

Wrist Strap Tester - Operation, Installation and Calibration Instructions

Pass Range 800K Ohms to 10 Megohms, 9 Volt Battery Operation



Figure 1. Model [225220](http://Vermason.co.uk) Wrist Strap Tester

Description

The Vermason [225220](http://Vermason.co.uk) Wrist Strap Tester is a battery operated "on demand" wrist strap tester. When the wearer of a wrist strap plugs in their coiled cord and touches the metallic surface of the Wrist Strap Tester, a path for current flow is completed from the wearer's skin, through the wrist strap. This action will cause the green "test good" LED to light as long as the resistance of the circuit path is between 800k ohms and 10 megohms.

The Vermason [225220](http://Vermason.co.uk) Wrist Strap Tester can be used to test per EN 61340-5-1 Annex A Wrist Strap test method. "The operator shall wear the wrist strap in the normal position and plug the free end of the cord into the test apparatus. The hand contact

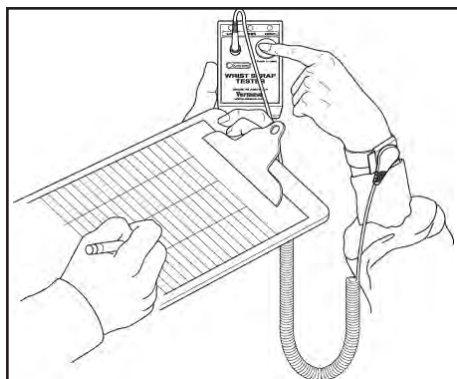


Figure 2. Testing a wrist strap

plate shall be pressed to verify that the wrist strap system resistance is within acceptable parameters. The test apparatus can be an integrated, commercially available tester". Being a portable battery powered tool, it is perfect for small labs or for a supervisor to spot-check workers and/or ensure compliance.

Per EN 61340-5-1 Edition 1.0 2007-08 "All personnel shall be grounded ...when handling ESDs [ESD sensitive items]. When personnel are seated at ESD protective workstations, they shall be connected to ground via a wrist strap system." [clause 5.3.2 Personnel grounding] "A compliance verification plan shall be established to ensure the organization's fulfillment of the requirements of the plan. ... Compliance verification records shall be established and maintained to provide evidence of conformity to the technical requirements. The test equipment selected shall be capable of making the measurements defined in the compliance verification plan." [clause 5.2.3 Compliance verification plan]

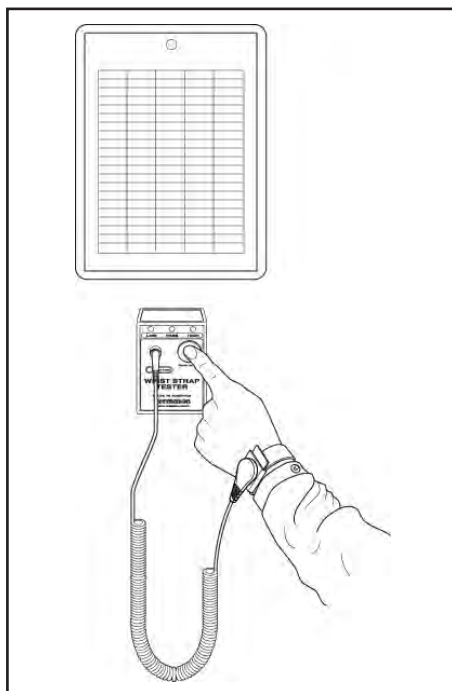


Figure 3. Recording results.

Installation

The Wrist Strap Tester is battery powered. When received, open the battery compartment and install the battery, and you will be ready to test your wrist straps while worn.

Note: the low battery indicator flashes every time the unit is used. When battery fail indicator is constant, check voltage of battery and/or replace it.

Operation

A wrist strap cord is plugged into the banana jack. Go to Vermason.co.uk to choose your cord. When the wearer of a wrist strap touches the metallic test button, the green "test good" LED will light if the operator-to-ground resistance is between 800 kilohms and 10 megohms. If the operator-to-ground resistance is below 800 kilohms, the red "LOW" LED will light and the alarm will sound. If the operator-to-ground resistance is above 10 megohms, the red "HIGH" LED will light and the alarm will sound. Per CLC/TR 61340-5-2 User guide Wrist Strap clause 4.7.2.4.3 Test procedure "If the resistance is still too high, dry skin might be the problem. Dry skin conditions can be resolved by applying moisturizing lotion on the wrist and repeating the resistance test again. The moisturizing lotion should be one that is compatible with process requirements and does not cause it contamination.

Note 2: Metal expansion bracelet style wrist bands may trap moisture underneath and can be more effective for people with dry skin."

If after application of ESD lotion such as Reztore™ ESD Hand Lotion, the resulting test is still fail "HIGH" or fail "LOW", the operator should notify their supervisor to have the wrist strap and cord checked.

Calibration

We recommend annual calibration of our testers. The model [225220](#) is calibrated to NIST traceable standards. Calibration may be performed to ensure that the tester is operating within limits.

If you are familiar with the procedure, the following resistance should give the display shown:

Resistance Value ($\pm 1\%$)	Test Output
750 kilohms:	Red (Low-hazard)
850 kilohms:	Green (OK-in limits)
9 megohms:	Green (OK-in limits)
11 megohms:	Red (High resistance)

Resistance Range

Per EN 61340-5-1 the limit is $< 3,5 \times 10^7$ ohms compliance verification test method per Annex A. The lower limit of 750 kilohms (0.75×10^6) ohms is to verify the presence of the 1 megohm $\pm 20\%$ current limiting resistor and to minimize false positive errors.

The 10 megohm upper limit meets the EN 61340-5-1 wrist strap system of $< 3,5 \times 10^7$ ohms as 1×10^6 is less than 3.5×10^7 . The 10 megohm upper limit has been an industry standard for many years included in EN 61340-5-1 product qualification test method ANSI/ESD S1.1 Table 3 "Functional Testing Limit is $< \text{or} = 10$ megohms or user defined value".

Procedure

Connect the test resistance from the banana jack to the test button. With resistance applied and test button pressed, display should yield proper output. Make sure test clips are insulated from users hands.

A unit failing the calibration test will need to be returned to the manufacturer.

Per ESD Handbook ESD TR 20.20 paragraph 5.3.2.4.2 Additional User Wrist Strap Testing, "Proper testing of the wrist strap includes the resistance of the groundable point on the end of the cord, the cord itself, the resistor, the cord-to-cuff snap connector, the resistance of the interface of the cuff, the cuff/wrist interface, and the resistance of the person between the wrist and the hand that contacts the test electrode. Typically, the maximum acceptable resistance most often used for wrist strap grounding is

the test electrode. Typically, the maximum acceptable resistance most often used for wrist strap grounding is less than ten megohms."

Limited Warranty

Vermason expressly warrants that for a period of one (1) year from the date of purchase, Vermason Statshield Wrist Strap Testers 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.