

## Zero Volt Monitor Programmer Operation and Maintenance



Figure 1. Vermason 222762 Zero Volt Monitor Programmer

### Description

The Vermason 222762 Zero Volt Monitor Programmer allows the user to program the upper and lower resistance levels of each operator of the Vermason 222755 Zero Volt Monitor. The Programmer's resistors define the PASS resistance range. The FAIL resistance ranges are chosen by the user. The programmer HIGH resistance range is from 10 Megohms to 35 Megohms and the LOW resistance range is from 402 Kilohms to 1.91 Megohms. The user may use any resistance value within the programmable limits.

### Packaging

- 1 Zero Volt Monitor Programmer
- 1 Data Cable
- 1 9 Volt Battery
- 1 Certificate of Calibration

### Operation

**NOTE:** The resistance calibrated is the total loop / series resistance, not the operator to ground resistance. To calculate the typical operator to ground resistance for a given series resistance, use the following equation:

$$R_{OPR\_GND} = \frac{R_{SERIES} + 2 \text{ Megohms}}{4}$$

Example:

If  $R_{SERIES} = 20$  Megohms  
Then  $R_{OPR\_GND} = 5.5$  Megohms

Therefore, the Programmer's HIGH resistance of 20 Megohms gives a typical PASS operator resistance to ground upper limit of 5.5 Megohms.

### SETUP

- I. The Zero Volt Monitor Programmer comes installed with default operator standard values 1.91 Megohms LOW LIMIT and 10 Megohms HIGH LIMIT for both operators. If other limits within the ranges specified above are desired, please see "CONFIGURING THE LIMITS" on page 2.
- II. Be sure that the Zero Volt Monitor is properly installed as described in its technical bulletin (TB-7561).

### PROGRAMMING PROCEDURE

- I. Disconnect the power from the Zero Volt Monitor that is to be calibrated.
- II. Connect one end of the included data cable to the jack labeled "DATA OUT" on the Programmer and the other end to the jack labeled "DATA OUTPUT" located on the back of the Zero Volt Monitor.
- III. Connect the 2 mono plugs from the Programmer into the operator remote jacks connected to the Zero Volt Monitor. The 2 plugs are interchangeable for operators 1 and 2 of the monitor.
- IV. Connect power to the Zero Volt Monitor.
- V. Upon power up, the Zero Volt Monitor should beep once and both operator red HIGH LEDs should illuminate. This indicates that the monitor is ready to calibrate the HIGH limits.

- VI. Toggle the switch on the Programmer to HIGH and the press and release the PROGRAM button to calibrate the HIGH limits of the monitor. The monitor should beep twice, the red LEDs should turn off, and the yellow LEDs should illuminate.

**NOTE:** If the red LEDs remain illuminated and the alarm sounds, there is a problem with the high limit calibration. Ensure that the toggle switch is set to HIGH and that all cords are properly connected.

- VII. The illuminated yellow LEDs indicate that the monitor has entered LOW limit calibration. Toggle the Programmer's switch to LOW and then press and release the PROGRAM button. The monitor should beep twice and the yellow LEDs should turn off.

**NOTE:** If the yellow LEDs remain illuminated and the alarm sounds, there is a problem with the low limit calibration. Ensure that the toggle switch is set to LOW and that all cords are properly connected.

- VIII. If the Zero Volt Monitor has been successfully calibrated it will immediately go into self-test (reset) mode (all of the LEDs will illuminate and the alarm will sound for 1 second).
- IX. Disconnect the data cable from the Zero Volt Monitor and the two mono plugs from the operator remotes.
- X. Verify the HIGH and LOW limits with the optional Vermason 222770 Zero Volt Monitor Limit Comparator.

## CONFIGURING THE LIMITS

The limits of the Zero Volt Monitor Programmer can be changed within the following ranges:

HIGH: 10 Megohms to 35 Megohms  
LOW: 402 Kiloohms to 1.91 Megohms

- I. Remove the 2 screws located on the back of the Programmer and the black switch cap. Disassemble the unit.
- II. There should be four resistors soldered to the circuit board. Two are for operator 1 (HIGH and LOW limits) and operator 2 (HIGH and LOW limits). Follow the table below to find the resistances that correspond to the desired LOW limit or HIGH limit. Each set of resistances for a given limit are connected in parallel.

	Resistors in Parallel
OPR1 LOW	R1, R2, R3
OPR1 HIGH	R4, R5, R6
OPR2 LOW	R7, R8, R9
OPR2 HIGH	R10, R11, R12

NOTE: OPR1 and OPR2 limits should both be changed simultaneously for new limits. For example, if OPR1 and OPR2 HIGH limits were previously 10 Megohms and it is desired to change the high limit to 35 Megohms, both OPR1 and OPR2 HIGH limit resistors need to be changed.

- III. Desolder or clip the existing resistors in the places where the limit change is to be made.

For example, if changing both operator LOW limits, remove the two resistors currently soldered in the board: R1, R2 or R3 for OPR1 and R7, R8 or R9 for OPR2.

- IV. Solder the new resistors in their appropriate places.

For example, solder the new resistors in R1, R2 or R3 for the OPR1 LOW limit and R7, R8 or R9 for the OPR2 LOW limit.

- V. Reassemble the unit.

- VI. Vermason recommends that you verify the new limits with our 222770 Zero Volt Monitor Limit Comparator. Program the Zero Volt Monitor with the Zero Volt Monitor Programmer and verify that the monitor fails at 10% of the calibrating resistance.

For example, if the Zero Volt Monitor is calibrated for a HIGH limit of 10 Megohms, the unit should FAIL HIGH when 11 Megohms (10 Megohms + 10%) is applied to the operator inputs. If the monitor is calibrated for a LOW limit of 1.91 Megohms, the unit should FAIL LOW at 1.72 Megohms (1.91 Megohms - 10%). In this example the operator should pass from 2.1 Megohms (1.91 Megohms + 10%) through 9 Megohms (10M - 10%).

## Maintenance

The two phono plug tips of the Zero Volt Monitor Programmer should be cleaned periodically with rubbing alcohol.

### Limited Warranty

Vermason expressly warrants that for a period of one (1) year from the date of purchase, Vermason Zero Volt Monitor Programmers will be free of defects in material (parts) and workmanship (labour). Within the warranty period, a unit will be tested, repaired or replaced at Vermason's option, free of charge. Call Customer Service at 0044 (0) 1462 672005 for a Return Material Authorisation (RMA) and for proper shipping instructions and address. Any unit under warranty should be shipped prepaid to the Vermason factory. You should include a copy of your original packing slip, invoice, or other proof of purchase date. Warranty repairs will take approximately two weeks.

If your unit is out of warranty, Vermason will quote repair charges necessary to bring your unit to factory standards. Call Customer Service at 0044 (0) 1462 672005 for a Return Material Authorisation (RMA) and proper shipping instructions and address.

### Warranty Exclusions

THE FOREGOING EXPRESS WARRANTY IS MADE IN LIEU OF ALL OTHER PRODUCT WARRANTIES, EXPRESSED AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH ARE SPECIFICALLY DISCLAIMED.

The express warranty will not apply to defects or damage due to accidents, neglect, misuse, alterations, operator error, or failure to properly maintain, clean or repair products.

### Limit of liability

In no event will Vermason or any seller be responsible or liable for any injury, loss or damage, direct or consequential, arising out of the use of or the inability to use the product. Before using, users shall determine the suitability of the product for their intended use, and users assume all risk and liability whatsoever in connection therewith.