Getting Started SuperTorque 8ZR

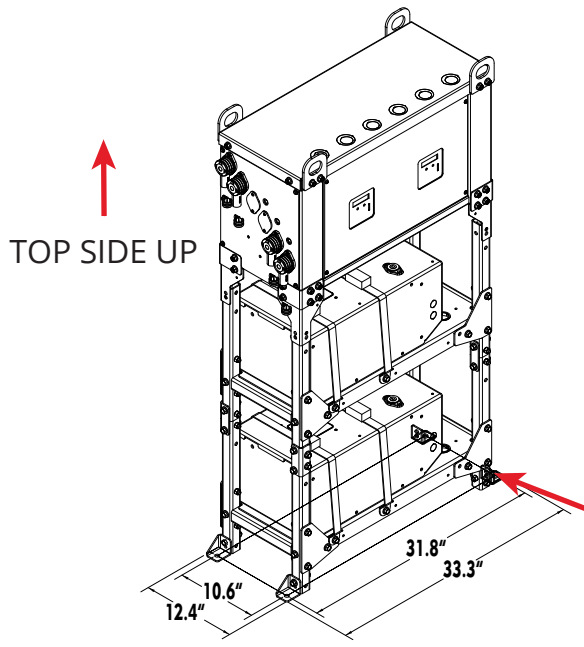
Integrated Engine Starting System

THIS PRODUCT COVERED BY ONE OR MORE PATENTS: WWW.SENS-USA.COM/PATENTS

Rigid Floor Mounting

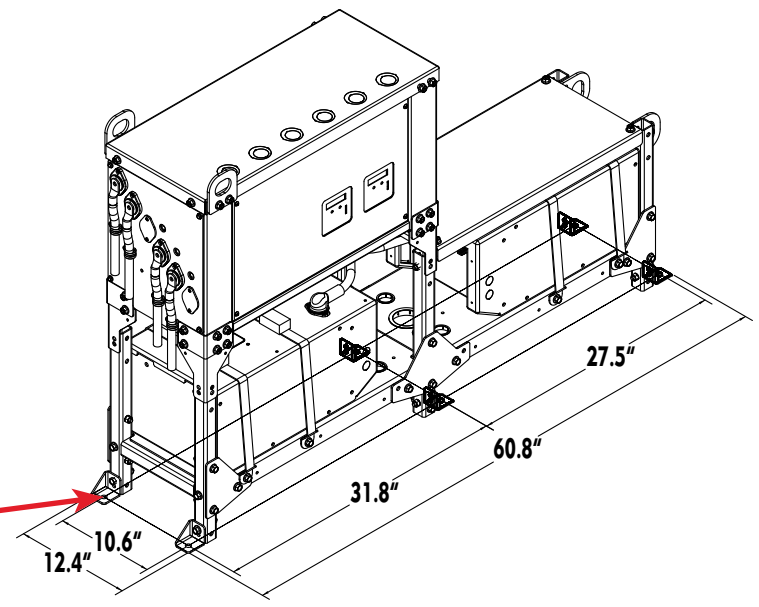
Common configurations shown below, multiple options available

Note - configuration options include optional internal BCS-120, optional internal BBS-4800, and optional DC disconnects.



IMPORTANT: ENSURE MOUNTING HARDWARE IS ENGINEERED FOR THE WEIGHT AND LOCAL SEISMIC REQUIREMENTS

Mounting holes sized for 1/2 inch hardware



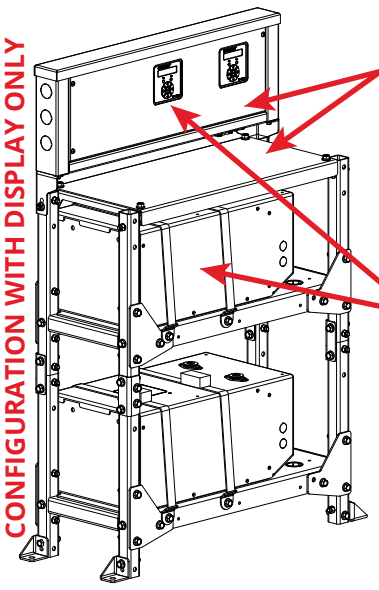
Connections

Common configurations shown below, multiple options available.

8ZR may contain multiple 8Z battery banks. See unit labeling for bank assignments.

