ETC 120 V Sensor IQ Intelligent Breaker System

Power Control Series

Type(s)	
Project	
Date	
Notes	

GENERAL INFORMATION

ETC's Sensor IQ Intelligent Breaker System provides mains-fed power distribution for up to 48 branch circuits in the industry's most compact footprint. Sensor IQ breakers combine high-inrush rated overcurrent protection, switched power control, and power usage/breaker status reporting in a single device. With built-in station and sensor support via contact input, DMX and Ethernet connectivity, and optional 0–10 V dimming or DALI output, Sensor IQ panels easily integrate into a broad range of systems and applications.

APPLICATIONS

- Theaters
- Schools
- Houses of worship
- Conference centers
- Studios
- Arenas and stadiums

FEATURES

- Mains Feed: Three-phase 120/208 V four-wire plus ground or single (bi) phase 120/240 V three-wire plus ground
- 12-, 24- or 48-position breaker subpanel
- Breakers
  - Hydraulic magnetic breaker with high inrush trip curve
  - 22 kA SCCR (up to 65 kA series rated with main breaker)
  - Freely mix one-, two- and three-pole breakers up to 30 A
  - Integrated air-gap relay switching
  - Integrated on/off/tripped and connected load feedback
  - No power required for handle operation at the breaker
  - 20 A single-pole intellingent breakers are suitable for plug load control
- DMX and Ethernet (sACN) control of preset and sequence playback
- Local user interface provides:
  - Panel configuration
  - Preset and sequence programming and playback
  - Individual channel control
- Built-in Ethernet port
  - Advanced control of relays over streaming ACN (sACN)
  - Web UI for configuration
- Available 0–10 V, contact input, and DALI control cards
- UL924 Listed emergency control bypass with load shedding

ORDERING INFORMATION

Panel Models

MODEL	DESCRIPTION
IQ12	120/208 V 12-circuit breaker panel, MCB optional
IQ12-ML	120/208 V 12-circuit breaker panel, main lug only
IQ24	120/208 V 24-circuit breaker panel, MCB optional
IQ48	120/208 V 48-circuit breaker panel, MCB optional
IQ12-1	120/240 V 12-circuit breaker panel, MCB optional
IQ24-1	120/240 V 24-circuit breaker panel, MCB optional
IQ48-1	120/240 V 48-circuit breaker panel, MCB optional

Note: Select surface or recess door below

Door Options

MODEL	DESCRIPTION
IQ DOOR 120-12R	Recess-mount door for IQ12/IQ12-1
IQ DOOR 120-12S	Surface-mount door for IQ12/IQ12-1
IQ DOOR 120-12R ML	Recess-mount door for IQ12-ML
IQ DOOR 120-12S ML	Surface-mount door for IQ12-ML
IQ DOOR 120-24R	Recess-mount door for IQ24/IQ24-1
IQ DOOR 120-24S	Surface-mount door for IQ24/IQ24-1
IQ DOOR 120-48R	Recess-mount door for IQ48/IQ48-1
IQ DOOR 120-48S	Surface-mount door for IQ48/IQ48-1

Optional Main Disconnects

MODEL	DESCRIPTION
IQ-MB100A22K*	Main Breaker: 120/208 V, 100 A, 22 kA SCCR
IQ-MB100A65K	Main Breaker: 120/208 V, 100 A, 65 kA SCCR
IQ-MB200A22K	Main Breaker: 120/208 V, 200 A, 22 kA SCCR
IQ-MB200A65K	Main Breaker: 120/208 V, 200 A, 65 kA SCCR
IQ-MB225A65K	Main Breaker: 120/208 V, 225 A, 65 kA SCCR
IQ-MB250A22K	Main Breaker: 120/208 V, 250 A, 22 kA SCCR
IQ-MB400A65K	Main Breaker: 120/208 V, 400 A, 65 kA SCCR
IQ1-MB100A22K*	Main Breaker: 120/240 V, 100 A, 22 kA SCCR
IQ1-MB200A22K	Main Breaker: 120/240 V, 200 A, 22 kA SCCR
IQ1-MB400A65K	Main Breaker: 120/240 V, 400 A, 65 kA SCCR

*100 A, 22 kA SCCR Main Breaker kits are not compatible with IQ48 panels.

Please see page 5 for more accessory information.

SPECIFICATIONS

REGULATORY AND COMPLIANCE

- Breakers Listed to UL 489
- Enclosures listed to UL 67, UL 508, UL 924
- Complies with ANSI DMX512-A standard
- Complies with ANSI E1.31 streaming ACN standard

USER INTERFACE

- Onboard web UI for simple configuration and management
- Graphical display
- Button interface
  - 0–9 number entry
  - Up, down and back-arrow navigation with enter
  - Test shortcut for local activation of preset, sequence and set level overrides
- USB interface for uploads of setup and software updates

