ETC 240V / 277V Sensor IQ Intelligent Breaker System

Power Control Series

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, sensor, DMX and TimeClock controls and Ethernet connectivity, plus optional 0–10 V dimming, DALI output, contact inputs, and isolated ground bar for audio loads, the Sensor IQ integration opportunities are limitless.

APPLICATIONS

- Theaters
- Schools
- Houses of worship
- Conference centers
- Stadiums and arenas

FEATURES

- Main Feed: 240 / 415 V or 277 / 480 V four-wire plus ground
- 12-, 24- or 48-position breaker subpanel
- Breakers
  - Hydraulic magnetic breaker with high inrush trip curve
  - 14 kA SCCR (or 65 kA series rated with main fuse)
  - Freely mix one-pole breakers up to 20 A
  - Integrated air-gap relay switching
  - Integrated on/off/tripped and connected load feedback
  - No power required for relay operation at the breaker
- Echo, sACN, DMX-512, TimeClock, or stand-alone control
- Built-in EchoConnect power supply for up to 6 Echo stations/sensors and 5 output products
- Built-in network interface provides:
  - Advanced control of relays over streaming ACN (sACN)
  - Measured energy usage reporting per branch circuit
  - Web UI for configuration
- Available 0–10 V, contact input or DALI control cards
- UL924 Listed emergency control bypass contact input with load shedding

ORDERING INFORMATION

Panel Options

MODEL	DESCRIPTION
IQ12-277	277 / 480 V 12-circuit breaker panel
IQ24-277	277 / 480 V 24-circuit breaker panel
IQ48-277	277 / 480 V 48-circuit breaker panel

MODEL	DESCRIPTION
IQ12-240	240 / 415 V 12-circuit breaker panel
IQ24-240	240 / 415 V 24-circuit breaker panel
IQ48-240	240 / 415 V 48-circuit breaker panel

Note: Select surface or recess door below

Door Options

IQ DOOR 277-12R	Recess-mount door for IQ12-240 or -277
IQ DOOR 277-12S	Surface-mount door for IQ12-240 or -277
IQ DOOR 277-24R	Recess-mount door for IQ24-240 or -277
IQ DOOR 277-24S	Surface-mount door for IQ24-240 or -277
IQ DOOR 277-48R	Recess-mount door for IQ48-240 or -277
IQ DOOR 277-48S	Surface-mount door for IQ48-240 or -277

Optional Main Fuse Kit

IQ277-MF200	Main Fuse Kit: 277 / 480 V (240 / 415 V), 200 A, 65 kA SCCR

Optional Main Breaker

IQ277-MB100	Main Breaker: 277 / 480 V (240 / 415 V), 100 A
IQ277-MB200	Main Breaker: 277 / 480 V (240 / 415 V), 200 A
IQ277-MB400	Main Breaker: 277 / 480 V (240 / 415 V), 400 A

NOTE: Main breakers for 240 / 277 V IQ panels are for convenience disconnect. To increase series SCCR, use the IQ Main Fuse Kit.

NOTE: IQ panels with Main Fuse Kits to increase SCCR must be fed by an upstream breaker that is rated at the amperage of the fuse kit or greater.

See page 4 for more accessory information.

Echo Power Requirements

EchoConnect:	1 Unit of Output Power
Auxiliary Power:	Not Required

Built-in EchoConnect Power Supply

EchoConnect:	Provides 6U of control power and an additional 5U of Output Power*
Auxiliary Power:	Not Provided

*Note: Built in power supply can be disabled.

Echo Presets

Supports 64 Echo Presets per space; up to 16 Echo spaces

For more information, download the Echo Quick Guide.

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

- 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
- Onboard Web UI for simple configuration and management

BREAKER

- Hydraulic magnetic breaker maintains trip curve through entire thermal range, reducing nuisance tripping
- Supports 15 A or 20 A single-pole breakers
- Utilizes stab on bus connection
- 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
- Maintains trip curve through entire thermal range, reducing nuisance tripping
- Load lugs accept 6–14 AWG load wiring
- Multi-conductor rated output terminal
- Integral mechanically held air gap relay
- Manual control of relay state using breaker handle without power
- Integral current sensing
- 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
- 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