CAUTION: always disconnect batteries before service

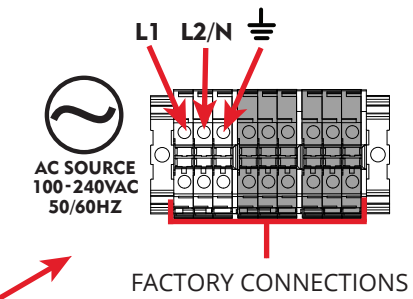
CONFIGURATION WITH DISPLAY ONLY



REMOVE PANELS TO CONNECT STARTER CABLES AND ACCESS ADDITIONAL CONNECTIONS

ONE DISPLAY AND DISCONNECT PER 8Z BANK

FIELD CONNECTIONS
(up to 3 AC connections, 14-10AWG, tighten to 10lb-in)



FACTORY CONNECTIONS

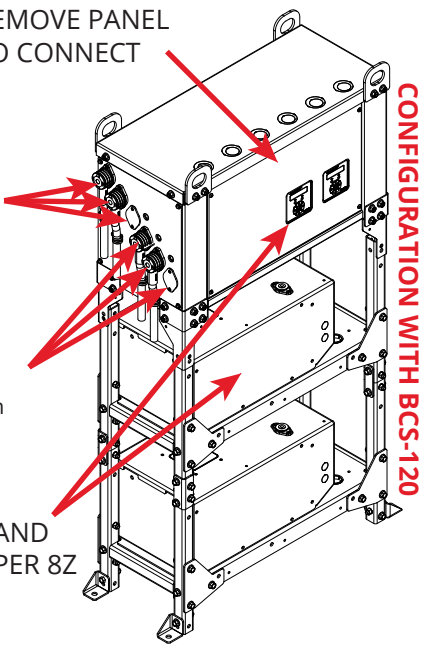
REMOVE PANEL TO CONNECT

DC (+): CONNECT TO STARTER (4/0AWG recommended using ring lugs, M10 fasteners, 17mm socket wrench, tighten to 70lb-in)

DC (–): INTERNALLY CONNECTED TO CHASSIS (4/0AWG recommended using ring lugs, M10 fasteners, 17mm socket wrench, tighten to 70lb-in)

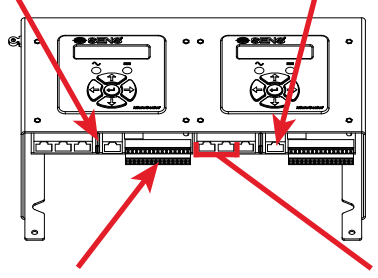
ONE DISPLAY AND DISCONNECT PER 8Z BANK

CONFIGURATION WITH BCS-120

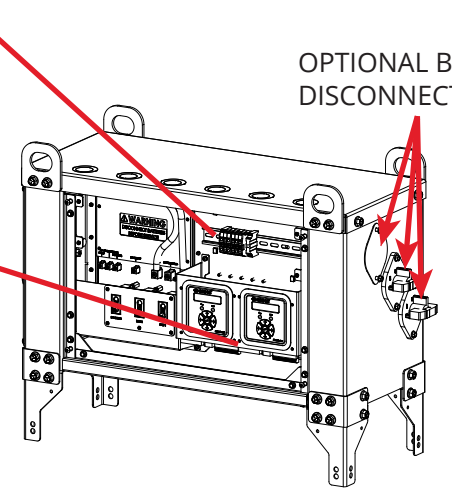


CONNECT SENS SETUP UTILITY TO USB TO CONFIGURE

CONNECT TCP/IP MODBUS NETWORK CABLE TO RJ45 CONNECTOR



OPTIONAL BATTERY DISCONNECTS



CONNECT STARTER CABLES (1/0AWG min wires using ring lugs, M8 fasteners, 13mm socket wrench, tighten to 60lb-in)

REMOVE PLUGGABLE ALARM TERMINAL BLOCK TO INSTALL ALARM WIRES (28-16AWG, tighten to 2lb-in, rated 30V AC/DC, 2A, see label for factory alarm assignments)

CONNECT RS-485 MODBUS OR J1939 NETWORK CABLE TO RJ45 CONNECTOR (pin 1: +D1 (A), pin 2: –D0 (B), pin 3: COM, pin 4: Shield)

BCS-120 Connections - optional

The Battery Control System (BCS-120) is an optional add-on available for the 8ZR. The BCS-120 delivers power from two isolated 8Z banks to DC loads, such as the engine control panel and ancillary DC loads. The BCS-120 also delivers power from one alternator input to two isolated 8Z banks.

