Sensor IQ
Intelligent Breaker Panel
Installation Manual

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Introduction

Congratulations on your purchase of the ETC Sensor IQ Breaker Panel. The Sensor IQ panel continues ETC's tradition of providing the highest quality products for the entertainment and architectural lighting market.

The Sensor IQ Intelligent Breaker panel offers a panel with a small footprint, low heat dissipation, and low noise, allowing it to be installed in a variety of locations. Features of the Sensor IQ panel include:
- Built-in time clock, preset, and DMX controls
- Built-in network interface provides per-circuit reporting and advanced control via streaming ACN (sACN)
- Control for up to 48 intelligent breaker circuits
- Optional main breaker
- 120V (bi-phase* available), 240V, and 277V
- Option cards allow for DALI control, 0–10V control, and contact closure input
- UL924 listed emergency dry contact input suitable for connection to external emergency systems
- Isolated ground option for 120V and 240V panels only

*Bi-phase is commonly called single phase or 1 phase.

Using This Manual

This manual contains procedures for installation of the Sensor IQ and highlights additional field-installed options such as the 0–10V output control option card, contact input, and ride-thru option.

When viewing this document in electronic form (pdf file) with Adobe Acrobat® Reader, blue italicized text followed by a page number is a link within the document. If you click on the link, Acrobat will navigate to that section or topic.

Warnings and Notice Conventions

These symbols are used in Sensor IQ documentation and equipment to alert you to possible danger or important information.

Note: *Notes are helpful hints and information that is supplemental to the main text.*

CAUTION: *A Caution statement indicates situations where there may be undefined or unwanted consequences of an action, potential for data loss or an equipment problem.*

WARNING: A Warning statement indicates situations where damage may occur, people may be harmed, or there are serious or dangerous consequences of an action.

WARNING: RISK OF ELECTRIC SHOCK! This warning statement indicates situations where there is a risk of electric shock.

Please email comments about this manual to: TechComm@etcconnect.com.

Important Safeguards

READ AND FOLLOW ALL SAFETY INSTRUCTIONS.

When using this electrical equipment, basic safety precautions should always be followed including the following:
- For indoor use only. Do not use outdoors.
- Do not mount near gas or electric heaters.
- Equipment should be mounted in locations where it will not readily be subjected to tampering by unauthorized personnel.
- The use of accessories, other than those listed as suitable for use with this product, is not allowed and may cause an unsafe condition.
- Do not use this equipment for other than its intended use.

SAVE THESE INSTRUCTIONS

Product Variants

Breaker Panels

120V Standard Breaker Panel Models

Model	Part Number	Description	Max current/phase	Recess Mounted Door	Surface Mounted Door
IQ12-ML	7131A1012	3 phase, 12 breaker panel with main lug only	100A	7131A1522	7131A1512
IQ12-1	7131A1111	bi-phase, 12 breaker with option for main lug or main breaker	100A	7131A1511	7131A1521
IQ12	7131A1011	3 phase, 12 breaker with option for main lug or main breaker	100A	7131A1511	7131A1521
IQ24-1	7131A1131	bi-phase, 24 breaker with option for main lug or main breaker	200A	7131A1531	7131A1541
IQ24	7131A1031	3 phase, 24 breaker with option for main lug or main breaker	200A	7131A1531	7131A1541
IQ48-1	7131A1161	bi-phase, 48 breaker with option for main lug or main breaker	400A	7131A1551	7131A1561
IQ48	7131A1061	3 phase, 48 breaker with option for main lug or main breaker	400A	7131A1551	7131A1561

240V/277V Standard Breaker Panel Models

Model	Part Number	Description	Max current/phase	Recess Mounted Door	Surface Mounted Door
IQ12-277	7131A1211	277V, 3 phase, 12 breaker panel with main lug	100A	7131A1621	7131A1611
IQ24-277	7131A1231	277V, 3 phase, 24 breaker panel with main lug	200A	7131A1641	7131A1631
IQ48-277	7131A1261	277V, 3 phase, 48 breaker panel with main lug	400A	7131A1661	7131A1651
IQ12-240	7131A1311	240V, 3 phase, 12 breaker panel with main lug	100A	7131A1621	7131A1611
IQ24-240	7131A1031	240V, 3 phase, 24 breaker with option for main lug or main breaker	200A	7131A1641	7131A1631
IQ48-240	7131A1161	240V, 3 phase, 48 breaker with option for main lug or main breaker	400A	7131A1661	7131A1561

Main Circuit Breaker Kits (120V)

See the *Sensor IQ Main Breaker Kits Installation Guide* for more information.

Amperage	AIC Rating, Poles	Kit Part Number	Description
100A	22kA, 3 pole	7131K1012	Main Breaker for top-feed IQ12 or IQ24
		7131K1012-B	Main Breaker for bottom-feed IQ12 or IQ24
	65kA, 3 pole	7131K1016	Main Breaker for top-feed IQ12, IQ24, or IQ48
		7131K1016-B	Main Breaker for bottom-feed IQ12, IQ24, or IQ48
	22kA, 2 pole	7131K1112	Main Breaker for top-feed IQ12 or IQ24
		7131K1112-B	Main Breaker for bottom-feed IQ12 or IQ24
200A	22kA, 3 pole	7131K1022	Main Breaker for top-feed IQ24 or IQ48
		7131K1022-B	Main Breaker for bottom-feed IQ24 or IQ48
	65kA, 3 pole	7131K1026	Main Breaker for top-feed IQ24 or IQ48
		7131K1026-B	Main Breaker for bottom-feed IQ24 or IQ48
	22kA, 2 pole	7131K1222	Main Breaker for top-feed IQ24 or IQ48
		7131K1222-B	Main Breaker for bottom-feed IQ24 or IQ48
225A	65kA, 3 pole	7131K1815	Main Breaker for top-feed IQ48
		7131K1815-B	Main Breaker for bottom-feed IQ48
250A	22kA, 3 pole	7131K1816	Main Breaker for top-feed IQ48
		7131K1816-B	Main Breaker for bottom-feed IQ48
400A	65kA, 3 pole	7131K1046	Main Breaker for top-feed IQ48
		7131K1046-B	Main Breaker for bottom-feed IQ48
	65kA, 2 pole	7131K1146	Main Breaker for top-feed IQ48
		7131K1146-B	Main Breaker for bottom-feed IQ48

Main Circuit Breaker Kits (240V/277V)

See the *Sensor IQ Main Breaker Kits Installation Guide* for more information.

Note: *Main circuit breakers in 240V/277V Sensor IQ panels do not add to the series SCCR of the panel but serve as convenience disconnects. A 200A Main Fuse Kit that raises the series rating of the panel to 65kA is available (240V/277V panels only). See Main Fuse Kits on page 10.*

Note: *Main circuit breaker kits for 240/277V Sensor IQ panels are custom items. If you want to use a main circuit breaker as a convenience disconnect, please contact the ETC Systems Group for ordering information. See Contacting ETC on page 12.*

Amperage	AIC Rating, Poles	Kit Part Number	Description
100A	3 pole, 10kA, 14kA*	7131K1211	Main Breaker for top-feed IQ12, IQ24, or IQ48
		7131K1211-B	Main Breaker for bottom-feed IQ12, IQ24, or IQ48
200A	3 pole, 10kA, 14kA*	7131K1226	Main Breaker for top-feed IQ24 or IQ48
		7131K1226-B	Main Breaker for bottom-feed IQ24 or IQ48
400A	3 pole, 10kA, 14kA*	7131K1246	Main Breaker for top-feed IQ48
		7131K1246-B	Main Breaker for bottom-feed IQ48
*Panels with a 20A or lower branch breaker have 14kA AIC rating, and 30A breakers have a 10kA AIC rating.			

Panel Overview

120V Panel Diagram

Panel ground

Keyholes for easy mounting (located top and bottom)

Main lugs or field-installed Main Circuit Breaker kit

Iso ground bar option installs here in the 48-circuit panel

Load ground bar

Iso ground bar option installs here for 12- and 24-circuit panels

Panel neutral

Branch Circuit Breakers

Breaker for User Interface

Ethernet Option Card (factory installed)

Wire tie points

User Interface panel

Option cards IQ-LVD, IQ-DALI, IQ-FLO, IQ-CI, IQ-RTO

Bottom keyholes are upside-down for inverted mounting

Expandable cable trough for low-voltage cable routing

240V/277V Panel Diagram

Keyholes for easy mounting (located top and bottom)

Panel ground

Load ground bar

Panel neutral

Branch breaker positions

Breaker for User Interface

Ethernet Option Card (factory installed)

Wire tie points

User Interface panel

Option cards
IQ-LVD, IQ-DALI,
IQ-FLO, IQ-CI,
IQ-RTO

Bottom keyholes are upside-down for inverted mounting

Expandable cable trough for low-voltage cable routing
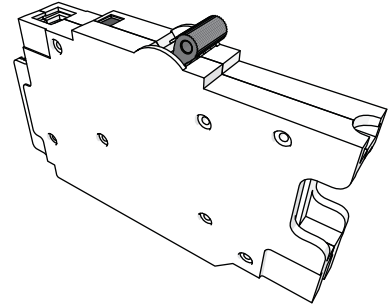
Circuit Breakers

The Sensor IQ ships standard with 12, 24, or 48 single-pole breakers included but not installed. Configured racks with a combination of single-pole, double-pole, and three-pole breakers are available as custom, or as a field-installed panel option. Reference *Product Variants* on *page 2* and *Breakers* on *page 38*.

Option Cards and Kits

Option cards are available for field installation into the Sensor IQ. Each option adds another level of features and functions to the Sensor IQ and the installation.

For more information on the specification or installation of option cards, see the appropriate installation guide supplied with the option card.
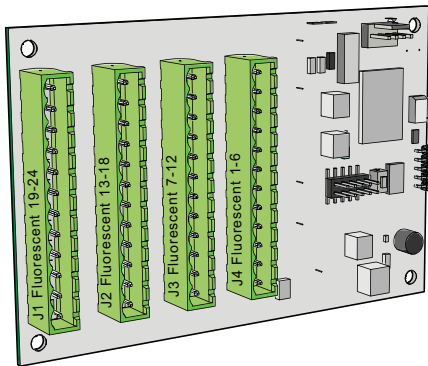
Ride-Thru Option

The Ride-Thru Option (IQ-RTO) maintains power to the Sensor IQ controller for a minimum of 15 seconds in the event of a brown-out or power loss.
  • The ride-thru option card installs using stand-offs to the inside wall of the low-voltage box.
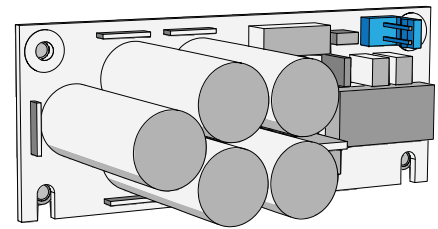
0–10V Dimming Control

The 0–10V Dimming Control option card (IQ-LVD) provides 24 outputs for control of 4-wire current-sink, 0–10VDC fluorescent or electronic loads.
  • Each of the 24 outputs are rated to control a maximum of 400mA per channel (up to 50 ballasts per channel).
  • Loss of power at the Sensor IQ controller results in releasing control levels to full.
  • The IQ-LVD option card installs using stand-offs to the inside wall of the low-voltage box.

WARNING: RISK OF DEATH OR INJURY BY ELECTRIC SHOCK! 0–10V wiring may not be fully isolated from high voltage AC power. Do not assume that 0–10V wiring is safe to touch, even when run as an NEC Class 2 signal. Test for AC voltage to ground before terminating any 0–10V control wiring to the Sensor IQ.

DALI Control
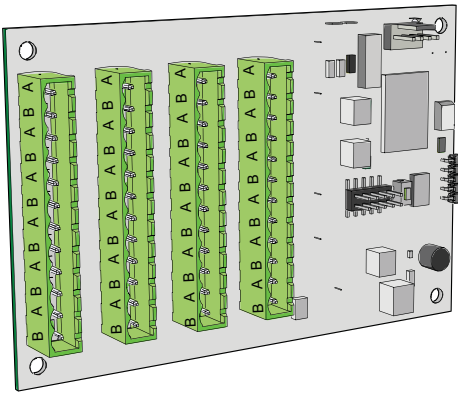
The Digital Addressable Lighting Interface Control card (IQ-DALI) controls 24 loops of 64 DALI-compatible ballasts in broadcast mode. Each loop of up to 64 ballasts is linked one-to-one with the panel circuit for power control.