BREAKER

- Hydraulic magnetic breaker maintains trip curve through entire thermal range, reducing nuisance tripping Bus connection type: Stab on
- One, two or three poles
- UL 489 Listed
- 15, 20 or 30 A
- 50/60 Hz frequency
- Inrush-pulse tolerance: 25 times rated current for half-cycle
- Integrated hall-effect sensors detect contact positions
- Integrated solenoid for remote operation
- Trips on overload even if handle is forcibly held in the "on" position
- Load lugs accept 14-6 AWG load wiring
- Multi-conductor rated output terminal
- Integral mechanically held air gap relay
- Integral current sensing
- Integral position and trip sensing
- Supports manual control of relay state using breaker handle without power
- Control and status provided by contact pads directly at bottom of the breaker case. No external wires or connections required for control or feedback
- Remote Feedback for breaker state, breaker type, current draw and phase voltage
- Visible state indication:

LED	HANDLE	INDICATION
LED on	Handle on	Output active
LED off	Handle on	Remotely controlled off
LED off	Handle off	Breaker tipped/Manually off

BREAKER CONTROL OPERATIONAL RATINGS

- No load-remote switching 1,000,000 cycles
- 24 A Resistive (30 A breaker) 100,000 cycles
- 16 A Resistive (20 A breaker) 100,000 cycles
- 12 A Resistive (15 A breaker) 100,000 cycles
- 15 A Electronic ballast (LED) 100,000 cycles
- Handle operations 10,000 cycles
- Duty cycle of 6 full cycles (12 operations) per minute
- Supports voltage isolation of 4000 V RMS
- Utilizes latching state relays
- Relays are mechanically held

SPECIFICATIONS

MECHANICAL

- Enclosure constructed of 16-gauge steel finished in black, fine-textured, scratch-resistant powder coat paint
- Removable outer panel includes integral locking door to limit access to electronics, breakers and local relay overrides
- Full front access with no side clearance required
- Removable covers for access to Class 1 and Class 2 wiring
- Complies with California building code - seismic zone four

ELECTRICAL

- Mains feed power input to support 120/208 V three-phase four-wire or 120/240 V bi-phase three-wire plus ground
- Max current input: 100 A at 12 circuits, 200 A at 24 circuits, and 400 A at 48 circuits
- Quiescent draw: <10 W with relays at steady state
- Optional isolation between chassis and equipment grounding
- Short-circuit current rating: 22,000 A or 65,000 A symmetrical (see chart a right)
- Overloads occurs at 50 operations of 600% of rated current
- Integrated current transformer
- Current measurement range of 1–30 A. The maximum crest factor of primary current is 2.5
- Feeder entry supported at top or top side
  - Bottom or bottom side entry supported by rotating enclosure during installation
- Load wire entry supported on top, sides or bottom

SHORT-CIRCUIT CURRENT RATING AND LUG SIZING

TYPE	MAX RATING	SCCR RATING	INPUT LUG WIRE SIZE
Main Lug	100 A,200 A, 400 A	22 kA	2x6 AWG-250 kcmil (or 1x500 kcmil w/ kit for 48ckt panels), 1x6 AWG-350 kcmil neutral (dual lug on 48-channel panel), 1x14 AWG-2/0 ground (1x6 AWG-350 kcmil on 48 channel panel)
Main Breaker	100 A	22 kA	1x4 AWG-1 AWG
	100 A 200 A 225 A	65 kA 22 kA, 65 kA 65 kA	1x1AWG-300 kcmil
	250 A	22 kA	1x4 AWG-300 kcmil
	400 A	65 kA	2x3/0 AWG-250 kcmil
Branch Breaker	15 A, 20 A, 30 A	22 kA	6-18AWG solid or stranded class B, C, K; 10,12 or 14 AWG dual conductor
Branch GND/ Neutral	NA	NA	6-14 AWG

Note: Main feed lugs accept copper or aluminum wire; branch breakers accept copper wire only.

SPECIFICATIONS

ENVIRONMENTAL

- Thermal: 0°C to 40° C (32°F to 104° F) operating temperature
  - 24 A circuit (30 A breaker) - 1.4 W, 4.8 BTU/hr
  - 16 A circuit (20 A breaker) - 1 W, 3.4 BTU/hr
- Humidity; 5%–95%, non-condensing
- Complies with ESD immunity to IEC standard 1000-4-2

CONTROL ELECTRONICS

- Input: 120–277 V (+/-15%), 50/60 Hz, <16 A
- Multi-tap transformer terminals accept up to 12 AWG wire
- Control wiring terminations:
  - Control terminals accept maximum of 12 AWG wire
  - Control wiring exiting the panel are Class 2
  - All control terminations utilize removable connectors

FUNCTIONAL

- System-Wide control
  - DMX or sACN input
    - Per-circuit patching
    - Per-circuit threshold
    - 0–200 prioritization
  - Configurable data loss behavior:
    - Play preset; Hold last look; Wait and fade
  - UL 924 emergency lighting with load shedding
    - Load shedding requires a UPS Control Backup Wiring Kit (7131K1817) and Uninterruptable Power Supply (UPS) by others
    - UPS to supply 800 W–2400 W AC power to control processor
- Application/Space segmented Control
  - Space segmenting: up to 16 spaces per panel
  - Power Sequencing: one 16-step sequence per space
  - Presets: up to 64 per space configurable via local UI
  - Zone control: up to 16 zones per space
- Monitoring Per Circuit:
  - Breaker-trip notification
  - Relay state
  - Current draw, phase voltage, and energy usage
- Monitoring Per Space:
  - Active sequences, presets, and clock events
  - Zone levels

