

Preliminary  
TECHNICAL DATASHEET #TDAX081860  
**48Vdc/24Vdc Non-isolated Step-Down Converter**  
**720 W Output**  
**P/N: AX081860**

- Wide input operating voltage 30 to 72 Vdc (48 Vdc nominal)
- Conditioned output of 24Vdc
- High current output capability (30 A nominal), 720W
- Switch mode operation delivers very high efficiency >96%
- Capable for parallel (redundancy) application
- Design manages heat dissipation avoiding forced cooling
- Reverse polarity, input under/over voltage protections
- Inrush current limit
- Overtemperature protection
- Short-circuit protection
- Rugged and highly reliable
- Compact size for ease of mounting in confined spaces
- Suitable for moist, high shock and vibration environments
- Operational from -40 to 70°C
- IP67 protection



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**Applications:** Designed to interface between 48V batteries and 24V electrical systems found on mobile construction equipment, lift and access equipment and buses.

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**Ordering Part Numbers:**

Converter with Wire Harness KIT: **AX081860K** (Converter, Wire Harness)

Items can also be ordered individually.

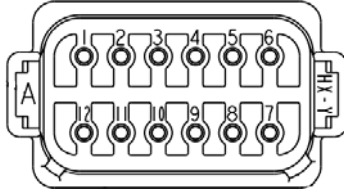
Converter: **AX0801860**

12 pin Mating Wire Harness, 2 m: **AX070163**

Or Mating Plug Kit: **AX070105**

**Description:** The DC-DC Converter provides regulated 24Vdc power suitable for solenoids, relays and other electrical systems. For operation under the most harsh and demanding conditions, the IP67 rated unit protects against moisture, shock and vibration. Power from a battery or other source of 48 Vdc is converted to a 24Vdc output. The unit has a high current output capability of 30 Amps. The device manages heat dissipation and requires no forced cooling systems. Short-circuit and reverse polarity protections are provided. The compact unit is designed with extremely rugged surge and transient suppression in addition to sustained over/under voltage protection. With a nameplate rating of 720 Watts of output power, the DC-DC Converter provides proprietary multi-phase topology for a high efficiency of >96%.

## Technical Specifications:

Input Specifications		Output Specifications	
Power Source	48 Vdc nominal	Nameplate Rating (Output Power)	720 Watts nominal
Operating Voltage Range	30 to 72 Vdc	Output Current (DC)	30 A continuous
Maximum Input Current	25 A <sub>bc</sub> @ 30 VDC, 30 A I-output	Output Voltage	23.5-26.5 Vdc Maximum Factory set at 24 Vdc (nominal) ± 0.5% Regulation ± 3%
Inrush Current Protection	Provided	Output Voltage Ripple	$V_{O(RIPPLE)} \leq 100$ mVpp
Input Reverse & Under/Over-voltage Protection	Provided Turn-on >23V Turn-off <20V	Start-up Time (with full load)	1 sec. maximum
Output Over-voltage Protection	Provided 80 V Typical	Turn-on Overshoot	<1% of output voltage
Isolation	Not provided	Stability	Stable at all load conditions
		Transient Response	5% of Output Voltage (25% - 75% Load, $V_{in} = 48V$ )
		Short-Circuit Protection	Provided, Auto-recover
		Overload Protection	Provided 35A Typical
General Specifications			
Efficiency	>96% Refer to Figure 1.0.		
Quiescent Current	60mA @ 48Vdc Typical		
Operating Temperature	-40 to 70°C (-40 to 158°F) Refer to Figure 2.0.		
Storage Temperature	-40 to 85°C (-40 to 185°F)		
Humidity	0-99% relative humidity (non-condensing)		
Shock and Vibration <b>Pending</b>	MIL-STD-202G, Test 204D and 214A (Sine and Random), Test 213BA – 6 ms (Shock) 15 g peak (Sine) 7.68 Grms peak (Random) 50g (Shock)		
Enclosure	Cast Aluminum housing, integral gasket and connector 8.14 x 11.12 x 3.11 inches (206.00 x 282.00 x 79.00 mm) L x W x H including integral connectors Refer to the dimensional drawing, Figure 3.0.		
Protection rating	IP67		
Weight	6.44 lb (2.92 kg)		
Electrical Pinout	 <p>12 pin connector (equivalent TE Deutsch P/N: DT13-12P) Connector Pin out: Pin 5: Voltage Input + Pin 6: Voltage Input + Pin 7: Voltage Input + Pin 3: Voltage Input - Pin 4: Voltage Input - Pin 8: Voltage Input - Pin 9: Voltage Output - Pin 10: Voltage Output - Pin 11: Voltage Output - Pin 1: Voltage Output + Pin 2: Voltage Output + Pin 12: Voltage Output + (Input - and Output - are internal connected)</p> <p>Suitable for 14 AWG wire</p>		

