Wilmore® ELECTRONICS CO., INC.

USER MANUAL

Model 1741-60-7
DC-DC Converter

MODEL 1741-60-7
Voltage-Boosting
DC-to-DC Converter

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I. General Description

The Model 1741-60-7 dc-to-dc power converters enable nominal 74-Vdc locomotive electronics to operate from input voltages as low as 20 Vdc by boosting lower voltages to 60 Vdc (well within the operating voltage range for most 74-Vdc equipment). At input voltages above 60 Vdc, this converter will pass through the source voltage essentially unchanged while providing substantial filtering and transient-withstand capability for load equipment. When the input voltage falls below 60 Vdc, the converter boosts this voltage to a regulated 60-Vdc output.

The normal operating input voltage range is 20.0 to 90.0 Vdc. Output current rating is 0-7.0 amperes. Isolation capable of passing a 2000 Vdc "hipot" test is provided between the converter circuitry and chassis. The input and output share a common return.

Protection against moderate output overloads is provided electronically, and the unit will return to normal operation upon removal of the fault. More severe overloads and output short circuits may cause the input fuse to open. Protection against accidental reversal of the input-voltage polarity during installation is provided by a shunt diode working in conjunction with the front-panel input fuse.

WARNING: THE USER SHOULD NORMALLY PROVIDE AN APPROPRIATELY RATED FUSE OR CIRCUIT BREAKER BETWEEN THE OUTPUT OF THIS CONVERTER AND THE LOAD(S) TO WHICH IT IS PROVIDING POWER, as the converter's input fuse is not sized or intended to protect against output wiring or load faults (See Section II: Installation and Operation).

At input voltages below 60 Vdc, this converter is a constant-output-power device, i.e., with a constant load, the input current and input voltage are inversely proportional. This means that the maximum input current is drawn at the minimum input voltage. An approximation of input current for a specific input voltage and output load current can be determined as follows:

$$\text{Input Current} = \frac{(\text{Output Voltage})\ (\text{Output Current})}{(0.9)\ (\text{Input Voltage})}$$

This approximation applies for output load currents equal to or greater than 20% of maximum rated load current. For loads less than 20% of the maximum rating, linearly decrease input current from its calculated value at 20% load to 150 milliamperes at no load.

II. Installation and Operation

WARNING: THE USER SHOULD NORMALLY PROVIDE AN APPROPRIATELY RATED FUSE OR CIRCUIT BREAKER BETWEEN THE OUTPUT OF THIS CONVERTER AND THE LOAD(S) TO WHICH IT IS PROVIDING POWER.

The converter's front-panel fuse is in series with its positive input terminal and is sized to protect against gross faults internal to the converter or input polarity errors during installation. Consequently, it is not sized for, nor is it intended to protect against, output wiring errors or load faults. The converter will protect itself from such output fault currents but cannot interrupt them other than by means of its input fuse, which is necessarily rated many times higher than the converter's output current rating. Therefore, consistent with good installation practices, the user should install an appropriately rated fuse or circuit breaker between the output of this converter and the load(s) to which it is providing power.

Connection and operation of Series 1741 converters is almost entirely self-explanatory from the front-panel markings on each unit. The positive and negative terminals are clearly marked on the input and output connections of the terminal block, and deliberate caution should be exercised to avoid polarity mistakes. Both the input and the output of the converter are dc-isolated from the chassis but not from each other (the negative input and negative output terminals are electrically common). A chassis ground screw is provided on the front panel.

The terminal block and chassis ground screw accept lugs for use with #8 hardware. To connect the Model 1741-60-7 to its input power source, it is suggested that #10 AWG power cables be used. These cables should be kept as short as possible, and if their length must exceed 10 feet, it may be desirable that larger cable be used. Connections from the converter to the user's load(s) are defined and constrained by user installation choices of wire size and fusing (see the **WARNING** regarding output fusing earlier in this section).

III. Maintenance Information

A damaged or malfunctioning unit should be returned to Wilmore for repair. Multiple-component cascade failures in power conversion circuitry can greatly complicate trouble-shooting procedures, and factory technicians familiar with the circuitry can locate the problem quickly, explore adjacent circuitry for stressed or damaged components, and subject the inverter to a thorough retest.

Wilmore maintains a **Return Material Authorization** system in order to efficiently track your inbound shipment and expedite its repair and return to you. Before shipping material for repair to Wilmore, please call (919) 732-9351 or email *info@wilmoreelectronics.com* and request an **RMA Number** for your shipment. If possible, please provide the complete model number of the equipment, its serial number, and a brief description of the problem. Place this **RMA Numbe**r on the outside of the package and ship prepaid to:

WILMORE ELECTRONICS CO., INC.
607 U.S. 70A East
P.O. Box 1329
Hillsborough, NC 27278

IV. Limited Warranty

Wilmore Electronics Company, Inc. warrants this product to be free from defects in material and workmanship for one (1) year after delivery to the original purchaser. During this period, a defective product for which an authorization to return the product has been given, shall be returned to Wilmore freight prepaid. The products will be repaired, replaced, or credit allowed only if the defect, after examination by Wilmore, is determined to be a defect in material or workmanship. If this returned product is determined by Wilmore to have suffered from user misuse or abuse or to have been opened or modified without written instructions from Wilmore, or if the date of receipt of a request for return authorization exceeds the 1-year warranty period, the warranty is null and void. In such cases, Wilmore will determine the cost of repair, quote this price to the purchaser, and continue as advised by the purchaser.

The sole obligation of Wilmore and the purchaser's exclusive remedy under this or any other warranty, expressed or implied, is the repair or replacement of a defective product as provided above, or the issuance of credit in an amount not to exceed the contract price for the product deemed to be defective. Wilmore makes no warranty of merchantability or fitness for a particular use. Wilmore shall not be responsible for incidental or consequential damage, whether or not foreseeable, caused by defects in this product. There are no other warranties which shall extend the description above.