

110-VOLT TO 72-VOLT DC-DC CONVERTERS

OPERATE 72-VOLT LOCOMOTIVE ELECTRONICS ON BOARD 110-VOLT RAIL VEHICLES



Model 1744-72-10



Model 1744-72-5

- 77-137.5V EXTENDED INPUT RANGE
- 10-AMPERE AND 5-AMPERE MODELS
- -40°C to +70°C TEMPERATURE RANGE
- INPUT SURGE/TRANSIENT PROTECTION
- RUGGED DESIGN AND CONSTRUCTION

The Series 1744 dc-to-dc converters provide a regulated and well-filtered 72-Vdc output voltage from 110-Vdc electrical systems on locomotives and other rail vehicles. An extended input voltage range enables these converters to continuously power on-board electronics in the presence of large variations in the vehicle's battery voltage. The units are able to produce high output power with high conversion efficiency and yet operate with a low standby current. A field-proven input-transient protection system, conservative electrical design and extremely rugged mechanical construction make them especially suited for powering sensitive electronic loads in the harsh railroad vehicle environment.

SPECIFICATIONS

Input Voltage Range

77 Vdc to 137.5 Vdc (110 Vdc nominal)
 The converter will not be harmed by occasional excursions to 150 Vdc for up to 20 minutes.

Output Voltage

72 Vdc

Output Current

For Model 1744-72-10, 0 to 10 Adc
 For Model 1744-72-5, 0 to 5 Adc

Output Voltage Regulation

Output voltage regulation is better than +1/-3% with line and load variations

Output Voltage Ripple

Typically less than 15 mV rms and 50 mV peak-to-peak

Efficiency

The efficiency of the converter exceeds 95% for most of the load range. The no-load input current is less than 100 milliamperes.

Isolation

Isolation capable of passing a 2,000-Vdc insulation stress test is provided between the converter circuitry and chassis ground. The input and output are not isolated from each other and share a common return.

Protection

Protection against overloads, short circuits and output overvoltages is provided electronically. Recovery to normal operating conditions is automatic upon removal of the fault.

Protection against accidental reversal of the dc input voltage polarity during installation is provided by a shunt diode working in conjunction with a user-supplied input fuse or circuit breaker. See section titled "Installation."

Transient-Withstand Capability

The converter will not be damaged when its input is subjected to high-energy transients as specified in IEC 1000-4-5, Surge Immunity Test, Level 3, applied line-to-line or line-to-chassis. The converter will not be damaged when its input is subjected to transient bursts as specified in IEC 1000-4-4, Electrical Fast Transient/Burst Immunity Test, Level 4.

Installation

Good installation practice for mobile electronic equipment dictates that input fuses or circuit breakers should be located at the power-source end of the cables feeding the converter. For this reason, no protection devices are built inside the Model 1744 to protect against fault conditions at the input to the converter. Instead, an appropriately rated fuse or circuit breaker should be installed near the dc-input source in series with the positive (+) input line.

Ambient Temperature Range

-40°C to +70°C (-40°F to +158°F)

Shock and Vibration

The converter has been designed to meet the shock/vibration requirements set forth in AAR Standard S-9401 for Vehicle Interior, Non-Cab environments.

Mechanical: Dimensions given in inches (mm):

Model 1744-72-5: 1.9 (48) high x 7.0 (177) wide x 9.0 (228) deep (excluding flanges and terminal block). Weight: 3.5 pounds (1.6Kg)
Model 1744-72-10: 3.0 (76) high x 7.0 (177) wide x 9.0 (228) deep (excluding flanges and terminal block). Weight: 5 pounds (2.3Kg)

Mounting flange on base is 0.5 (13) wide (each side), and accepts four #10 screws (two on each side). Hole pattern is 6.6 (168) front-to-back and 7.6 (193) wide. Terminal block extends 0.5 (13) from front panel.

Input/Output Connections

The input and output connections are provided via heavy-duty barrier-strip terminal blocks that accept lugs for use with #6 hardware. The chassis/ground connection is made via a #6 sems screw.

For Additional Information

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