SPECIFICATIONS

ACCESSORIES

0-10 V Dimming Option

- 24 outputs of 0–10 V sink dimming control rated for 100 mA per output

Contact Input Option

- 24 dry contact inputs which can be used to:
  - trigger presets and sequences, which will play at the priority configured for architectural sources, or;
  - directly control one or more outputs. The priority of these outputs is configurable. If nothing is configured, the last action takes precedence

DALI Control Option

- 24 control loops of broadcast DALI control
- Each loop supports up to 64 ballasts
- External DALI power supply required

RideThru Option

- Short-term power backup of control electronics
- Automatically engages when power is lost
- Recharges during normal power operation

UPS Backup Kit for Load Shedding

- Allows Power Control Processor to be powered via external UPS (by others)
- Required for load shedding applications
- UPS provides power to drive relays off when normal power is lost
- UPS for each Sensor IQ panel must by UL 924 Listed and rated for a minimum of 200 W peak load

Branch Circuit Fuse Kit

- Aids engineers in selective coordination* of emergency circuits

*Note: Selective coordination is a study on emergency systems that assures that an overcurrent on the output of any downstream branch circuit results in that branch tripping/clearing before the upstream mains breakers.

SENSOR IQ BREAKERS

GENERAL INFORMATION

ETC's Sensor IQ breaker is a high-quality, UL 489 Listed circuit breaker which incorporates the ability to rapidly switch the load using an internal solenoid when the breaker is in the 'on' position. The IQ breaker is designed with a high-inrush trip curve to handle the demands of modern entertainment and architectural lighting fixtures. IQ's unique hydraulic-magnetic trip mechanism maintains this trip curve throughout the operating temperature of the breaker, giving you outstanding protection against nuisance tripping.

A variant of the breaker without switching is available for standard breaker applications.

Sensor IQ breakers are designed for use in Sensor IQ panels only.

Intelligent Breakers with Switching

MODEL	RATED CURRENT	POLES
IQ SM B15	15 A	1-Pole
IQ SM B20	20 A	1-Pole
IQ SM B30	30 A	1-Pole
IQ SM B152	15 A	2-Pole
IQ SM B202	20 A	2-Pole
IQ SM B302	30 A	2-Pole
IQ SM B153	15 A	3-Pole
IQ SM B203	20 A	3-Pole
IQ SM B303	30 A	3-Pole