Input Mating Wire Harness	<p>For the 12-pin input connector, a <b>mating wire harness, P/N AX070163</b>, is equivalent to the TE Deutsch P/Ns: DT06-12SA, W12S and twelve contact sockets 0462-201-16141, with 2m (6.5 ft.) of 14 AWG unterminated lead wires. Refer to Figure 4.0.</p> <p>Also available is a plug kit. Mating Plug KIT (DT06-12SA, W12S, 12 0462-201-16141 contacts, 3 sealing plugs) P/N: <b>AX070105</b></p>
<b>Installation</b>	
<p><b>Set up</b></p> <ol style="list-style-type: none"> <li>1. A 30 fuse is recommended in the primary circuit to provide protection for the primary wiring.</li> <li>2. Use four ¼-20 1 inch screws to mount the converter.</li> <li>3. Snap the mating plug connector with wiring harness into the receptacle mounted on the converter.</li> <li>4. Once the load is ready to receive power, turn on the power source to the converter.</li> </ol>	
<b>Grounding</b>	<p>Protective Earth (PE) must be connected to the chassis to reduce the risk of electric shock. All chassis grounding should go to a single ground point designated for the machine and all related equipment.</p>
<b>Mounting</b>	<p>Mounting ledges include holes sized for ¼ inch or M6 bolts. The bolt length will be determined by the end-user’s mounting plate thickness. Typically, ¾ inch (20 mm) is adequate.</p> <p>If the module is mounted without an enclosure, it should be mounted vertically with connectors facing left and right to reduce likelihood of moisture entry.</p> <p>All field wiring should be suitable for the operating temperature range of the module.</p> <p>Install the unit with appropriate space available for servicing and for adequate wire harness access (6 inches or 15 cm) and strain relief (12 inches or 30 cm).</p>
<b>Paralleling</b>	<p>The converters can be installed in a parallel configuration for current sharing or redundancy.</p>

