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## 1. Overview

- Avid Extreme Inverter modules (*AEI's*) require a 24V auxiliary supply – the rating of which varies according to model (details are provided in the appropriate data sheets).
- Avid *Auxiliary Power Unit – Type G (AEI-APU-G)* provides this supply from the DC link of the AEI module.
- The Model Number for the Type G Auxiliary Power Unit is AEI-APU-G-xx, where xx is the compatibility indication. Systems must not mix APUs with different compatibilities. As of the current revision of this Data Sheet, only compatibility 00 exists. Unless specified, “AEI-APU-G” refers to all current and future compatibility.
- The following table lists the specific models of AEI Models that may be powered using the AEI-APU-G

Model Number	Description	
AEI550A- xxxxxx-xx-x	Avid Extreme Inverter Module 550A Rating	Air-Cooled All options
AEI900L- xxxxx-xx-x	Avid Extreme Inverter Module 900A Rating	Liquid-Cooled All options
AEI1000L- xxxxxx-xx-x	Avid Extreme Inverter Module 1000A Rating	Liquid-Cooled All options

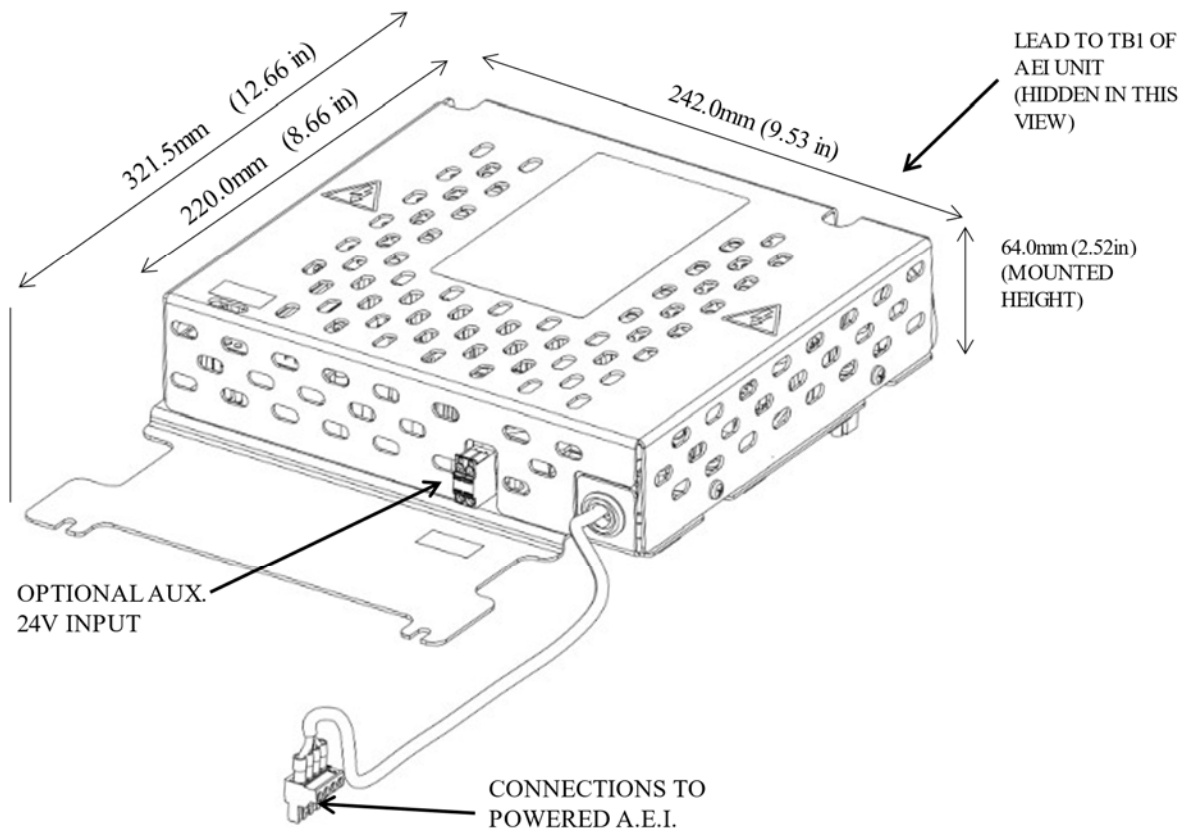
- Note that this list **DOES NOT** include the high power AEI1250L and AEI1400L modules.
- When powered by the AEI-APU-G, typically none of the control functions of the AEI units (power to the controller, RS485 or LED diagnostics) are available until the DC link is established. **To provide these functions without DC link power, an auxiliary 24VDC may be connected to the AEI-APU-G, see section 6 for details.**

