

EnerGenius® IQ

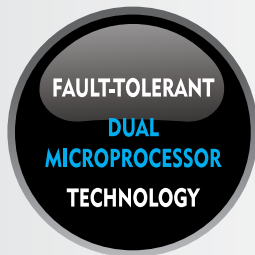
Automatic DC Power Supply/Charger With Intelligent Battery Monitoring and Data Logging



Built-in intelligence **makes it easy to correctly configure charger for battery and site conditions**
Battery check system **automatically tests battery to reduce risk of unexpected application shutdown**
Black box data recorder **helps spot previously hidden problems and direct preventive maintenance**
Advanced user interface, USB PC utility **provide easy to understand system status and control**
Dual microprocessors, digital load sharing **minimize risk of single point failure**
Modbus communication option **provides remote monitoring, administration**



Consulting – Specifying Engineer 2009 Product of the Year



Rugged utility-grade charger

C-UL listed, CE Marked

Filtered output

Temperature compensation

Optional Modbus data communications



Backlit, full-text LCD

Simple charge mode control

LED system mimic panel



Battery check system

Dual microprocessors

Onboard data logger

Battery Expert System



All-digital design – no potentiometers

Constant Voltage, Current Limited, Filtered Battery Charger



Refineries and chemical plants
DC control systems
Engine starting



Oil and gas pipelines
Offshore platforms



Electric utility substations
Switchgear

EnerGenius IQ is a rugged utility-grade battery charger/rectifier with microprocessor control.

In addition to providing DC power and charging your battery, EnerGenius IQ automatically tests your battery performance, logs all relevant site data and clearly communicates results.

Key Features

Constant voltage, current limited and filtered DC output

Simultaneously supplies smooth DC to critical loads, recharges the connected system battery and automatically maintains flooded lead-acid, VRLA, or nickel-cadmium batteries in peak condition.

Integrated battery check system cuts risk of undetected battery failure

Batteries have limited lifetimes, and can fail without warning. The on-board battery system determines if your battery can support a connected continuous load without taking the battery offline or shutting down charger input power.

● PASS
● FAIL



Black box recorder discovers hidden battery and site data to direct preventive action

Data recorder captures and logs previously unavailable system and site data. Data helps to perform failure analyses and to demonstrate if site conditions are conducive to long battery life. Users can leverage this knowledge to improve reliability of battery sites throughout their networks.

Dual microprocessors minimize risk of single point failure

Dual microprocessors provide internal fault tolerance, and provide a level of system reliability superior to either conventional analog or single microprocessor-controlled chargers.

Optional multi-function communications module extends the IQ's capabilities to the network

CommsGenius provides Modbus networking (RS-485 and Ethernet), precise digital load sharing for two chargers, and PC-based charger setup & administration.

Maximizes DC system reliability at lowest total cost

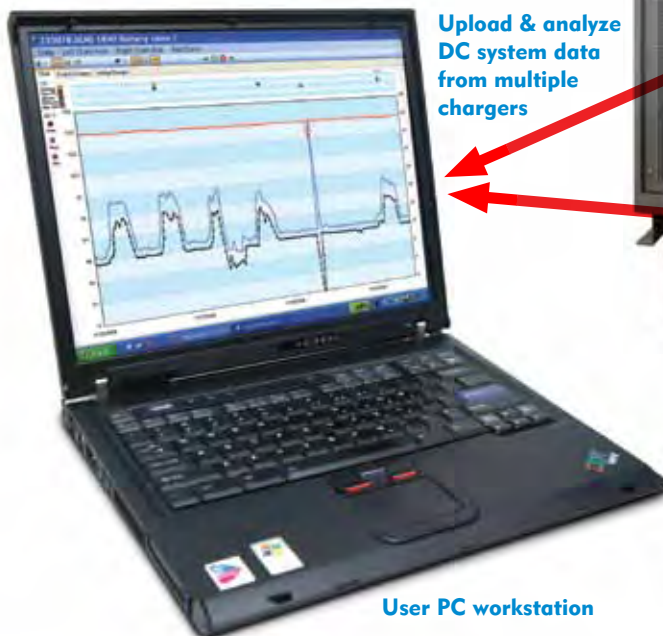
On-board Information Technology Takes System Reliability to a New Level

