This isolated DC to DC power supply is used for eliminating ground loops or addressing isolation issues when interfacing to PLC analog I/O modules. The design features handle many types of configuration problems. The FA-DCDC-1 is a DIN-rail mount, ±10VDC, ±5VDC isolated power supply, with each output rated at 125mA. The input voltage range is 12-24V DC ±15% at approximately 6.7 Watts.

FA-DCDC-1 General Specifications

Input Voltage Range
12V to 24VDC ± 15%

Input Power
6.7 Watts, Vin 27.6V, 125mA load each channel

Output Voltage (25°C)
+5V ±1%, 125mA load; -5V ±1% 125mA load
+10V ±1% typical, ±2% maximum; -10V ±1% typical, ±2% maximum

Output Current
125mA (per output voltage)

Output Ripple
±5V channels: <10mV peak to peak, Vin 10.2V 125mA load on both channels
±10V channels: <25mV peak to peak, Vin 10.2V, 125mA load on both channels

Line Regulation
±5V channels: <10mV, Vin 10.2V to 27.6V, 125mA load on both channels
±10V channels: <20mV, Vin 10.2V to 27.6V, 125mA load on both channels

Load Regulation
±5V channels: <20mV, Vin 10.2V, 0 - 125mA load variation
±10V channels: <40mV, Vin 10.2V, 0 - 125mA load variation

Isolation
Input to Output: 1500V, ±5V to ±10V: 1500V

Inrush Current (50ms)
970mA, Vin 10.2V, 125mA load all channels

Holdup Time (all channels)
30ms minimum, Vin 10V, 125mA load all channels

Overshoot Protection
No overshoot - Turn on and turn off of Vin

Input Protection (reverse DC input voltage)
Up to -50V reverse, ± Vin reverse polarity connection.

Overload Protection
Auto shutdown, Short circuit, Cycle Vin post event

Output Protection
Indefinite duration, ±5V tied to ±10V

Peak Line Transient Voltage
100V for 10ms, Voltage spike on input

Operating Temperature
0 to 60°C (32 to 140°F) full rated

Storage Temperature
-20 to 70°C (-4 to 158°F)

Enclosure
Clear Lexan 221-111 with UN5016 transparent blue colorant

Mounting
35mm wide DIN rail: part # DN-R35S1 or DN-35HS1; surface mount

Connection
3.5mm screw terminal, 28-16AWG, 1.7 lb-in torque

Relative Humidity
5 to 90% (non-condensing)

Environmental Air
No corrosive gases permitted

Vibration
MIL STD 810C 514.2

Shock
MIL STD 810C 516.2

Noise Immunity
NEMA ICS3-304

Agency Standards and Approvals
UL/cUL listed, UL file E200031, UL508/CSA - C22.2 No. 142-M1987 for ordinary locations. Class I, Division 2, Groups A, B, C, D Hazardous Locations

Notes: 1. All specifications are over the full operating temperature range (0°C to 60°C) unless stated otherwise.
2. "Channel" means Output Voltage. For example: +5V is one channel and -10V is another.
3. All output voltage channels are independent of each other. Changing loading on one will have no effect on the other voltage outputs.
4. LINE Regulation: varying the Input Voltage over entire range (12V to 24V ± 15%) and the resultant change in the Output Voltage(s) under worst case load conditions (all output channels drawing 125mA).
5. LOAD Regulation: varying the output loads from no-load to a worst case 125mA load and measuring the resultant change in the Output Voltage(s) under a worst case minimum Input Voltage (10.2V) condition.
RHINO DC to DC Isolated Converter

Applications

When using a linear potentiometer, the +10V connects to the high side of the potentiometer and the COM1 becomes the zero volt reference. The wiper connects to the analog input. The result is 0 to 10V at the analog module input. (Fig. 1)

Use in a solar/battery application where unregulated 12VDC is available and the analog module requires 24VDC for operation, connect the +10V to +24V module power, connect the -10V to the +5V and the COM2 to the 0V module power. (Fig. 2)

Use to power a load cell application. (Fig. 3)

Dimensions, in(mm)

Warning - Explosion Hazard - Substitution of components may impair suitability for Class I, Division 2/Zone 2.

Warning - Explosion Hazard - Do not connect or disconnect connectors or operate switches while circuit is live unless the area is known to be non-hazardous.

Power Supplies

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