V-SLIM
Canister Variant
TECHNICAL DATA SHEET

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SUBSEA LINE INTEGRITY MONITOR

V-SLIM®
A VIPER INNOVATION

V-SLIM TECHNICAL DATA SHEET

A PRECISE AND ACCURATE ELECTRICAL CABLE INTEGRITY MONITOR FOR DISTRIBUTED UNGROUNDED/FLOATING ELECTRICAL SYSTEMS

The Problem

Water ingress into subsea electrical cables is the dominant cause of electrical faults in subsea electrical systems. This results in an increase in leakage current, which triggers a low insulation resistance alarm. Continual insulation degradation eventually leads to failure of the circuit. Existing topside-located line insulation monitors only display a single insulation resistance result for the complete subsea system. When the insulation resistance drops, the topside monitor provides no information on the number of faults or their location. Identifying faults often requires a costly subsea fault-finding campaign, which may disrupt production and risks introducing new faults into previously functional connections. Even if the fault can be found and fixed, the entire process must be repeated each time a new fault occurs, providing no long-term added value.

Distribution systems that include subsea-deployed isolation transformer modules pose an additional integrity management challenge. In these systems, a topside-located line insulation monitor can only monitor up to the primary winding of the transformer, effectively covering the main umbilical only. Integrity monitoring of the electrical distribution equipment attached to the secondary side of the transformer, as is now commonly required by field operators, must be addressed by other means. A topside-located device cannot monitor the integrity of the secondary side of a transformer or utilise V-LIFE to recover low insulation resistance faults in that section.

The Solution

The V-SLIM's unique ability to measure both total system insulation resistance and downstream insulation resistance provides operators with a comprehensive view of the electrical integrity of the distribution system. Installation of the V-SLIM at strategic locations allows for monitoring of degradation of the remote electrical distribution network as well as fault location using analytics.

When deployed as a standalone integrity monitor on the secondary side of an isolation transformer, V-SLIM fills the gap in critical integrity monitoring of the complete electrical system to provide information which cannot be obtained by a topside-located line insulation monitor. For subsea located systems, the V-SLIM can also be V-LIFE enabled allowing low insulation to be recovered even on systems with remote isolation transformers. This is particularly advantageous as infield umbilicals, electrical flying leads and other distribution equipment on the secondary side is difficult to fault find and costly to replace.

Key Features:

- Measurement of total system insulation resistance and insulation resistance downstream of the unit
- **V-LIFE**® - award-winning cable rejuvenation technology
- Built-in measurement of additional parameters including line voltage, current, frequency, and insulation capacitance
- Patented measurement technology allowing wires to be routed directly through the V-SLIM with no need for in-line switches or electronics
- Compatibility with AC or DC systems
- Compatibility with external IR verification testing activities
- Timestamped measurement data is logged to internal memory

Key Benefits:

- Provides information to enable electrical fault location
- Minimises subsea intervention costs
- Mitigation of unplanned production loss
- Industry-standard interface compatible with pressure-balanced oil-filled (PBFO) hoses enabling PBFO electrical harness integration

Alternative Product Variants

- **V-SLIM** Eurocard PCBA

Product Accessories

- Mounting receptacle

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Product Specification

Total Insulation Resistance Measurement Range

1kΩ to 1GΩ

Downstream Insulation Resistance Measurement Range

1kΩ to 1MΩ

Total Insulation Capacitence Measurement Range

0.1µF to 150µF

Downstream Insulation Capacitance Measurement Range

0.1µF to 20µF

Line Frequency Measurement Range

47Hz to 63Hz @1% ±0.5Hz (True Rms)

Line Voltage (True Rms) Measurement

Up to 1000V ± 3% ± 5V

Line Current (True Rms) Measurement

Up to 10A ±1%

Qualifications

API STD 17F, 5th Edition
ISO 13628-6

Overvoltage Category

CAT III
BS EN 61010-1 / IEC 61010-1

EMC

BS EN IEC 61326-1

Temperature Rating (in accordance with API 17F)

Operating:	-5°C to +40°C
Transport:	-18°C to +50°C
Storage:	-18°C to +50°C

Line Rating

1000V
Up to 10A continuous

Standalone Communications

Ethernet:
- 10/100 Base TX Auto-Negotiation
- DHCP / Static (Configurable) IP Addressing
- Modbus TCP/IP, HTTP protocols supported
- Configuration and data reading

