



BAU48/4

Battery Asymmetry Unit

Installation and User Manual

Specification Number: 541649

Model Number: BAU48/4

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Technical Support Site

If you encounter any installation or operational issues with your product, check the pertinent section of this manual to see if the issue can be resolved by following outlined procedures.

Visit <https://www.vertiv.com/en-us/support/> for additional assistance.

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Admonishments Used in this Document



DANGER! Warns of a hazard the reader **will** be exposed to that will **likely** result in death or serious injury if not avoided. (ANSI, OSHA)



WARNING! Warns of a potential hazard the reader **may** be exposed to that **could** result in death or serious injury if not avoided. This admonition is not used for situations that pose a risk only to equipment, software, data, or service. (ANSI)



CAUTION! Warns of a potential hazard the reader **may** be exposed to that **could** result in minor or moderate injury if not avoided. (ANSI, OSHA) This admonition is not used for situations that pose a risk only to equipment, data, or service, even if such use appears to be permitted in some of the applicable standards. (OSHA)



ALERT! Alerts the reader to an action that **must be avoided** in order to protect equipment, software, data, or service. (ISO)



ALERT! Alerts the reader to an action that **must be performed** in order to prevent equipment damage, software corruption, data loss, or service interruption. (ISO)



FIRE SAFETY! Informs the reader of fire safety information, reminders, precautions, or policies, or of the locations of fire-fighting and fire-safety equipment. (ISO)



SAFETY! Informs the reader of general safety information, reminders, precautions, or policies not related to a particular source of hazard or to fire safety. (ISO, ANSI, OSHA)

Important Safety Instructions

Safety Admonishments Definitions

Definitions of the safety admonishments used in this document are listed under “Admonishments Used in this Document” on page iv.

Safety and Regulatory Statements

Refer to Section 4154 (provided with your customer documentation) for Safety and Regulatory Statements.

Déclarations de Sécurité et de Réglementation

Reportez-vous à la Section 4154 (fourni avec les documents de votre client) pour les déclarations de sécurité et de réglementation.

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1 Description

1.1 BAU48/4 Battery Asymmetry Unit

The mid-point voltage of battery string will deviate from the normal value (half of battery string voltage) when a short circuit, open circuit or battery cell failure occurs in a battery string. Therefore, the BAU48/4 Battery Asymmetry Unit is available to detect this situation. It measures the battery string voltage and the midpoint voltage respectively. It then compares the midpoint voltage with the reference voltage that is half of the measured total battery string voltage. If the deviation exceeds the alarm threshold, the normally-open or normally-closed dry contacts of the Battery Asymmetry Unit will activate and generate an alarm signal.

On the other hand, when the connection to the midpoint of the battery string is broken and the corresponding bit of SW2 is set to "ON", the normally-open or normally-closed dry contacts of the Battery Asymmetry Unit will also activate and generate a signal.

The Battery Asymmetry unit can detect the faults of up to 4 battery strings.

Included in the kit are the following:

- The BAU 48/4 Battery Asymmetry Unit
- Four Fuses (250Vac/5A) and Fuse Holders
- Two Pieces of Double-Sided Tape
- Two Mounting Screws

2 Installing the BAU48/4

2.1 Planned Installation Area

Mechanical dimensions of the Battery Asymmetry Unit are shown in Figure 2.1.

2.1.1 Fastening the Battery Asymmetry Unit

The Battery Asymmetry Unit has two brackets and two double-sided tapes on its back plate. It can be installed in two ways:

