

METERING

ECOMeter VI 125/170

Energy meter for railways application

ECOMeter VI 125/170 are sensors able to measure line current and voltage and calculate the consumed and regenerated active or reactive energy of a traction unit.

The ECOMeter VI125 and VI170 can be used on railway vehicles which operate in AC 25 kV 50 Hz, AC 15 kV 16.7 Hz, DC 3 kV, DC 1.5 kV and DC 750V voltage systems according to EN50163. The line voltage and the line current are measured, and the energy value is calculated in compliance with EN 50463-2.

The device features very high accuracy voltage measurement and high galvanic insulation degree between Low and High Voltage side. The device is characterized by very low energy absorption.



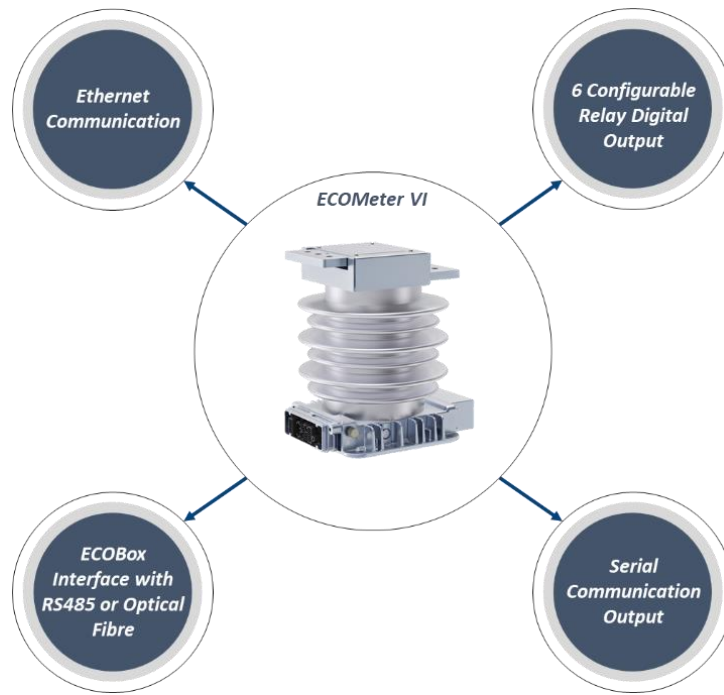
MICROELETTRICA

Characteristics

Voltage and Current Measurement	25 kVac 50 Hz	15 kVac 16 2/3 Hz	3 kVdc	1.5 kVdc	0.750 kVdc	Reference
Nominal Voltage [kV]	25	15	3	1,5	0.750	EN 50163
Min. Voltage – Max. Voltage [kV]	17,5 – 29	11 – 18	2 – 3,9	1 – 1,95	0.5 – 1	
Full Scale Range [kV]	75	50	5	5	1,5	
Max Amplitude of Harmonics [kV]	50	30	-	-	-	EN 50388
Frequency [Hz]	50	16,67	-	-	-	EN 50163
Max. Current without ventilation [A]	3000	3000	3000	3000	3000	
Max. Current with 3 m/s ventilation [A]	4000	4000	4000	4000	4000	
Max. Short circuit current of supply system [kA]	15	40	50	100	-	EN 50388
Accuracy	0,5 R					EN 50463-1

Mechanical Characteristics	Value		Reference
Weight	40,000 kg ± 10%		
Fire and smoke class	HL3		EN45545-2
Protection class	IP 67		EN60529
Electrical Characteristics	ECOMeter VI170	ECOMeter VI125	Reference
Over Voltage Degree	OV4	OV4 / (OV3 for 25kV)	EN 50124-1
Pollution degree	PD4	PD4 / (PD3A for 25kV)	
Insulation Voltage Test	80 kV 50 Hz – 60s	50 kV 50 Hz – 60s	
Rated Pulse Voltage UNI	±170 kV	±125 kV	
Creepage	900 mm	600 mm	
Clearance	310 mm	210 mm	
Material Group	I (CTI≥600)		
Auxiliary Power Supply	Value		Reference
Nominal supply voltage	24÷110 Vdc		
Power consumption	< 12 W		
Rated current (@ 24V and @ 25°C)	0,5 A		
Inrush current (@ 24V and @ 25°C)	5,9 A peak (over rated current for 20 ms)		
Environmental Conditions	Value		Reference
Shocks and vibrations	Cat. 1 – Class B		EN 61373
Ambient temperature	OT4 Range		EN 50155 EN 50125-1
Temperature yearly average	45°C		
Temperature variation	±3°C/s		
Average yearly relative humidity	h<75%		EN 50125-1
Continuous relative humidity	30 days 75% < h < 95%		
Absolute maximum humidity	30 g/m3		
Maximum Operating Wind Speed	30 m/s		EN 50125-1
Absolute Maximum Wind Speed (No damages may occur)	50 m/s		
Maximum rain rate	6 mm/min		EN 50125-1
Snow - Maximum hailstones diameter	15 mm		EN 50125-1
Maximum solar radiation level	1120 W/m²		EN 50125-1
Maximum solar radiation exposure time	8h		
Maximum altitude	AX		EN 50125-1

Inputs/Output



Ethernet Communication

One Ethernet communication port is available and dedicated to the data transfer to the DHS. Ethernet communication can be used also to transmit data to the train communication network and for diagnostic purpose. Mechanisms of protection and security can be applied to ensure both the integrity and the management of data transmitted over the line. Data exchange with TCMS is foreseen according to protocol specification to be defined.