SPECIFICATIONS

MECHANICAL

- Enclosure constructed of 16-gauge steel finished in black, fine-textured, scratch-resistant powder coat pain
- 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: 240 / 415 V or 277 / 480 V four-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 rating: 14,000 A or 65,000 A symmetrical (See chart below)
- 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	10 kA or 14 kA	2x6 AWG-250 kcmil (or 1x500 kcmil w/ kit for 48ckt panels), 1x350 kcmil neutral (dual lug on 48 channel panel), 1x14 AWG-2/0 ground (1x6 AWG-350 kcmil on 48 channel panel)
Main Fuse	200 A	65 kA	2x6AWG-250 kcmil
Branch Breaker	15 A, 20 A,	14 kA	6-14 AWG solid or stranded class B, C, K; 10,12 or 14 AWG dual conductor
GND/Neutral	NA	NA	6-14 AWG

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

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SPECIFICATIONS

ENVIRONMENTAL

- Thermal: 0°–40° C)32°–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

FUNCTIONAL

- **System-Wide control**
  - DMX input
    - Per-circuit patching
    - Per-circuit patch exclusions
    - Per-circuit threshold
    - 0-200 prioritization (matches sACN priorities)
  - Choice of DMX loss behavior: Hold last look or wait time
  - sACN input
    - Circuit-by-circuit patching
    - Circuit-by-circuit patch exclusions
    - 0-200 prioritization (matches sACN priorities)
  - Choice of sACN loss behavior: Hold last look or wait time
  - Global data loss behavior
  - UL924 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 800–2400 W AC power to control processor
- **Application/Space segmented Control**
  - Space segmenting: up to 16 spaces per panel
  - Power sequencing
  - Presets: up to 64 per space configurable via local UI or Echo Inspire control stations
    - Presets 1-16 can be configured remotely via Echo Access or integrated Web UI
  - Zone control: up to 16 zones per space
  - TimeClock (up to 50 events)
    - Event types: Preset and sequence activation, Flick warn
    - Timed hold (24 hours max.)
    - Auto-timed hold
    - Indefinite holds
    - Scheduled event overrides
    - Calendar and time of day based event scheduler
    - Holiday shut off
    - Astronomical time events: sunrise/sunset offsets
  - Integral station power supply (for up to six stations with up to six power panels connected)
- **Global monitoring**
  - Per circuit
    - Breaker-trip notification
    - Relay state
    - Current draw per circuit
    - Phase voltage
    - Energy usage
  - Per space
    - Active sequences
    - Active presets
    - Zone levels
    - Active-clock events

SPECIFICATIONS

OPTION CARDS AND ACCESSORIES

0–10 Dimming Option

- 24 outputs of 0–10 V sink dimming control rated for 400 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

Ride Thru 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

- DIN-rail electrical enclosure with choice of 6, 12 or 24 fuse holders for class-CC fusing placed on the output of the breaker/relay
- 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-panel applications.

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

Intelligent Breakers with Switching

MODEL	RATED CURRENT	POLES
IQ SM B15-277	15 A	1-Pole
IQ SM B20-277	20 A	1-Pole

NOTE: All of the above branch circuit breakers are compatible with 240 / 415 V systems.

Standard Breakers without Switching

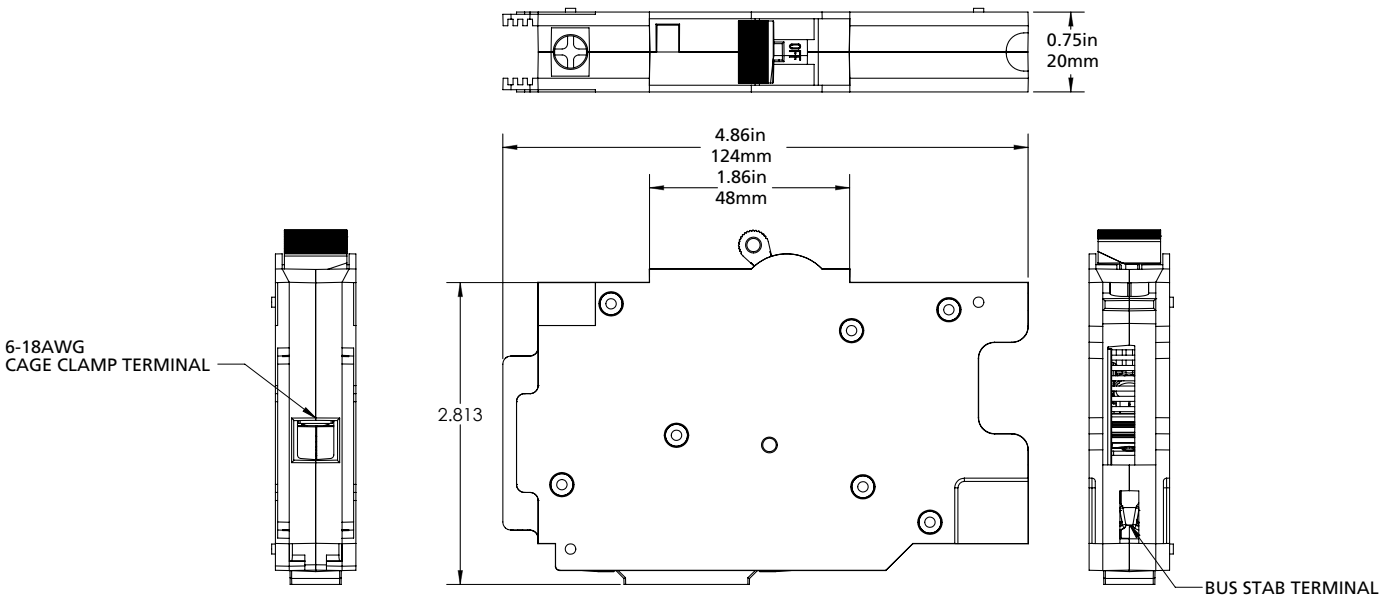
MODEL	RATED CURRENT	POLES
IQ B15-277	15 A	1-Pole
IQ B20-277	20 A	1-Pole

