

ExLRT



**INTRINSICALLY SAFE
LOOP & JOINT RESISTANCE TESTER**



- ✓ Certified as Intrinsically Safe for Class 1 Div 1 (Zone 0) applications
- ✓ Approved by The Boeing Company as an alternative to the LRT Loop Resistance Tester

SAFE IN EXPLOSIVE ENVIRONMENTS

The ExLRT is certified to ISA Standard 60079-11 for Class 1 Div 1 (Zone 0) applications; where an explosive atmosphere is continuously present. Its outdoor use rating is IP54, meaning it is protected against dust and water splashing from any angle. With an operating temperature range of -10C to +40C (14F to 104F), it's ideal for most testing environments.



SUPERIOR DESIGN, VERIFIED BY BOEING

The ExLRT is the result of a close collaboration with The Boeing Company's EME (Electro Magnetic Effects) team as a replacement for the LRT, acknowledging of the need for a tool designed for modern industrial use. The resistance measurements have been independently verified by The Boeing Company as equivalent or superior to the existing LRT.

MAINTENANCE MADE SIMPLE

Integrated self test capability. Simple and rapid calibration process - typical onsite calibration time is only 30 minutes. We also offer a 12-month comprehensive warranty.

FUTURE-READY PLATFORM

Designed around a software platform that allows for additional capability in the future. Our wishlist for future releases currently includes automatic test sequences, ATE remote control, user-authored programs with instruction guidance, APG and memory stack recording of data points.

SIZE MATTERS

At just over 6lbs (3kg) the ExLRT is 30lbs lighter than the legacy LRT models. It's significantly smaller too, minimising the health and safety risk common to LRT users. Designed to meet the latest ergonomic design standards, it is suitable for single operator use.

DESIGNED FOR MROs, ALSO SUITABLE FOR OEMs

The ExLRT has been designed for factory floor and field applications. This is a tough tool full of features to make testing easier and therefore quicker. Wearable, lightweight harness and belt clip options keep hands free for testing rather than carrying. The simple to use interface is enhanced with a large backlit screen for easier distance reading, even in sunlight. Push button controls and scrolling mean minimum clicks are required from the operator. LED indicators on the unit, probes and clamps mean the tool can be used flexibly no matter the testing environment.



Actual size: 200mm / 7.87in

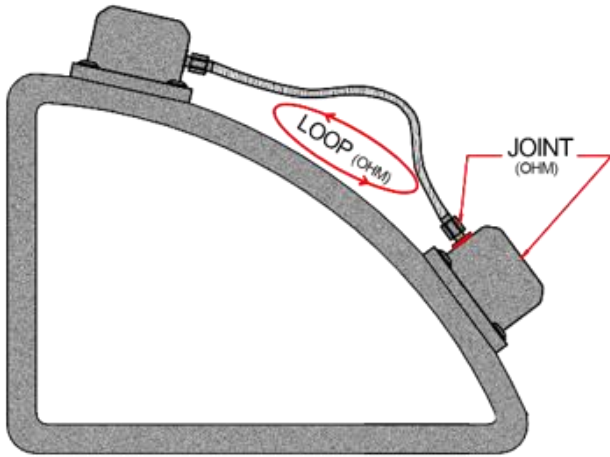


WHAT IS RESISTANCE TESTING?

The electrical bonding on an aircraft protects the aircraft and passengers by limiting the effects of lightning strikes, stray currents, HIRF and EMC. The integrity of bonding circuits is critical to ensure they perform reliably to ensure normal and safe operation of the aircraft control and communication systems.

LOOP AND JOINT TESTS EXPLAINED

A “loop” is a complex structure comprising of series and parallel resistive elements. However, it’s the joint connections within this complex structure that is ultimately tested, as it’s the resistance between these elements which is critical in determining the total loop resistance. In other words, if any joint within the loop fails, it can cause the loop test to fail as well. The ExLRT’s loop test makes use of a specially designed test method which uses clamps to inject and detect current flowing through the loop. For joint testing, while the ExLRT loop clamps are injecting a known current through the ground loop, joint probes are used to measure the volt drop across specific joints. The volt drop is then phase corrected, and the joint resistance reported.



WHAT DOES ‘INTRINSICALLY SAFE’ MEAN?

Intrinsically Safe describes equipment which is incapable of releasing sufficient electrical or thermal energy under normal or abnormal conditions which may cause ignition of a specific hazardous atmospheric mixture in its most easily ignited concentration.

The Boeing Company specify the use of Intrinsically Safe equipment within the fuel vapour zones around airplanes and on fuelled aircraft. All equipment must be suitably certified for use within these zones to avoid the risk of spark ignition and the potential for catastrophic damage to personnel and property.

The ExLRT is specifically certified for safe use in the Division 1 Class 1 (Zone 0) fueled environment and is therefore suitable for use on fuelled aircraft in accordance with Boeing’s requirements.

Figure 2: Hazardous locations: open fuel tanks — before the airplane is purged and unfueled

Only explosion-proof equipment can be used within these flammability zones, which extend to a 50-foot (15-meter) radius around the airplane.

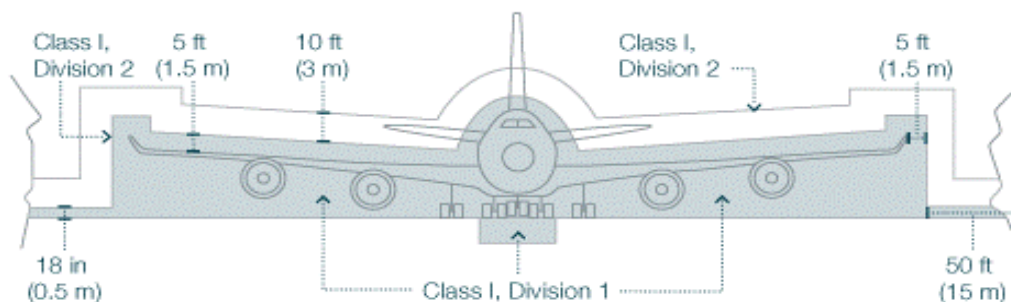


Figure taken from ‘Flammability zones around an airplane with open fuel tanks’ from The Boeing Company

HOW DOES THE ExLRT COMPARE TO THE LEGACY LRT?

