



ELT Vmax Battery Leak Detector

Inline leak testing for
series production of
metal-ion batteries



 INFICON

Battery leak test processes at top speed

The highly dynamic global battery market continues to grow at a remarkable pace. In order for battery manufacturers to keep up with developments, they must systematically make their production processes more efficient. Faster and more cost-effective battery leak test processes must also be implemented.

The ELT Vmax speeds up leak testing in battery mass production. Offering unrivaled reliability, this leak detector enables high throughput levels on fully automated production lines with extremely short measuring times. In addition to meeting the highest standards in quality assurance, it is also very easy to integrate while saving a great deal of space. Speed up your leak testing today to gain the competitive edge.



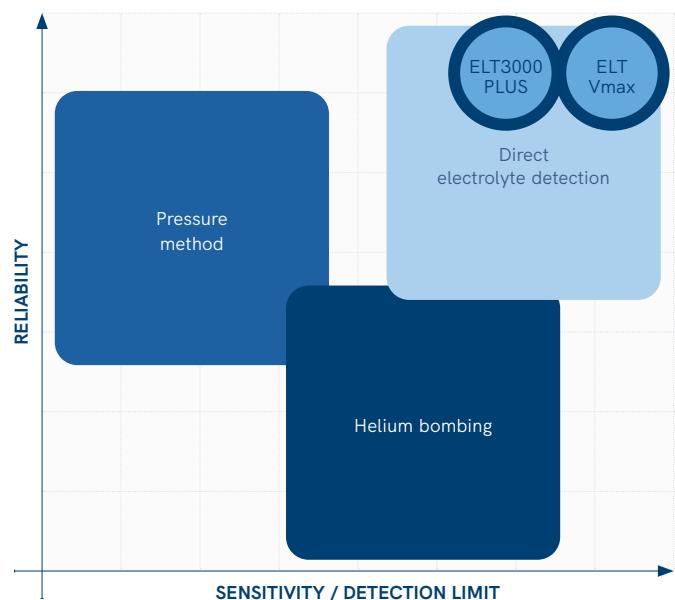
Maximum precision

The ELT Vmax makes use of the direct electrolyte measuring procedure developed and patented by INFICON. As a result, it enables particularly fast and efficient leak testing during the fully automated production. The direct electrolyte leak testing method powers reliable testing of metal-ion batteries such as lithium-ion, sodium-ion, and aluminum-ion batteries in all cell formats, semi-solid state batteries as well as complete battery modules. Everything from drive batteries in the automotive industry to power packs used in communications technology, consumer goods, electric tools, and medical devices.

ELT Vmax can detect electrolyte leaks down to the micrometer level, 1,000 times smaller than those detected by conventional pressure methods.

Maximum reliability

INFICON is setting new standards with its patented direct electrolyte leak detection procedure for the fully automated battery production. The procedure promptly detects even the smallest leaks right after filling and sealing the metal-ion cells, thus preventing unnecessary costs and risks due to leaks resulting from formation of faulty cells.



Once the batteries have been formed and aged, leak testing allows faulty cells to be rejected before further processing. After welding the battery cells to form modules or power packs, leak testing is performed again.

This continuous monitoring ensures that all of the manufactured products are flawless.



Inline leak testing keeps pace with battery cell production

When it comes to flexibility and cost savings, the ELT Vmax takes quality assurance of your fully automated battery mass production to the next level.

For system integrators and for in-house equipment construction flexibly tailored to customer requirements, the compact modular design of the ELT Vmax offers maximum freedom – not only when integrating into high-speed production lines, but also when choosing the test gas and the optimum vacuum system. By combining intelligent process control and a powerful mass spectrometer system, the ELT Vmax opens the door to even shorter cycle times and therefore even faster measurement.

Maximum flexibility

Space-saving, sleek, and easy to integrate: the measuring unit of the ELT Vmax focuses on the essentials and is optimized for use on fully automated production lines. Multi-chamber connection and the combination with powerful external pumps provide the perfect foundation for high throughput.

BENEFITS

✓ High-speed throughput

Particularly short measuring times via the combination of intelligent process control and a powerful sensor. Further positives include the best possible vacuum system design comprising external pumps and larger chambers, optimized batch sizes, and carrier gas inlet for minimal response times.