The DALI ballast must be powered by an external DALI loop power supply (supplied by others). This supply is connected externally of the Sensor IQ panel. Each DALI loop requires its own power supply and possibly more than one power supply depending on the ballast load.

- Installation is limited to 64 DALI-compatible fluorescent ballasts per DALI loop.
- The IQ-DALI Control card installs using stand-offs to the

Note: *A single Sensor IQ supports the use of either the 0–10V output control option or a DALI option card, but not both in the same panel.*

Contact Input
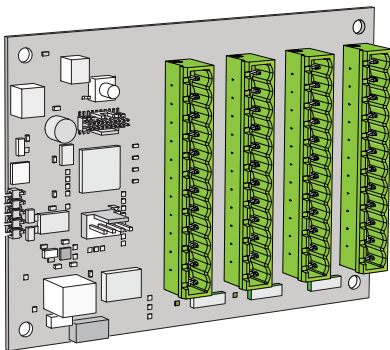
The Contact Input card (IQ-CI) provides the ability to directly control the breakers using a momentary or maintained dry contact input.

- The IQ-CI card installs using stand-offs to the inside wall of the low-voltage box.

UPS Control Backup Wiring Kit
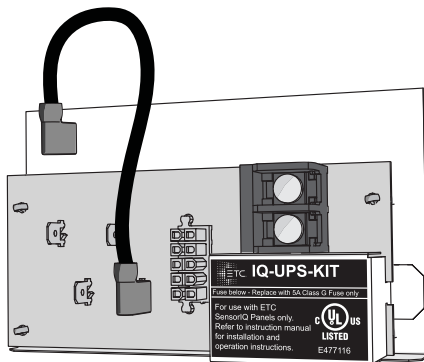
The UPS Control Backup Wiring Kit provides a way to connect an auxiliary source of power to the Echo Power Control Processor (PCP). The backup UPS will allow breakers to change state as needed in emergency lighting control systems where the panel must shed loads to avoid overloading the emergency power source.

500kcmil Kit (120V and 240V/277V)

The 500kcmil kit replaces the standard lug assembly to accept a single conductor feed of 400A. 120V and 240V/277V versions are available.
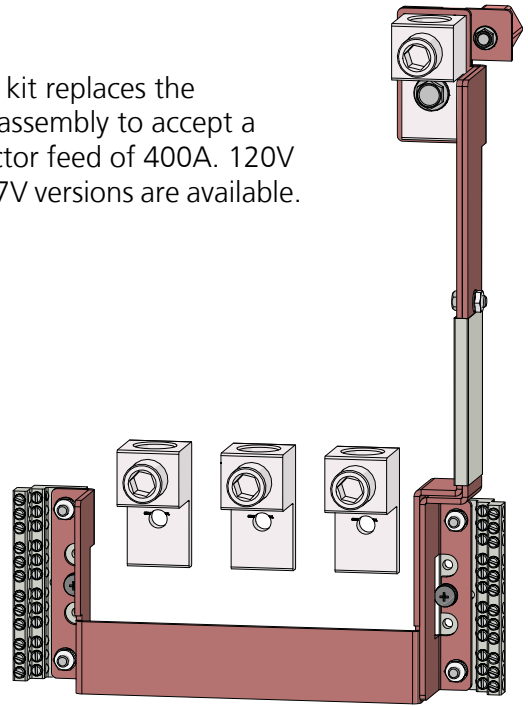
120V 500kcmil kit

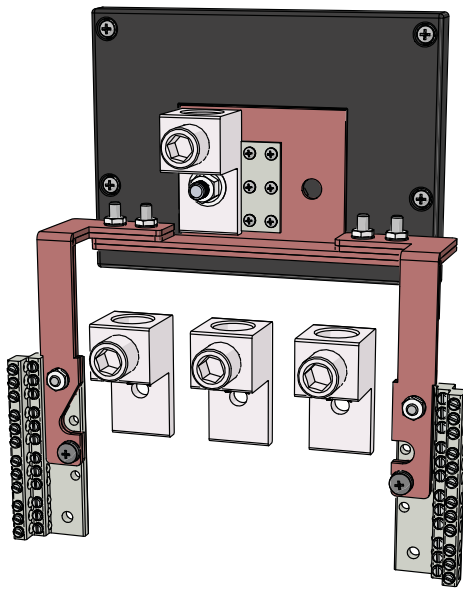**240V/277V 500kcmil kit**

Main Fuse Kits

Sensor IQ 120V Main Fuse Kits provide three UL Listed Class T fuses in line with the main feed of a Sensor IQ panel. The Sensor IQ 240V/277V 200A Main Fuse Kit provides three UL listed Class J branch fuses in line with the main feed of a Sensor IQ panel. The fuses provide overcurrent protection and an increased UL series rating for the panel. See the *Sensor IQ 120V Main Fuse Kit Installation Guide* and S*ensor IQ 240V/277V 200A Main Fuse Kit Installation Guide* for more information.
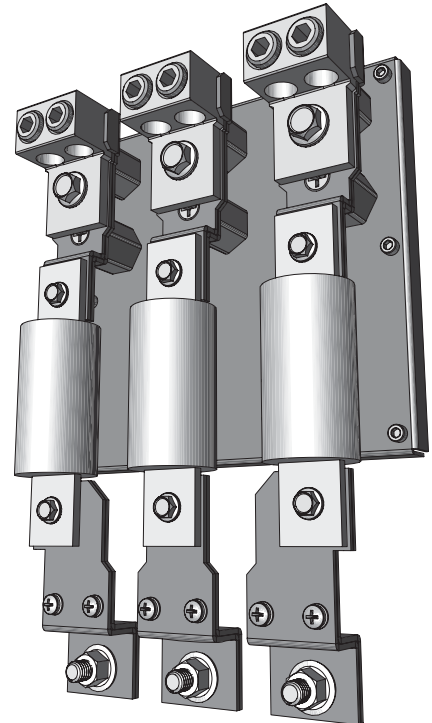
Tap Kit

The Sensor IQ Tap Kit is used to provide a low-current normal sense circuit from the three phase bars of an ETC Sensor IQ 12, 24, or 48 breaker panel to an emergency lighting control device such as an ETC SC1008 Branch Circuit Emergency Lighting Transfer Switch (BCELTS) or an ETC Emergency Bypass Detection Kit (EBDK). The Tap Kit is compatible with 120V, 240V, and 277V Sensor IQ panels. See the *Sensor IQ Tap Kit Installation Guide* for more information.

Contacting ETC

For questions about your Sensor IQ system delivery, contact ETC Systems Group at any of the offices listed below.

If you are having technical difficulties with the Sensor IQ or installation, your most convenient resources are the references given in this manual. To search more widely, try the ETC Web site at etcconnect.com.

If none of these resources is sufficient, contact ETC Technical Services directly at one of the offices listed below. Emergency service is available from all ETC offices outside of normal business hours.

When calling for help, please have the following information available:
• Sensor IQ model number and serial number
• Type of breakers used, including the model number and quantity
• A list of all option cards installed in the panel
• Type of control stations used (if any), including model number and quantity
• DMX or network control source used for system-wide control, if any

Americas

ETC, Inc.
Technical Services Department
3031 Pleasant View Road
Middleton, WI 53562
800-775-4382 (USA, toll-free)
+1-608 831-4116
service@etcconnect.com

United Kingdom

ETC Ltd
Technical Services Department
26-28 Victoria Industrial Estate
Victoria Road,
London W3 6UU England
+44 (0)20 8896 1000
service@etceurope.com

Asia

ETC Asia
Technical Services Department
Room 1801, 18/F
Tower 1, Phase 1 Enterprise Square
9 Sheung Yuet Road
Kowloon Bay, Kowloon, Hong Kong
+852 2799 1220
service@etcasia.com

Germany

ETC GmbH
Technical Services Department
Ohmstrasse 3
83607 Holzkirchen, Germany
+49 (80 24) 47 00-0
techserv-hoki@etcconnect.com

Chapter 1

Prepare to install

Inspect the Shipment

Before you begin installation, check your shipment and confirm that it arrived complete and undamaged.

1: Check the shipping container for physical damage.
   - If you find damage, document it to help with a claim against the shipper.
2: Inspect the order for completeness.
   - Check the box contents received against the packing list to ensure that your order is received complete.
   - If you discover a problem with the contents of the shipment, contact ETC Systems Group. See *Contacting ETC* on *page 12*.

Unpack the Panel

For best results, follow these instructions when unpacking the panel from the box.

1: Lay the box flat, top side up on a floor or flat horizontal surface. The top side of the box is labeled for your convenience.
2: Lift and remove the box lid. A standard model Sensor IQ Breaker Panel ships from the factory pre-wired with low-voltage control. As you remove the panel from the shipping carton, confirm that the following items are included:
   - A door, packaged separately. Check that the door is the correct model as ordered.
   - The Sensor IQ panel with interiors.
   - The quantity and type of breakers ordered.

Note: *All accessory options and option cards are packaged separately.*

Note: *It is recommended to perform the next step with a minimum of two people as the panel may be awkward and heavy to remove from the packaging.*

3: To lift the panel from the packaging, one person lifts from the top side of the enclosure, indicated with an arrow on the panel interior, while another person lifts from the bottom side of the panel.
4: Rest the panel on a floor or flat horizontal surface until the installation personnel are ready to begin the installation procedure.

Installation Environment

For proper operation of the Sensor IQ Breaker Panel, ensure that the intended installation location conforms to the following environmental and electrical requirements.
   - Dry room (5%–95% humidity, non-condensing), 32°F–104°F (0°C–40°C) ambient temperature, dust free.
   - All Sensor IQ models can be surface-mounted.

- Sensor IQ models can be flush-mounted under certain conditions:
  - The 120V 12-breaker and 24-breaker panels can be flush-mounted between studs; assuming 3.5″ (8.9 cm) stud depth with 1/2″ (1.3 cm) surfacing material and studs are on 16″ (40.6 cm) centers.
  - The 120V 48-breaker panel, 240V panel, and 277V panel can be flush-mounted if there is deeper wall construction (e.g., 2″x6″) with custom framing to accommodate the additional depth and width of the panel.
- The installation location must support a fully populated and wired Sensor IQ Breaker Panel, not exceeding 120 pounds (54.5 kg).
- The US National Electric Code requires that the highest circuit breaker be located no more than 6′7″ (2 m) off the floor.

Note: *The maximum weight, 120 pounds (54.5 kg), includes a fully populated breaker panel and does not include the weight of conduit, wiring, or options (e.g., main breakers, fuses, etc.).*

Electrical Input Requirements

- Refer to *Product Variants* on *page 2* for information on mains feed for each Sensor IQ Breaker Panel model.
- This equipment must be connected to a suitable safety earth/ground.

Clearance

- Sensor IQ doors can be mounted to open from the left or the right.
- Allow clearances as described below.