- Battery check system
- Industry-first “black box” data logger

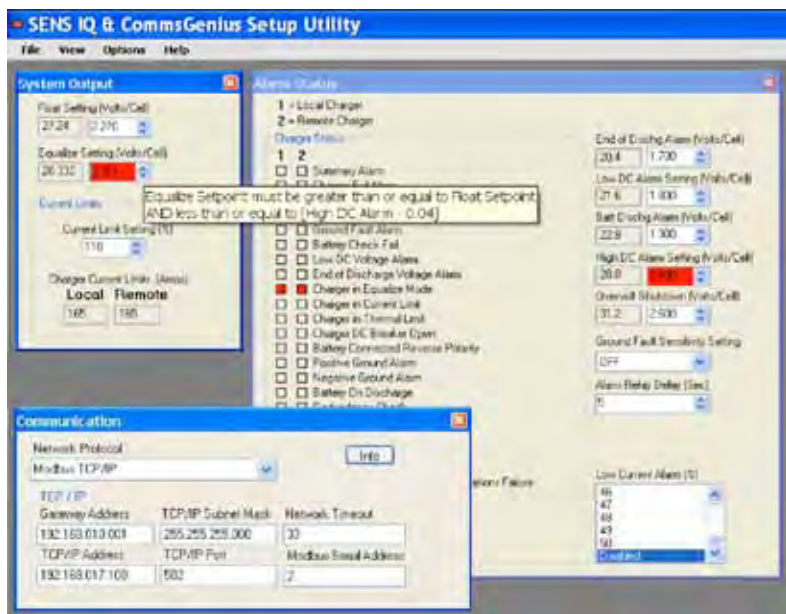
Standby batteries have limited lifetimes and typically fail without warning – causing costly application shutdown. SENS EnerGenius IQ integrates battery checking and system data logging functions into the charger, making DC system health assessment less costly and easier to use than ever before.

- **Insight GUI application makes history data easy to understand**

SENS *Insight* is a PC-based application that converts charger history data into easy-to-understand charts and tables. *Insight* helps you to see and compare a variety of different analog and digital information. Understanding this information helps avert system downtime, and is essential in performing root cause diagnosis of system problems.



- **Setup Utility GUI application makes setup a snap**



SENS *Setup Utility* is a PC-based application that communicates with the charger over USB. It is included with the Modbus communications option and the forced load share & remote temperature compensation package.

Setup Utility's GUI makes communications parameter setup easier than ever before, and enables deployment of pre-programmed standard voltage and alarm settings to multiple chargers, as might be required across a fleet of chargers.

