

X-Motor Zebra

*Model VZ-6
MINI-Manual*



Contents

Specifications	2
Safety Information	3
Watch the DVD's!	4
Using Your <i>X-Motor Zebra</i>	5
Voltage Checking	6
Harnesses	7
Adapters	7
Warranty	Back Cover

The **DVD's** enclosed with your tool have training sessions and suggestions not included in this manual; please watch them completely to learn how to use this diagnostic tool.

Specifications

Maximum Input Voltage	30 Volts
Overall Circuit Protection	1 A. @ 24 VAC
Unit Size	10.75"L. x 7.25"W. x 3"H.
Unit Weight	2.0 lb.
Warranty	One Year Limited Warranty

Safety Information

Please read all of the instructions and watch both DVD's before attempting to use your *X-Motor Zebra*. They have information to protect you, your customers, and their property from harm or damage. Understanding the proper use of this tool will also help you to make more accurate diagnostics on the equipment that you are servicing.

Maximum Input Voltage.....30 Volts

Maximum Current Through Unit.....1 Amp

• **NEVER connect any lead to (nor allow any unconnected lead to touch) Line Voltage, or any voltage higher than 30 Volts.**

• This tool is intended for use by Professional HVAC Technicians ONLY! If you are not a Trained HVAC Professional, do not attempt to use this tool or perform any repair procedure described in the manual or DVD's.

• Never allow your *X-Motor Zebra* to get wet. If it does - dry it thoroughly before using.

Watch the DVD's!

There are two DVD's included with your tool:

1) **Understanding ECM Systems** - An overview of ECM (Electronically Commutated Motor) Technology - gives a background on how the motors work, how they interface with their systems, and how they differ from "standard" PSC blower motors. We recommend that you watch it FIRST to get a good foundation of ECM Technology and understand common terms.

2) **Using Your *X-Motor Zebra*** - is intended to replace a comprehensive manual for the product. It visually demonstrates how the different sections and components of the tool help you to perform an accurate diagnosis of systems where X-Motors are installed.

Watch the DVD's in a standard DVD player (although some computers can play them as well.) It is strongly recommended that you watch the second DVD at least twice before attempting to use your tool in actual field conditions.

Using your *X-Motor Zebra*

5

The *X-Motor Zebra* is inserted electrically in-between the system circuit board and the motor; intercepting the calls for motor speeds and displaying them on the YELLOW LED's 1-5.

Each of these speed lines can then be ECHO'ed out to the motor or left OFF. Additionally, each line can be manually activated to test that blower speed. When an outgoing speed line is active, the corresponding GREEN LED is lit.

Incoming 24VAC power is continuously monitored for low-voltage conditions with 3 LED's.

If a problem is discovered to be in the motor itself, provision is made (through a WINDING SECTION TEST) to determine if the fault is in the Module Section or the Winding Section. Some Modules may be independently replaced, with a considerable savings to the Customer.

This manual is only a brief introduction on how to use your *X-Motor Zebra*; please watch both DVD's to get a full understanding.

Voltage Checking

Voltage problems in a system are frequently overlooked. For instance, if the system transformer is already close to its output capacity, and a new contactor requires a higher current level than the one being replaced, intermittent problems are likely to arise, especially if the line voltage drops a few percent because of high summer/winter demand.

The *X-Motor Zebra* has a built-in voltage monitor section that makes it easy to tell if the voltage being supplied at the Red and Black leads is adequate. (These voltages could easily be determined with a voltmeter, of course; but many Techs don't check for low-voltage levels while under load, even though they *could*.)

Getting used to glancing at the VOLTAGE section of the *X-Motor Zebra* may help you detect some of these problems before they actually cause a fault.

The **LOW LED** lights when the input power is at least 8 volts. The **?? LED** is fully on at 20.5 Volts. The **O.K. LED** is fully bright at 23 Volts. If all three of the red LED's are not on when testing, get out your voltmeter and discover why. It's probably the reason a motor would be operating erratically.

Harnesses & Adapters

7

Four harnesses extend from the *X-Motor Zebra's* storage compartment -

- (1) The Input Signal Harness has a gold or yellow 6-position connector on its end.
- (2) The Output Signal Harness has a blue 6-position connector on its end.
- (3) The Power Harness has a black 2-position connector on its end.
- (4) The Winding Test Harness has a white 3-position connector (and alligator clip) on its end.

Five harness adapters are also included -

- (1) The Standard Input Harness has a gold connector and 6 wires with male disconnects.
- (2) The Standard Output Harness has a blue connector and 6 wires with female disconnects.
- (3) The ECM 142 Input Harness has a gold connector and a green connector.
- (4) The ECM 142 Output Harness has a blue connector and a red connector.
- (5) The Standard Power Harness has a black connector and a red and a black wire, each with a fuseholder and an alligator clip.

One Year Limited Warranty

For a period of one year from the original end-user's date of purchase, Zebra Instruments warrants that this tool is without manufacturing defects. Should you encounter any problems, please contact us and we will attempt to resolve your problem as quickly as possible. This resolution may include replacement, exchange, or repair of a defective tool; at our option. This warranty does not apply to tools that have been exposed to: voltages and/or currents that are higher than those specified in this manual; abuse or rough handling; any damage to connectors, or damage from moisture or exposure to chemicals. Out-of-warranty repairs are available for a nominal charge plus shipping. Please contact us for an RMA (return authorization number) before returning a tool for repair.

Zebra Instruments

www.ZebraInstruments.com

© Zebra Instruments

Manufactured under license

U.S. Patent No. 6,826,454