V-LIM
Portable

Electrical Line Integrity Monitoring Module

INTELLIGENCE INSTALLED

A precise and accurate electrical cable integrity monitor for ungrounded/floating electrical systems.

V-LIM Portable

Long term operation and exposure to harsh environmental conditions causes insulation degradation in cables and other electrical equipment over time.

Powered by the original V-LIM unit enclosed in a rugged enclosure, the V-LIM Portable is intended to provide a line integrity monitoring solution to systems requiring a V-LIM on a non-permanent basis or where it is not possible to integrate the standard V-LIM unit into existing control equipment. The V-LIM Portable has the same capabilities as a standard V-LIM unit, including the ability to run the V-LIFE process upon a purchase of runtime licence.

The V-LIM Portable allows precise and accurate measurements of insulation resistance, capacitance, and other electrical parameters. V-LIM Portable provides not only a detailed view of the system's health over time but also opportunities to prevent problems before they occur. This is achieved through V-LIFE - an exclusive, patented feature for subsea applications that can be activated to increase system insulation resistance (IR), without the need for costly interventions or the risk of introducing new faults, reducing reliance on reactive measures following failures.

The V-LIM Portable employs digital signal processing techniques to facilitate the trending and characterisation of system conditions, providing reliable fault detection across a wide measurement range. It is fully compatible with power transmission systems, communication systems, and combined communication-on-powerline systems. Integration into existing or new infrastructure is straightforward, thanks to the rugged case with interface options suiting a wide range of systems.

The V-LIM Portable features two independently adjustable alarms and relay contacts, which can be set to predefined, user-configurable thresholds. When the insulation resistance falls below these thresholds, the alarms are triggered, and the relays operate.

The V-LIM Portable provides a comprehensive view of system condition as a standalone unit, which can be interrogated via its touch-enabled LCD panel or easily downloaded using its USB-A port.

Additionally, simultaneous measurement of cross-coupled channels is supported through the V-NET Sync protocol. This protocol is specifically designed to mitigate interference between units caused by cross-coupling via inherent mutual capacitance and resistance in systems with multiple channels, where each channel is monitored by an individual V-LIM unit.

The V-LIM Portable's integrated memory allows the storage of timestamped system health and line-characterising parameters. By uploading this data to Viper Innovations' online portal, PlatformVi, users gain access to comprehensive insights, analytics, and personalised recommendations for the monitored system.

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Key Features

- Portable rugged case allows temporary or permanent installation in systems with wide range of form factors

- V-LIFE – Award winning cable rejuvenation technology

- Two separately configurable alarms with associated relay contacts to take desired action

- Timestamped measurement data is logged to internal memory

- Touchscreen LCD and web interface display

- Ethernet, RS485 and 4-20 mA interfaces

- Upload firmware and configuration settings from the front USB-A interface via a memory stick

- Download data log to memory stick

- Compatible with temporary application of external IR test unit without physical disconnection of V-LIM Portable

- Multiple user security levels supported for secure access

- Facility to disconnect the V-LIM Portable from the line monitored

- Cross-coupling immunity provided by V-NET Sync feature, enabling multiple V-LIM units to take accurate simultaneous measurements on adjacent cables by eliminating effects of cross-coupled electrical noise

- Coupler Module connection capability for voltage >1 kV

- Built-in self-test

Product Standards	Industry Standards
BS EN / IEC 61557-1	API 17F
BS EN / IEC 61557-8	ISO 13628-6
BS EN / IEC 61010-1	
BS EN / IEC 61010-2-30	
BS EN / IEC 61326-1	
BS EN / IEC 61326-2-4	

Electrical

Supply Voltage	110 V to 240 V AC 140 V to 335 V DC ± 10% tolerance
Supply Frequency	DC, 50/60 Hz ± 6% tolerance
Power Consumption	5 W typical 14 W maximum
Line Voltage	Up to 1000 V DC / AC 47-410 Hz
Line Capacitance (operating)	Up to 500 µF