120V Sensor IQ Panel Dimensions

Model	Height	Width	Depth
12 breaker - no main breaker panel only	34.25″ (870 mm)	14.25″ (362 mm)	4″ (102 mm)
12 breaker - with main breaker panel only	40.25" (1022 mm)	14.25″ (362 mm)	4″ (102 mm)
12 breaker - no main breaker with recess mounted door	36" (914 mm)	16" (406 mm)	4.75" (120 mm)
12 breaker - with main breaker with recess mounted door	42" (1066 mm)	16" (406 mm)	4.75" (120 mm)
12 breaker - no main breaker with surface mount door	34.25" (869 mm)	14.25" (362 mm)	4.75" (120 mm)
12 breaker - with main breaker with surface mount door	40" (1022 mm)	14.25" (362 mm)	4.75" (120 mm)
24 breaker panel only	50.25″ (1267 mm)	14.25″ (362 mm)	4″ (102 mm)
24 breaker with recess mount door	52" (1321 mm)	16" (406 mm)	4.75" (120 mm)
24 breaker with surface mount door	50.25″ (1267 mm)	14.25″ (362 mm)	4.75″ (120 mm)
48 breaker panel only	64" (1626 mm)	20" (508 mm)	5.25" (133 mm)
48 breaker with recess mount door	66" (1676 mm)	22" (558 mm)	6" (152 mm)
48 breaker with surface mount door	64″ (1626 mm)	20″ (508 mm)	6″ (152 mm)

240V/277V Sensor IQ Panel Dimensions

Model	Height	Width	Depth
12 breaker, panel only	49" (1245 mm)	20" (508 mm)	5.25" (133 mm)
12 breaker with recess mounted door	51" (1295 mm)	22" (558 mm)	6" (152 mm)
12 breaker with surface mount door	49" (1245 mm)	20" (508 mm)	6" (152 mm)
24 breaker, panel only	55" (1397 mm)	20" (508 mm)	5.25" (133 mm)
24 breaker with recess mount door	57" (1448 mm)	22" (558 mm)	6" (152 mm)
24 breaker with surface mount door	55" (1397 mm)	20" (508 mm)	6" (152 mm)
48 breaker, panel only	73" (1854 mm)	20" (508 mm)	5.25" (133 mm)
48 breaker with recess mount door	75" (1905 mm)	22" (558 mm)	6" (152 mm)
48 breaker with surface mount door	73" (1854 mm)	20" (508 mm)	6" (152 mm)

Note: *The NEC requires a minimum 3' distance (NEC 110.26(A)(1)) in front of a Sensor IQ panel. The NEC requires that the handle of the highest circuit breaker in a breaker panel be no more than 2.0 m (6'7") above the floor (NEC 240.24(A)). Check other electrical and safety codes for additional requirements.*

Compliance

- UL/cUL Listed to UL67
- FCC: This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
- Complies with ANSI E1.11 USITT DMX512-A
  - Breakers occupy one DMX slot each, freely assignable to any slot, and respond only to null start code packets.

Parts and Tools

The following parts and tools are needed, but not supplied, for this installation:
- 3/8" (10 mm) fasteners for mounting the Sensor IQ panel

Note: *Both the installation location and the mounting hardware must support a fully populated panel, including conduit and cable, which weighs approximately 120 pounds (54.5 kg).*

- Torque wrench with 3/16", 5/16", and 3/8" Allen wrench sockets for feed wiring
- Lineman's pliers
- Screwdrivers: a small 1/8" (3 mm) flat-blade screwdriver for data terminations, a 3/16" flat-blade screwdriver for ground and neutral terminations, and a #2 Phillips screwdriver for breaker load and panel screws
- A drill and conduit punch or hole saw for conduit holes in the enclosure
- Insulation stripping tool

Cable Routing and Conduit Access

When planning conduit entry and cable routing to the Sensor IQ Breaker Panel, pay special attention to the recommendations shown in the figure below. Arrows indicate acceptable conduit entry locations.

Bottom-Feed Mounting   **Top-Feed Mounting**
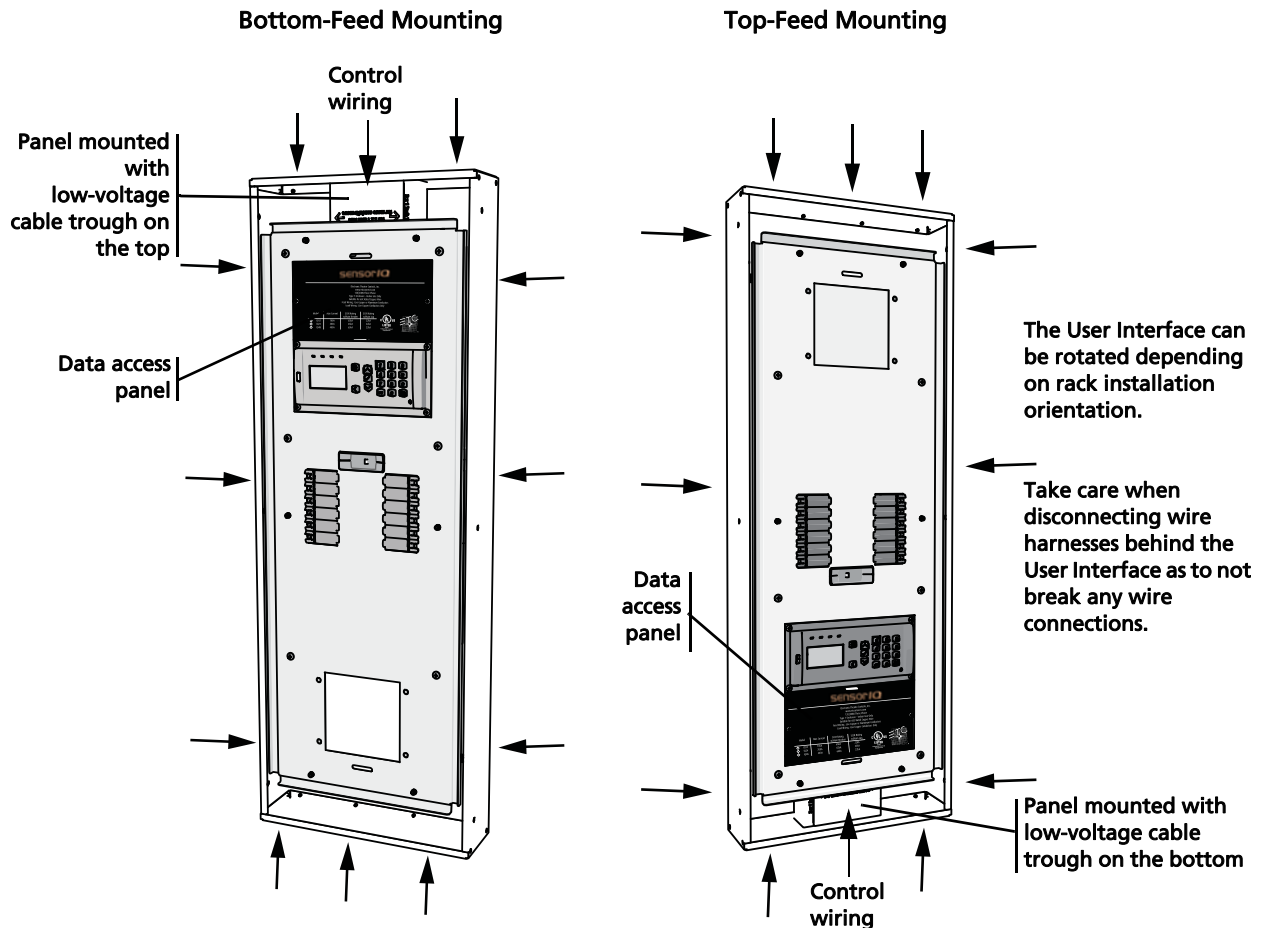
The low-voltage wiring trough is located between the edge of the panel and the User Interface. The panel can be mounted with the trough on the top or the bottom, allowing for data and low-voltage cable routing flexibility.

Cable Routing Options

Purpose	Top Entry	Bottom Entry	Top Side Entry	Bottom Side Entry
Feed wiring	Outside of low-voltage cable trough only	Outside of low-voltage cable trough only	Yes	Yes
Load wiring			Yes	Yes
Control wiring (DMX, Network, option cards, etc.)	Through low-voltage cable trough only	Through low-voltage cable trough only	No	No

Note: *Control wiring (DMX, Ethernet, etc.) and power wiring must be run in separate conduit in accordance with local code.*

Rotating the User Interface

The User Interface (UI) is installed with four Phillips-head screws and can be rotated to accommodate top-feed or bottom-feed mounting. Rotating the User Interface involves disconnecting and reconnecting factory-installed wire harnesses located on the back side of the UI. Take note of the connector orientation when reconnecting all wire harnesses.

The Data Access panel may also need to be rotated to keep the label text in a readable orientation.

1: Remove the two Phillips-head screws holding the panel in place.
2: Rotate the panel 180°.
3: Reattach the panel using the screws.

Branch Circuit Numbering

Depending on the orientation of the UI, the number used to designate each circuit breaker may be different. A breaker panel with top-feed wiring will have circuit breaker 1 in the top-left position; whereas a breaker panel with bottom-feed wiring will have circuit breaker 1 in the bottom-right position. This breaker positioning is the same for all size and voltage panels.

Bottom-Feed Wiring   **Top-Feed Wiring**

Circuit 48   Circuit 1

Circuit 1   Circuit 48
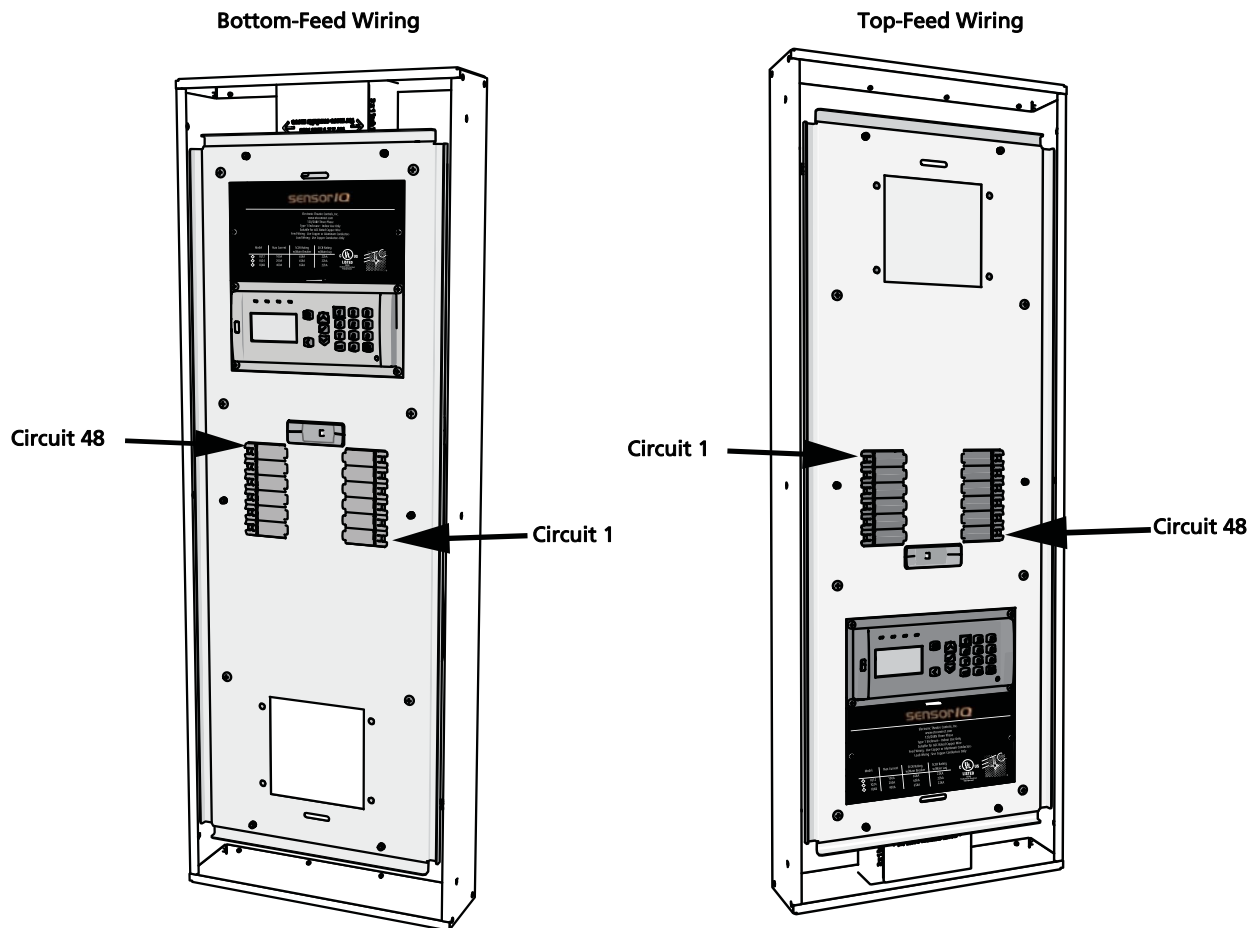
Chapter 2
Installation

