










Instruction Sheet

| | | | |
|---|--|---|---|
|  | No smoking, no naked flames, no sparks |  | Clean all acid splash in eyes or on skin with plenty of clean water. Then seek medical help. Acid on clothing is to be washed with water. |
|  | Electrical hazard |  | Read instructions |
|  | Electrolyte is corrosive |  | Re-cycle scrap batteries. Contains lead |
|  | Shield eyes |  | Risk of explosion or fire. Avoid any short circuit. Metallic parts under voltage on the battery, do not place tools or items on top of the battery. |
|  | Danger | | |

California Proposition 65 Warning – Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

PowerSafe® SBS batteries are supplied in a charged condition, and are capable of extremely high short circuit currents. Take care to avoid short-circuiting terminals of opposite polarity.

1. Receiving

1.1 In-Transit Damage or Short Shipments

Upon receipt of a shipment, check that the items delivered are undamaged and match the carrier's Bill of Lading. Report any damage or shortages to the carrier. EnerSys® is not responsible for shipment damage or shortages that the receiver does not report to the carrier.

1.2 Shipment Damage or Shortages

Open the shipping containers and check the contents for damage and against the packing slip. Immediately inform EnerSys of any damaged or missing items. EnerSys is not responsible for damaged or missing items after a shipment has been in storage.

2. Storage

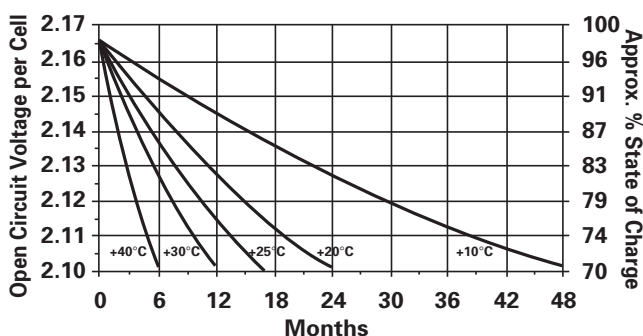
2.1 Storage Conditions and Time

If a battery cannot be immediately installed it should be stored in a clean, cool, dry area.

During storage batteries lose capacity through self-discharge.

High temperature increases the rate of self-discharge and reduces the storage life.

The chart below shows the relationship between open-circuit voltage (OCV) and storage time at various temperatures.



The maximum storage times before a freshening charge is required and recommended open circuit voltage audit intervals are:

| Temperature (°C / °F) | Storage Time (Months) | OCV Audit Interval (Months) |
|-----------------------|-----------------------|-----------------------------|
| +10 / +50 | 48 | 6 |
| +15 / +59 | 34 | 6 |
| +20 / +68 | 24 | 4 |
| +25 / +77 | 17 | 4 |
| +30 / +86 | 12 | 3 |
| +35 / +95 | 8.5 | 2 |
| +40 / +104 | 6 | 2 |

Monoblocs must be given a freshening charge when bloc voltages approach the equivalent of 2.10 Volts per cell or when the maximum storage time is reached, whichever occurs first.

2.2 Commissioning Charge

Before conducting a capacity discharge or fully loaded duty cycle test, the battery must be given a commissioning charge. The commissioning charge shall consist of 7 continuous days of float charge at the recommended float voltage (2.29Vpc at 20°C) with no load connected to the battery.

2.3 Freshening Charge

Charge the monoblocs, or strings at a constant voltage equivalent to 2.29 - 2.4Vpc with 10% of the C₁₀ current available for a period of 24 hours.

3. Battery Location

The battery compartment/room must have adequate ventilation to limit hydrogen accumulation to a maximum of 1% by volume of free air.

4. Installation

Each monobloc is supplied with the terminal/connector fasteners.

On each monobloc the positive terminal is identified by a "+" symbol. Install the batteries in accordance with the instructions and/or layout drawing, taking care to ensure correct terminal location and polarity.

Connect the blocs with the connectors and fasteners provided. The fastener torque value is:

| Battery Type | Fastener Size | Torque Nm / lbf in |
|---------------|---------------|--------------------|
| SBS 8 | M4 | 1.0 / 9 |
| SBS 15-60 | M6 | 3.9 / 35 |
| SBS 110-390 | M8 | 5.0 / 44 |
| SBS J types | M6 | 6.8 / 60 |
| SBS B8, B10 | M8 | 5.0 / 44 |
| SBS B8F, B10F | M6 | 5.0 / 44 |

Place the insulating covers in position immediately after tightening the fasteners.