EnerGenius IQ Features and Equipment Packages

	Feature	Filtered ¹ 511	Eliminator ² 512	Eliminator Plus ³ 514	Extreme ⁴ 534
OUTPUT	12, 24, 48, 110/120 or 220/240 VDC nominal	Lead or ni-cd	Lead or ni-cd	Lead or ni-cd	Lead or ni-cd
	Line and load voltage regulation	+0.25%	+0.25%	+0.25%	+0.25%
	Batt temp comp w/adjustable slope and expert system	Std	Std	Std	Std
	Adjustable current limit 33% to 110%	Std	Std	Std	Std
	Output ripple				
	60 Hz: standard filter: 12, 24, 48V DC (on/off battery ⁵)	30 mV / 480 mV	--	--	--
	60 Hz: standard filter: 120V DC (on / off battery)	100 mV / 2%	--	--	--
	60 Hz: standard filter: 240V DC (on / off battery)	200 mV / 2%	--	--	--
	60 Hz: battery eliminator filter: 48V DC (on & off battery)	--	30 mV / 30 mV	30 mV / 30 mV	30 mV / 30 mV
	60 Hz: batt. elim. filter: 12, 24, 120V DC (on / off battery)	--	30 mV / 100 mV	30 mV / 100 mV	30 mV / 100 mV
	60 Hz: batt. elim. filter: 240V DC (on / off battery)	--	30 mV / 200 mV	30 mV / 200 mV	30 mV / 200 mV
	50 Hz: 12, 24, 48 V DC (on battery)	1%	30 mV	30 mV	30 mV
INPUT	50 Hz: 120V DC (on battery)	1%	100 mV	100 mV	100 mV
	50 Hz: 240 V DC (on battery)	1%	200 mV	200 mV	200 mV
INPUT	120/208/240 VAC, field selectable standard ⁶	Others optional	Others optional	Others optional	Others optional
USER INTERFACE	2 x 20 backlit LCD plus LED mimic panel	Std	Std	Std	Std
	Float, auto & manual equalize charging modes and LEDs	Std	Std	Std	Std
	Manual & automatic equalize charge timer 0-256 hours	Std	Std	Std	Std
METERS	All parameters keypad adjustable, with keypad lock	Std	Std	Std	Std
	1% accy digital DC V & A meters; pct nom. AC input V	Std	Std	Std	Std
REMOTE ALARMS & COMMUNICATIONS	DC voltmeter displays both volts/cell and total voltage	Std	Std	Std	Std
	Alarm status via summary Form C contact	Std	Std	Std	Std
	Alarm status via individual Form C contacts	Optional	Optional	Optional	Optional
	Analog data & alarm status via Modbus data communications	Optional	Optional	Optional	Optional
BATTERY CHECK SYSTEM	Individual Form C contacts + Modbus data communications	Optional	Optional	Optional	Optional
	Front panel battery check button	Std	Std	Std	Std
HISTORY & EVENT LOGGING	Fully adjustable automatic battery check system	Std	Std	Std	Std
	1 GB or larger long-term black box memory	Std	Std	Std	Std
SAFETY & RELIABILITY FEATURES	SENS <i>Insight</i> PC-based event log analysis software	Web site download	Web site download	Web site download	Web site download
	60 Hz units NEMA PE-5 compliant & high efficiency	Std	Std	Std	Std
	2-pole AC circuit breaker, 10K AIC	Std	Std	Std	--
	2-pole AC circuit breaker, 18-25K AIC, w/ inrush limiter	--	--	--	Std
	2-pole AC circuit breaker, 65K AIC, w/ inrush limiter	--	--	--	Factory option ⁷
	2-pole UL listed DC circuit breaker	Std	Std	Std	Std
	Electronic soft start & programmable start delay	Std	Std	Std	Std
	Backwards battery protection	Audible alarm	Audible alarm	Audible + diode	Audible + diode
	Fault-tolerant dual-microprocessor architecture	Std	Std	Std	Std
	All-digital design – no potentiometers	Std	Std	Std	Std
	Conformal coated, surface-mount technology circuit cards	Std	Std	Std	Std
	Redundant and selective over voltage shutdown	Std	Std	Std	Std
	-40C to + 50C operating temp with overtemp current cutback	Std	Std	Std	Std
	Equalize pilot relay	Optional ⁸	Optional ⁸	Optional ⁸	Optional ⁸
	Battery temperature compensation	Std	Std	Std	Std
	Remote battery temperature compensation	Optional ⁹	Optional ⁹	Optional ⁹	Optional ⁹
	Digital load and mode sharing system	Optional ⁹	Optional ⁹	Optional ⁹	Optional ⁹
	Surge withstand: ANSI 62.41, ANSI C37.90, IEC 61000-6-2	Std	Std	Std	Std
	Blocking diode & reverse polarity protection diode	--	--	Std	Std
	Low voltage battery disconnect	Optional ¹⁰	Optional ¹⁰	Optional ¹⁰	Optional ¹⁰
INDUSTRY STANDARDS & AGENCY COMPLIANCE	60 Hz units: C-UL listed	Std	Std	Std	Std
	50/60 Hz units: C-UL listed + CE marked	Std	Std	Std	Std
	3rd party certified to IBC 2000-2006; S _{ds} value of 2.28g	Std ¹¹	Std ¹¹	Std ¹¹	Std ¹¹
	RF emissions: FCC Part 15 Class A; EN 61000-6-4:2007	Std	Std	Std	Std
	RF immunity: EN 61000-6-2	Std	Std	Std	Std
MECHANICAL	NEMA 1, IP 20 protection rating	Std	Std	Std	Std
	Rugged steel housing & tough baked polyester finish	Std	Std	Std	Std
	Drip shield	Optional	Optional	Optional	Optional

"Std" = standard feature. "--" = not available. "Factory option": factory installed option only. "Optional": Feature can be installed in the system at any time. (1) Lowest cost package. (2) Specify for lower output ripple. (3) Adds reverse polarity protection and blocking diodes to Eliminator package. (4) Specify for sites with heavier electrical transients and/or where AC supply is of low impedance. (5) "On battery" ripple measured at the terminals of a battery rated in AH > 4 times charger's amp rating. "Off battery" ripple measured at the load end of charger output cables. (6) On units rated < 3.4 KW output. Higher power units require single input voltage. See last page for details. (7) Only available in larger Q2 housing. (8) Requires Extended Individual Form C Relays package (Option B in Section F on Page 7). Relay rating is 60W @ 117 VAC. (9) Requires Remote Alarms & Communications Feature Package L, K, M or N (see Section F on Page 7). (10) Requires Extended Individual Form C Alarms option + external contactor ordered separately. (11) Standard on wall-mount units only.