Connection	Connection Type	Allowed Wire Gauge (AWG)*	Required Torque (lb-in)	Tool
GROUND	Barrel Post Lug	14 - 1/0	150	1/4in hex
BATT 1 and BATT 2	Terminal Block	8 - 1/0	100	4mm hex
ALTERNATOR B+	Terminal Block	8 - 1/0	100	4mm hex
DC OUTPUT, DC LIGHTS, B+ CRANK DISCON, COMP	Terminal Block	14 - 1/0	35	4mm hex
		8	40	
		6 - 4	45	
		3 - 2	50	

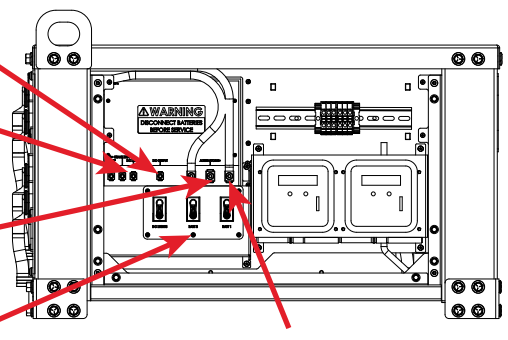
*Refer to National Electrical Code for wire gauge selection

DC LOAD/ENGINE PANEL CONNECTION

DC LIGHTS OR AUXILIARY DC OUTPUT CONNECTION

ALTERNATOR CONNECTION

BREAKERS FOR BATTERY BANKS AND DC AUX/LIGHTS



PRE-CONNECTED BATTERY

SENS®
STORED ENERGY SYSTEMS

Need Help?

CONTACT SENS CUSTOMER SERVICE:

800-742-2326 / 303-678-7500 / service@sens-usa.com

SuperTorque 8ZR

Integrated Engine Starting System

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Installation/Operation

The 8ZR integrated engine starting system including a high-performance NiZn battery, charging system, controls, communications, and user-interface in one package, specially targeted for long-life and high reliability.

- Limited to indoor use: IP2X
- AC Input Current (max per 8Z module): 3A at 12VDC or 4A at 24VDC
- Alternator ratings (max): 14.5/29VDC, 60A input
- Design Life: >15 years at 25°C
- Engine controller high DC alarm voltage threshold must be set to 16/32V

Ratings Per Bank Without Optional Best Battery Selector (BBS)

# of 8z per Bank	Recharge Current[1] (0°C to 45°C)	Capacity (80/90Ahr)	Discharge 15s on, 15s off (-40°C – 40°C)	Incident Energy[2] (80/90Ahr)	Bolted Fault/Short Circuit Current[3] (80/90Ahr)
1	15A	80/90Ahr	800A	0.79/0.91 cal/cm^2	5400/6200A
2	30A	160/180Ahr	1600A	1.58/1.82 cal/cm^2	10800/12400A
3	45A	240/270Ahr	2400A	2.37/2.73 cal/cm^2	16200/18600A

System Ratings With Optional Best Battery Selector (BBS)

# of 8z per Bank	Recharge Current[1] (0°C to 45°C)	Capacity (80/90Ahr)	Discharge 15s on, 15s off (-40°C – 40°C)	Incident Energy[2] (80/90Ahr)	Bolted Fault/Short Circuit Current[3] (80/90Ahr)
1	15A	80/90Ahr	800A	1.58/1.82 cal/cm^2	10800/12400A
2	30A	160/180Ahr	1600A	3.16/3.64 cal/cm^2	21600/24800A

[1]Calculated using NFPA 70E, Annex D, Method D.5
[2]Battery voltage: 13V (12V systems) / 26V (24V systems) nominal, 15.2V/30.4V max
[3]1/2 bolted fault current is the bolted fault current divided by 2

1 - Ensure optional disconnect switches are in OFF position. Verify no voltage present at DC terminals before servicing or making connections.

2 - Connect communications wiring

3 - Connect DC wires from unit to engine starter / DC bus

4 - Connect AC power to unit to start charging internal battery

5 - Turn optional disconnect switches to ON position. **CAUTION: 8ZR/engine DC power now live!**

6 - Use optional keypad to configure communications and view settings. Press up and down arrow keys to scroll through main menu options. Press left and right arrow keys to scroll through data available within each menu. Press center key to return to main menus. Output settings factory programmed. Attempt no adjustment.

7 - Charge for 8 hours minimum prior to placing into service

Do not leave AC disconnected. To avoid battery damage, do not drain battery below 11.2VDC (12V nominal systems) or 22.4VDC (24V nominal systems). If AC voltage is going to be disconnected for an extended period of time, press the "Sleep" button to put the 8Z to sleep and disconnect the 8Z from DC loads and engine.

