

Limit Comparator Operation Instructions



Made in the
United States of America



Figure 1. Vermason [222696](#) Limit Comparator

Description

Frequency of recalibration should be based on the critical nature of those ESD sensitive items handled and the risk of failure for the ESD protective equipment and materials. In general, Vermason recommends that calibration be performed annually.

Use the Vermason [222696](#) Limit Comparator to perform periodic testing (once every 6-12 months) of the Combo Tester X3. The Limit Comparator can be used on the shop floor within a few minutes virtually eliminating downtime, verifying that the tester is operating within tolerances.

The Vermason [222696](#) Limit Comparator is to be used with the following items:

Item	Description
222550	Combo Tester X3
222551	Combo Tester X3 with Stand
222553	Combo Tester X3 with 10mm Adaptor
222554	Combo Tester X3 with Stand and 10mm Adaptor

Packaging

- 1 Limit Comparator
- 2 Test Leads with Banana Plug Terminals
- 1 Certificate of Calibration

Tester Configuration

The resistance limits for footwear and wrist strap tests are controlled by the DIP switches located on the left side of the tester. Use the following tables for the DIP switch settings and their corresponding test values.



Figure 2. Locating the DIP switch on the Combo Tester X3

FOOTWEAR RESISTANCE

DIP switches 1 and 2 control the HIGH test limit.

Switch 1	Switch 2	HIGH Limit Resistance
ON	ON	10 Megohms (1×10^7)
OFF	OFF	35 Megohms (3.5×10^7)
ON	OFF	100 Megohms (1×10^8)
OFF	ON	1 Gigohm (1×10^9)

DIP switches 3 and 4 control the LOW test limit.

Switch 3	Switch 4	LOW Limit Resistance
ON	OFF	100 Kilohms (1×10^5)
OFF	ON	750 Kilohms (7.5×10^5)

default setting

NOTE: At 1 Gigohm high limit resistance, a dirty foot plate could result in a false pass. Be sure to keep the foot plate clean particularly when using this setting. This setting is not suitable for relative humidity greater than 50%.

WRIST STRAP RESISTANCE

DIP switches 5 and 6 control the HIGH test limit.

Switch 5	Switch 6	HIGH Limit Resistance
OFF	OFF	wrist strap test disabled
ON	ON	10 Megohms (1×10^7)
ON	OFF	35 Megohms (3.5×10^7)

default setting

DIP switch 5 must be ON (default setting) for the wrist strap test to be active. The wrist strap test will be disabled if DIP switch 5 is set to OFF.

The LOW limit for the wrist strap test is set to 750 Kilohms and cannot be modified by the user.

Operation

Testing the Wrist Strap Circuit

1. Plug the two included test leads into each yellow banana jack located at the top of the Limit Comparator.
2. Connect one of the test leads from the Limit Comparator to the "SINGLE-WIRE" jack located on the face of the tester. Connect the other lead from the Limit Comparator to the ground jack located on the bottom of the tester.
3. Select "750K LOW" with the Limit Comparator's rotary switch.
4. Touch and hold the test plate of the tester until the test is completed. The tester should indicate a wrist strap FAIL LOW condition.
5. Select "750K PASS" on the Limit Comparator and repeat the test. The tester should indicate a wrist strap PASS condition.
6. Select either the "10M PASS" or "35M PASS" setting, whichever one is appropriate, on the Limit Comparator and repeat the test. The tester should indicate a wrist strap PASS condition.
7. Select either the "10M HIGH" or "35M HIGH" setting, whichever one is appropriate, on the Limit Comparator and repeat the test. The tester should indicate a wrist strap FAIL HIGH condition.

Testing the Footwear Circuit

1. Insert the Limit Comparator's stereo plug into the jack labeled "FOOT PLATE" on the bottom of the tester.
2. Select the appropriate FAIL LOW setting on the Limit Comparator.
3. Touch and hold the test plate of the tester until the test is completed. The tester should indicate a FAIL LOW condition for both feet.
4. Select the appropriate PASS LOW setting on the Limit Comparator and repeat the test. The tester should indicate a PASS condition for both feet.

5. Select the appropriate PASS HIGH setting on the Limit Comparator and repeat the test. The tester should indicate a PASS condition for both feet.
6. Select the appropriate FAIL HIGH setting on the Limit Comparator and repeat the test. The tester should indicate a FAIL HIGH condition for both feet.

NOTE: The Combo Tester X3 does not feature any adjustable parts for calibration. The tester must be returned to the manufacturer for re-calibration should it fail any calibration tests with the Limit Comparator.

Specifications

Dimensions:

3.8" L x 2.4" W x .9" H
(9.7 cm x 6.1 cm x 2.3 cm)

Weight:

.2 lbs
(.1 kg)

Resistance Values:

Setting	Nominal Resistance	% Tolerance of Nominal Resistance
100K LOW	90K	±2%
100K PASS	110K	±2%
750K LOW	675K	±2%
750K PASS	825K	±2%
1M LOW	909K	±2%
1M PASS	1.10M	±2%
10M PASS	9.09M	±2%
10M HIGH	11.09M	±2%
35M PASS	31.09M	±2%
35M HIGH	37.89M	±2%
100M PASS	90.9M	±5%
100M HIGH	112.9M	±5%
1G PASS	812.9M	±5%
1G HIGH	1.213G	±5%

These resistance values may be verified using a digital voltmeter by setting it to read Ohms (Ω). Connect your voltmeter's test leads into each of the Limit Comparator's yellow banana jacks. If any value is out of specification, the Limit Comparator must be returned to the manufacturer for repair.

Limited Warranty

Vermason expressly warrants that for a period of one (1) year from the date of purchase, Vermason Limit Comparators 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.