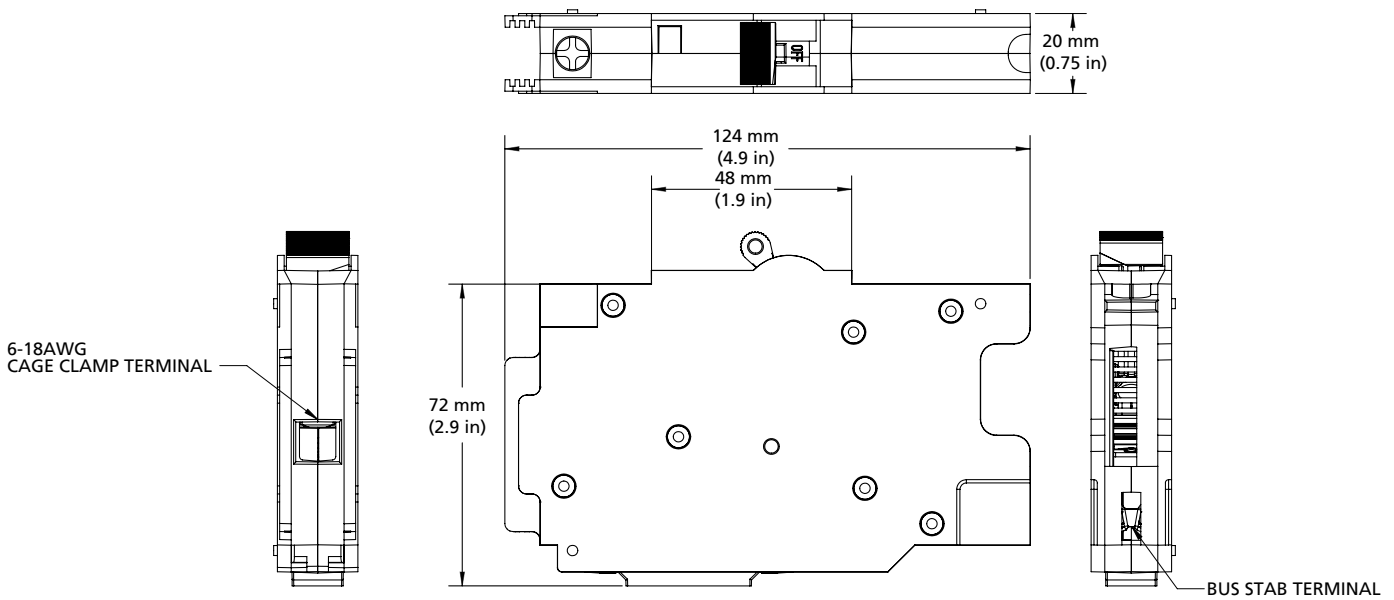
Standard Breakers without Switching

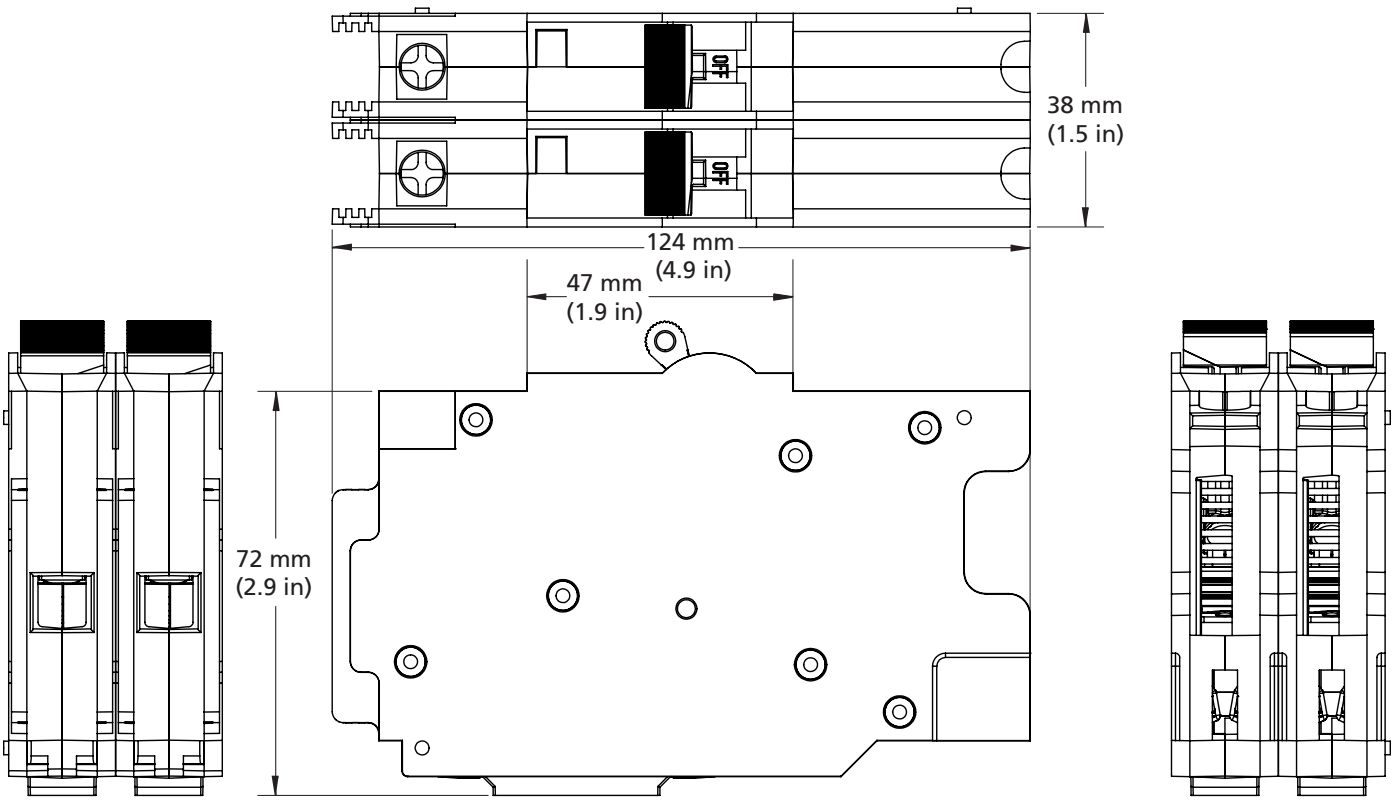
MODEL	RATED CURRENT	POLES
IQ B15	15 A	1-Pole
IQ B20	20 A	1-Pole
IQ B30	30 A	1-Pole
IQ B152	15 A	2-Pole
IQ B202	20 A	2-Pole
IQ B302	30 A	2-Pole
IQ B153	15 A	3-Pole
IQ B203	20 A	3-Pole
IQ B303	30 A	3-Pole