Mount the Back Pan

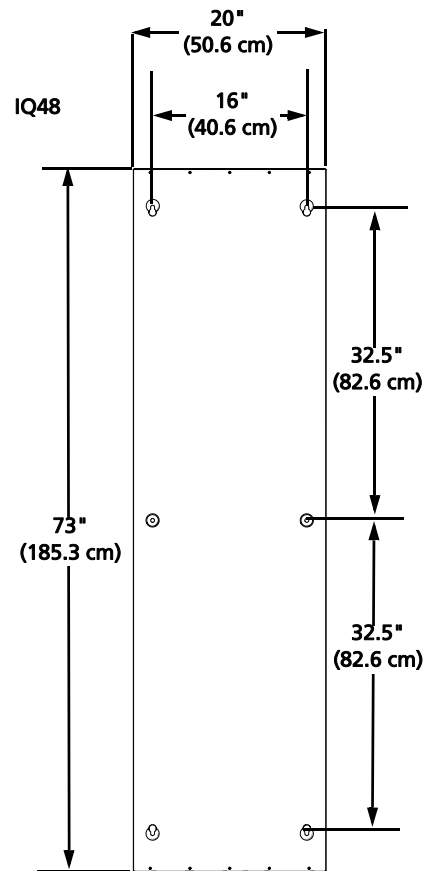The Sensor IQ Breaker Panel can be surface-mounted or flush-mounted.
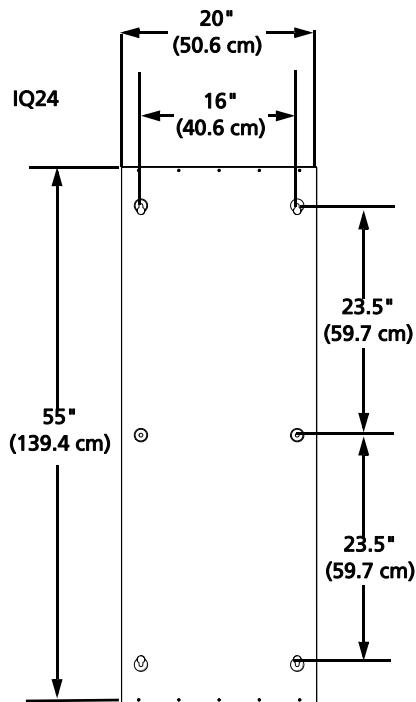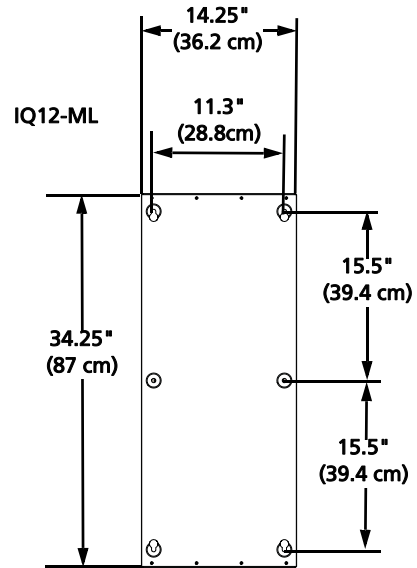
1: Determine where your panel will be installed using the details outlined in *Installation Environment* and *Clearance* on *page 13*.

2: Remove the six or eight screws securing the front panel to the Sensor IQ. Set the screws and the panel aside.

120V Sensor IQ panel shown with Power Controller at the bottom

Remove front panel
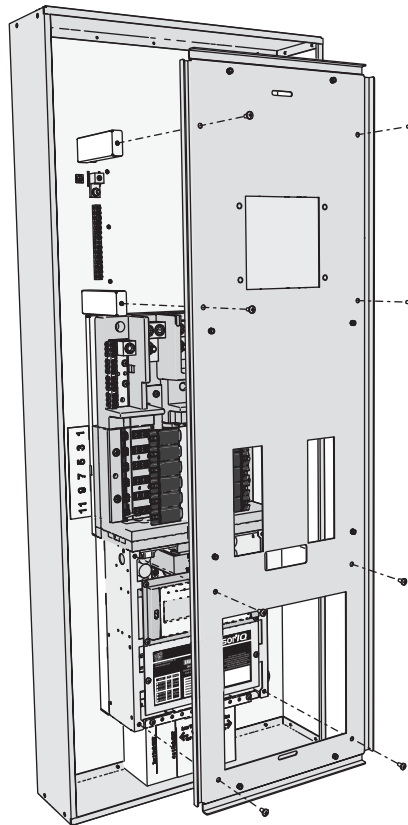
3: Four mounting keyholes are provided on the rear of the panel: two for upright mounting and two for inverted mounting. You must supply your own 3/8″ (10 mm) mounting hardware. Mark and pre-drill the mounting holes to the mounting surface using the drawings below as a guide.

IQ12

20" (50.6 cm)
16" (40.6 cm)
49" (124.2 cm)
20.5" (52.1 cm)
20.5" (52.1 cm)

IQ12-ML

14.25" (36.2 cm)
11.3" (28.8cm)
34.25" (87 cm)
15.5" (39.4 cm)
15.5" (39.4 cm)

IQ24

20" (50.6 cm)
16" (40.6 cm)
55" (139.4 cm)
23.5" (59.7 cm)
23.5" (59.7 cm)

IQ48

20" (50.6 cm)
16" (40.6 cm)
73" (185.3 cm)
32.5" (82.6 cm)
32.5" (82.6 cm)
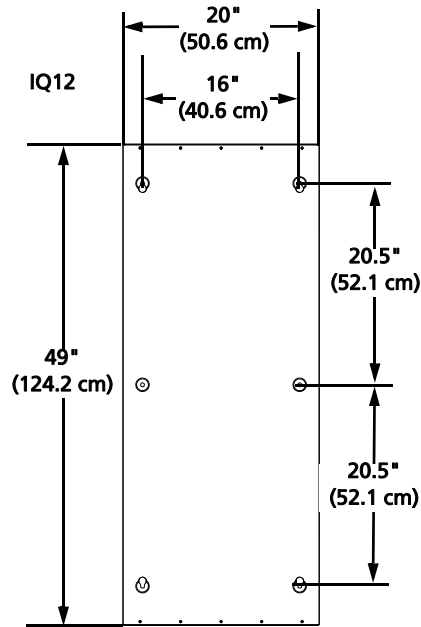
4:    Install the mounting hardware. See *Parts and Tools* on *page 15*. Leave approximately 1" (25 mm) of threads exposed for ease of mounting the panel.

5:    Temporarily mount the panel with the installed mounting hardware.

6:    With the panel installed (temporarily), mark the required conduit entry locations. See *Cable Routing and Conduit Access* on *page 16*.

Note: *When punching holes for conduit, keep in mind that the low-voltage trough runs through the chimney between the controller and the edge of the panel.*

7:    Remove the panel from the mounting hardware and cut the conduit entry into the panel.

8:    Re-attach the panel to the mounting hardware and install any remaining mounting hardware. There are six or eight sets total, depending on your panel.

9:    Tighten the mounting bolts securely.

10:    Attach and tighten the conduit to the enclosure.

Install Main Circuit Breaker (Optional)

The Sensor IQ Breaker Panel ships with main lugs. ETC offers Main Circuit Breaker Option Kits for field installation, if required.

See the Main Circuit Breaker Kits table under *Product Variants* on *page 2*.

Refer to the installation instructions provided with the main circuit breaker kit ordered.

Install Main Fuse Kit (Optional)

The Sensor IQ Breaker Panel ships with main lugs. ETC offers a Main Fuse Kit for field installation, if required.

Refer to the installation instructions provided with the main fuse kit ordered. Main feed termination instructions are outlined below.

Install Breakers

Breakers are field installable and no additional tools are required.

1:    Peel off the protective film that covers the control contacts in the areas where you will install breakers.

2:    Position the breaker with the handle pointed towards you and the wire termination points facing the outside wall of the panel.

3:    Hook the outer corner of the breaker under the breaker clip located on the edge of the breaker interior.

4:    Pivot the breaker into place until the inner edge snaps onto the bus bar.

5: Test installation by pulling firmly on the outer edge of the breaker. When installed correctly, the breaker should not easily release without the use of tools (such as a screwdriver).

Insert screwdriver and pry outward to release the breaker from the interior.
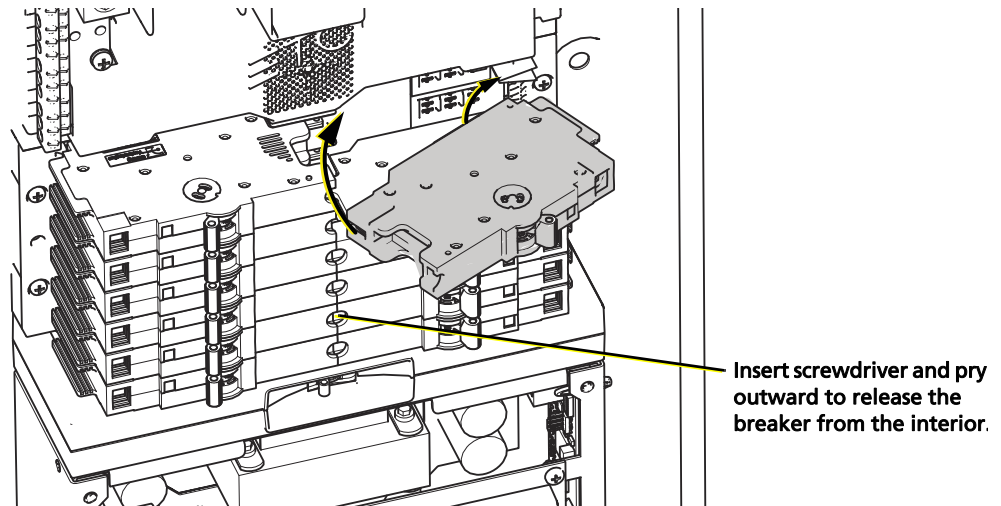
6: Install provided breaker blanks in any positions where you will not use a breaker.
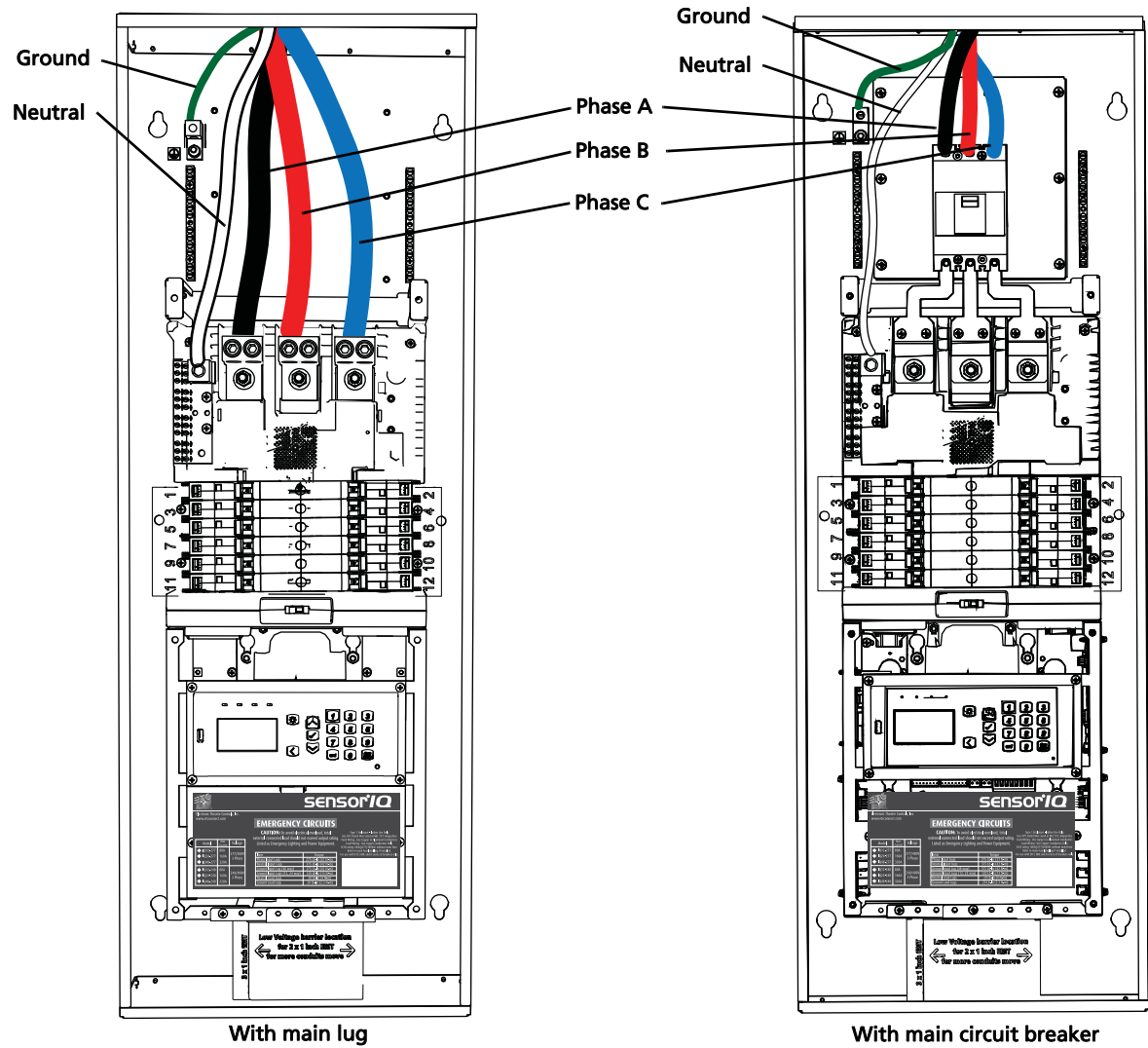
Rough-in and Terminate Cable

The recommended cable for each termination is limited to the wire lugs and termination connectors provided in the Sensor IQ Breaker Panel. Refer to the chart included with each termination section for wire specification, strip length, and torque settings.