NOTE: All of the above branch circuit breakers are compatible with 240 / 415 V systems.

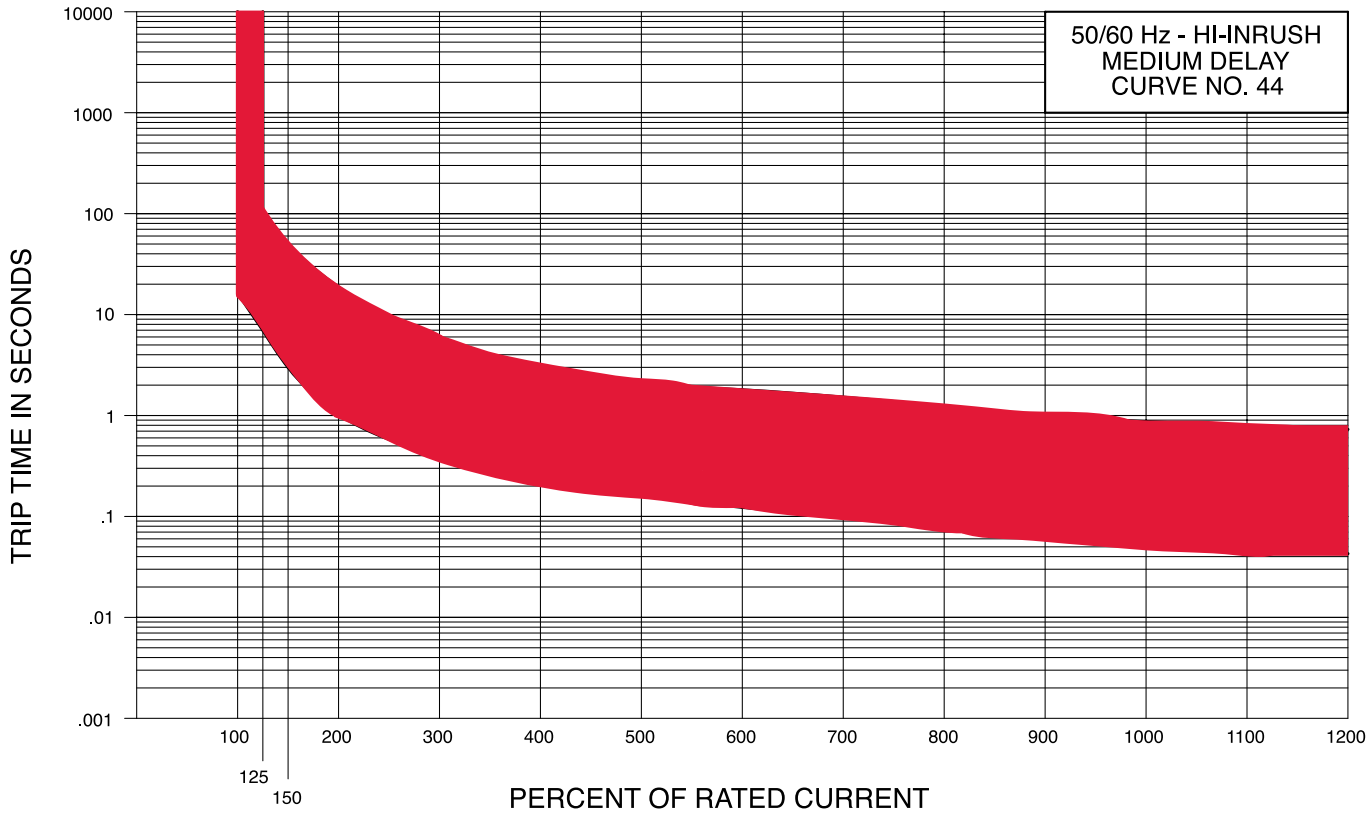
OPTION CARDS AND ACCESSORIES

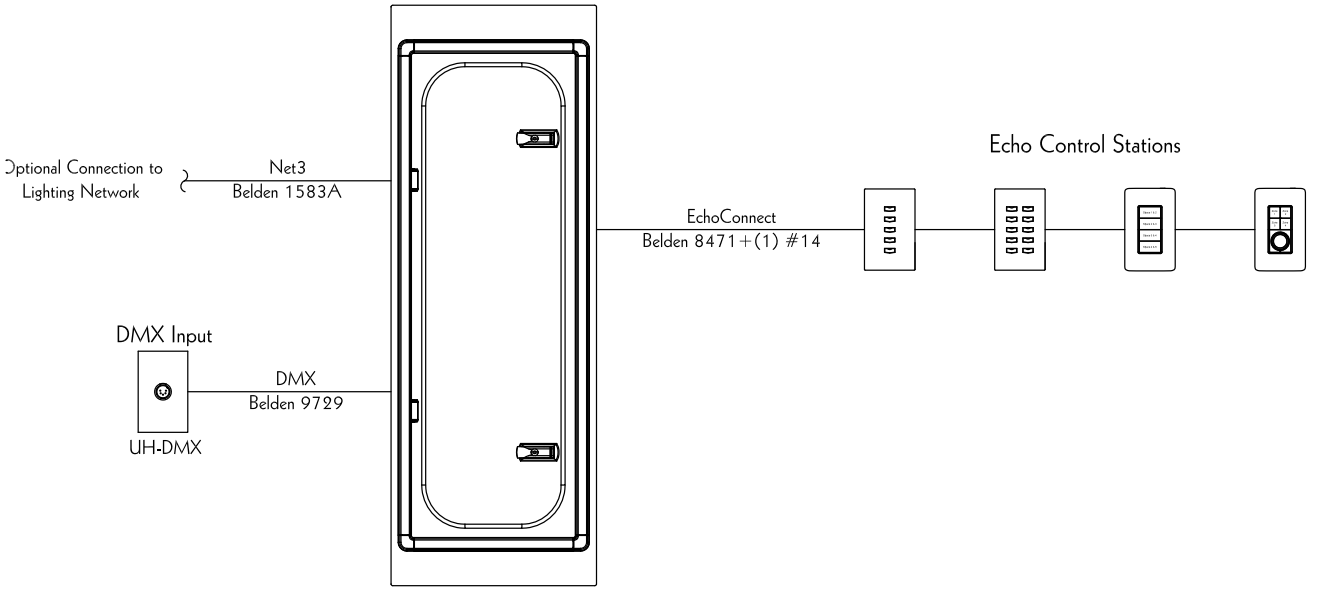
MODEL	DESCRIPTION
IQ-LVD	0-10V Dimming Control Option
IQ-DALI	DALI Control Option
IQ-CI	Contact Input Option
IQ-UPS-KIT	UPS Control Backup Wiring Kit - **required for shedding normal loads when the emergency state is active; a UL 924 Listed UPS (provided by others) with a minimum load rating of 200 W peak load is recommended for each Sensor IQ panel for load shedding applications**
IQ-RTO	RideThru Option
IQ277-500KCMIL	IQ-48 500 kcmil feeder lug kit for support of 400 A feeders up to 500 kcmil
IQSC-6, -12, -24	Branch circuit fuse boxes that may be used for selective coordination of loads (see page 3 for details)
IQ12/24 ISO GND, IQ48 ISO GND	Isolating ground bar
NEW IQ-TAP	Mains feed tap kit for normal sense circuits for emergency lighting control
	Echo Sensors, Stations, Zone Controllers, Station Power Modules and Interfaces