OPTION CARDS AND ACCESSORIES

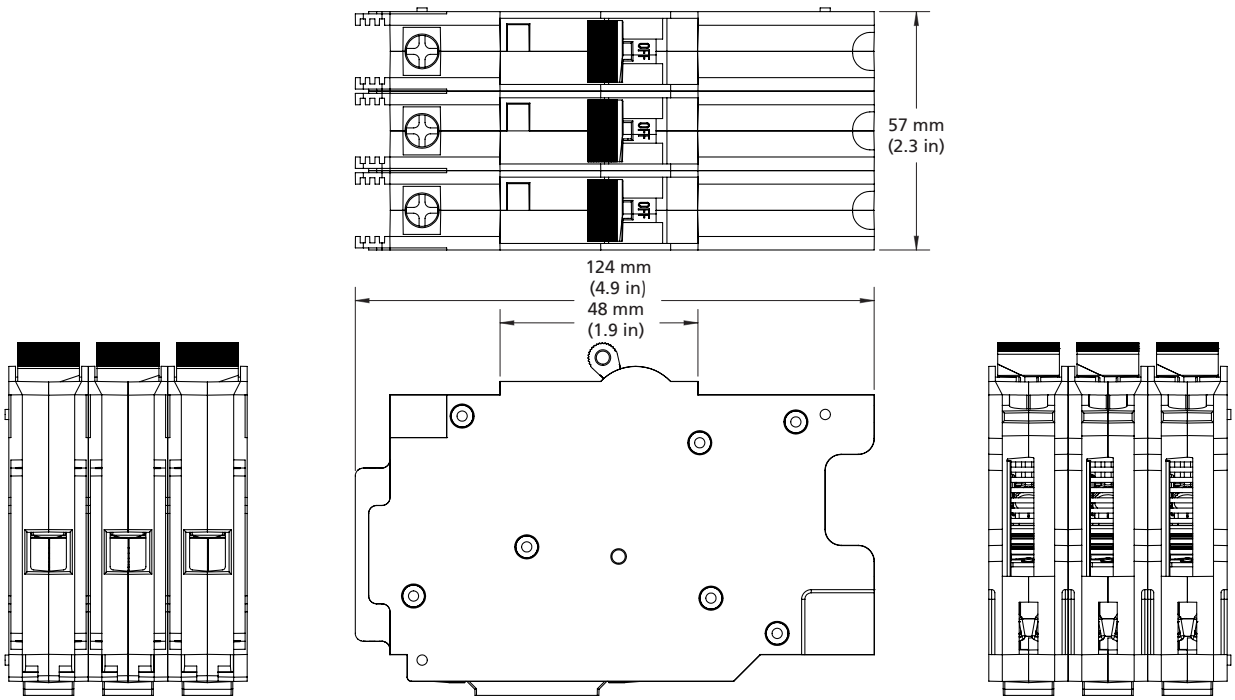
MODEL	DESCRIPTION
IQ-LVD	0–10 V Dimming Control Option
IQ-DALI	DALI Control Option
IQ-CI	Contact Input Option
IQ-RTO	RideThru Option
IQ-UPS-KIT	UPS Control Backup Wiring Kit - required for shedding normal loads when the emergency state is active; a UL 924 Listed UPS (provided by others) with a minimum load rating of 200 W peak load is recommended for each Sensor IQ panel for load shedding applications
IQ-500KCMIL	IQ-48 500 kcmil feeder lug kit for support of 400 A feeders up to 500 kcmil (main lug panels only)
IQSC-6, -12, -24	Branch circuit fuse boxes that may be used for selective coordination of loads (see page 4 for details)
IQ24 ISO GND, IQ48 ISO GND	Isolating ground bar
IQ-TAP	Mains feed tap kit for normal sense circuits for emergency lighting control
IQ-TIE	Breaker handle tie kit for 2-Pole or 3-Pole multiwire branch circuits. For use with normal 120 V circuits only.