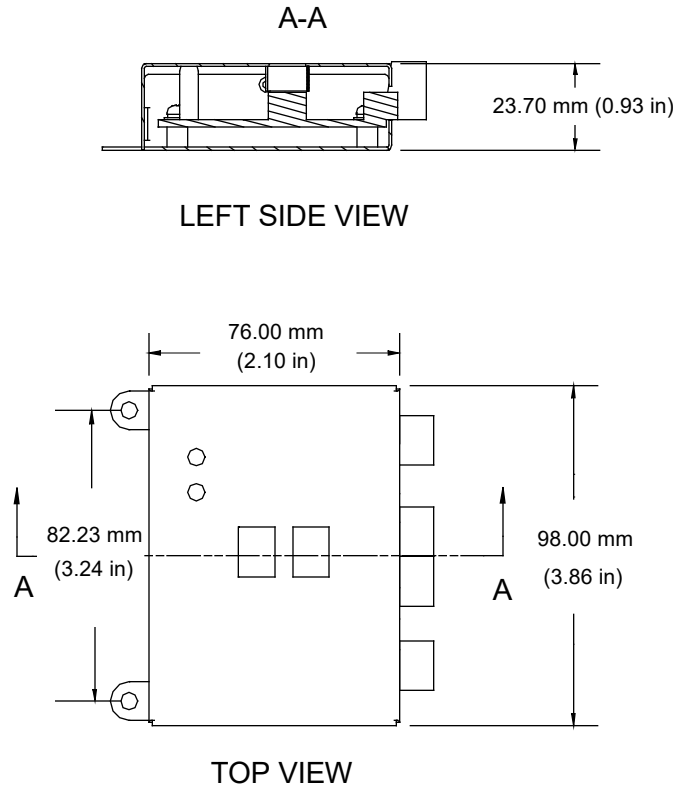
Installed with Double-Sided Tape

1. Remove the paper on the tape and press the Battery Asymmetry Unit onto the installation area firmly.

Installed with Screws

1. Use the two supplied screws to fasten the Battery Asymmetry Unit onto the installation area.

Figure 2.1 Mechanical Dimensions



3 Making Electrical Connections

3.1 Important Safety Instructions



DANGER! Batteries can produce large amounts of electrical current. Read and follow the “Important Safety Instructions” at the beginning of this document before proceeding.

The Battery Asymmetry Unit has three sockets for connecting to other equipment, which are Power Supply Socket, Battery Data Sampling Socket and Alarm Output Socket.

See Figure 3.1 and Table 3.1.

Figure 3.1 Sockets

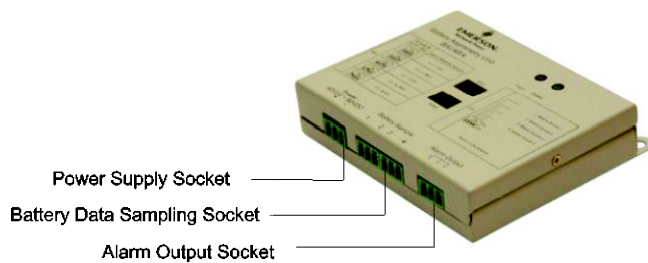




Table 3.1 Pin Definition of Sockets

Socket	Pin	Wiring	Description
Power Supply	+	To positive of battery string	20V DC to 60 VDC
	-	To negative of battery string	
Battery Data Sampling	1	To midpoint of battery string 1	0V DC to 60V DC
Alarm Output		Provide one pair of normally close contacts	Maximum power: 60W; Maximum voltage: 220VDC/250V AC; Maximum current: 2A; Minimum contact paramaters <10m Vdc @10μA
		COM	
		Provide one pair of normally open contacts	



NOTE! In order to ensure the safety of the user, it is recommended that the voltage of the dry contacts shall not exceed 60V DC or 42.5V AC.

“Contact parameters” mean the voltage and current of the relay contacts that are closed.