Mechanical

Environmental

Operating Temperature Range:	-20 °C to +60 °C (-4 °F to 140 °F)
Storage Temperature Range:	-40 °C to +85 °C (-40 °F to 185 °F)
Relative Humidity:	Up to 85% non-condensing
Pollution Degree:	BS EN 61010-1: Degree 2
Overvoltage Category:	BS EN 61010-1: CAT III
Measurement Category:	BS EN 61010-2-030: CAT III

Packaging
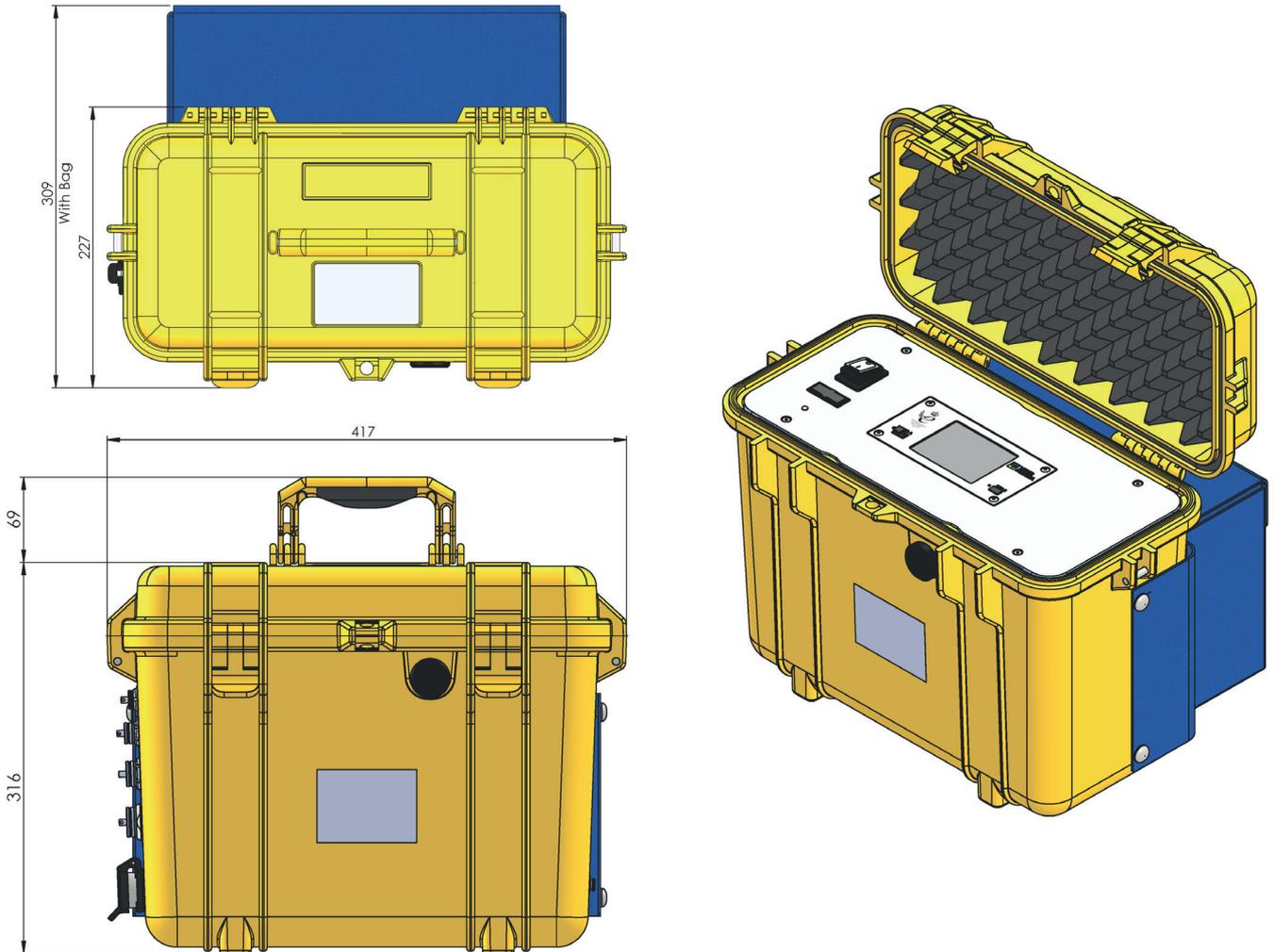
Dimensions:	See diagram below
Weight:	5.1kg
Enclosure IP Rating:	IP54 (with lid shut)

Data storage

Circular FIFO buffer
Typical two year data storage without overwrite @ one reading per minute.