WARNING: RISK OF DEATH BY ELECTRIC SHOCK! Failure to disconnect all power to the panel before working inside the panel could result in serious injury or death.

De-energize main feed to the breaker panel and follow appropriate Lockout/Tagout procedures as described in NFPA Standard 70E. It is important to note that electrical equipment such as breaker panels can present an arc flash safety hazard if improperly serviced. This is due to available large short circuit currents on the feeders of the equipment. Any work on energized equipment must comply with OSHA Electrical Safe Working Practices.
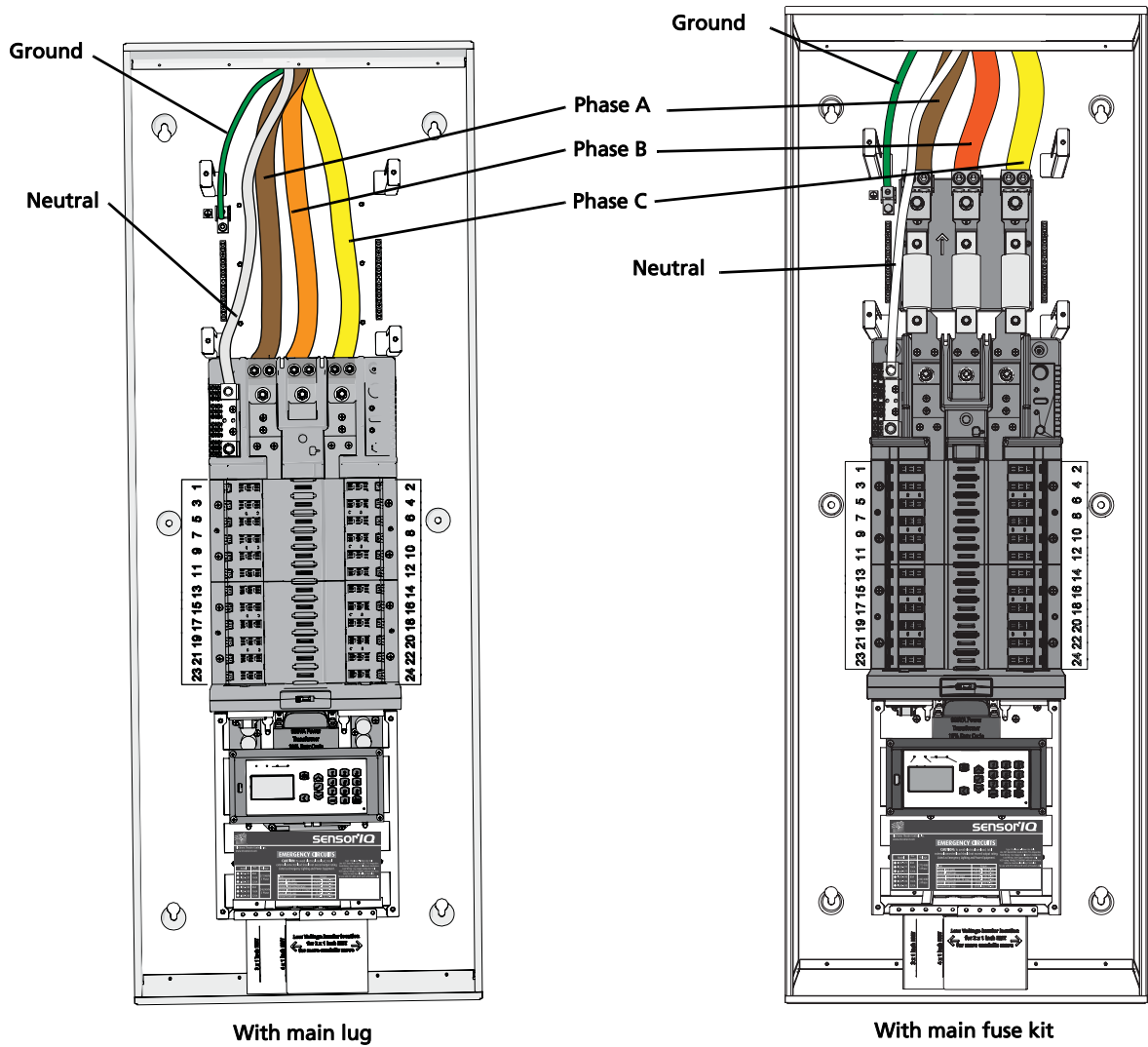
Connect Main Feed 120V

Ground

Neutral

Phase A

Phase B

Phase C

Ground

Neutral

With main lug

With main circuit breaker

Note: *Main feed may be copper or aluminum conductors.*

120V Main Feed Cable Specification

Purpose and Type	Wire Range Per	Strip length	Torque (lb-in)	Wrench
Main Lugs 120/240V bi-phase Main Lugs 120/208V 3 phase	Dual 6 AWG–250 kcmil* (16 mm^2–120 mm^2)	1″ (25 mm)	275 in-lb (31 Nm)	5/16″
Main Circuit Breaker 22kA 120/240V bi-phase, 100A Main Circuit Breaker 22kA 120/208V 3 phase, 100A	Single 4 AWG–1 AWG (25 mm^2–50 mm^2)	5/8″ (16 mm)	53 in-lb (6 Nm)	4 mm
Main Circuit Breaker 65kA 120/208V 3 phase, 100A	Single 1 AWG–300 kcmil (50 mm^2–150 mm^2)	3/4" (19 mm)	160 in-lb (18 Nm)	3/16"
Main Circuit Breaker 22kA 120/240V bi-phase, 200A Main Circuit Breaker 22kA 120/208V 3 phase, 200A	Single 1 AWG–300 kcmil (50 mm^2–150 mm^2)	13/16″ .8" (20 mm)	135 in-lb (15 Nm)	6 mm
Main Circuit Breaker 65kA 120/208V 3 phase, 200A	Single 4 AWG–300 kcmil (25 mm^2–150 mm^2)	3/4″ (19 mm)	160 in-lb (18 Nm)	6 mm
Main Circuit Breaker 65kA 120/208V 3 phase, 225A	Single 1 AWG–300 kcmil (50 mm^2–150 mm^2)	0.79" (20 mm)	135 in-lb (15 Nm)	8 mm
Main Circuit Breaker 22kA 120/208V 3 phase, 250A	Single 4 AWG–1 AWG (25 mm^2–50 mm^2)	0.79" (20 mm)	135 in-lb (15Nm)	8 mm
Main Circuit Breaker 65kA 120/240V bi-phase, 400A Main Circuit Breaker 65kA 120/208V 3 phase, 400A	Dual 3/0 AWG–250 kcmil (95 mm^2–120 mm^2)	.9" top (23 mm) 2.2" bottom (56 mm)	160 in-lb (18 Nm)	8 mm
Neutral Input Lug (12- and 24-channel)	Single 6 AWG–350 kcmil (16 mm^2–150 mm^2)	0.9" (23 mm)	375 in-lb (42 Nm)	3/8″
Neutral Input Lugs (48-channel)	Dual 6 AWG–350kcmil (16 mm^2–150mm^2)	0.9" (23 mm)	375 in-lb (42 Nm)	3/8″
Ground Input Lug (48-channel and all ISO ground option kits)	Single 6 AWG–350 kcmil (16 mm^2–150 mm^2)	0.9″ (23 mm)	375 in-lb (42 Nm)	3/8″
Ground Input Lug (12- and 24-channel)	Single 14 AWG-2/0 (2.5 mm^2–50 mm^2)	5/8″ (16 mm)	120 in-lb (13 Nm)	3/16″
*_500kcmil Kit (120V and 240V/277V)_ available.				

Connect Main Feed 240V/277V

Ground

Neutral

With main lug

Ground

Phase A

Phase B

Phase C

Neutral

With main fuse kit

Note: *Main feed may be copper or aluminum conductors.*

240V/277V Main Feed Cable Specification

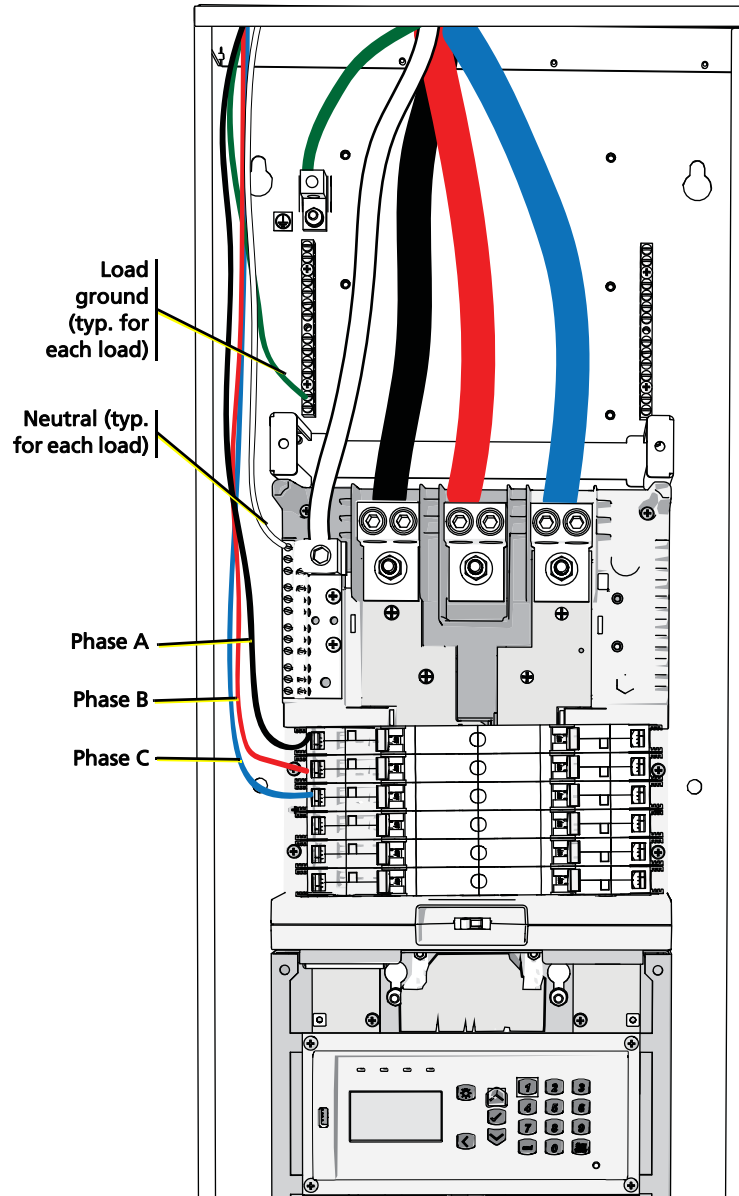| Purpose and Type	Wire Range Per	Strip length	Torque (lb-in)	Wrench
Main Lugs (all models)	Dual 6 AWG–250 kcmil* (16 mm^2–120 mm^2)	1" (25 mm)	275 lb-in (31 N-m)	5/16"
Main Circuit Breaker 240/415V or 277/480V 3 phase, 100A	Single 4 AWG–1 AWG (25 mm^2–50 mm^2)	5/8" (16 mm)	53 lb-in (6 N-m)	4 mm
Main Circuit Breaker 240/415V or 277/480V 3 phase, 200A	Single 1 AWG–300 kcmil (50 mm^2–150 mm^2)	13/16" .8" (20 mm)	135 lb-in (15 N-m)	6 mm
Main Circuit Breaker 240/415V or 277/480V 3 phase, 400A	Dual 3/0 AWG–250 kcmil (95 mm^2–120 mm^2)	.9" Top (23 mm) 2.2" bottom (56 mm)	160 lb-in (18 N-m)	8 mm
Neutral Input Lug (12- and 24-channel)	Single 6 AWG–350 kcmil (16 mm^2–150 mm^2)	0.9" (23 mm)	375 lb-in (42 N-m)	3/8"
Neutral Input Lug (48-channel)	Dual 6 AWG–350 kcmil (16 mm^2–150 mm^2)	0.9" (23 mm)	375 lb-in (42 N-m)	3/8"
Ground Input Lug (48-channel and all ISO ground option kits)	Single 6 AWG–350 kcmil (16 mm^2–150 mm^2)	0.9" (23 mm)	375 lb-in (42 N-m)	3/8"
Ground Input Lug (12- and 24-channel)	Single 14 AWG–2/0 (2.5 mm^2–50 mm^2)	5/8" (16 mm)	120 lb-in (13 N-m)	3/16"
*500kcmil Kit (120V and 240V/277V) available.				

