 43. Contact your local Schneider Electric representative to obtain a seismic certificate.
Switchboards

The Schneider Electric equipment referenced in this certificate has been qualified to the site-specific requirements of the listed model building code and/or standard. This certification is based on tri-axial shake table test results conducted in accordance with the AC156 test protocol (Acceptance Criteria for Seismic Qualification Testing of Nonstructural Components):


Product Platform: Switchboards
Product Description: QED-2
Product Type: Free Standing

Site-Specific Location: Zip/Postal Code - 89108 with 10 mile/16 km Radius
Code Requirement: F / W = 0.84 G's, (S_D = 0.52)
Equipment Capacity: F / W = 1.96 G's, (S_D = 1.22)
Importance Factor: I = 1.5
Installation Restrictions: None - Ground level or roof level installations permitted

Plot of Tested Equipment vs. Code Acceleration Demand

![Plot of Tested Equipment vs. Code Acceleration Demand](image)

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Certificate

11149
Switchboards

Compliance Notes

1. The site-specific location is defined as the final geographic location of equipment installation. The seismic certification contained herein is valid for equipment installations located within the following US region, state(s), or geographic coordinate: Zip/Postal Code - 89108 With 10 mile/16 km Radius - Lat/Lon (36.211690, -115.220219). For the purpose of this document; the location is defined as a circle centered at the latitude and longitude with the radius indicated.

2. By reference to ASCE 7-05, the 2006 IBC specifies seismic demand requirements for nonstructural equipment in terms of a lateral force coefficient, \( F_P / W_P \). The lateral force coefficient is defined in terms of a site-specific ground spectral acceleration factor, \( S_{DS} \), which varies with geographic location and is adjusted for geotechnical site class effects per Chapter 11 of ASCE 7-05. The lateral force coefficient is also defined in terms of the component amplification factor, \( a_p \), and a maximum value of two-and-a-half (\( a_p = 2.5 \)) is assumed. The maximum \( S_{DS} \) value for Site Class D (code default site class) was determined using the USGS ground motion data, as required by ASCE 7-05, for the specified location(s) and is used as the 2006 IBC requirement for this seismic certification.

3. Equipment capacity was determined from tri-axial seismic shake table test results as defined in the International Code Council (ICC) Acceptance Criteria for Seismic Qualification by Shake-Testing of Nonstructural Components and Systems (AC156). Per Section 13.2.5 of ASCE 7-05, seismic qualification by testing based upon a nationally recognized testing standard procedure, such as ICC ES AC156, shall be deemed to satisfy the design and evaluation requirements provided that the tested seismic capacity equals or exceeds the seismic demands determined in accordance with Sections 13.3.1 and 13.2.2.

4. An equipment importance factor of 1.5 (\( I_P = 1.5 \)) indicates that equipment functionality was verified before and after seismic simulation testing. This importance factor is indicative of critical facilities where maximizing the probability of post event functionality is a priority.

5. Seismic qualification of nonstructural components by Schneider Electric is just one link in the total chain of responsibility required to maximize the probability that the equipment will be intact and functional after a seismic event. During a seismic event the equipment must be able to transfer the loads that are created through the mounting pad and anchorage to the load-bearing path of the building structural system. Anchorage of equipment to the primary building structure is required to validate this seismic certification. The structural engineer or design engineer of record is responsible for detailing the equipment anchorage requirements for the given installation. The installer and manufacturers of the anchorage system are responsible for assuring that the mounting requirements are met. Schneider Electric is not responsible for the specification and performance of anchorage systems.

This document is typical of the seismic certifications available for the referenced product and standards. Actual performance may be configuration dependent. Certificates must be signed and numbered to be valid for construction. Contact your local Schneider Electric representative for additional information or to obtain actual seismic certificates.
Specifications

General

Furnish and install the switchboard(s) as herein specified and shown on the associated electrical drawings. The switchboard(s) shall meet Underwriters Laboratories (UL) requirements and be furnished with a UL service entrance label.