3.2 Wiring Considerations

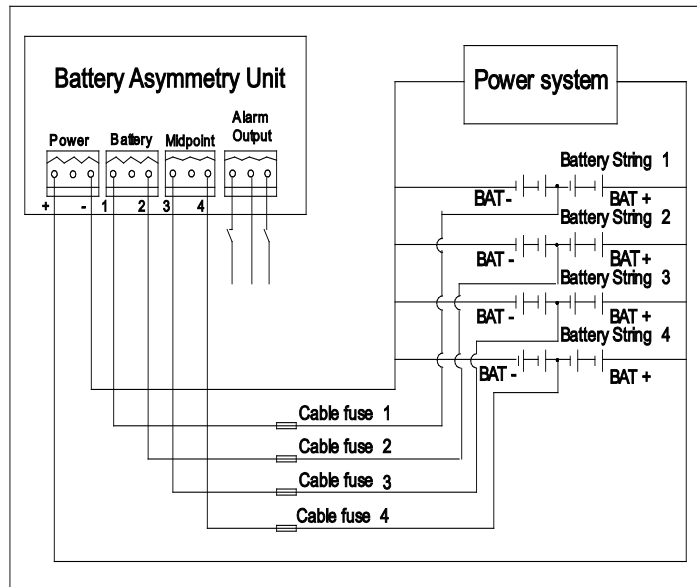
All wiring should follow the current edition of the American National Standards Institute (ANSI) approved National Fire Protection Association’s (NFPA) National Electrical Code (NEC), and applicable local codes. For operation in countries where the NEC is not recognized, follow applicable codes.

Wiring the BAU48/4 Battery Asymmetry Unit is shown in Figure 3.2.

Procedure

1. The Battery Asymmetry Unit will use the midpoint voltage of the battery string as the reference voltage, so its power supply socket can only be connected to two ends of the monitored battery string.
2. A fuse shall be connected between the midpoint of the battery string and the sampling socket of the Battery Asymmetry Unit so as to prevent the faults of Battery Asymmetry Unit from influencing the operation of the battery string.
3. The normally open or normally closed contacts are connected to DC Power controller.

Figure 3.2 Wiring the BAU48/4



4 Operation

Installation and operation guidance are printed on the Battery Asymmetry Unit, as shown in Figure 4.1.

- Operation Indicator: The LED (green) turns “ON” when the input power supply is normal.
- Fault Indicator: The LED (red) turns “ON” when the battery has a fault.
- SW1: Set the switch per Figure 4.1 to correspond to different alarm thresholds. The relationship is shown in Figure 4.2.
- SW2: Set the switch per Figure 4.1 to correspond to the sampling points of different battery strings. The relationship is shown in Figure 4.2.

If one bit of the dip switch is set to “ON”, the midpoint voltage of the battery string that corresponds to this bit as shown in Figure 4.2 will be measured by the Battery Asymmetry Unit. If the bit is set to “OFF”, the Battery Asymmetry Unit will not measure the midpoint voltage.



NOTE! When the Battery Asymmetry Unit measures several battery strings, the user can judge which battery string has fault by setting the bits of SW2 to “ON” one by one.