1: With the conduit in place, make sure the upstream source of power is off or isolated, and then pull the incoming power cables (phase, neutral and ground) to the panel. Refer to the wire specification chart above for wire, strip length, torque, and tool specification.

2: Strip back the wire to the lengths indicated in the wire specification chart, depending on the connection.

3: Terminate the ground wire to the ground lug.

4: Terminate the neutral wire(s) to the neutral lug(s).

5: Terminate the phase wires to the main lugs or main circuit breaker (if installed). Using the appropriately sized Allen wrench, tighten the lug to the torque indicated above.

Note: *It is the installing contractor's responsibility to comply with all local electrical codes. For UL 924 emergency installation, secure an emergency power source for control electronic power and line feeds as required.*

Connect Load Wiring 120V

Load ground (typ. for each load)

Neutral (typ. for each load)

Phase A

Phase B

Phase C

Load Wire Specification (120V, 240V, and 277V)

Purpose and Type (All Models)	Wire Range	Strip Length	Torque (lb/in)	Driver
Neutral, Ground, and Iso Ground	14 AWG–10 AWG (2.5 mm^2–6 mm^2)	3/8" (9.5 mm)	20 lb-in (2.3 N-m)	Slotted
	8 AWG (10 mm^2)		25 lb-in (2.8 N-m)	
	6 AWG–4 AWG (16 mm^2)		35 lb-in (4 N-m)	
Circuit breaker output	16 AWG–6 AWG Solid, Class B, C & K (1 mm^2–10 mm^2 Solid, Class 1, 2 & 5) Note: Also UL listed for 2 x 12 AWG or 2 x 10 AWG stranded class B, C, and K stranded wire only.	1/2"	20–25 lb-in (2.2–2.8 N-m)	#2 Phillips or slotted

Note: *Load wire must be copper wire only.*

Connect Load Wiring 240V/277V

Load ground (typ. for each load)

Neutral (typ. for each load)

Phase A

Phase B

Phase C
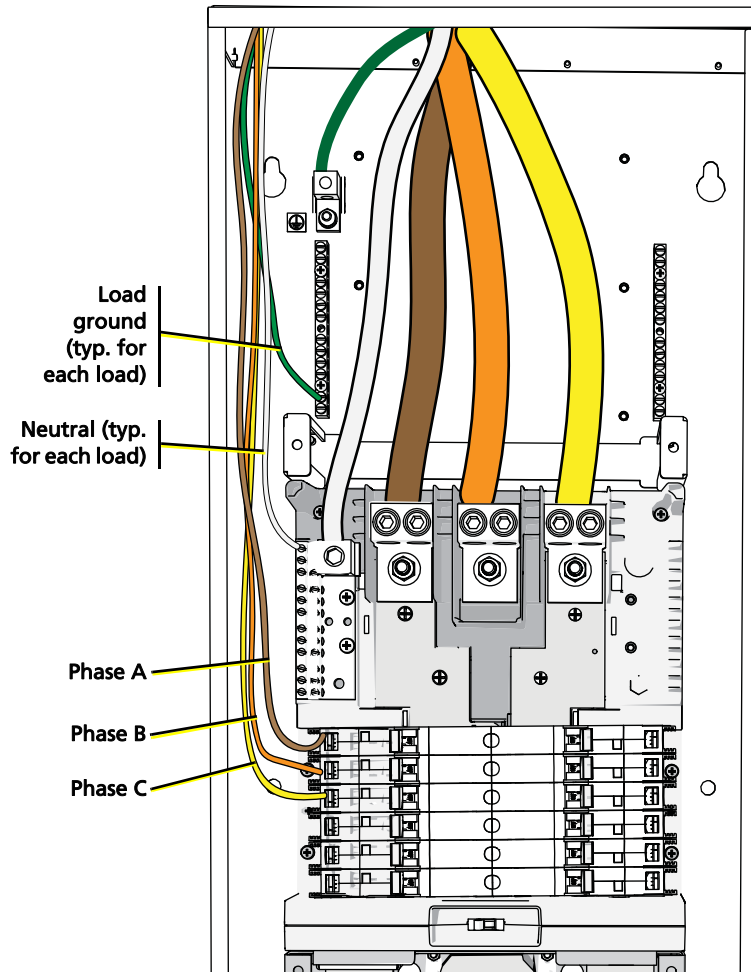
⚠ **WARNING:** RISK OF ELECTRIC SHOCK! Check that power is OFF to the circuit breakers prior to proceeding with control electronics power wiring.
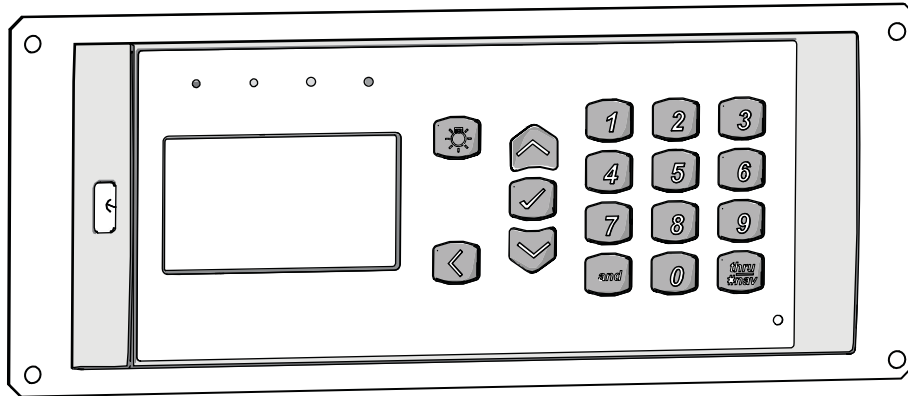

ℹ **Note:** *All low-voltage (control) wiring must be routed separately from high voltage wiring.*

⚠ **CAUTION:** *Remove all cuttings and debris. Debris left in the panel may short the electronics at power up and void the factory warranty.*

Power Control Processor

The Power Control Processor ships installed in the Sensor IQ panel. For information on setup and programming, please see the *Power Control Processor Configuration Manual*. All ETC documentation is available for free download at etcconnect.com.

Remove the protective film from the front of the Control Processor before use.

Low-Voltage Trough

The low-voltage trough is attached to the Power Control Processor box and is adjustable to accommodate the number of wires required for low-voltage connections.
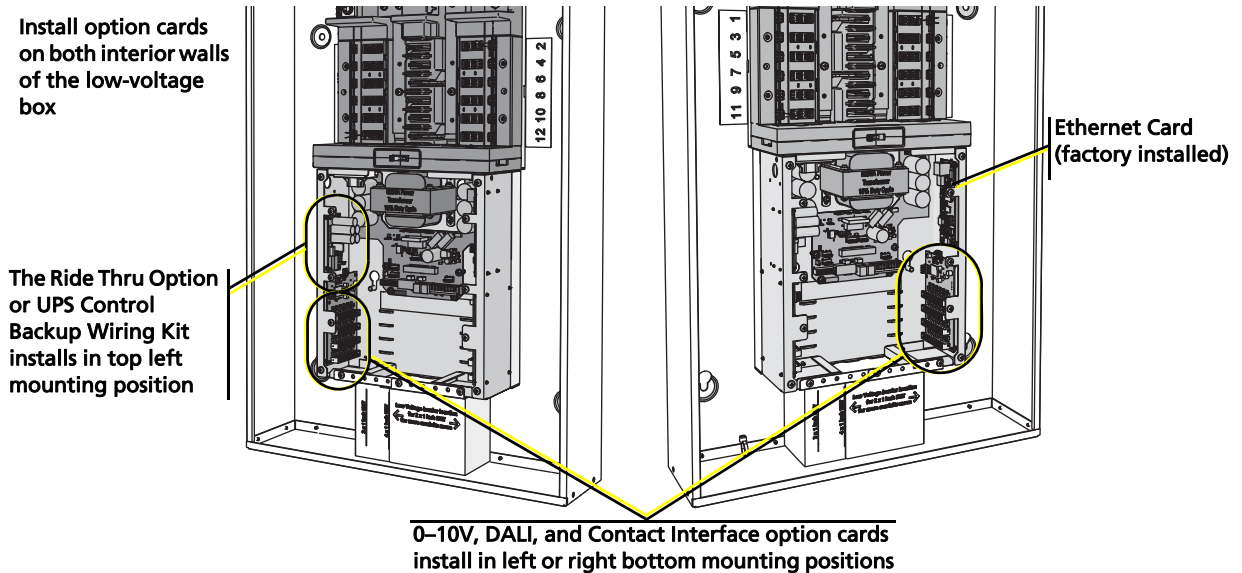
To adjust the trough:

1: Remove the two screws securing the top plate in place.

2: Slide the top plate to increase or decrease the size, lining up the holes on the top plate with the holes on the low-voltage box.