Data Storage

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

Product Marks

CE UKCA

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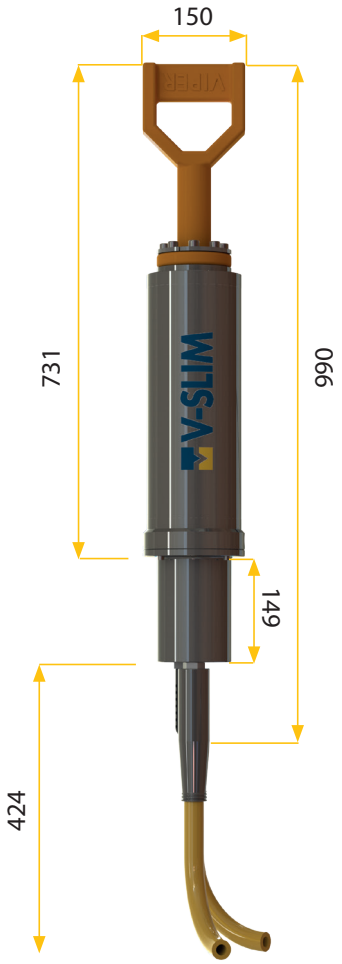
Assembly Dimensions



Power Input

24V DC nominal, 5W(max)
Line powered option available on request

Welding

Electron Beam Welding of Super-Duplex

V-SLIM Weight (Including Handle)

In air:	24.6 kg
Subsea:	19.9 kg

Environmental Data

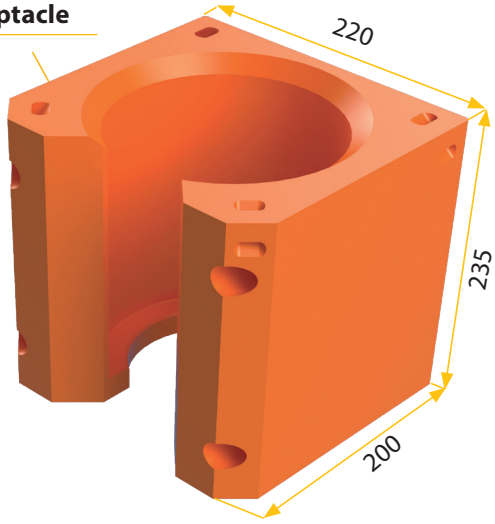
Operating Depth rating: 3000m

Canister Materials

Exposed Metal:
- Super Duplex UNS S32750

Non metals:
- PEEK 450G (Probe Insulator)
- Acetal Co-Polymer (Probe cover)
- Polyurerthane 90 ShoreA (handle)

Mounting Receptacle



Receptacle Weight

In air:	5.9 kg
Subsea:	0.25kg

Receptacle Material

Nylon

Note:
Dimensions in mm
Accessories available on request

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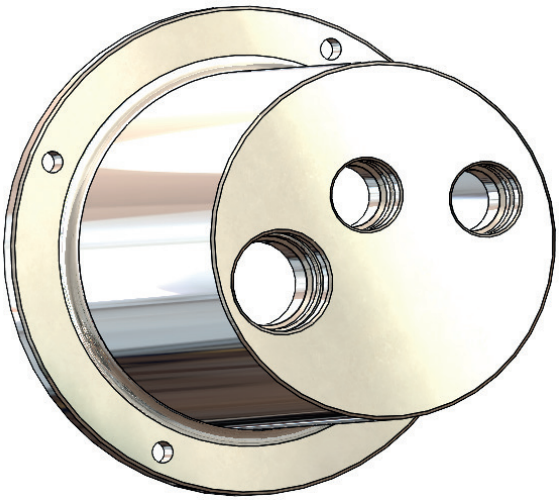
Capping Block Variants

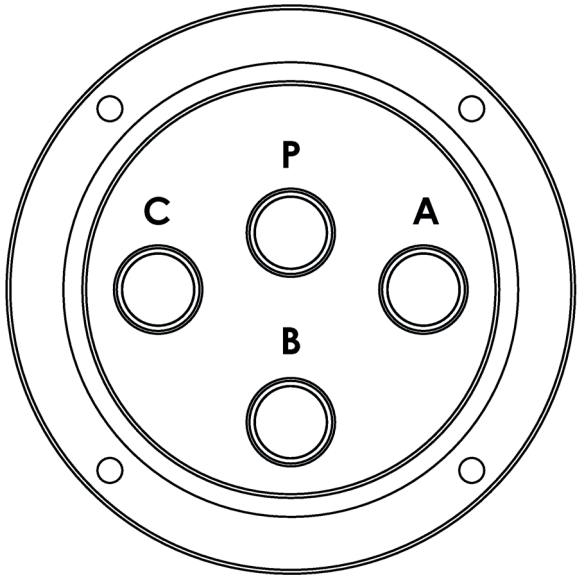


V-SLIM Capping Block

The hose connections to the V-SLIM are made using industry-standard Mk2 interfaces, which can accommodate either M25 or M32 female connection interfaces in the capping block.

Alternative end cap variants are available upon request, as specified below.

	P (Probe)	Hole A	Hole B	Hole C
Option 1 **(Default)**	M25	M25	Blank	M32
Option 2	M25	M25	Blank	M25
Option 3	M25	M25	M25	M32
Option 4	M25	M25	M25	M25



Example end view

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For more information visit:

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