

Technical Datasheet



Product Description:

The AWARE – Rack Level product is a low-power and compact device that monitors lithium ion batteries for increased safety. The monitor is integrated into lithium ion battery racks and provides a localized signal that indicates not only when a lithium ion battery cell has experienced an off-gassing event, but also precisely where it has occurred as well.

Our products provide value through gas sensing that is acutely sensitive to battery electrolyte solvent vapors. This sensing ability is paired with proprietary algorithms creates a product that can detect a single cell failure without electrical interrogation of cells or mechanical contact at the earliest possible indication – sometimes ahead of battery management systems and well ahead of thermal runaway.

The utilization of the Li-ion Tamer AWARE creates a completely independent perspective of battery health that can be used to provide an extra layer of safety for your lithium ion battery systems.

Key Features:

- Compatible with all lithium ion battery form factors and chemistries
- Parts-per-million level detection threshold
- Calibration-free product
- Distributed sensing network provides localized gas detection
- Provides early warning of lithium ion battery failures
- Long product lifetime
- Fast response time to off-gassing events
- Highly reliable output signal
- Low power consumption
- Several mounting options
- Unobtrusive sensor with easy installation
- Independent and redundant perspective on battery health

Physical description:

The AWARE consists of several subsystems, the off-gas monitors which are the detection points for off-gas events and the controller, which aggregates all of the monitor's signals and contains the algorithm logic. A standard wire length for the different cables is also provided. These cables connect the monitors to the controller, provide power to the controller, and there is also a signal cable included which supplies the output signals from the AWARE.

Physical specifications

Part	Dimensions
Controller	107 (W) x 107 (L) x 33 (H) [mm]
Sensor	Ø 28.6 x 25.4 [mm]
Monitor cable (front)	5150 [mm]
Monitor cable (back)	2400 [mm]
Power cable	1200 [mm]
Signal cable	1200 [mm]

Environmental description:

The AWARE product is intended to be integrated into spaces with lithium ion batteries and, therefore, has very similar specifications to that of a standard lithium ion battery system.

Environmental specifications

Condition	Specification
Temperature	-10 to +80°C
Humidity	5 to 95% RH
Max temperature change	8.6°C/min

Electrical description:

The AWARE product provides signals specific to the battery rack where it is installed. With this localized signal, you will be able to know specifically which rack is off-gassing and take action accordingly. Output signals for the OK state range from 5 – 24 VDC and can be adjusted based on customer's needs.

*AC/DC power supplies can be provided

Electrical specifications

Detail	Specification
Controller power input	4.75 - 5.5 VDC*
Power consumption	0.95 W - 1.95 W per rack
Output signal type	Sinking transistor
Output signal (OK)	5 - 24 VDC
Output signal (alarm)	0.6 VDC

Gas detection description:

The AWARE is equipped with a sensing element that is acutely sensitive to lithium ion battery electrolyte solvent vapors. This acute sensitivity is how this product is able to provide indication of a single cell battery failure without electrical or mechanical contact of battery cells.

Gas detection specifications

Detail	Specification
Target gases	Lithium ion battery electrolyte solvent vapors
Min. detection threshold	5 - 100 ppm
Response time	5 seconds
Fault detection	Single cell failure

Product life description:

The associated algorithms provided an extended lifetime product that does not require calibration. The product is intended to have comparable lifetime to lithium ion battery systems.

Product life specifications

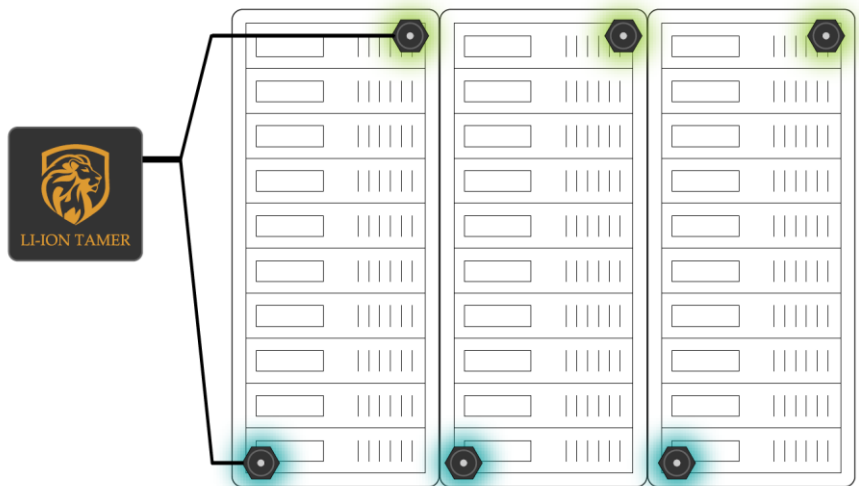
Detail	Specification
Target lifetime	5 - 10 years
Warranty	1 year

