

Application Report | Electric Vehicle Market

All-in-one portable leak test system for EV batteries and cooling circuits

Flexible. Portable. Powerful. The LTC-EV provides production-grade leak testing in the workshop or field environment for large volume assemblies. An all-in-one solution with everything you need in one case, the LTC-EV features an independent pressure / vacuum generator and, with the optional use of a standard 18V battery, you don't even require external power.

The integrated LTC-802 Leak Test Computer technology provides the same reliability, user-friendly experience and touchscreen, flexibility and variety of test parameters used in production testing. Designed for large volume parts, the LTC-EV over-pressure or vacuum generation is capable of filling a 100 l volume up to 100 mbar in less than 100 sec. The lightweight case makes it easy for you to bring leak testing to where you need it.

Accurate leak testing, made to travel

- ✓ Detect very fine leaks like 0.01 Pa
- ✓ No external air or vacuum required
- ✓ Robust, lightweight case
- ✓ Most flexibility in a portable leak tester for large part testing

Common types of applications:

- Battery housing
- Coolant circuits
- Inverter housing



Test methods for electric batteries and cooling circuit with LTC-EV

The 100% final test of battery systems and their cooling circuits is usually performed as a pressure differential test with vacuum or compressed air from - 900 mbar to 4 bar rel. and in rare cases up to 6 bar rel.

These tests are carried out during production, but also at regular intervals at service stations.



The typical test method is the Pressure differential method:

TEST PROCESS CONNECTION TO THE TEST ITEM

1. The water circuit of the cooling circuit or the electric plug of the battery system is connected to the test port of the leak test computer LTC-EV. The manual or pneumatically controlled quick connector of the KA or KI-S series is used for this purpose.



innomatec connec® quick connector

STARTING THE TEST

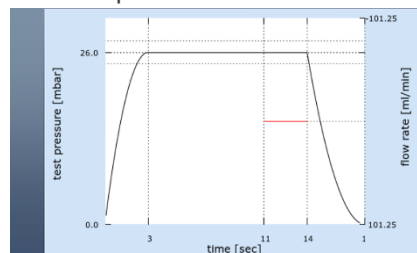
2. As soon as the operator has manually closed all openings with an innomatec quick connector system, he presses the start button on the test instrument & activates the test system. First, a storage volume is filled via the integrated pressure generation and then the leak test is started.

VACUUM OR PRESSURISATION OF THE BATTERY SYSTEM

3. The LTC-EV fills the battery system with the predefined test pressure for the set filling time. The pressure is monitored by the pressure transducer of the tester and compared with min/max limits. In this way, a gross leak is detected immediately.

STABILISATION: REDUCTION OF THE NATURAL PRESSURE DROP:

4. After the preset filling time has elapsed, the shut-off valve inside the unit closes, trapping the pressure in the test item for a stabilization time set by the operator. This time serves to minimize the natural pressure loss of even dense parts due to expansion or creeping, adiabatic heat effect and possibly absorption. Once the compressed air has settled, the measurement can take place.



Measurement Process

TEST: DETECTION OF FINE LEAKS

5. After the stabilization time, the pressure transducer is tared, the resulting pressure drop during the set test time is recorded and compared to the set min/max pressure limits to determine if fine leaks are present.

VENTILATION

6. At the end of the test, the pressure trapped in the test item is vented to the atmosphere. Our test systems are capable of holding the pressure on good parts at the end of the test cycle. In this case, after checking the dimensions, the operator can start the deflation simply by pressing the start/reset button.

TEST RESULT DATA

7. After the venting process is complete, the test result data is displayed on the LTC-EV. Clearly visible indicators on the display and the front panel make it clear to the operator which test items have passed or failed the test, so that he can disconnect the test item from the LTC-EV leak test computer and continue processing the test items.

Typical test parameters

Housing:

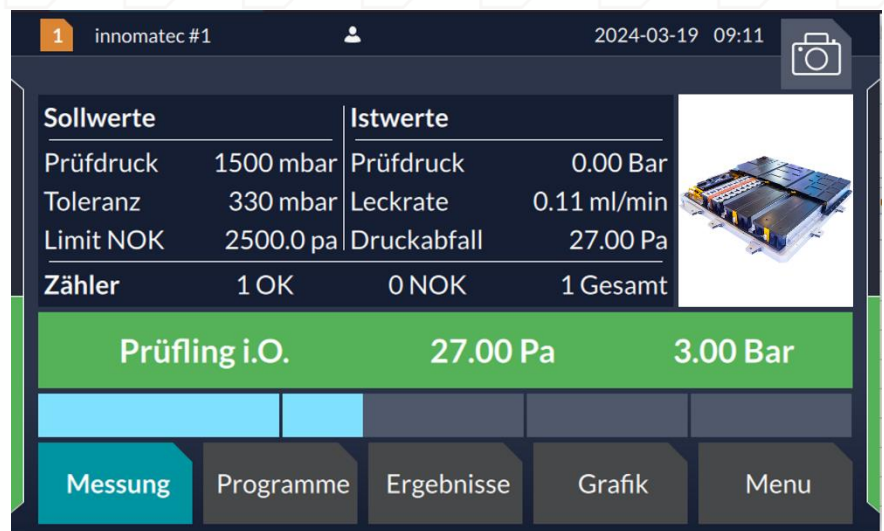
Test pressure: -200 - 200 mbar rel.
Leakage rate: 3 - 120 ml/min
Test volume: 2 - 140 l

Cooling:

Test pressure: 1,5 – 6 bar rel.
Leakage rate: 0,4 - 16 ml/min
Test volume: 0,1 - 25 l

Parameters are mainly depending on sensitivity, medium inside the test part, field results and simulations.

Normally provided by OEM



Operator Interface of a Leak Test Computer LTC-EV | Touch-Display

LTC-EV Highlights

- Can detect very fine leaks like 0.1 Pa
- Test range: 0,9 bar vacuum to 6 bar over pressure
- 100 different test programmes with integrated programme change history log
- Intuitive touch screen panel to set and monitor test activities while testing, like programs, parameters, pressure stability, leak values, errors, notifications, etc.
- 1.000.000 test result data storage capacity and extraction by USB
- Individual parameter setup by operator log-in protection
- Self-generation of vacuum and overpressure with integrated pump. Only power supply by cord or battery-system needed
- Comes with a moisture separator filter, which avoids entering test part moisture into the device
- Lightweight and ready to fly
- Super robust housing for workshop environment, as well as rough field applications
- Standards programmes for device validation with plug-in test leak
- Calibration, validation, and service auto-reminder pop-up
- Optional traceability by 2D-Code scanner or serial number entry
- 100-240 VAC 50/60 Hz (Compatible Worldwide) Optional with rechargeable battery system



Independent, All-in-One System



Robust Housing

The LTC-EV was designed to fit our customer needs in workshop and field applications. For industrial production facilities we do offer solutions like our LTC-802, which can be customized towards the needs of any end of line test.

Try to find a leak spot? – Use our MHLS leak detection system!

Dimensions	
Dimensions	425 x 335 x 175 mm
Weight	~ 8,65 kg - Workshop environment robust housing design
Supply	
Input voltage	100-240 VAC 50/60 Hz (Compatible Worldwide)
Energy consumption	80 W max.
Power plug	Country-specific power cable
Environmental conditions	
Operation	2 to 40 °C
Shipment and storage	-10 to 60 °C
IP protection class	IP 65 (housing closed); IP 54 (operating)
Humidity	20 to 80 % non-condensing
Normen and certification	EN 61010-1; UL 201 Garage-Equipment Protection class I
Measurement characteristics	
Pressure range	- 900 to 6.000 mbar rel.
Filling pressure accuracy	± 2 % of pressure range or 2 digits
Resolution of test pressure	1 Pa
Filling time (low pressure)	100 Liter in 100 s to 100 mbar rel.
Filling time (high pressure)	5 Liter in 2 min to 2 bar rel.
Differential pressure resolution	0,1 Pa
Interfaces	
HMI	7" Color touch display for finger & glove usage (800x480 px, 300 Lumen)
USB	USB 2.0 & 3.0 compatible
Ethernet	Maintenance port
Programs	100 individual programs, change log & user administration
Result storage	1.000.000 (loop storage system)
Connection to product	Ø 6 mm Quick coupling
Options	
3 or 6 m measurement hose, Test leak, External venting valve, vacuum filter, Scanner (printed label), USB printer (with standard label), 18V battery system (CAS, AMPShare, Power for all, Einhell, etc.)	

Preliminary data sheet. Products and specifications subject to change without notice.

Contact us, to discuss your application

For more information on our industry-leading leak testing solutions for high-volume applications such as EV vehicle battery systems, fuel tanks, transmissions, and other Leak Test Computer requirements, contact us anytime or request a quote today.



Innomatec Mess- und Schnellanschluss-Systeme GmbH

Am Wörtzgarten 12-14 | 65510 Idstein | Deutschland
 Telefon: +49 (0) 6126 9420 | info@innomatec.de
 www.innomatec.de