3: Reinstall the screws, making sure that the top plate and bottom plate are secured together with at least one of the screws.
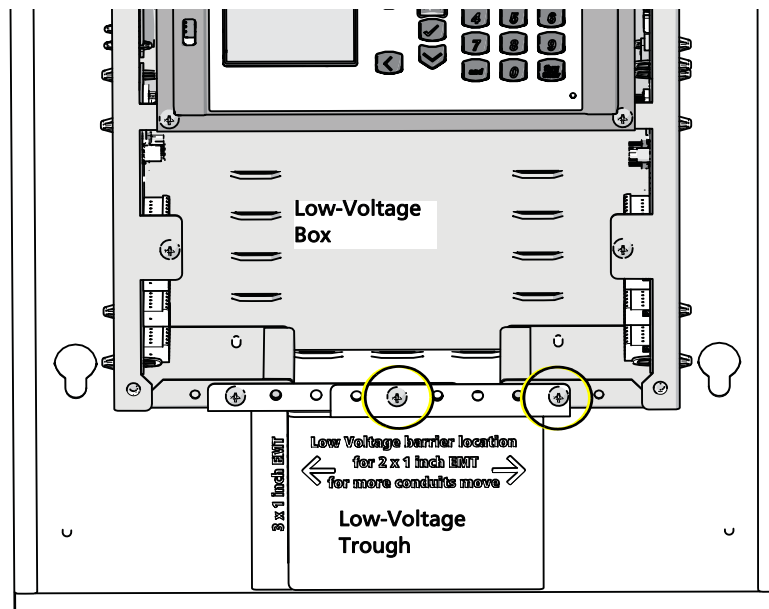
Install Option Cards

Option cards, including the *0–10V Dimming Control* card, *DALI Control* option card, *Contact Input* option card, *Ride-Thru Option* card, and *UPS Control Backup Wiring Kit* are available for field installation into the Sensor IQ Breaker Panel. Installation instructions are provided with each individual option card.
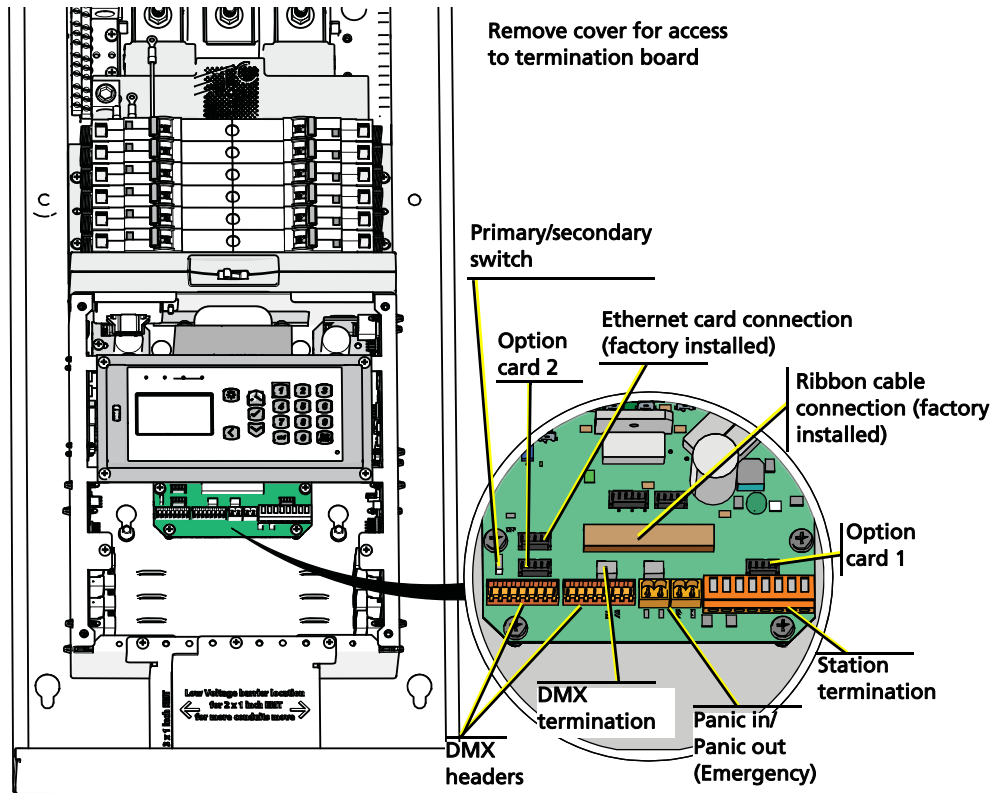

Install option cards on both interior walls of the low-voltage box

The Ride Thru Option or UPS Control Backup Wiring Kit installs in top left mounting position

Ethernet Card (factory installed)

0–10V, DALI, and Contact Interface option cards install in left or right bottom mounting positions

Note: *The panel shown above is mounted in a top-feed orientation. If your installation requires bottom-feed mounting, your Ride Thru option or UPS Control Backup Wiring Kit will be mounted on the lower right wall of the low-voltage box.*

Note: *If you are installing a UPS Control Backup Wiring Kit and you do not see a 3/4 " diameter wiring access hole on the side of the low-voltage box near the card installation location, contact ETC Technical Services.*

Connect Data Wiring

Remove cover for access to termination board

Primary/secondary switch

Option card 2

Ethernet card connection (factory installed)

Ribbon cable connection (factory installed)

Option card 1

Station termination

DMX termination

Panic in/ Panic out (Emergency)

DMX headers

Low Voltage barrier location
Use 2 x 1 inch DMX for more conduite space

The Sensor IQ Panel termination board is located in the low-voltage box, behind the Power Control Processor and the Data Access Panel.

- DMX In and DMX Pass-Thru: Used to connect the breaker panel to a DMX512 control source. See *Data and Control Wire Specification* below.
- Panic In and Panic Out (Emergency): Allows override of the lighting control for specified loads by emergency systems, such as a fire alarm system.
- EchoConnect: Station bus (up to four terminations) allows ETC's Echo line of preset stations to control loads in the breaker panel.
- Option 1 and Option 2 connectors: Allow connection of optional DALI, 0–10V, and Contact Input cards used to control a variety of possible system loads.

Data and Control Wire Specification

Purpose	Recommended Cable	Notes
DMX In and DMX Pass-Thru (J10 and J6)	Belden 9729	Belden 9729 or equivalent (contact ETC for list of equivalents). DMX is RS485 serial and must be installed in series (i.e., daisy-chain) topology.
Ethernet	Belden 1583A (Category 5e or better)	Install per EIA/TIA 568B. Test to TSB 67 standards. Ethernet card is factory installed and connected to termination board at J3.
Panic In Emergency Contact Input and Panic Out Emergency Indicator (J13 and J16)	2–1.5 mm^2 (16 AWG), twisted pair	Contact input for UL 924 emergency lighting loads and +24VDC output for emergency indicator.

Data and Control Wire Specification

Purpose	Recommended Cable	Notes
EchoConnect® Station Bus (J17)	Belden 8471 (or equivalent) plus one 14 AWG (2.5 mm^2) ESD ground wire	Topology-free. The total length of all signal wiring cannot exceed 1,640 feet (500m).
Contact Input (Contact Input Option Card)	12–18 AWG (4–0.5mm^2) Class 1 wire	Maximum of 24 individual dry contact inputs. Option card connects to termination board at J4 or J18.
0–10V Dimming Control (0-10V Option Card)	12–24 AWG (4–.25mm^2) Class 1 wire	Maximum of 50 ballasts (400mA) per channel. Option card connects to termination board at J4 or J18.
DALI (DALI Option Card)	12–24 AWG (4–.25mm^2) Class 1 wire	Maximum of 24 loops and 64 ballasts per loop. Option card connects to termination board at J4 or J18.
UPS Control Backup Wiring Kit	10–8 AWG (6-0.75mm^2) (copper wire solid/stranded)	

Primary/Secondary Switch (IQ48 only)

When using any combination of two 0–10V, DALI, or Contact Input option cards in a Sensor IQ you will need to position the Primary/Secondary switch prior to startup. The Primary/Secondary switch controls which set of breakers responds to each option card.

Option Card 1 will always control circuits 1-24. If the Primary/Secondary switch is in the "OFF" position, Option Card 2 will also control circuits 1-24. If the Primary/Secondary switch is in the "ON" position, Option Card 2 will control circuits 25-48. See the examples in the tables below.
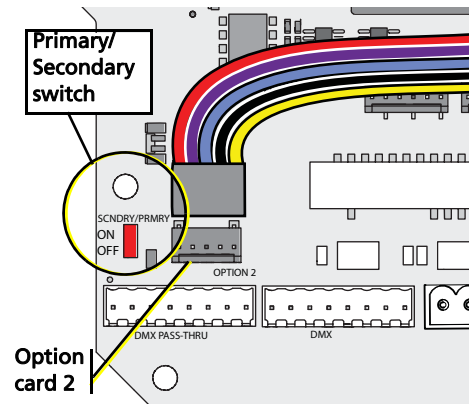
Example 1: Single Card Configurations

If you are using a single option card, the following configurations are possible:

Option Card 1	Option Card 2	Primary/Secondary Switch Position
0-10V (circuits 1-24)	-	ON/OFF
-	0-10V (circuits 1-24)	OFF
-	0-10V (circuits 25-48)	ON

Example 2: Two Card Configurations (Same Card Types)

If you are using two option cards of the same type (e.g. two 0-10V option cards), the following configuration is required:

| Option Card 1	Option Card 2	Primary/Secondary Switch Position
0–10V (circuits 1-24)	0-10V (circuits 25-48)	ON

Example 3: Two Card Configurations (Different Card Types)

If you are using two option cards of different types (e.g. one DALI card and one Contact Input card), the following configurations are possible:

Option Card 1	Option Card 2	Primary/Secondary Switch Position
0-10V (circuits 1-24)	Contact Input (circuits 1-24)	OFF
Contact Input (circuits 1-24)	0-10V (circuits 1-24)	OFF
Contact Input (circuits 1-24)	0-10V (circuits 25-48)	ON
DALI (circuits 1-24)	Contact Input (circuits 1-24)	OFF
Contact Input (circuits 1-24)	DALI (circuits 1-24)	OFF
Contact Input (circuits 1-24)	DALI (circuits 25-48)	ON
O-10V (circuits 1-24)	DALI (circuits 25-48)	ON
DALI (circuits 1-24)	0-10V (circuits 25-48)	ON

DMX Control Wiring and Termination

DMX wire preparation will vary with the type of wire and termination kit being utilized. Please refer to the instructions provided with the DMX termination kit for specifics on the wire preparation. DMX termination is made to J8 and J9 on the termination board.
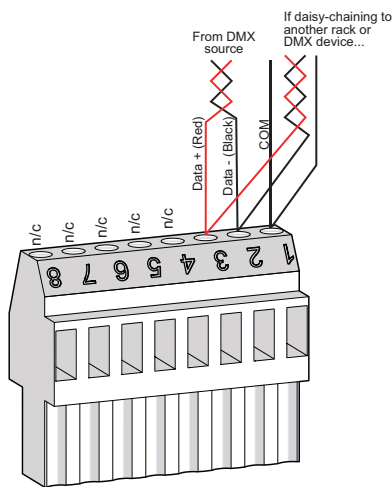

The graphic on the left illustrates DMX termination using screw terminal connectors that are intended for use with Belden 9729 cable (or approved equivalent).

Screw terminal connectors are supplied in the DMX Preparation Kit w/Screw Connector (part number 4100A1012) and shipped with your Sensor IQ Breaker Panel.

Be aware that cable other than Belden 9729 may have a different color code for its wire pairs.

The graphic on the right illustrates DMX termination using IDC connectors that are intended for use with Category 5 solid core cable (or equivalent cable types). IDC connectors are supplied in the Cat5 Preparation Kit w/ IDC Connector (part number 4100A1013) and shipped only when ordered separately.

Use a second connector on the DMX Pass-Thru if daisy-chaining to another panel or DMX device.
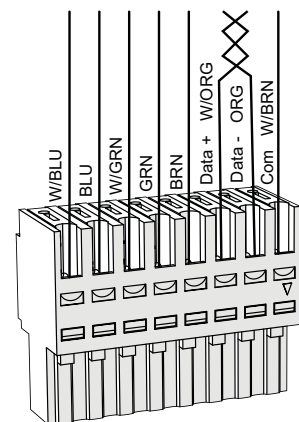
After completing the DMX data connections, you must properly terminate the DMX line using the termination switch (S2) on the panel termination board. Data termination eliminates reflections at the end of the DMX data run. Turn on DMX termination by sliding the switch to END in the last panel/device that is physically connected to the DMX chain; for other devices, the switch should be in the middle (OFF) position.

Connect and Configure Emergency Contact

The Sensor IQ Breaker Panel can connect to an external emergency circuit. Emergency can be triggered by a normally open or normally closed contact input. In addition, the breaker panel optionally offers a +24 VDC (maximum 25 mA) Emergency Out that provides a feed to a lamp or LED, indicating emergency activity.

Connect Emergency Input

1: Pull two 16 AWG (1.5 mm²) wires from your Emergency contact location to the Sensor IQ Breaker Panel through conduit. See *Cable Routing and Conduit Access* on *page 16*.
2: Strip 3/16" (5 mm) of insulation from the ends of each wire.
3: Remove the two-pin Emergency Input connector from J13 on the termination I/O board.
4: Loosen the terminal screws.
5: While maintaining the wire twist as close to the connection as possible, insert each wire into the terminals on the connector.
6: Tighten the screws firmly to secure the wires into the connector.
7: Replace the connector to the termination board.