Designed for certifications

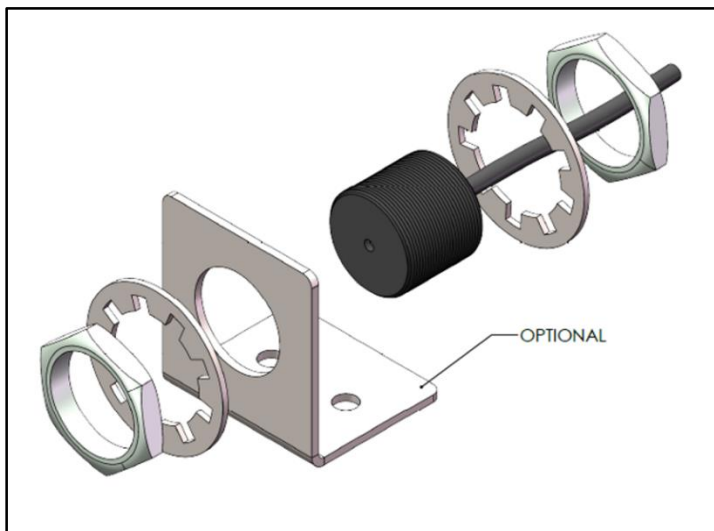
Detail	Certification
Hazardous Location EX classification	Class I B T2
Hazardous Location EX Zone	Division 2 / Zone 2 / Category 3
EMC	IEC 61000-4-2 through IEC 61000-4-6
Shock	MIL-STD-901D
Vibration	MIL-STD-167-1A

System implementation:

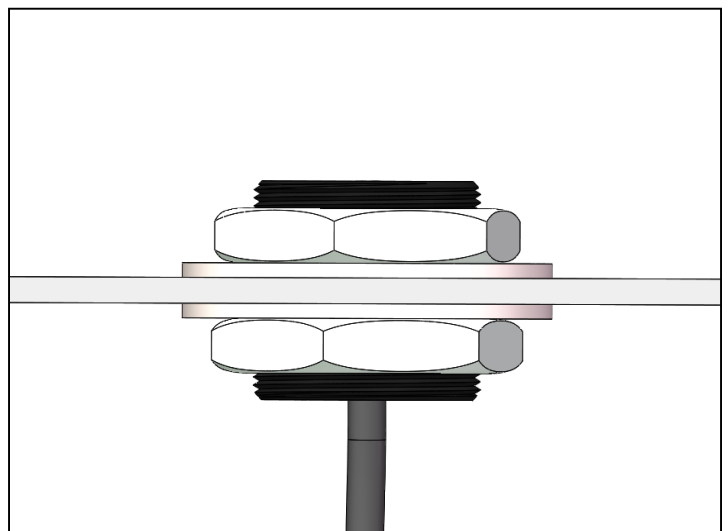
For highly reliable signal outputs the AWARE product is arranged so that two sensors monitor every battery rack. Sensors can be mounted in two ways, shown below, with a through-wall mount option and a bracket accessory option.



Mounting bracket



Through-wall mount



NOTICE: This device detects off-gas from lithium ion batteries. It does not prevent fires or thermal runaway. This device is not a stand alone safety device and should be incorporated into a proper safety system. If device responds, there is a risk of battery fault which could lead to thermal runaway. To avoid injury, leave area immediately.



Controller dimensions
(33 mm depth not shown)



Off-gas monitor dimensions
and thread count