SENSOR IQ BREAKER PHYSICAL SPECIFICATIONS

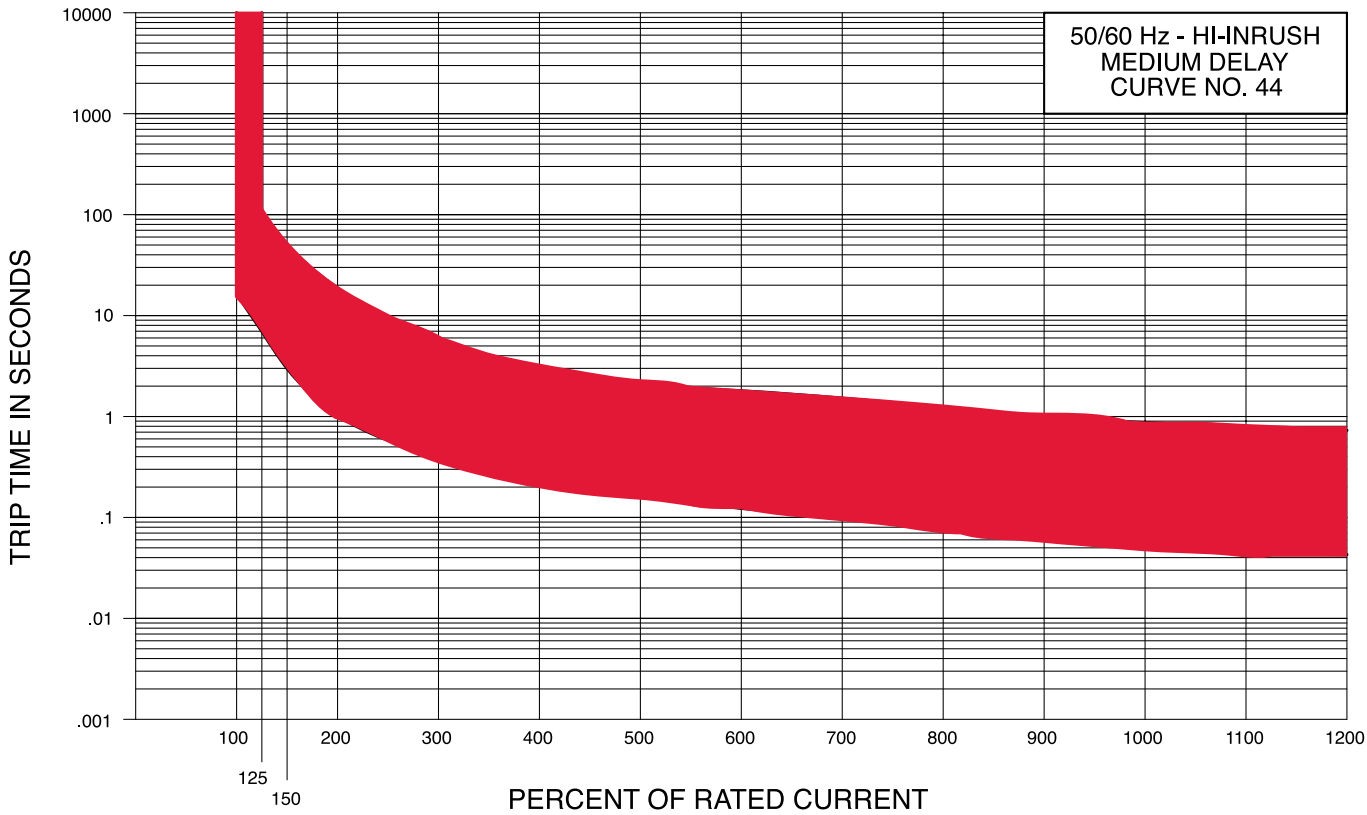




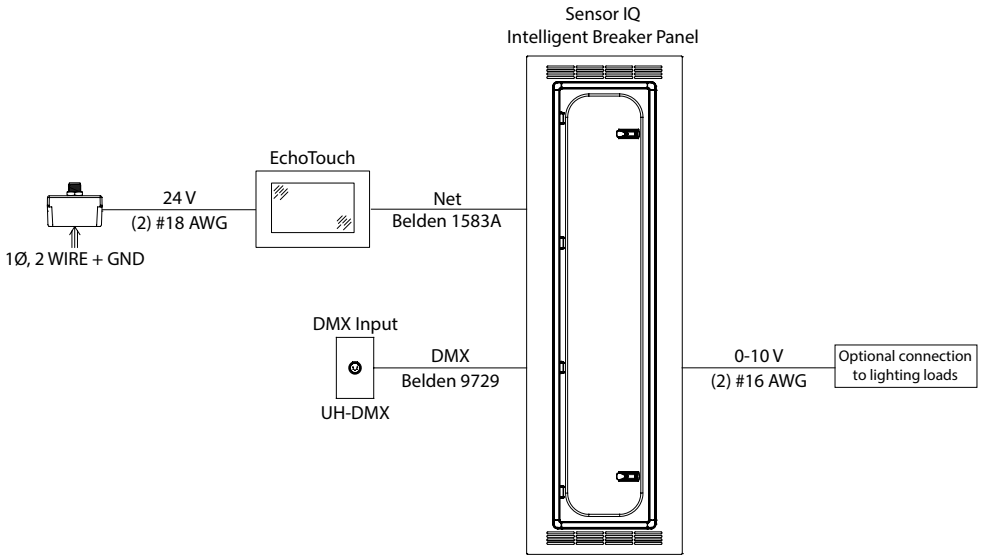
SENSOR IQ BREAKER PHYSICAL SPECIFICATIONS

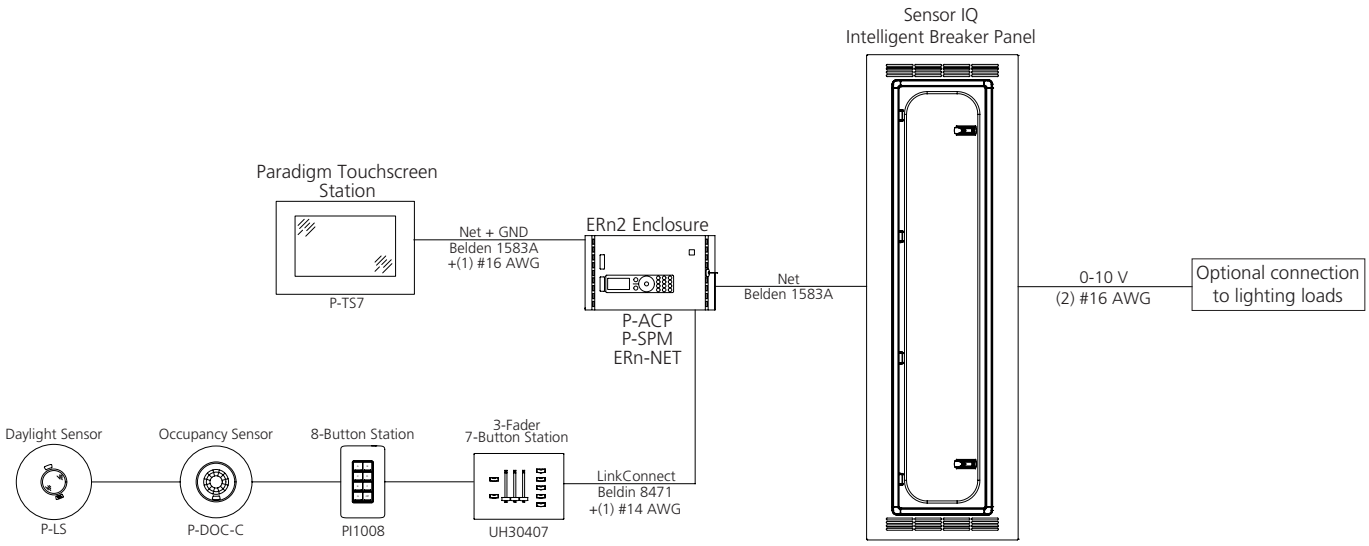


TIME CURRENT CURVE



SAMPLE RISER DIAGRAMS





PHYSICAL

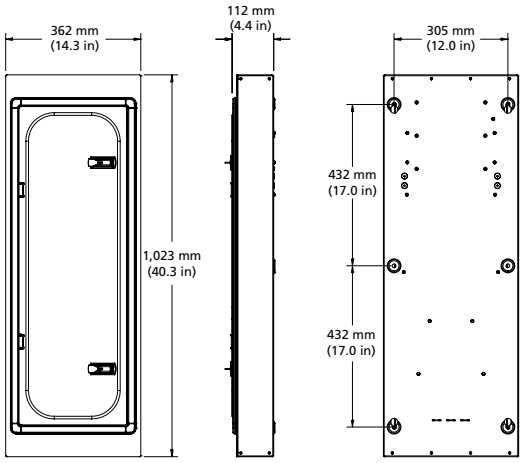
Sensor IQ Dimensions

MODEL	HEIGHT		WIDTH		DEPTH	
	mm	in	mm	in	mm	in
IQ12 SRF	1,023	40.3	362	14.3	112	4.4
IQ12 REC	1,067	42.0	407	16.0	112	4.4
IQ12-ML SRF	870	34.3	362	14.3	112	4.4
IQ12-ML REC	915	36.0	407	16.0	112	4.4