Structures

The switchboard shall be enclosed, dead front, free standing, front and rear aligned with front and rear accessibility. The switchboard shall be NEMA Type (1 General Purpose) (3R Non-Walk-in Outdoor). The framework shall be of UL gauge steel secured together to support all cover plates, bussing, and component devices during shipment and installation. Formed removable closure plates shall be used on the front, rear, and sides. All closure plates are to be single tool, screw removable. Ventilation shall be provided when required. Each section shall include a single-piece removable top plate.

Finish

All painted parts shall be pretreated and provided with a corrosion-resistant, UL Listed acrylic baked paint finish. The paint color shall be ANSI #49 medium light gray per ANSI standard Z55.1-1967. NEMA Type 3R enclosures shall be treated with the same process except that all exterior parts shall be of galvannealed steel. All exterior hardware on NEMA Type 3R enclosures shall be zinc-plated steel.

Ability to Withstand a Fault

The entire switchboard shall be suitable for operation at the specified available fault current. The switchboard shall be labeled to indicate the maximum available fault current rating, taking into account the structure, bussing, switchboard main disconnect(s), and switchboard branch circuit devices. The short circuit current rating of the switchboard(s) shall not be less than _____ rms symmetrical amperes. The switchboard branch circuit devices short circuit current rating shall be fully rated or determined by UL labeled series connected ratings.

Bussing

The switchboard through bus shall be (tin-plated aluminum) (tin-plated copper) (silver-plated copper). The switchboard bussing shall be of sufficient cross-sectional area to meet UL Standard 891 for temperature rise. The through bus shall have a maximum ampacity of (1,200) (1,600) (2,000) (2,500) (3,000) (4,000) (5,000) A and extend the full length of the switchboard. The through bus shall be 100% rated. Provisions shall be provided for future splicing of additional sections from either end. The neutral bus shall be 100% rated.

The switchboard distribution section bus shall be of the same material as the through bus and shall be rated (1,200) (1,600) (2,000) (3,000) A. The distribution section neutral plate shall be of copper provided with Cu/Al lugs for the devices installed and future specified devices. The ground bus shall be sized per UL Standard 891 and be of the same material as the through bus.

Utility Metering Compartments

The switchboard utility metering compartment shall be located in the service entrance section of the switchboard and connected for (hot) (cold) sequence metering. The utility metering compartment shall be (barriered) (unbarriered) and covered with a (single hinged door) (double hinged door) with sealing provisions.
Main Disconnect Devices

The main disconnect device(s) shall be a (molded case circuit breaker) (solid-state trip, molded case circuit breaker) (fused bolted pressure switch). With the main device, (ground fault protection) (with zone interlocking) (undervoltage trip) (phase failure protection) (capacitor trip) (alarm switch) (auxiliary switches) (long time, short time) (long time, short time, instantaneous) shall be provided. Fuses for the bolted pressure switch are to be supplied by the (manufacturer) (user). A PowerLogic (power meter) (circuit monitor) (ION meter) with the appropriate transformers shall be provided, as required.

Group Mounted Branch Devices

The switchboard group-mounted (fusible) (circuit breaker) branch devices are to be front accessible and front connectable. The (fusible) (circuit breaker) connections to the distribution panel bussing shall be of a “blow-on” design such that the connections grip the bus bars firmly under high fault conditions.

Individually Mounted Circuit Breakers

Individually mounted branch circuit breakers shall be of the molded case type and be positioned vertically with the operating handles extending through the hinged front cover plates of the section. Each circuit breaker shall be individually fed by connectors from the main bus of the switchboard.