✓ Always ready for operation

Integrated detection of gross leaks protects the device from severe contamination and maintains operational readiness.

✓ Fully automated calibration

E-Check Connection Kit links the test leak to the vacuum chambers for constant and fast availability without manual intervention.

✓ Easy integration

Compact, space-saving design for hassle-free integration into high-speed production lines.

✓ Universally capable

Testing of all cell formats, from battery cells filled with liquid electrolyte, semi-solid state battery cells as well as battery modules and power packs.



OUR OPTIONAL ACCESSORIES FOR ADDITIONAL FUNCTIONALITY:

The ELT Vmax combines high performance with compact dimensions, enabling reliable and fast battery test processes on automated production lines. Boost your efficiency still further with our modular and compatible add-ons such as the CP7 control unit and the truly unique E-Check Connection Kit.



Maximum calibration

The E-Check Connection Kit is specially designed to provide fast function testing and inline calibration (without manual intervention) for automated processes in series production. An extra benefit is that refilling and recertification can be performed by INFICON, helping you save on labor, time, and costs.



Maximum control

In the event of a fault, the CP7 control unit supports efficient troubleshooting and ensures that the test system is quickly ready for further use.



Maximum connectivity

Even without a display, all process data can be accessed via the modern fieldbus interfaces.

Get the competitive edge

Faster. More reliable. More cost-effective. INFICON is at your side throughout the entire test process.

We help operators and system integrators realize the full potential of the ELT Vmax, supporting their efforts to optimize the inline leak test process within their battery cell production - whether for cell or module / power pack cell testing. As part of the professional operator consulting we provide for all aspects of use of the ELT Vmax, we work with you to develop concepts for the best possible integration of the leak detector into your systems - thereby ensuring maximum production speed.

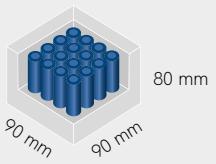
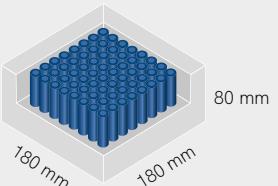
Maximum support

Would you like to learn more about how to use the ELT Vmax and direct electrolyte leak testing in fully automated serial production processes? Get ready to benefit from our years of knowledge and share ideas with our experts. From on-demand

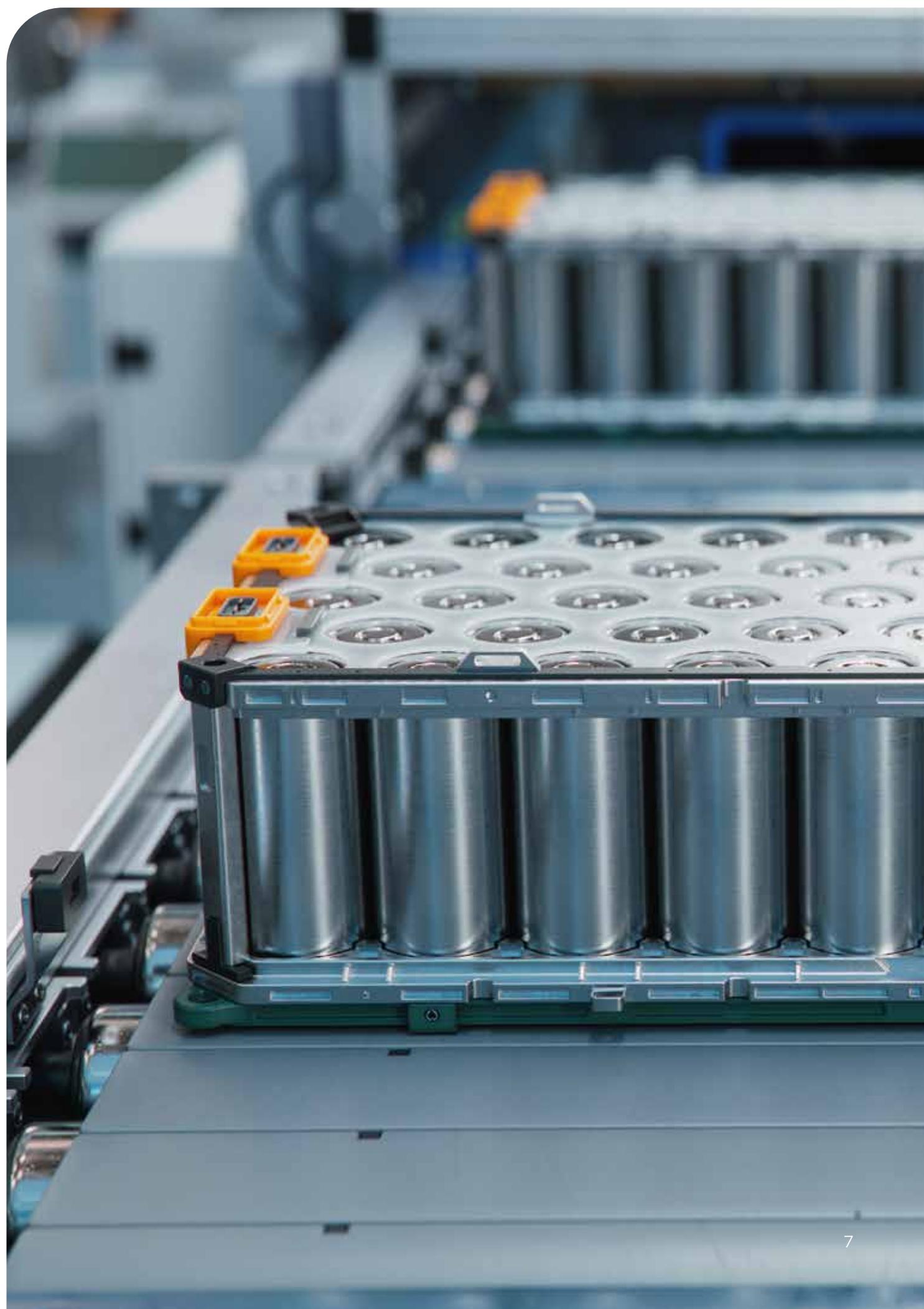
webinars to tailored training courses and product demonstrations, we provide support across the board and look forward to hearing from you.