IQ24 SRF	1,277	50.3	362	14.3	112	4.4
IQ24 REC	1,321	52.0	407	16.0	112	4.4
IQ48 SRF	1,626	64.0	508	20.0	161	6.4
IQ48 REC	1,677	66.0	559	22.0	161	6.4

Sensor IQ Weights

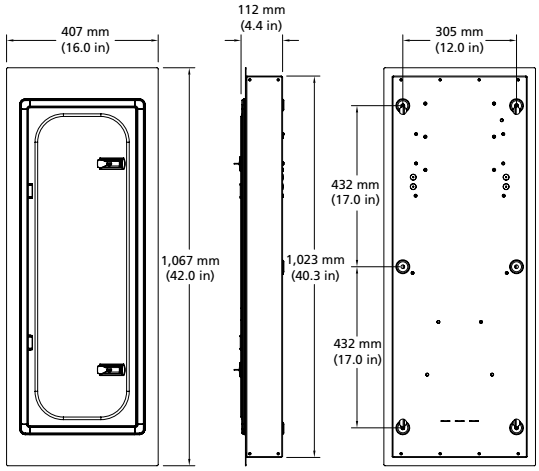
MODEL	WEIGHT		SHIPPING WEIGHT	
	kg	lb	kg	lb
IQ12	18.2	40.0	20.3	44.6
IQ12-ML	18.2	40.0	20.3	44.6
IQ24	22.7	50.0	24.5	54.0
IQ48	39.0	86.0	41.4	91.3

IQ12 (SURFACE)



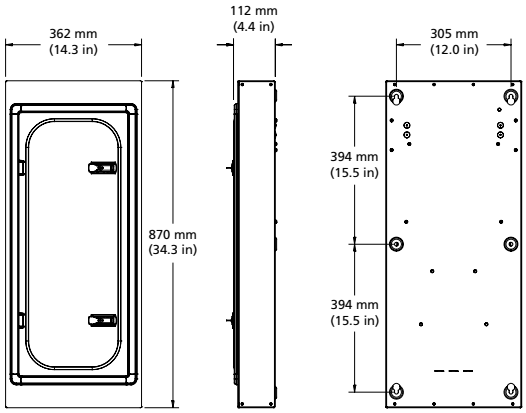
IQ12-DIMS-SURF

IQ12 (RECESSED)

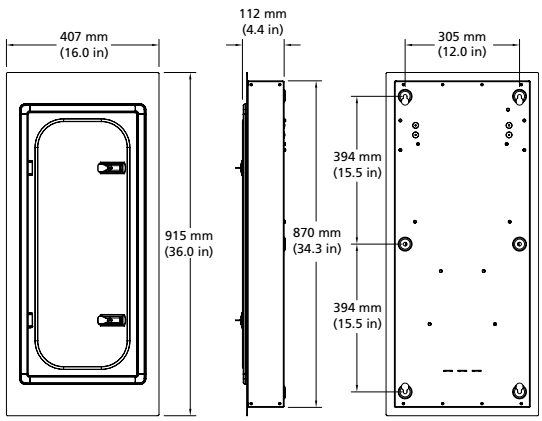


IQ12-DIMS-REC

IQ12-ML (SURFACE)



IQ12-ML (RECESSED)