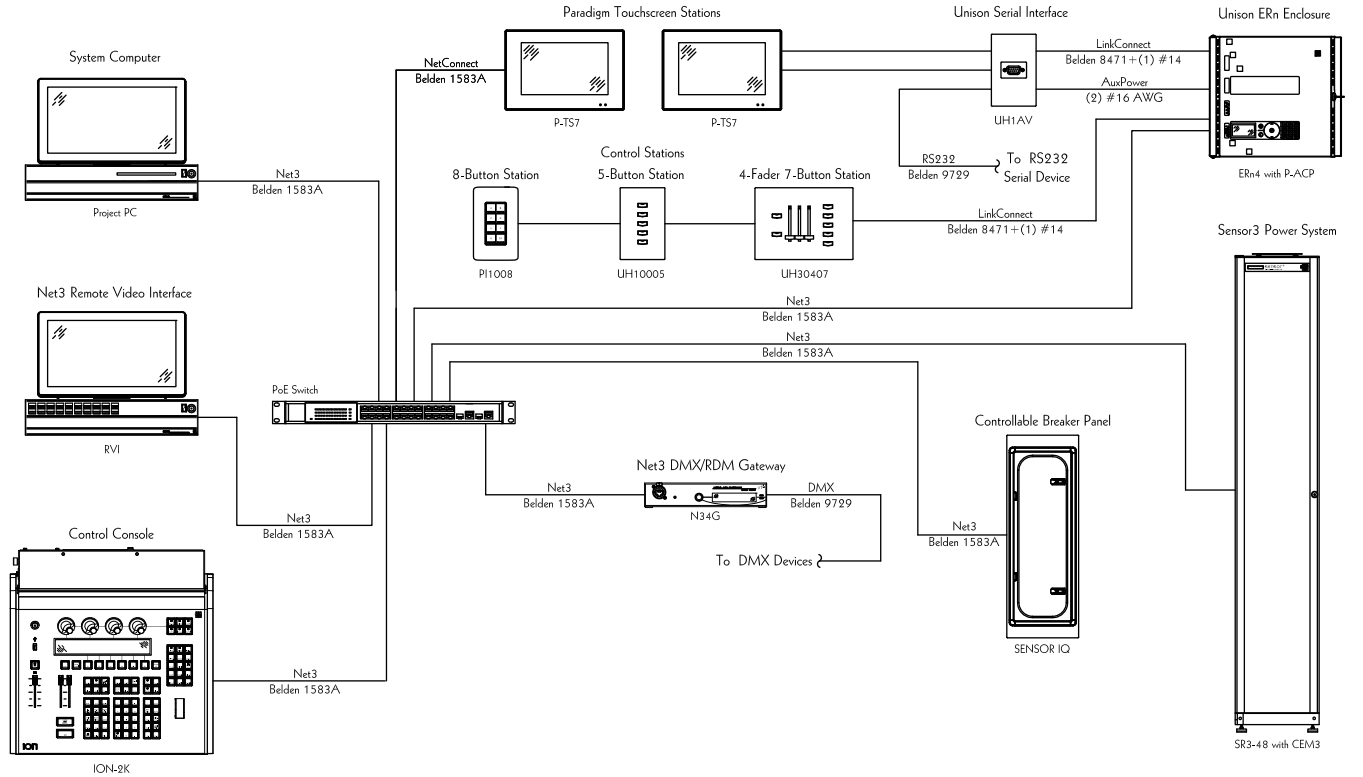
SENSOR IQ BREAKER PHYSICAL SPECIFICATIONS



TIME CURRENT CURVE




Optional Connection to Lighting Network
Net3
Belden 1583A
Echo Control Stations
EchoConnect
Belden 8471+(1) #14
DMX Input
DMX
Belden 9729
UH-DMX


Paradigm Touchscreen Stations
Unison Serial Interface
Unison ERn Enclosure
System Computer
NetConnect
Belden 1583A
P-TS7
P-TS7
UH1AV
LinkConnect
Belden 8471+(1) #14
AuxPower
(2) #16 AWG
ERn4 with P-ACP
Net3
Belden 1583A
Project PC
Control Stations
8-Button Station
5-Button Station
4-Fader 7-Button Station
RS232
Belden 9729
To RS232
Serial Device
LinkConnect
Belden 8471+(1) #14
PI1008
UH10005
UH30407
Sensor3 Power System
Net3 Remote Video Interface
Net3
Belden 1583A
Net3
Belden 1583A
PoE Switch
RVI
Controllable Breaker Panel
Net3 DMX/RDM Gateway
Net3
Belden 1583A
N34G
DMX
Belden 9729
Net3
Belden 1583A
To DMX Devices
Control Console
Net3
Belden 1583A
SENSOR IQ
Net3
Belden 1583A
ION-2K
SR3-48 with CEM3