## 2. Warnings

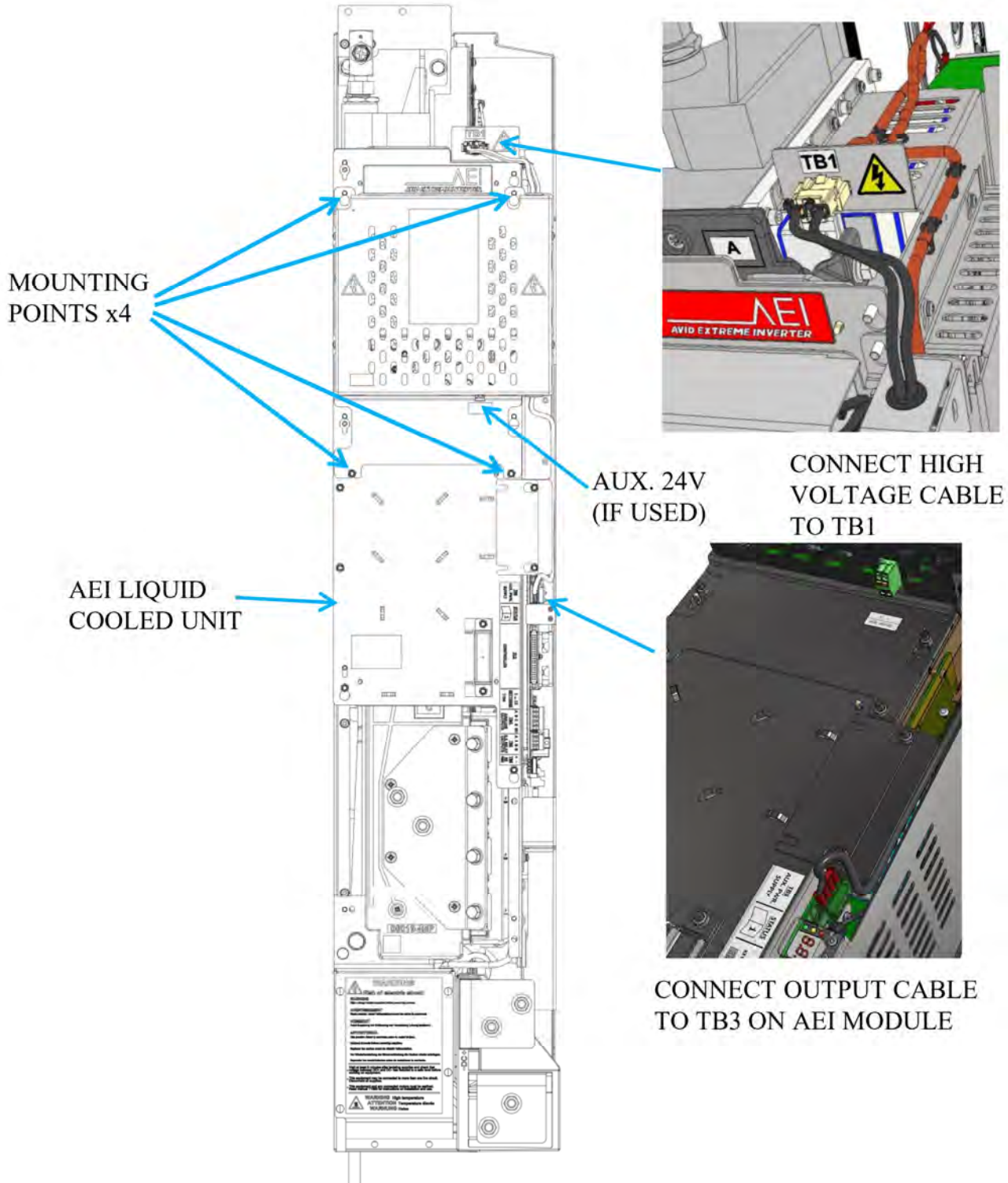
- The AEI-APU-G is used to power Avid Extreme Inverters, which may be connected to more than one live circuit.
- Wait at least **EIGHT** minutes after isolating all supplies and check that the voltage between DC+ and DC- has reduced to a safe level before working on the equipment. Especially **DO NOT** unplug TB1 from an AEI before it is safe to do so.
- Surfaces on the coolant pipes of the AEI system can reach high temperatures and remain hot for some time after power is removed.
- Ensure that all coolant has reached safe temperature and the equipment is suitably drained and isolated before the external pipework is disconnected from the equipment.