5. Operation

Constant voltage chargers are recommended. The charging voltage should be set at the equivalent of 2.29Vpc at 20°C/68°F or 2.27Vpc at 25°C/77°F. The minimum charging voltage, at any temperature, is 2.21Vpc. The recommended float voltage temperature compensation is:

| | Temperature (°C / °F) | | | | | | |
|-------------|-----------------------|-------|-------|-------|-------|-------|--------|
| | 10/50 | 15/59 | 20/68 | 25/77 | 30/86 | 35/95 | 40/104 |
| Recommended | 2.33 | 2.31 | 2.29 | 2.27 | 2.25 | 2.23 | 2.21 |
| Minimum | 2.31 | 2.29 | 2.27 | 2.25 | 2.23 | 2.21 | 2.21 |

Disconnecting the battery from the load when the recommended end voltage is reached will eliminate the risk of over-discharge. We recommend that the charge voltage is reapplied within 24 hours, up to a maximum of 7 days, of any discharge.

6. Maintenance

In practice, the user usually specifies the maintenance schedule based on site criticality, location and manpower.

The following is a suggested maintenance schedule.

• Monthly (record all readings)

Measure the battery string voltage. If necessary, adjust the

float voltage to the correct value.

• Every six months (record all readings)

Measure the battery string voltage. If necessary, adjust the float voltage to the correct value.

Measure individual bloc voltages. The blocs should be within 5% of the average.

Inspect for contamination by dust, loose or corroded connections. If necessary isolate the string/bloc and clean with a damp soft cloth. Warning - Do NOT use any type of oil, solvent, detergent, petroleum-based solvent or ammonia solution to clean the battery containers or lids. These materials will cause permanent damage to the battery container and lid and will invalidate the warranty.

Contact EnerSys® if you have any questions regarding maintenance.

7. Disposal

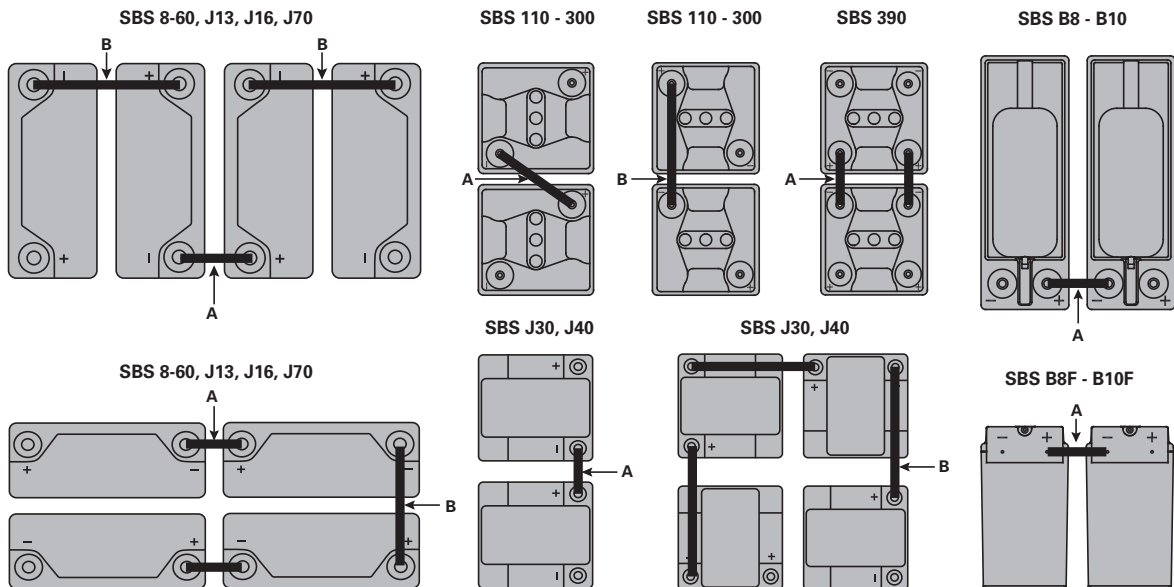
PowerSafe® SBS batteries are recyclable. Scrap batteries must be packaged and transported in accordance with prevailing transportation rules and regulations.

Scrap batteries must be disposed of in compliance with local and national laws by a licensed or certified lead acid battery recycler.

8. Connectors

| Battery Type | Connector Part No. | |
|---------------|--------------------|-----------|
| | A | B |
| SBS 8 | 2205-8982 | 2205-8981 |
| SBS 15 | 2205-9851 | 2205-9850 |
| SBS 30, 40 | 2205-4090 | 2205-4215 |
| SBS 60 | 2205-4090 | 2205-4260 |
| SBS 110 - 300 | 2205-9887 | 2205-8865 |
| SBS 390 | 2205-9759 x 2 | N/A |

| Battery Type | Connector Part No. | |
|---------------|--------------------|-----------|
| | A | B |
| SBS J13, J16 | 2205-9851 | 2205-9850 |
| SBS J30, J40 | 2205-4090 | 2205-4260 |
| SBS J70 | 2205-4090 | 2205-4420 |
| SBS B8, B10 | 2205-8919 | N/A |
| SBS B8F, B10F | 2205-8891 | N/A |



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