Surge Protective Device (SPD)

- Listed and Component Recognized in accordance with UL 1449, 3rd edition, to include Section 37.3 highest fault current category. SPD devices shall be UL 1283 listed.
- Provide surge current diversion paths for all modes of protection—L-N, L-G, and N-G—in Wye systems.
- Modular in design. Each mode, including N-G, shall be fused with a 200 kAIR, UL-classified surge-rated fuse and incorporate a thermal cutout device.
- Provide audible diagnostic monitoring by way of audible alarm. Alarm shall activate upon a fault condition. Provide push-to-test switch, and alarm on/off switch to silence alarm.
- If a dedicated breaker for the SPD is not provided, the SPD shall include a UL-classified disconnect switch.
- Meet or exceed the following criteria:
  - Minimum surge current capability (single pulse rated) per phase: (480 kA) (320 kA) (240 kA) (200 kA) (160 kA) (120 kA) (100 kA).
  - UL 1449 suppression voltage rating, voltage L-N, L-G, N-G: (208Y/120 V; 400 V) (480Y/277 V; 600 V).
- EMI/RFI Filtering: up to -30dB 100 kHz with insertion ratio of 50:1 using MIL-STD-220A methodology.
- Provide with one set of NO/NC dry contacts.
- Accessories:
  - Six-digit transient-counter set to total transient surges that deviate from the sine-wave envelope by more than 125 V.

Shipping Splits

Switchboards shall be separated into shipping blocks. Each switchboard section shall be capable of being handled individually with the use of removable lifting bars (where practical) or rollers, and shall be clearly labeled with proper handling procedures.
Methodology and Intended Use

Short-circuit currents are calculated by dividing the secondary full load current of the transformer, based on the self-cooled kVA rating, by the arithmetic sum of the transformer and primary system per unit impedances (assumes transformer X/R identical to primary system X/R). Vectorial addition of per unit impedances produces slightly higher short-circuit currents.

Motor contribution adds to the available short-circuit current. Motor contribution is based on four times the motor full load current (assumes average motor impedance of 25%). Connected motor load is assumed to be 50% at 208 V or 100% for 240 V and above based on the full load amperes of the transformer.

Short-circuit values are based on the percent impedance (%Z) shown. Per NEMA and ANSI standards, actual %Z can vary +/-7.5% due to manufacturing tolerances for transformers shown with 5.75 %Z (2.0 %Z and 4.5 %Z are minimum values). If desired, account for the minimum tolerance by multiplying the XFRMR (Transformer) Alone short-circuit values in the table by 1.081 if the %Z is 5.75%. Motor contribution can be added using the previously mentioned methodology.

Due to transformer design differences, %Z can vary for different types of transformers of the same kVA rating.

Short-circuit currents in the table apply when system power factor is greater than the tested value (X/R is less than the tested value) for the type equipment involved.

Test pf and X/R Ratio

Short-circuit currents in the table are given in RMS symmetrical amperes. For a system X/R ratio greater than the test X/R ratio of the overcurrent device in question, the available fault current equivalent RMS symmetrical duty for comparison must be adjusted by a multiplying factor greater than 1.0. The fault current will increase.

See IEEE Std. 242-2001 (Buff Book) and IEEE Std. 1015-1997 (Blue Book) for details.

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<th>Device Type</th>
<th>Test pf</th>
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<td>UL Molded Case Circuit Breaker Interrupting Rating</td>
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<td>Greater than 20 kA</td>
<td>20%</td>
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<td>Greater than 10 kA to 20 kA</td>
<td>30%</td>
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<td>10 kA and less</td>
<td>50%</td>
<td>1.732</td>
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<td>ANSI Power Circuit Breaker, Fused</td>
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<td>4.899</td>
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<td>ANSI Power Circuit Breaker, Unfused</td>
<td>15%</td>
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### Secondary Full Load and Short Circuit Currents

#### Power-Style® QED-2 Low Voltage Switchboards

#### Technical Information

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About Schneider Electric

As a global specialist in energy management with operations in more than 100 countries, Schneider Electric offers integrated solutions across multiple market segments, including leadership positions in energy and infrastructure, industrial processes, building automation, and data centers/networks, as well as a broad presence in residential applications. Focused on making energy safe, reliable, and efficient, the company's 120,000 employees achieved sales of more than 25.6 billion US dollars (17.3 billion euros) in 2007, through an active commitment to help individuals and organizations “Make the most of their energy.”