Product Marks

UK CA   CE   [RCM mark]

Notice: Product complies with Part 15 of the FCC rules, subject to the following two conditions: 1. The device may not cause harmful interference. 2. This device must accept any interference received, including interference that may cause undesired operation.
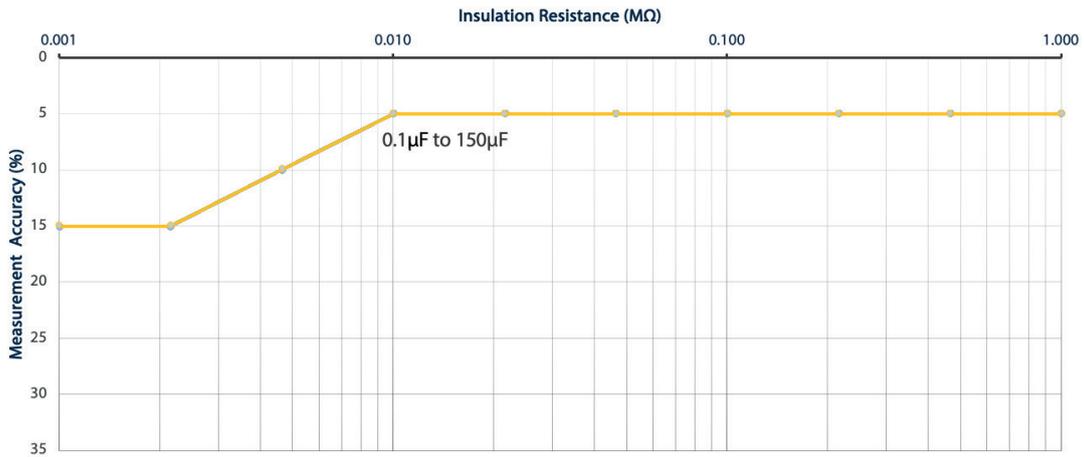
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Dimensions in mm

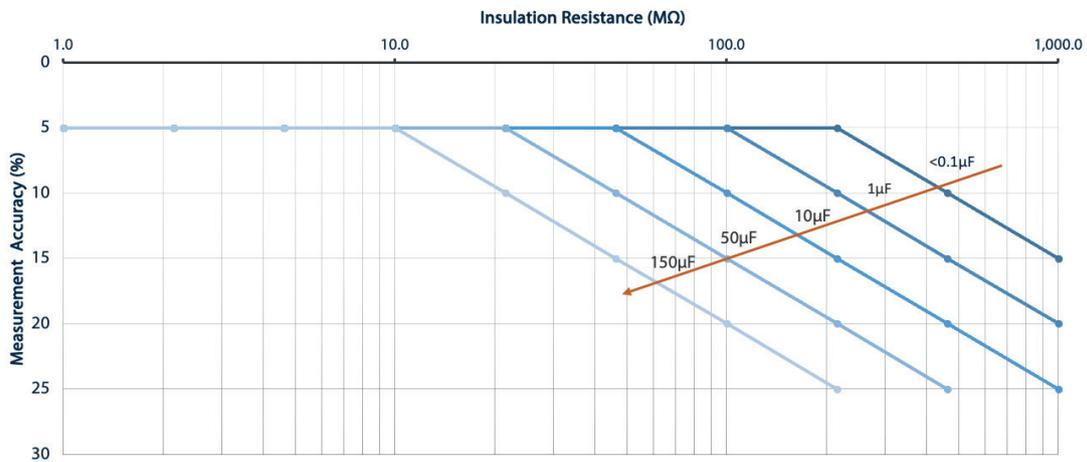# Measurement

Insulation Resistance

1 kΩ to 1 GΩ* @ see graphs below

* The maximum IR changes depending on the measurement profile selected. When V-LIFE is enabled, the IR range is between 10 kΩ and 500 MΩ.