### 3. Mechanical

- The following figure shows the general mechanical layout and overall dimensions of the unit.



**4. Installing on Inverter Unit**



## 5. Specifications

### 5.1 Mechanical

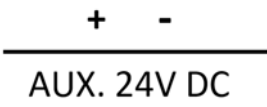

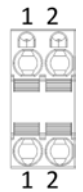
Specification	Value	Notes & Applicable Conditions
Dimensions	321.5mm L x 242.0mm W x 64.0 mm H (12.66-in x 9.53-in x 2.52-in)	
Weight	3.2 kg (7.1 lb.)	
Enclosure	IP00 (IEC 60529:1989; BS EN 60529:1992) NEMA 1	Must be installed within suitable enclosure with restricted access

### 5.2 Environmental

Specification	Value	Notes & Applicable Conditions
Ambient Temperature	0 to 50°C	
Cabinet air	Pollution Degree 2 as per IEC60664-1, UL 840 & CSA C22.2 No. 0.2-93 Maximum chemicals 15ppm H <sub>2</sub> S, 25ppm NO <sub>2</sub> , 25ppm SO <sub>2</sub>	Air must be clean, free from dust, condensation and conductive or corrosive gases.
Humidity	5% to 95% RH Non-condensing	Unit must not be operated in the presence of condensation.

### 5.3 Electrical

Specification	Value	Notes & Applicable Conditions
Input DC Voltage (operating and non-operating)	500Vdc to 1300Vdc	
Output Voltage	Suitable for AEI900L, AEI1000L and AEI550A modules	Not approved for other applications.
Output Current		

Specification	Value	Notes & Applicable Conditions
Auxiliary 24VDC Voltage Input (Optional)	24V +10%/-5% @ 4A Maximum	<ul style="list-style-type: none"> <li>Maximum load from APU-TYPE G and connected AEI with Controller is 4A.</li> <li>For AEI modules not powering the controller the maximum load is 1A.</li> <li>When the main input DC voltage is above minimum, load on the Aux. 24V is zero</li> </ul>
Auxiliary 24VDC Voltage Input Polarity	Pin 1 = Positive Pin 2 = Negative	<ul style="list-style-type: none"> <li>As labelled on unit:  <div style="text-align: center;">  </div> </li> <li>Older units have single terminals:  <div style="text-align: center;">  </div> </li> <li>Newer units have dual terminals to make daisy-chaining easier:  <div style="text-align: center;">  </div> </li> </ul>
Indication	Three Green LEDs: - 24V Out Healthy - Main 24V Healthy - Aux. 24V Healthy	<ul style="list-style-type: none"> <li>As labelled on unit:            - AUX.            - MAIN            - OUT         </li> </ul>