Determine Emergency Switching

1: Set the Emergency switch, S3 on the termination I/O board, to indicate the Emergency Input contact closure type: Normally Closed Closure (N/C), Off, or Normally Open Closure (N/O).

Connect Emergency Output (Optional)

1: Pull two 16 AWG (1.5 mm²) wires from your external emergency indication lamp to the Sensor IQ Breaker Panel through conduit. See *Cable Routing and Conduit Access* on *page 16*.
2: Strip 3/16" (5 mm) of insulation from the ends of each wire.
3: Remove the two-pin Emergency Output connector from J16 on the termination I/O board.
4: Loosen the terminal screws.
5: Insert the negative wire into pin 1 and insert the positive wire (which carries 24 VDC, maximum current draw of 25 mA, to the lamp) into pin 2 of the terminals on the connector.
6: Tighten the screws firmly to secure the wires into the connector.
7: Replace the connector to the termination board.

Connect EchoConnect

EchoConnect is the communication bus that connects the Sensor IQ Breaker Panel to other Echo native products for configuration of presets, sequences, and level control between devices such as the Echo Preset Stations.
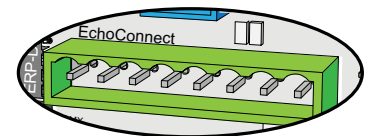
Using Belden 8471

Termination is available for up to four separate EchoConnect data runs and is topology-free. EchoConnect includes one pair of wires (data + and data -) plus a separate ESD ground wire. The total combined length of a EchoConnect wire run cannot exceed 1,640 feet (500 m), with a maximum distance of 1,313 feet (400 m) between any two devices.

For systems utilizing Echo Preset stations, ETC recommends terminating the station data run to the Echo host product with the station power supply enabled.

CAUTION: *Enable only one EchoConnect power supply per system. See the* Power Control Processor Configuration Manual*, Station Power menu, for instructions to enable or disable the power supply. Enabling more than one power supply may interrupt communication and cause undesirable results.*

1: Pull Belden 8471 (or an equal type) control wiring and a 14 AWG (2.5 mm^2) ground into the Sensor IQ Breaker Panel through conduit.

2: Strip 5/16" (8 mm) of insulation from the ends of each wire pair.

3: Remove the connector (J6) from the termination I/O board.

4: Loosen the terminal screws for as many wire pairs as you are terminating.

5: Insert each white wire (typical) from the pairs into the "+" terminal on the connector and tighten the screws firmly to secure the wire into the connector.

6: Insert each black wire (typical) from the pairs into the "-" terminal on the connector and tighten the screws firmly to secure the wire into the connector.

7: The 14 AWG (2.5 mm^2) ground wire can terminate in one of three ways:
    • Connected between stations using WAGO Lever-Lock connectors (ETC part number J4166).
    • Grounded to metal conduit.
    • If grounded metal conduit is not installed, connect the ground wire to the Sensor IQ Breaker Panel ground bus (same as the loads are grounded) and to the green/yellow striped wire connected to the Echo Preset Station using a WAGO Lever-Lock connector. See the related station installation instructions for details.

8: Replace the EchoConnect connector to J6 on the termination I/O board.

Using Category 5 cable

When using EchoConnect over Cat5 cable, the bus uses all pairs in the Cat5 cable plus a separate ESD ground wire. The combined length of an EchoConnect wire run using Cat5 cable cannot exceed 1000' (300 m).

To terminate Category 5 cable to the Sensor IQ Panel, you will need to use a Unison EchoConnect Cat5 ERP Termination Kit (part number 7186A1208). For instructions on installing this kit, please see the *Echo Relay Panel Cat5 Termination Kit Installation Guide*. ETC manuals can be downloaded at etcconnect.com.

Chapter 3

Final installation and power up

Verify installation

- Is the Sensor IQ Breaker Panel securely mounted with all mounting hardware tight?
- Remove all metal shavings and debris from the unit.
- Is there sufficient clearance in the front of the unit for door access?
- Check wiring:
  - Are all load wires terminated to the correct breaker? See *Load Wire Specification (120V, 240V, and 277V)* on *page 27*.
  - Are all load circuits free of short circuits?
  - Do all control cables meet specifications? See *Data and Control Wire Specification* on *page 31*.
  - Are all low-voltage control cables routed separately from high voltage cables?
  - Are all data terminations terminated? See *Connect Data Wiring* on *page 31*.

Install the Front Panel

1: If a main breaker has been installed, remove the main breaker access panel from the front panel before installing the front panel to the Sensor IQ.
   - The main breaker access panel is attached to the rear of the panel with four nuts that thread onto PEM studs on the rear of the front panel.

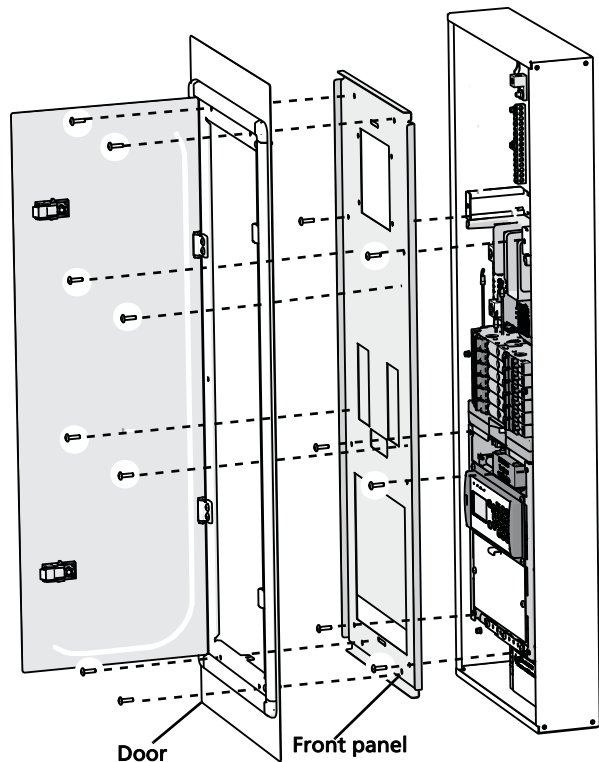2: Using the six or eight previously removed screws, reattach the front panel to the Sensor IQ.

Main Breaker Access Panel
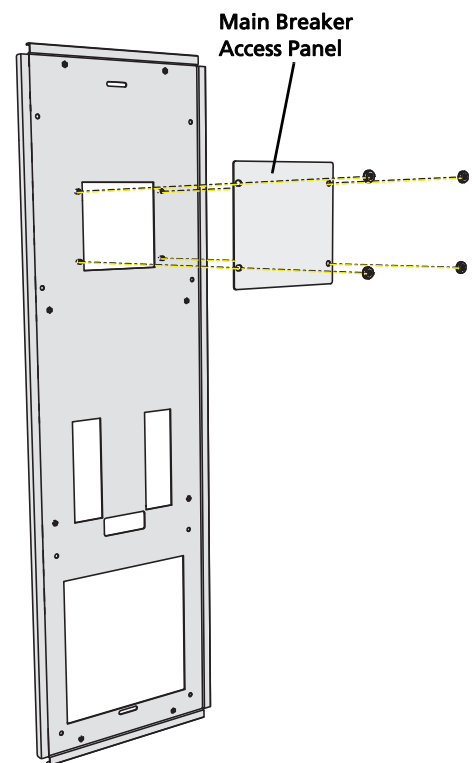
Rear View of Sensor IQ Front Panel

Install the Door

The door can be installed to open to the left or to the right.

1: Orient the door so the hinges are on the proper side for your installation.
2: Attach the door using the eight screws provided

Door **Front panel**

Power Up and Test

WARNING: RISK OF DEATH BY ELECTRIC SHOCK! Make sure both front panels and the door have been installed before turning on the power to the rack.

1: Turn off all branch circuit breakers and the main circuit breaker (if installed).
2: Turn on the power source to the panel.
3: Turn on the main circuit breaker (if installed).
4: Turn on the breaker in the panel that is feeding the control electronics. This breaker has a blue handle and is located near the control electronics.
5: Verify that the control electronics powers up. The display and power LED illuminates.
    • If the display does not illuminate, check the incoming power feed and terminations.
6: Turn on the remaining branch circuit breakers in the panel.
7: For each load, press the corresponding button on the override panel to verify the load can be controlled.

If you have any difficulties installing your system, please contact ETC Technical Services at the office nearest you (see *Contacting ETC* on *page 12*). See the *Power Control Processor Configuration Manual* for operation instructions and maintenance information.
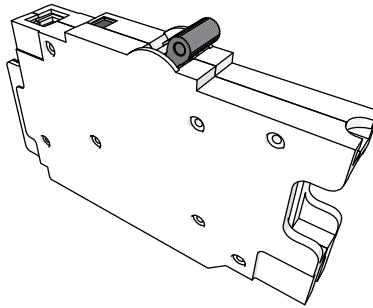
Appendix A

Breakers

Intelligent Breaker Specifcation

Note: *Series ratings up to 65kA is available with appropriate main breaker.*

120V Breaker Ratings

The Sensor IQ Panel uses the following 120V breakers.

Current Rating	With switching			Without switching		
	1 pole	2 pole	3 pole	1 pole	2 pole	3 pole
120V 15A	IQ SM B15	IQ SM B152	IQ SM B153	IQ B15	IQ B152	IQ B153
120V 20A	IQ SM B20	IQ SM B202	IQ SM B203	IQ B20	IQ B202	IQ B203
120V 30A	IQ SM B30	IQ SM B302	IQ SM B303	IQ B30	IQ B302	IQ B303

Rated Voltages: 120V, 120 / 240V, 120/208V

Rated Frequency: 50/60Hz

Interrupt Rating: 22kA

240V/277V Breaker Ratings

The Sensor IQ Panel uses the following 240V/277V breakers.

| Current Rating	With switching	Without switching
	1 pole	1 pole
240V/277V 15A	IQ SM B15-277	IQ B15-277
240V/277V 20A	IQ SM B20-277	IQ B20-277
240V/277V 30A	IQ SM B30-277	IQ B30-277

Rated Voltages: 230V, 240V, 277V

Rated Frequency: 50/60Hz

Interrupt Rating: 14kA (15A, 20A), 10kA (30A)

Install

Breakers are field installable and no additional tools are required.

1: Position the breaker with the handle pointed towards you and the wire termination points facing the outside wall of the panel.

2: Hook the outer corner of the breaker under the breaker clip located on the outside edge of the interior breaker panel.

3: Pivot the breaker into place, pushing firmly to ensure it is seated completely.

4: Test installation by pulling firmly on the outer edge of the breaker. When installed correctly, the breaker should not easily release without the use of tools (such as a screwdriver).

Insert screwdriver and pry outward to release the breaker from the interior
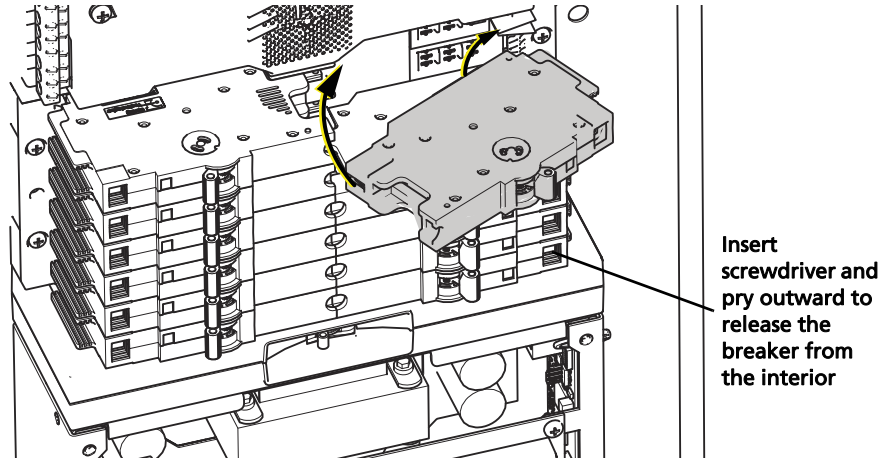
Main Breakers

For information on Sensor IQ Main Breaker options, see the *Main Breaker Installation Guide*. All ETC documentation is available for free download at etcconnect.com.