Specify the EnerGenius IQ System Best For Your Needs

Follow these simple steps to specify the correct charger model number:

A Choose the right output voltage to suit your battery

Nominal charger volts	Lead-acid battery	Nickel-Cadmium battery
12	4-6 cells	6-10 cells
24	8-12	12-20
48	16-24	25-38 (25-40)
110-120	40-60	64-93 (64-96)
220-240	80-120	128-185 (128-192)

Cells in (parentheses) indicate lower maximum per-cell charging voltages

B Choose the correct output current rating

Use formula to solve for charger amp rating to simultaneously power your load and recharge your battery

FORMULA

$$\left[\frac{AH \times K}{T} \right] + L = I$$

AH, or ampere hours capacity to be returned to the battery. Specify either duty cycle (amps x discharge hours) or AH rating of battery.

Constant K recharge inefficiency constant

- Lead battery 1.15
- Nickel battery..... 1.40

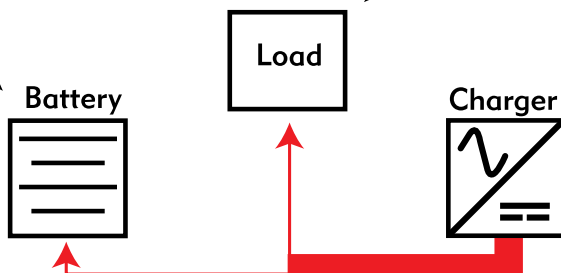
T is the time in hours you wish to allow for recharge.

Amps load "L" + **Charger amp rating "I"**

Example: Recharge a 220 AH lead-acid battery in 12 hours while powering a 10 amp load.

$$\frac{220 \times 1.15}{12} + 10 = 31.08 \text{ amps.}$$

Use 35A charger, which is next available rating.



C Specify your AC input supply

All chargers supplying output power less than 3.4 KW come standard with field selectable input

D Safety agency marks

Factory specified – no decision needed

E Specify the IQ features package suited to your needs

F Specify alarm relay/communications configuration

G Specify mounting configuration

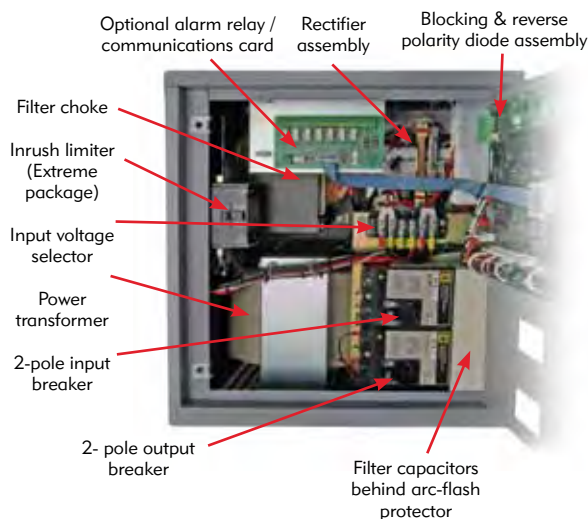
H Specify optional accessories as needed to complete your system

I Specify battery type and number of cells

How To Order

IQ	Nominal DC output voltage			Rated output current			AC	Agency	Feature package			Alarm	Mounting	SENS use
Q	0	4	8	0	3	5	T	L	5	1	4	A		
	A			B			C	D	E			F	G	
Q														

	Parameter	Code	Value
A	Nominal DC output voltage	012	12 volts DC nominal
		024	24
		048	48
		120	110-120
		240	220-240
B	Rated output current	006	6 amps
		012	12
		016	16
		025	25 (largest 240 VDC charger)
		035	35
		050	50 (largest 120 VDC charger)
		075	75
		100	100 (largest 12V & 48V chargers)
C	AC input, single phase	T	115-120/208/230-240 V, 60 Hz
		P	115-120/208/230-240 V, 50/60 Hz
		3	208 V, 60 Hz (> 3.4 KW output power)
		S	240 V, 60 Hz (> 3.4 KW output power)
		8	480 V, 60 Hz
		4	230 V, 50/60 (> 3.4 KW output power)
		V	400 V, 50/60 Hz
D	Agency marks	L	C-UL listed (60 Hz units)
		G	C-UL listed & CE marked (50/60 Hz units)
E	Feature package	511	Filtered package: Standard input breaker and standard output filter
		512	Eliminator package: Adds lower ripple filter to Filtered package
		514	Eliminator Plus package: Adds reverse polarity diode and blocking diode to Eliminator package
		534	Extreme package: Adds inrush limiter to Eliminator Plus package and upgrades input breaker to 18-25K AIC rating
		574	Extreme package: Upgrades input breaker in 534 to 65K AIC. Available only in Q2 housing
F	Remote alarms & communications feature packages	A	Summary Form C alarm ¹
		C	Individual Form C alarms ²
		B	Extended individual Form C alarms ³
		L	Remote temp sense & load share kit
		K	Individual Form C alarms + RTS & load share
		M	Modbus data communications ⁴
		N	Modbus data comm + individual Form C alarms
G	Mounting configuration	(Blank)	Wall mount or optional free-standing Q2
		R	Relay rack mount (factory installed option only)