## 6. Use of Auxiliary 24VDC Input

### 6.1 General

- The auxiliary 24VDC input powers the connected AEI unit when the DC link is absent and the main DC/DC converter in the AEI-APU-G is not powered. When the main DC/DC is powered, the supply to the AEI units switches automatically to this.
- If the connected AEI unit is connected to PL2 of the MV3000 controller (CDC), then the CDC will also be powered by the auxiliary 24VDC input.
- The following table gives the approximate worst-case steady-state current consumption for the auxiliary 24VDC input:

Powered CDC Type	Approximate maximum steady-State load current
Not Powering CDC – connected to PL3 to PL7 of CDC	1A
Powering non-renewable or generator side CDC via PL2	3A
Powering renewable grid side CDC (equipped with DSP) via PL2	4A

### 6.2 Start-Up

- Each AEI unit contains a large internal capacitance on its 24VDC input – this provides supply stability and prevents issues of capacitor aging. This capacitance causes a significant in-rush current at start-up.
- The AEI-APU-G contains a current limit that restricts the in-rush current to approximately six amps.
- Therefore, the power supply used to provide the auxiliary 24VDC input must be capable of sourcing a **6A** surge for *each* AEI-APU-G it is powering. The voltage must remain above the specified -5% tolerance.
- The surge duration is between 40ms and 100ms, depending on the CDC type being powered via the AEI unit.
- Avid recommends a 24VDC power supply with a minimum of 600W rating to provide auxiliary power for six AEIs in a 2.3MW turbine. The power supply used in the AEI-APU-D & AEI-APU-E modules works well in this application (MEAN WELL HRP-600-24CC).
- If there are problems at start-up due to the power supply going out of tolerance during this in-rush, it may be helpful to increase the 24VDC supply by 1 to 2 volts – staying within the +10% tolerance.

### 6.3 Wire Selection & Segregation

- The auxiliary 24VDC connector can accept wires up to 4mm<sup>2</sup> / 12 AWG. The minimum wire size recommended is 1.5mm<sup>2</sup> / 16AWG. A stranded twin-core cable with outer PVC jacket is recommended.
- If the auxiliary 24VDC is “daisy chained” from the PSU to multiple AEI-APU-G modules, it is recommended to use the thickest possible wire to minimize the voltage drop during the start-up transient.
- The auxiliary 24VDC wire should be segregated from the AC and DC power conductors of the AEI system. It is recommended to run alongside the 40-way ribbon cables or the AEIs and be tie-wrapped to these at regular intervals.

### 6.4 CDC Auxiliary Supply

- If the auxiliary 24VDC input of the AEI-APU-Gs is used, it is recommended *not* to also use the CDC’s auxiliary 24V supply option.
- If system operations require a reboot of the CDC for any reason, it will be necessary to remove the auxiliary 24VDC input from the AEI-APU-Gs to power-cycle the CDC unit.

## 7. Servicing and Maintenance

- The AEI-APU-G contains no user-serviceable parts.
- Periodically remove any dust build-up from the ventilation slots using clean, dry compressed air.
- For support, please contact your Avid Controls Authorized Distributor, or Avid Controls directly (contact details are on the front page of this Data Sheet).

## 8. Document Revision History

Rev.	Date	Author	Changes
00	SEPT 4 2020	G. Pace	Document created
01	JULY 14 2021	G. Pace	Weight specified. Aux. 24V & indication more completely specified. Minor format changes.
02	JULY 21 2021	G. Pace	Warning section added
03	SEPT 21 2021	G. Pace	Application section for auxiliary 24VDC added
04	JULY 1 2022	Z. Gordon	Updated section notes & Illustrations for 24V Connector