Maximum efficiency

We tailor our service to meet your needs. For example, our expert team can provide advice during the design of your test system and test process to achieve reliable leak testing at high throughput levels. By taking into account the individual requirements of your automated production line, our experts give a cost-effective and time-saving boost to your battery leak test processes.

	Cycle time [s]	Batch size of 16 cells	Batch size of 64 cells
Example layout			
Stand-alone ELT3000 PLUS	47	3 s/cell 20 cells/minute	0.7 s/cell 85 cells/minute
ELT Vmax – one-chamber	20	1.25 s/cell 48 cells/minute	0.31 s/cell 192 cells/minute
ELT Vmax – multi-chamber	6	0.4 s/cell 160 cells/minute	0.1 s/cell 640 cells/minute

Example batch testing procedure for type 21700 round cells with DMC as solvent.



ELT VMAX BATTERY LEAK DETECTOR

TECHNICAL DATA

Smallest detectable leak rate	5×10^{-8} mbar l/s (helium-equivalent leak rate)
Leak rate unit	mbar l/s, atm cc/s, Pa m ³ /s
Detection sensor	Quadrupole mass spectrometer (2 cathodes)
Interfaces	PROFIBUS, PROFINET, DeviceNet, EtherNet/IP, serial interfaces (RS232), digital I/Os
Dimensions (W x H x D)	482.6 x 233.4 x 497.5 mm (19 x 9.2 x 19.6")
Operating languages	German, English, Spanish, Korean, Chinese, Japanese

ORDERING INFORMATION

PRODUCT	CATALOG NUMBER
ELT Vmax	600-301
Calibration leak E-Check (DMC)	600-105
ACCESSORIES	
E-Check Connection Kit (E-Check not included in scope of supply)	600-106
CP7 control unit	600-310
Carrier gas capillary 10 sccm	600-107
Module I/O1000	560-310
Data cable I/O1000	
2 m	560-332
5 m	560-335
10 m	560-340
Bus module BM1000	
PROFIBUS	560-315
PROFINET	560-316
DeviceNet	560-317
EtherNet/IP	560-318



ALSO IN OUR PRODUCT PORTFOLIO:

The ELT3000 PLUS is a complete ready-to-go solution for battery leak testing. It is perfect for development teams, research projects, and pilot lines with smaller production quantities. Scan the QR code for further information.