Summary relay ¹	5-alarm relay card ²	7-alarm relay card ³	AC pilot relay	CommsGenius card	Remote temp sense cable	Load share cable	USB cable	Setup software CD	Modbus daughtercard ⁴
✓									
✓	✓								
✓		✓	✓						
✓				✓	✓	✓	✓	✓	
✓	✓			✓	✓	✓	✓	✓	
✓				✓	①	②	✓	✓	✓
✓	✓			✓	①	②	✓	✓	✓

(1) Activates on any alarm listed under Footnote #3. (2) AC fail, charger fail, low DC volts, high DC volts, ground fault, battery check fail. (3) AC fail, charger fail, low DC volts, high DC volts, end of discharge, ground fault, battery check fail. (4) Enables remote reading of all alarms & analog values. Ethernet and RS-485 interfaces. RTU and ASCII modes.

NOTE: When dual charger configurations are set up for forced load share only 1 ea. charger may be equipped with the CommsGenius card. One CommsGenius supports load share, RTS and Modbus function in both chargers.

H Optional features not shown above

- ☐ Freestanding, floor-mounting housing (size Q2 only): Order p/n 209399
- ☐ Drip shield: Order p/n 209320 for Q1 or 209321 for Q2
- ☐ Front door lock: Order p/n 808990
- ☐ AC surge protective device to UL 1449 3rd ed.: 480 & 400 VAC order p/n 808357; ≤ 240 VAC order p/n 808358

I Specify battery type and number of cells

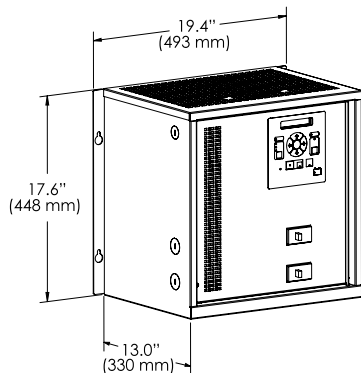
- Flooded lead-acid VRLA Ni-Cd (specify number of cells in Ni-Cd battery)