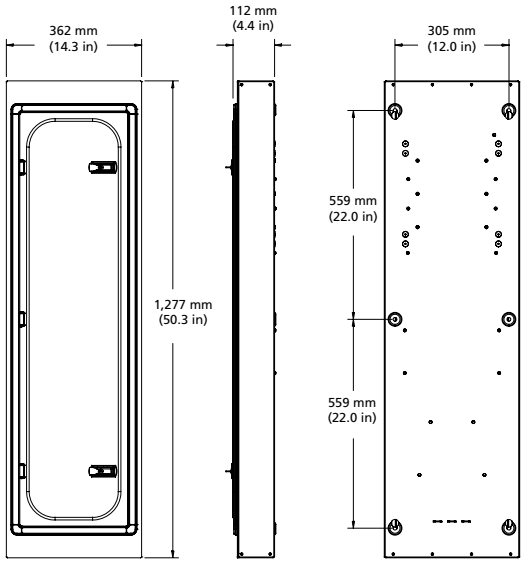


120 V Sensor IQ Intelligent Breaker System*

Power Control Series

PHYSICAL

IQ24 (SURFACE)



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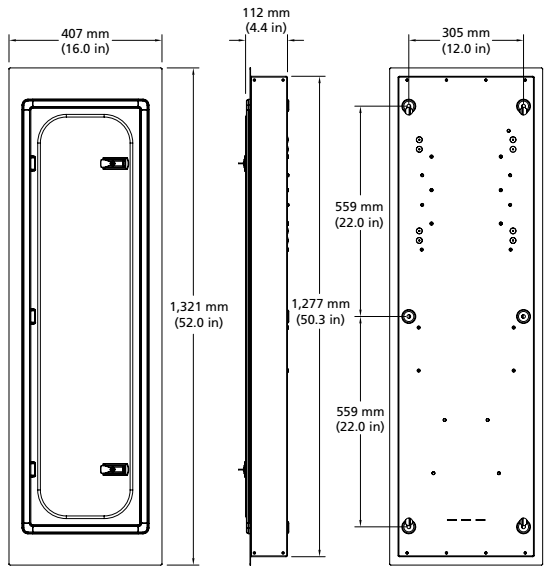
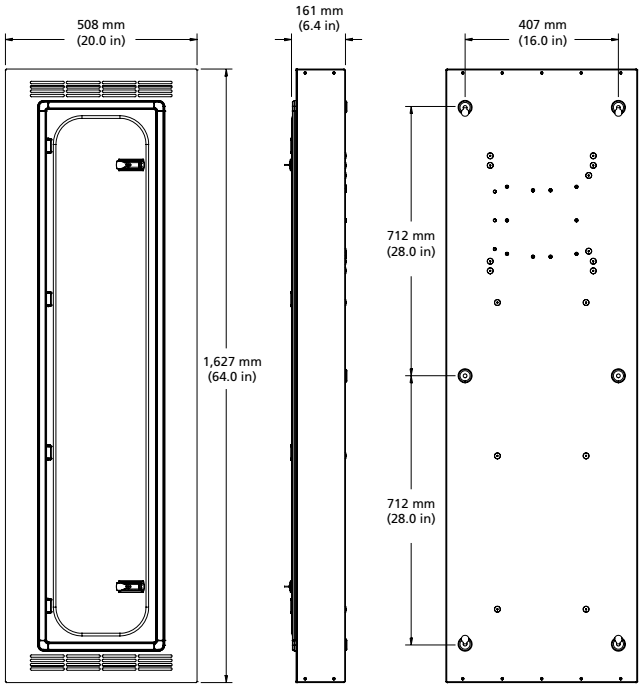
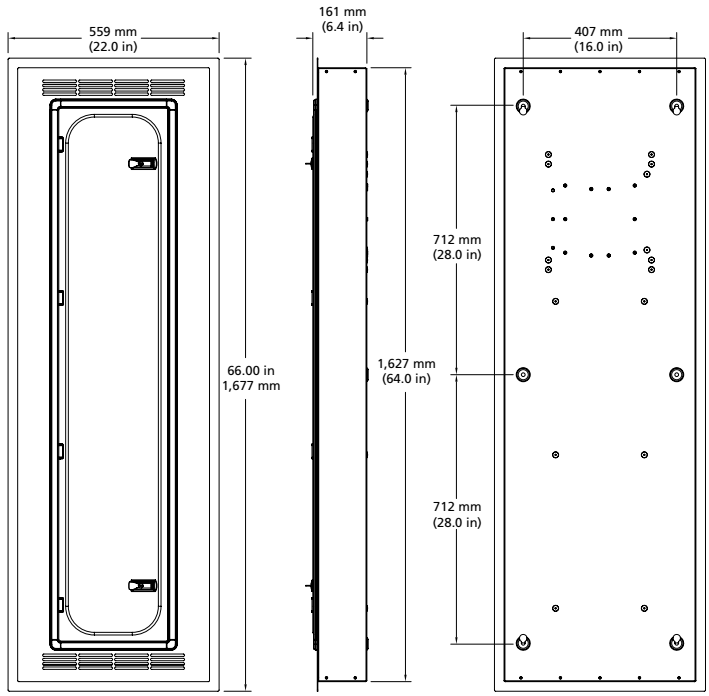


IQ48 (SURFACE)



IQ48 (RECESSED)



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