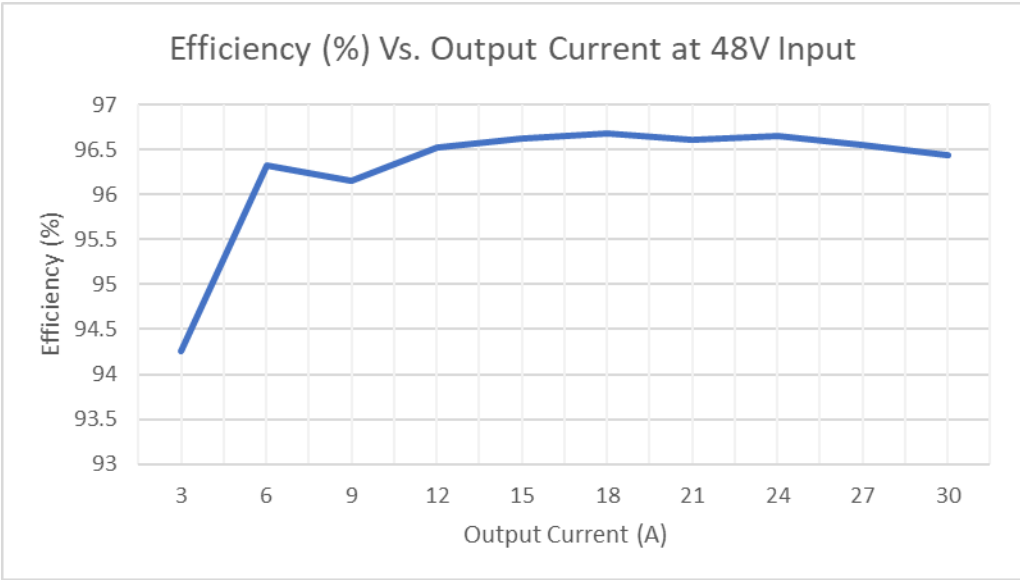


Figure 1.0 - Efficiency at 48V Input and Different Loads

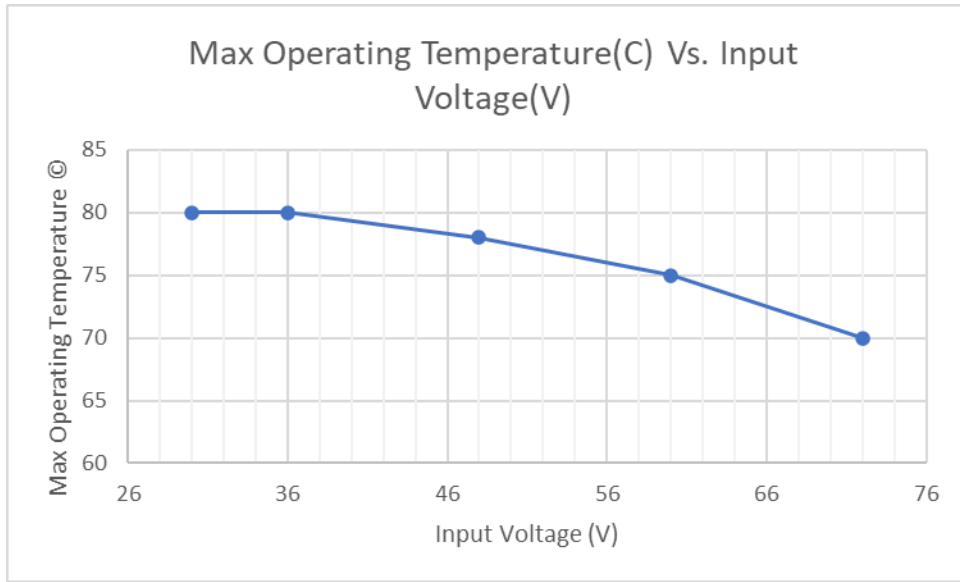


Figure 2.0 - Max. Operating Temperature vs. Input Voltage at 30A Load

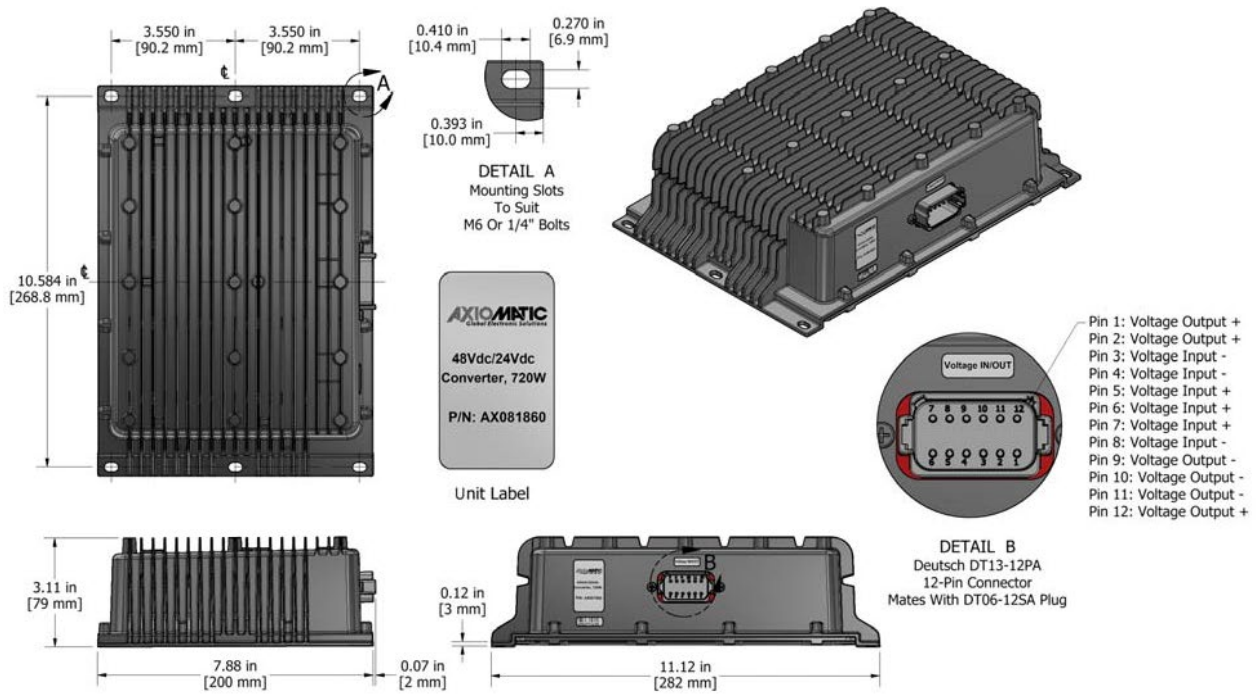


Figure 3.0. – Dimensional Drawing

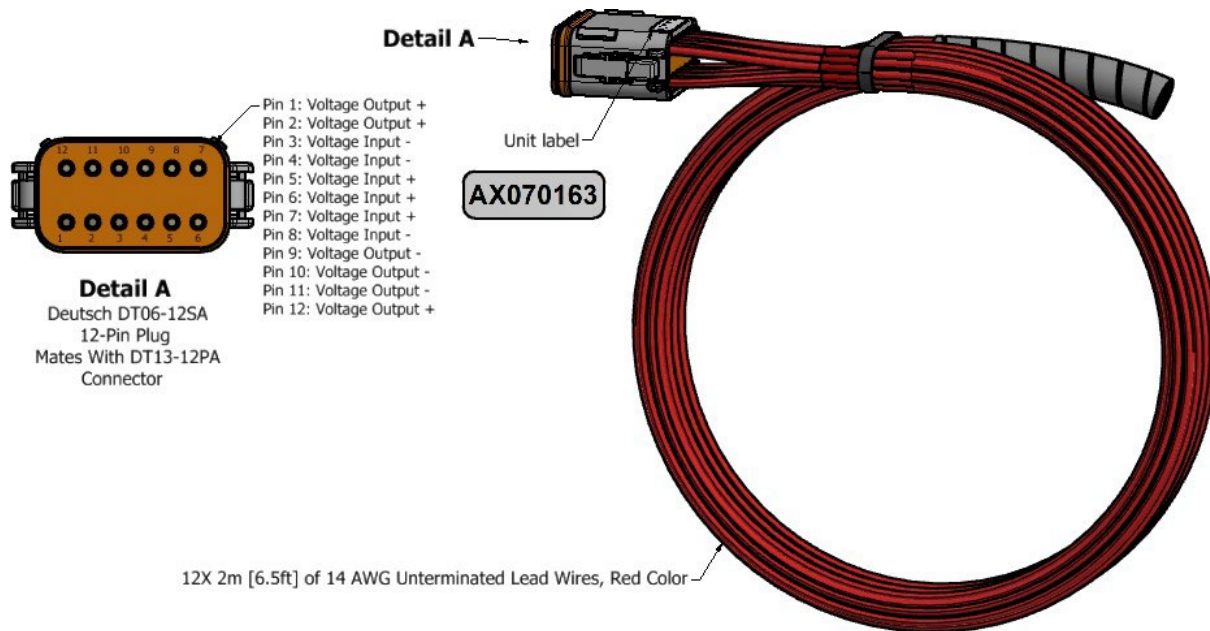


Figure 4.0 – Drawing of Wire Harness AX070163

Specifications are indicative and subject to change. Actual performance will vary depending on the application and operating conditions. Users should satisfy themselves that the product is suitable for use in the intended application. All our products carry a limited warranty against defects in material and workmanship. Please refer to our Warranty, Application Approvals/Limitations and Return Materials Process as described on <https://www.axiomatic.com/service/>.

Form: TDAX081860-06/23/23