Figure 4.1 Installation and Operation Guidance

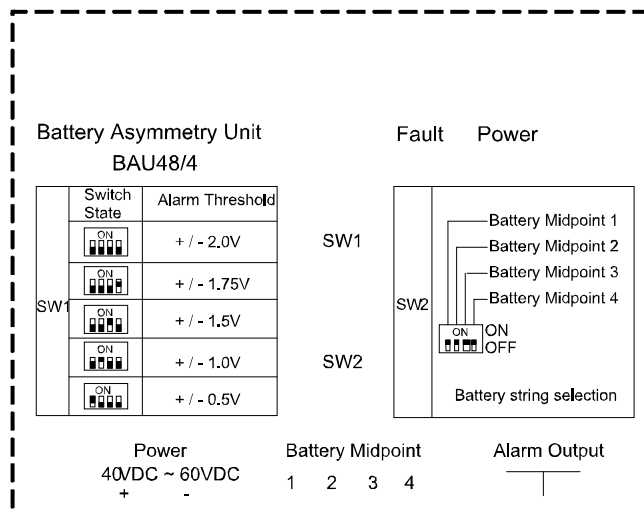
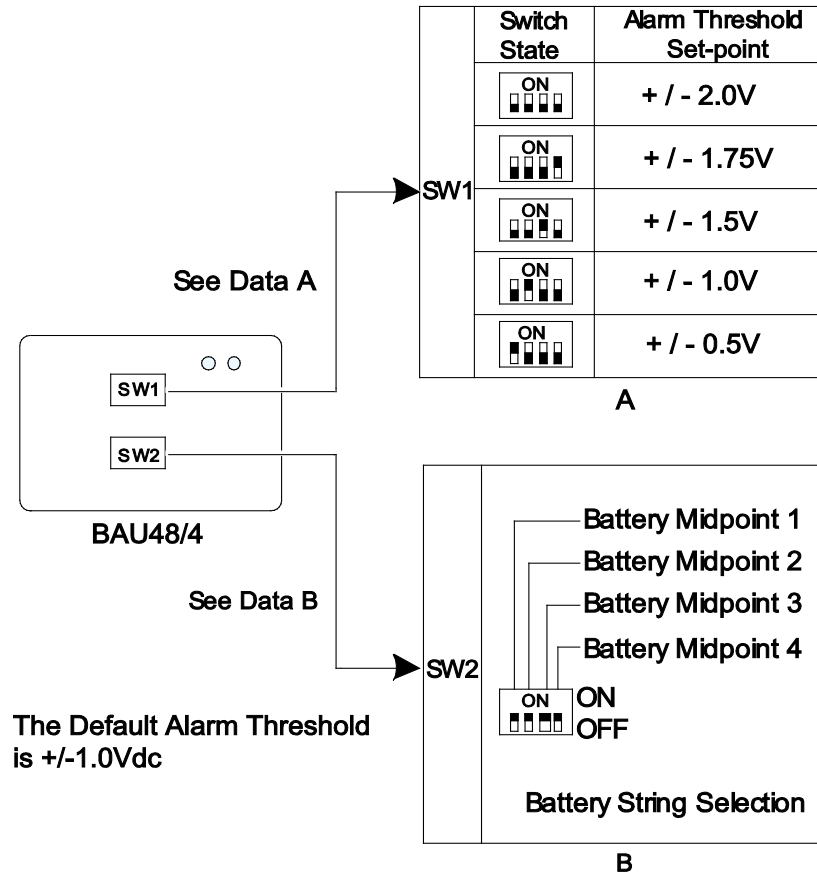


Figure 4.2 DIP Switch Setting



5 Technical Data

Environment

- Working Temperature: -10°C ~ 50°C
- Working Humidity: ≤ 95%
- Air Pressure: 86kpa ~ 106kpa

Power Supply Input and Battery Voltage Sampling

- Rated Voltage: DC 48V
- Voltage Range: DC 20V ~ 60V
- Operating Current: ≤ 25mA

Battery String Midpoint Voltage Sampling

- The midpoint voltage of up to 4 battery strings can be measured and the voltage range is 0-60Vdc.

Alarm Setting

- Alarm Threshold: ± 0.5Vdc to ± 2.0Vdc
- Adjustment Mode: 4-bit dip switch
- Step: 0.5Vdc (deviation voltage <1.5V), 0.25Vdc (deviation voltage >1.5V)
- Default Setpoint: ±1.0Vdc

Alarm Output

- Dry relay contacts are used to output alarm signals. The ratings of the contacts:
 - a) Maximum Power: 60W
 - b) Maximum Voltage: 220Vdc / 250Vac
 - c) Maximum Current: 2A
 - d) Contact Parameter: 10mVdc @ 10μA

Insulation

- DC-Enclosure ≥ 10 × 106Ω
- Test Conditions: 25 ± 5°C ambient temperature, 90% relative humidity, DC 500V test voltage
- DC-Enclosure can withstand DC 707V for one minute without breakdown and arc with leakage current less than 10mA. Test Conditions: 25 ± 5°C ambient temperature, 90% relative humidity

Noise

- <50dB measured at 1.5m

Mechanical Data

- Dimension (H × W × D): 23.7 mm × 98 mm × 76 mm (0.93 in × 3.86in × 2.99 in)
- Weight < 0.5kg (1.102 lbs)

6 Troubleshooting and Repair

6.1 Contact Information

Refer to Section 4.15.4 (provided with your customer documentation) for support contact information.

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