PHYSICAL

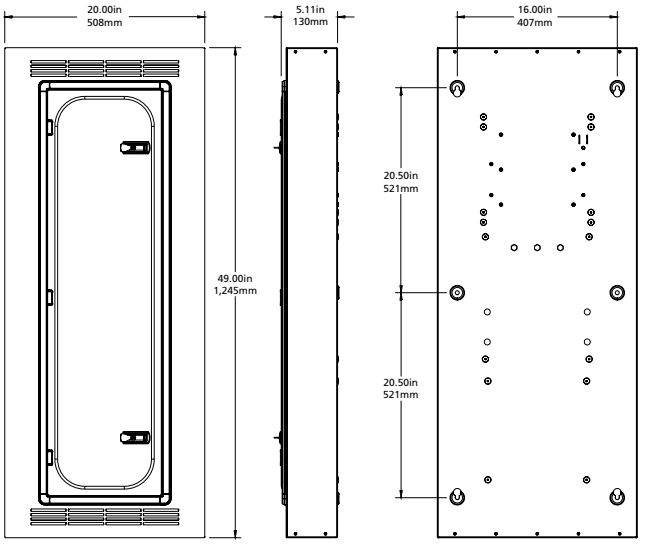
Sensor IQ Dimensions

MODEL	HEIGHT		WIDTH		DEPTH	
	in	mm	in	mm	in	mm
IQ12-277(240)	49	1,245	20	508	5.11	130
IQ24-277(240)	55	1,397	20	508	5.11	130
IQ48-277(240)	73	1,855	20	508	5.11	130

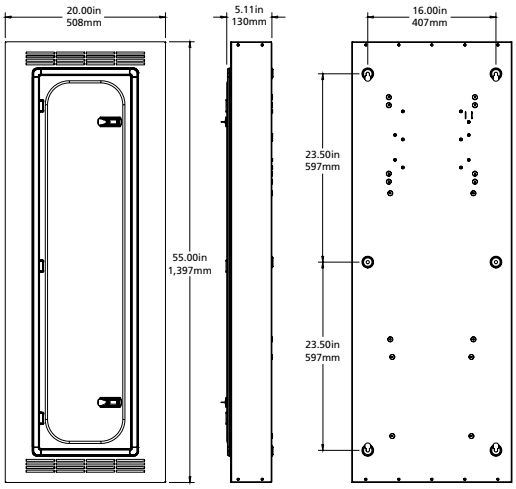
Sensor IQ Weights

MODEL	WEIGHT		SHIPPING WEIGHT	
	lb	kg	lb	kg
IQ12-277(240)	40.0	18.2	44.6	20.3
IQ24-277(240)	50.0	22.7	54.0	24.5
IQ48-277(240)	86.0	39.0	91.3	41.4

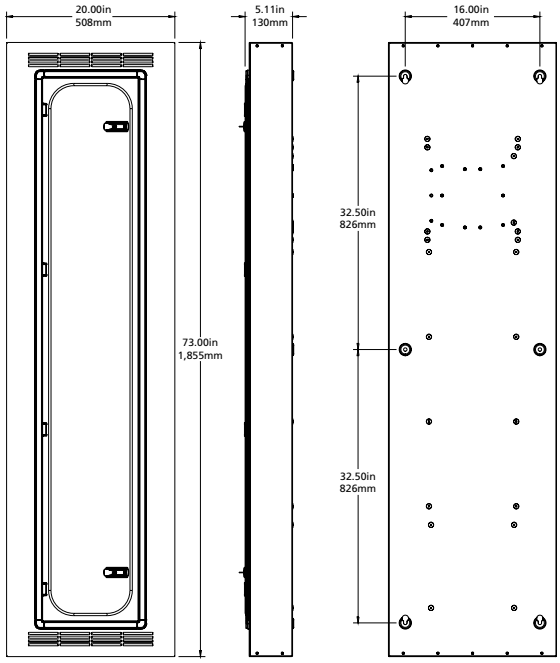
IQ12-277(240)



IQ24-277(240)



IQ48-277(240)



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