



Wilmore®
ELECTRONICS CO., INC.

USER MANUAL
Series 1640XR
DC-DC Converters

SERIES 1640XR DC-to-DC Converters



1640XR-48/130-13-7.5



1640XR-48/130-13-15

This User's Information Manual is applicable for the following Models:

1640XR-24/48-13-7.5
1640XR-24/48-13-15
1640XR-24/48-24-4
1640XR-24/48-24-8

1640XR-48/130-13-7.5
1640XR-48/130-13-15
1640XR-48/130-24-4
1640XR-48/130-24-8



Wilmore Electronics Company, INC.
P.O. Box 1329, Hillsborough, NC 27278

Telephone 919.732.9351 | Fax 919.732.9359
www.wilmoreelectronics.com

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I. General Description

Series 1640XR dc-to-dc power converters provide an isolated, regulated dc output voltage from nominal 24, 36, 48, 60 and 130-volt battery systems in mobile or stationary applications. Their operating input voltage range is shown in Table 1, and they are available with output power ratings of 100 and 200 watts. Standard output voltage and current combinations are also listed in Table 1 below according to model number. Each converter's output is galvanically isolated from its chassis ground and, therefore, may be connected as either a positive or a negative voltage.

Table 1

Model Number	Input Voltage Range (Vdc)	Nominal Output Voltage (Vdc)	Maximum Output Current/Power ¹
1640XR-24/48-13-7.5	20-80	13.6	7.5A/100W
1640XR-24/48-13-15	20-80	13.6	15A/200W
1640XR-24/48-24-4	20-80	24.0	4A/100W
1640XR-24/48-24-8	20-80	24.0	8A/200W
1640XR-48/130-13-7.5	40-150	13.6	7.5A/100W
1640XR-48/130-13-15	40-150	13.6	15A/200W
1640XR-48/130-24-4	40-150	24.0	4A/100W
1640XR-48/130-24-8	40-150	24.0	8A/200W

¹Depending upon output load and ambient temperature, a duty-cycle restriction may apply. See Bulletin #76A0008B for more information.

These converters are electronically protected against overloads, short circuits and output overvoltages. Recovery to normal operating conditions is automatic upon removal of an overload or short-circuit fault. Following an overvoltage shutdown, input power to the converter may need to be removed and reapplied to resume converter operation. Protection against accidental reversal of the input-voltage polarity during installation is provided by a shunt diode working in conjunction with an appropriately rated, user-supplied input fuse or circuit breaker (see Section II: Installation and Operation).

These converters are constant-output-power devices, 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:

$$\text{Input Current} = \frac{(\text{Output Voltage}) (\text{Output Current})}{(0.8) (\text{Input Voltage})}$$

This approximation applies for output load currents equal to or greater than 20% of maximum rated load current.

For **Series 1640XR-24/48**, for loads less than 20% of the maximum rating, linearly decrease input current from its calculated value at 20% load to 200 milliamperes at no load with input voltage =20Vdc (higher values of Input Voltage will draw proportionally lower no-load input current).

For **Series 1640XR-48/130**, for loads less than 20% of the maximum rating, linearly decrease input current from its calculated value at 20% load to 100 milliamperes at no load with input voltage =40Vdc (higher values of input voltage will draw proportionally lower no-load input current).

II. Installation and Operation

Read this section in its entirety prior to commencing any installation work.

WARNING – DANGER OF ELECTRIC SHOCK!

**DISCONNECT THE DC INPUT POWER SOURCE END OF THE CABLES BEFORE
MAKING ANY CONNECTIONS TO THE CONVERTER!**

CAUTION:

**SERIES 1640XR CONVERTERS ARE NOT INTERNALLY FUSED. EXTERNALLY FUSE
INPUT AS INSTRUCTED BELOW.**

Good installation practice for electronic equipment operated from a battery source dictates that input fuses or circuit breakers should be located at the power distribution end of the cables feeding the converter. For this reason, no protection devices are built inside Series 1640XR converters to protect against fault conditions at the input to the converter. It is recommended, instead, that an appropriately rated fuse or circuit breaker be connected near the dc-input source in series with the input lines to the converter (see Table 2 for recommended values). The fuse or circuit breaker should be installed in series with the positive (+) input line when the dc source is negative-grounded, or in series with the negative (-) input line when the dc source is positive-grounded.

Connection and operation of Series 1640XR converters are almost entirely self-explanatory from the front-panel markings on each unit. The mounting flange on the base accepts four #10 screws on a 6.6" (168mm) front-to-back and 7.6" (193mm) wide hole pattern. The positive and negative terminals are clearly marked beside the input and output terminal blocks, and deliberate caution should be exercised to avoid polarity mistakes. The terminal block screws and chassis/ground terminal screw accept lugs for use with #6 hardware, and the manufacturer's recommended tightening torque is 9 in.-lbs. Both the input and the output of the converter are galvanically isolated from the chassis and from each other.

It is suggested that the following sizes of input and output power cables be used (see Table 2). These cables should be kept as short as possible, and if their length must exceed 10 feet, it may be desirable to use larger cable.

Table 2

Model Number	Input Cable Size (AWG)	Output Cable Size (AWG)	Recommended Input Fuse Rating (A)
1640XR-24/48-13-7.5	14	14	10
1640XR-24/48-13-15	12	12	20
1640XR-24/48-24-4	14	16	10
1640XR-24/48-24-8	12	14	20
1640XR-48/130-13-7.5	18	14	7
1640XR-48/130-13-15	14	12	10
1640XR-48/130-24-4	18	16	7
1640XR-48/130-24-8	14	14	10

III. Maintenance Information

Other than preventing dust accumulation on external surfaces of the converter, no periodic maintenance should be required.

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 Number** 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.