V-LIM Insulation Resistance Accuracy (IR < 1MΩ)

V-LIM Insulation Resistance Accuracy (IR > 1MΩ)

Note: Measurement accuracies are specified in the form ± YY% ± 1 kΩ, where YY is the tolerance expressed as a percentage of measured value from the graph above on the Y axis.

Response Value (Alarms)[1]
1 kΩ to 10 MΩ

Insulation Capacitance
0.1 µF to 150 µF @ ± 25% ± 0.05 µF

Line Voltage (True RMS)
50 to 1000 V AC/DC @ ± 3% ± 5 V

Line Frequency
DC, AC 47 – 410 Hz @ ± 1% ± 0.5 Hz

[1] *Based on BS EN / IEC 61557-8 reference conditions*

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Interfaces

Connection

- Circular push-pull receptacles with keyed alignment
- RJ45 Ethernet

Alarms

- 2 x Single pole volt-free changeover contacts compatible with signals up to 240 V AC, 2 A
- 60 W, 62.5 VA maximum switching power
- User configurable non-failsafe (default) and failsafe modes

Ethernet

- 10/100 Base-TX Auto negotiation
- DHCP / static (configurable) IP addressing
- Modbus TCP/IP, HTTP protocols supported

RS485

- 9600, 19200, 38400, 57600, 115200 bps
- Modbus RTU

USB

- USB 2.0 Type-A data download and configuration update via memory stick
- Mini USB Type-B laptop service port access

Current Loop

Internal 24 V DC input voltage supply.
Multiple configurable Linear IR Ranges:

- 0Ω (4 mA)   - $1 G\Omega$ (20 mA)
- 0Ω (4 mA)   - $500 M\Omega$ (20 mA)
- 0Ω (4 mA)   - $100 M\Omega$ (20 mA)
- 0Ω (4 mA)   - $10 M\Omega$ (20 mA)
- 0Ω (20 mA)   - $10 M\Omega$ (4 mA) Inverted
- 0Ω (4 mA)   - $1 M\Omega$ (20 mA)
- 0Ω (20 mA)   - $1 M\Omega$ (4 mA) Inverted
- 0Ω (4 mA)   - $100 k\Omega$ (20 mA)

Two configurable non-linear IR ranges for Legacy systems.
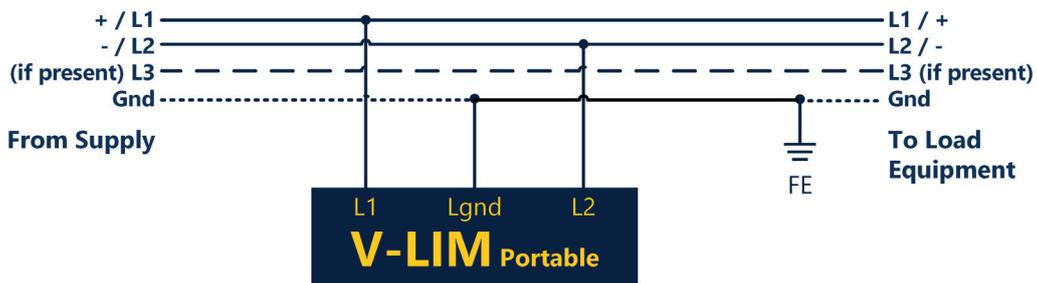
LCD

- 640 x 480 touch screen

Order Codes

- VA-224315-1000/A   V-LIM Portable (V-LIFE capable)

Full list of installation accessories including compatible flying leads and interface modules is available upon request.

Standard Line Connection

Description

The V-LIM Portable is connected to each line conductor (L1 and L2) and associated ground.

Refer to the V-LIM Portable Installation and Operating Manual 5648-134487 for more detailed information.

Measurements available

- Insulation Resistance
- Insulation Capacitance
- Line Voltage
- Line Frequency

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