Table of Ratings, Inputs, Circuit Breakers, Weights and Dimensions

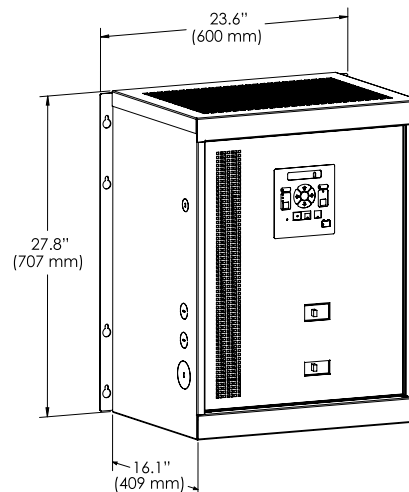
Output		Model Number	Input ratings		AC, DC breaker amps ^c	Case size & shipping weight		
V	A		Input voltage ^a	Input current, worst case ^b		Case	Lbs	Kg
12	12	Q012-012	120/208/240°, 480	3.2, 1.8, 1.6, 0.8	15°, 15, 15	Q1	92	42
12	25	Q012-025	120/208/240°, 480	4.2, 2.4, 2.1, 1	15°, 15, 35	Q1	96	44
12	50	Q012-050	120/208/240°, 480	13, 7.2, 6.3, 3.1	20°, 15, 70	Q1	120	55
12	100	Q012-100	120/208/240°, 480	24, 14, 12, 6.1	30°, 15, 125	Q2	298	135
24	6	Q024-006	120/208/240°, 480	2.9, 1.5, 1.5, 0.7	15°, 15, 15	Q1	92	42
24	12	Q024-012	120/208/240°, 480	5.6, 3.2, 2.8, 1.4	15°, 15, 15	Q1	96	44
24	16	Q024-016	120/208/240°, 480	7.4, 4.3, 3.7, 1.8	15°, 20	Q1	104	47
24	25	Q024-025	120/208/240°, 480	12, 6.7, 5.8, 2.9	15°, 15, 35	Q1	119	54
24	35	Q024-035	120/208/240°, 480	16, 9.1, 7.9, 4	20°, 15, 45	Q1	129	59
24	50	Q024-050	120/208/240°, 480	23, 13, 11, 5.6	30°, 15, 70	Q1	134	61
24	75	Q024-075	120/208/240°, 480	33, 19, 17, 8.3	45°, 15, 90	Q2	308	140
24	100	Q024-100	120/208/240°, 480	44, 25, 22, 11	60°, 15, 125	Q2	320	145
24	150	Q024-150	208, 240°, 480	37, 32, 16	50, 40°, 20, 200	Q2	354	161
48	6	Q048-006	120/208/240°, 480	5.2, 3, 2.6, 1.3	15°, 15, 15	Q1	96	44
48	12	Q048-012	120/208/240°, 480	10, 5.9, 5.1, 2.6	15°, 15, 15	Q1	108	49
48	16	Q048-016	120/208/240°, 480	13, 7.7, 6.7, 3.3	20°, 15, 20	Q1	122	55
48	25	Q048-025	120/208/240°, 480	21, 12, 10, 5.2	30°, 15, 35	Q1	148	67
48	35	Q048-035	120/208/240°, 480	29, 16, 14, 7.1	40°, 15, 45	Q1	167	76
48	50	Q048-050	120/208/240°, 480	40, 23, 20, 10	50°, 15, 70	Q1	190	86
48	75	Q048-075	208, 240°, 480	34, 30, 15	45, 40°, 20, 90	Q2	335	152
48	100	Q048-100	208, 240°, 480	45, 39, 20	60, 50°, 25, 125	Q2	360	164
120	6	Q120-006	120/208/240°, 480	12, 7, 6.1, 3.1	15°, 15, 15	Q1	130	59
120	12	Q120-012	120/208/240°, 480	23, 14, 12, 5.9	30°, 15, 15	Q1	152	69
120	16	Q120-016	120/208/240°, 480	31, 18, 16, 7.8	40°, 15, 20	Q1	186	85
120	25	Q120-025	120/208/240°, 480	47, 27, 23, 12	60°, 15, 35	Q1	210	95
120	35	Q120-035	208, 240°, 480	38, 33, 16	50, 45°, 20, 45	Q2	322	146
120	50	Q120-050	208, 240°, 480	54, 46, 23	70, 60°, 30, 70	Q2	375	170
240	6	Q240-006	120/208/240°, 480	23, 14, 12, 5.9	30°, 15, 15	Q1	150	68
240	12	Q240-012	120/208/240°, 480	45, 26, 23, 11	60°, 15, 15	Q1	210	95
240	16	Q240-016	208, 240°, 480	35, 30, 15	45, 40°, 20, 20	Q2	320	140
240	25	Q240-025	208, 240°, 480	54, 46, 23	70, 60°, 20, 35	Q2	375	170

^a Indicates standard input voltage configuration. Standard input voltage configuration for 50/60 Hz units is either field selectable 120/208/220-240 VAC or 230 volts. All units with field selectable 60 Hz input also have field selectable 50/60 Hz voltage. Circuit breaker ratings are identical for field selectable units. 400 VAC, 50/60 Hz is available on special order. ^b Current ratings shown are for respective input voltages. Current consumption at nominal input voltage is 8-13% less than worst case value shown, depending on model. ^c Numbers in black show AC input breaker ratings that correspond to input voltage options. Number in **blue** shows DC output breaker rating.

Housing Dimensions



Housing size Q1
Wall mount configuration
(19" rack mount
also available)



Housing size Q2
Wall mount configuration
(add 3.75" [95.25 mm] height
for free-standing option)
(23" rack mount
also available)

The future of reliable DC power



Contact information

For information and service on any SENS product, please contact us at:
Sales 1.866.736.7872 • 303.678.7500 • Fax 303.678.7504
www.sens-usa.com • info@sens-usa.com
Stored Energy Systems, LLC
1840 Industrial Circle, Longmont, CO 80501 USA