IMPORTANT SAFETY INSTRUCTIONS

1. **SAVE THESE INSTRUCTIONS** –This guide contains important safety and operating instructions for 8ZR integrated engine starting system. Conserver ces instructions. Ce manuel contient des instructions importantes concernant la sécurité et le fonctionnement.
2. Use of an attachment not recommended or sold by the manufacturer may result in a risk of fire, electric shock, or injury to persons.
3. This starting system is intended for commercial and industrial use. ONLY TRAINED AND QUALIFIED PERSONNEL MAY INSTALL AND SERVICE THIS UNIT.
4. Do not operate genset starting system if it has received a sharp blow, been dropped, or otherwise damaged in any way; shut off power at the branch circuit protectors and have the unit serviced or replaced by qualified personnel.
5. To reduce risk of electric shock, disconnect the branch circuit feeding the genset starting system before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.
6. **WARNING – RISK OF FIRE, EXPLOSION OR BURNS**
   - 6.1 **WORKING IN THE VICINITY OF A NICKEL-ZINC BATTERY IS DANGEROUS. BATTERY INCLUDES ALKALINE ELECTROLYTES. STORAGE BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL OPERATION. FOR THIS REASON, IT IS OF UTMOST IMPORTANCE THAT YOU READ THIS DOCUMENT AND FOLLOW THE INSTRUCTIONS EACH TIME YOU USE THE SYSTEM.**
   - 6.2 Do not disassemble battery, heat above 75°C, incinerate, puncture or impact. Mise en garde : Risque d'incendie, d'explosion ou de brûlures. Ne pas démonter, chauffer à plus de 75°C (ou °F) ou incinérer.
   - 6.3 To reduce the risk of battery explosion, follow these instructions and those published by the battery manufacturer and the manufacturer of any equipment you intend to use in the vicinity of a battery. Review cautionary markings on these products and on the engine. Pour réduire le risque d'explosion, lire ces instructions et celles qui figurent sur la batterie.
   - 6.4 Ensure battery spill control procedures exist in accordance with building, fire and installation codes
7. **PERSONAL PRECAUTIONS**
   - 7.1 Someone should be within range of your voice or close enough to come to your aid when you work near a storage battery.
   - 7.2 Have plenty of fresh water and soap nearby in case battery electrolyte contacts skin, clothing, or eyes.
   - 7.3 Wear complete eye protection and clothing protection. Avoid touching eyes while working near a storage battery.
   - 7.4 If battery electrolyte contacts skin or clothing, wash immediately with soap and water. If electrolyte enters eye, immediately flood the eye with running cold water for at least 10 minutes and get medical attention immediately.
   - 7.5 NEVER smoke or allow a spark or flame in vicinity of battery or engine. Ne jamais fumer près de la batterie ou du moteur et éviter toute étincelle ou flamme nue à proximité de ces derniers.
   - 7.6 Be extra cautious to reduce risk of dropping a metal tool onto battery. It might spark or short circuit battery or other electrical part that may cause explosion. Using insulated tools reduces this risk, but will not eliminate it.
   - 7.7 Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a storage battery. A storage battery can produce a short circuit current high enough to weld a ring or the like to metal, causing a severe burn.
   - 7.8 NEVER charge a frozen battery. Ne jamais charger une batterie gelée.
   - 7.9 The charging circuit contains a DC output fuse for internal fault protection, but this will not protect the DC wiring from fault currents available from the battery. Consult national and local ordinances to determine if additional battery fault protection is necessary in your installation.
8. **PREPARING BATTERY FOR CHARGE**
   - 8.1 Storage - recharge every 6 months or when open circuit battery voltage drops below 13.5VDC (12V nominal systems) or 27.0VDC (24V nominal systems). Storage temperature requirement: -20°C to 60°C.
   - 8.2 Ensure area around battery is well ventilated and in accordance with local fire and installation codes while battery is being charged.
   - 8.3 Ensure battery terminals are clean and properly tightened. Be careful to keep corrosion from coming in contact with eyes.
   - 8.4 Do not operate genset starting system with damaged cables. Defective cables must be replaced before operation.
   - 8.5 Verify that all cables are properly secured and connected.
9. **INSTALLATION**
   - 9.1 Charging temperature: 0°C to 45°C.
   - 9.2 Do not tip, keep genset starting system level.
   - 9.3 Do not set anything on top of genset starting system.
   - 9.4 Unit shall be installed in accordance with Article 480 or 706 of NFPA 70 or Section 64 of CSA C22.1.
10. **SERVICE**
    - 10.1 Do not open genset starting system, not field servicable.
    - 10.2 Recommended Annual Maintenance - check all field wiring connections for electrical and mechanical integrity. Verify no corrosion or loose hardware is present.
    - 10.3 Contact Stored Energy Systems to dispose and recycle genset starting system.

SENS® STORED ENERGY SYSTEMS

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

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