

Intrinsically Safe Micro-ohmmeter and Bond Tester

- Rugged: MIL PRF2880F Class 2
- Certifications: UL 913/CSA E79/CE/ATEX 94-9/ MIL 810E
- Portable: Long Battery Life (80 Hrs)
- Ranges: 2m Ω to 20 Ω
- Accuracy: 0.25% of reading
- Resolution: 1 $\mu\Omega$
- Simple Operation
- Offset Compensation
- Back Lit Display



The Model R1L-E2 is a portable low resistance ohmmeter/bond tester designed to measure low values of resistance, from 1 m Ω to 20 Ω , in explosive atmospheres. Applications include aircraft bond measurements for all phases of aircraft manufacturing as well as field maintenance test. It is certified intrinsically safe for use in and around Jet fuel tanks. A four-point measurement method eliminates errors caused by the measuring leads' resistance. Two leads pass a constant regulated current through the resistance under test, and two leads measure the resulting voltage drop across the resistance under test. The R1L-E2 then computes the resistance and displays the value digitally on a backlit liquid crystal display (LCD).

The R1L-E2 cycles the current ON and OFF during the measurement. During the current OFF state, thermal and offset voltages in the voltage measurement are stored. Then a correction is applied during the ON current time. The measurement current is well regulated to be constant over large changes in the unknown resistance and/or the resistance of the test leads. If the resistance under test becomes too high on a given range, the display shows a "1" followed by three blanks.

Rugged

Low obsolescence, high MTBF, rugged use and environmental extremes were major considerations when the Joint Strike Fighter team and US Navy evaluated this instrument.

The R1L-E2 surpassed all others, world wide. This critical support instrument also meets the long-term supportability, multi geographic use, field and manufacturing application requirements for these and related applications. The instrument's high resolution and accuracy specifications, combined with the proprietary pistol grip probes enable its ability to accurately and reliably discern bond flaws so critical to safety and integrity of aircraft.

A heavy-duty case contains and protects the R1L-E2. When closed, a gasket seals the lid to keep out water and dirt, while the R1L-E2 is transported through rain or other environmentally hostile conditions. When the lid is open, a second gasket provides additional protection, for the front panel. The removable battery access cover also has a gasket. The front panel is aluminum with durable markings. The R1L-E2 case lid also serves as a storage area for the supplied pair of test probes and instruction manual.

Display and Controls

A 3½-digit LCD display with decimal points shows the value of the resistance measured, reading from 1.999m Ω to 19.99 Ω full scale. The display indicates the resistance reading and also signals low battery condition. A backlight is provided for illumination in low light conditions. An alternate-action push-button switch turns battery power ON and OFF for the R1L-E2. It is protected by a ring to prevent accidental actuation. The RANGE switch is used to select the desired resistance range for the resistance under test. There are five ranges marked 2, 20, 200 m Ω , and 2 and 20 Ω full scale.

Supplied Accessories

The instrument is complete and ready to use with heavy-duty pistol-grip probes, each with two durable hardened pointed tips which rotate when pressed against the surface to be tested. Each probe comes with eight feet of #12 AWG two-wire cable with color-coded spade lugs. Three ATEX-Approved Alkaline "D" Cells, Operation and Maintenance Manual are included.



Specifications

Full Scale	Resolution	Accuracy	Test Current
1.999mΩ	1 μΩ	0.2% of Reading +2 Counts	1.4A
19.99mΩ	10 μΩ	0.2% of Reading +2 Counts	140 mA
199.9mΩ	100 μΩ	0.2% of Reading +2 Counts	14mA
1.999Ω	1 mΩ	0.2% of Reading +2 Counts	1.4mA
19.99Ω	10 mΩ	0.2% of Reading +2 Counts	140μA

Certifications		
UL 913		EN 50014, 1997 Ed. Including Amendment 2
CSA E79-0		EN 50020, 2002 Ed.
CSA E79-11		EN 50284, 1999 Ed.
CE		EN 61326, 1997 Ed. Incl Amend 1: 1998 & Amend 2, 2001
ATEX Directive 94-9/EEC)		Mil 28800 Class 2
EMC Directive 89/336/EEC		Mil Std. 810 E, Explosive Atmospheres

Note: Certifications Apply to Instrument and all accessories

Physical		
Operating Temperature		-20° to + 50° C
Storage Temperature		-40° to + 71° C
Size		17.5"W x 11.5"D x 7.1"H
Weight		15.1 lbs.
Power		3 Alkaline D Cells, Atex Certified
Battery Life		Approximately 80 Hours of Use

R1L-E2 NSN 6625-01-527-5543

R1L-E2B Certified UL 913, Meets Mil-Std. 28800 Class 2, Mil Std. 810E, Explosive Atmospheres



Shown right, the HTP-101 Intrinsically Safe pistol Grip probes enable very stable and repeatable measurements. The hardened stainless steel pins are spring loaded and rotate as they are depressed on the surface under test. This mechanical action allows the probes to cut through dirt, grease and other substances that may be contaminating the surface and enabling high reliability connections for precision kelvin measurements.