FEATURES	ExLRT	LRT
Classification	✓ Division 1 (Explosive atmosphere continuously present)	✗ Division 2 (Explosive atmosphere is unlikely to occur but if it does, will exist only for a short period)
Operators	✓ Single	✗ 2 operators required
Calibration	✓ Can be carried out by user in around 30 minutes when using the calibration kit (available separately). Alternatively, the typical turnaround for systems returned to base is just 72 hours.	✗ Return to base – typical turnaround is 2 months
Weight	✓ 3kg / 6.6lbs	✗ 17kg / 37.5lbs
Batteries	✓ Replaceable batteries with external battery charger, ensuring the system is always available for use.	✗ Low battery power affects accuracy of results. Tool can't be used whilst battery is charging.
Typical leadtime	✓ Available from stock (after December 2019)	✗ 16-20 weeks
Connectivity	✓ USB for direct connection to a PC	✗ No connectivity

WHAT'S IN THE BOX?

STANDARD TOOLKIT (PART NUMBER XLR-9703-01)

- ✓ ExLRT loop and joint tester with Bluetooth*
- ✓ 1 set of MK52 (52mm internal diameter) loop test couplers
- ✓ 1 set of joint test probes
- ✓ Power kit - 1 x battery, 1 x charger, 1 x PSU with USA mains lead (suitable for 110V and 230V mains)
- ✓ Custom formed equipment carry case

OPTIONAL ACCESSORIES

- ✓ Additional battery
- ✓ Additional battery charger
- ✓ Additional PSU
- ✓ Regional mains power lead
- ✓ Wearables - harness and belt clip
- ✓ Loop adjustment jumper kit – 1 x 12ft cable, 1 x 42ft cable (PART NUMBER XLR-9801-01)
- ✓ Calibration kit, enables user to calibrate the ExLRT

WARRANTY AND SUPPORT

- ✓ 12 month comprehensive warranty
- ✓ Global repair and calibration service
- ✓ Local spares holding and service level agreements

*Bluetooth included as standard - can be enabled / disabled via software configuration. Also available without Bluetooth.



Joint test probes

SPECIFICATION

MAIN FEATURES

- ✓ Tough polypropylene enclosure, rated to IP54
- ✓ Custom LCD design for easy reading
- ✓ Batteries designed for quick change in safe zone
- ✓ Internal trickle charge or external rapid charge
- ✓ Lightweight and portable
- ✓ Carrying handle and optional harness
- ✓ Intuitive user interface for ease of use
- ✓ On-screen instructions
- ✓ Auto and manual modes
- ✓ USB port
- ✓ Active clamps and probes
- ✓ Pass/fail status indication on probes and clamps
- ✓ Part of MK family of Bond and Loop test equipment

SOFTWARE

- ✓ System includes MK Test ExLRT Test Management software
- ✓ Software includes automatic test flow import and export toolset
- ✓ Enables import of customers test requirement, and auto capture and upload of results.

SIZE

Weight 3kg / 6.6lbs (ExLRT only)
Length x width x depth 150mm x 200mm x 300mm

LOOP TEST MEASUREMENT

Mode	Range 1	Range 2	Range 3
Frequency	1 Arms (constant current) 200Hz	0.004 Vrms (constant voltage) 200Hz	0.004 Vrms (constant voltage) 200Hz
Resistance range	0.5mΩ to 4mΩ	>4mΩ to 40mΩ	>40mΩ to 4000mΩ
Resistance resolution	0.01mΩ	0.01mΩ	0.01mΩ
Resistance accuracy	±(2% of reading + 0.4mΩ)	±(2% of reading + 0.4mΩ)	±(5% of reading + 0.4mΩ)

JOINT TEST MEASUREMENT

Mode	Range 1	Range 2	Range 3
Frequency	1 Arms (constant current) 200Hz	0.004 Vrms (constant voltage) 200Hz	0.004 Vrms (constant voltage) 200Hz
Applied loop resistance range	0.5mΩ to 4mΩ	>4mΩ to 40mΩ	>40mΩ to 4000mΩ
Joint resistance range	0.05mΩ to 4mΩ	0.05mΩ* (@0.5mΩ loop) to 40mΩ	0.05mΩ* (@40mΩ loop) to 4000mΩ
Joint low calculation	0.05mΩ	1.25% of loop	1.25% of loop
Resistance resolution	0.01mΩ	0.01mΩ	0.01mΩ
Resistance accuracy	±(5% of reading + 0.025mΩ + 0.25% of loop reading)	±(5% of reading + 0.025mΩ + 0.25% of loop reading)	±(5% of reading + 0.025mΩ + 0.25% of loop reading)

* To determine lowest measurable joint resistance for a given loop use: Joint(low)=Loop resistance x percentage shown.


LOW JOINT INDICATION


Mode	Autoranging (max 1Arms)	Joint resistance range	Up to 0.05mΩ
Frequency	200Hz	Resistance resolution	n/a
Applied loop resistance range	0.5mΩ to 40mΩ	Resistance accuracy	System reports "<0.05mΩ"

SUPPORT AND FURTHER INFORMATION

MK Test System solutions combine powerful and flexible capability with a global sales and support network to provide our customers with the most complete solution available in the testing industry.



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