Optical Fibre - High Speed Serial Communication

One optical fibre and one serial “digital sensor” at RS485 communication level are available to interface the ECOBox with the ECOMeter. Optical fibre and digital sensor can be used both together or independently. The maximum cable length allowed in case of RS485 communication is 4m.

Relay Digital Output

The ECOMeter VI provides six relays output to let available the device status and the detected catenary types. The first three relays are NO (normally open) and the second three relays could be NO (normally open) or NC (normally closed).

Specific Application Requirements

Catenary Detection

ECOMeter VI can detect the catenary to which it is connected and provide feedback through the digital outputs and eventually also by Ethernet communication through TRDP protocol.

Overcurrent Detection

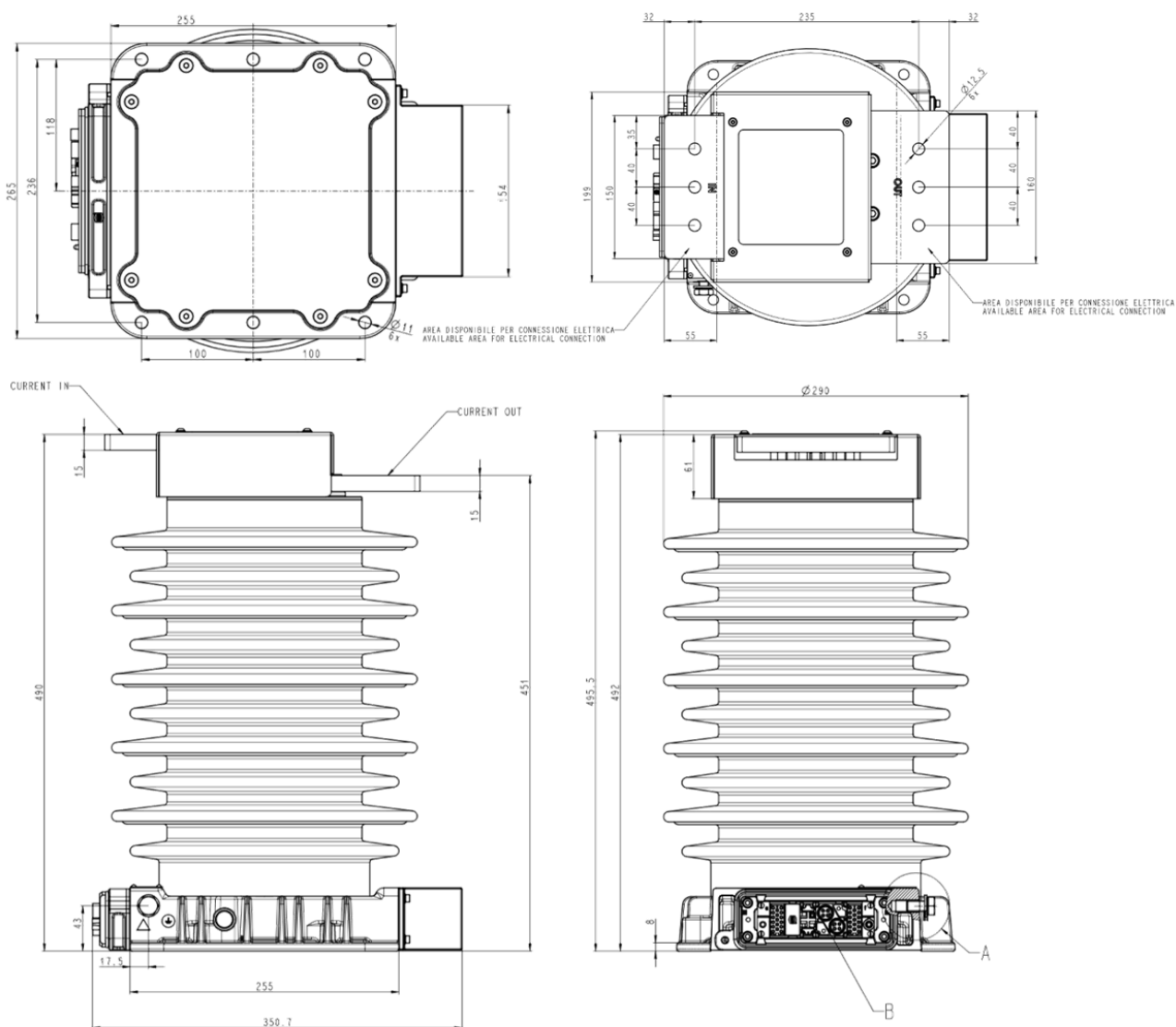
The overcurrent can be detected by the ECOMeter VI with the following options:

- AC/DC Fast Overcurrent Detection – Useful to drive the train VCB in case of short-circuit
- AC/DC Slow Overcurrent Detection – Useful to protect the system against overloads

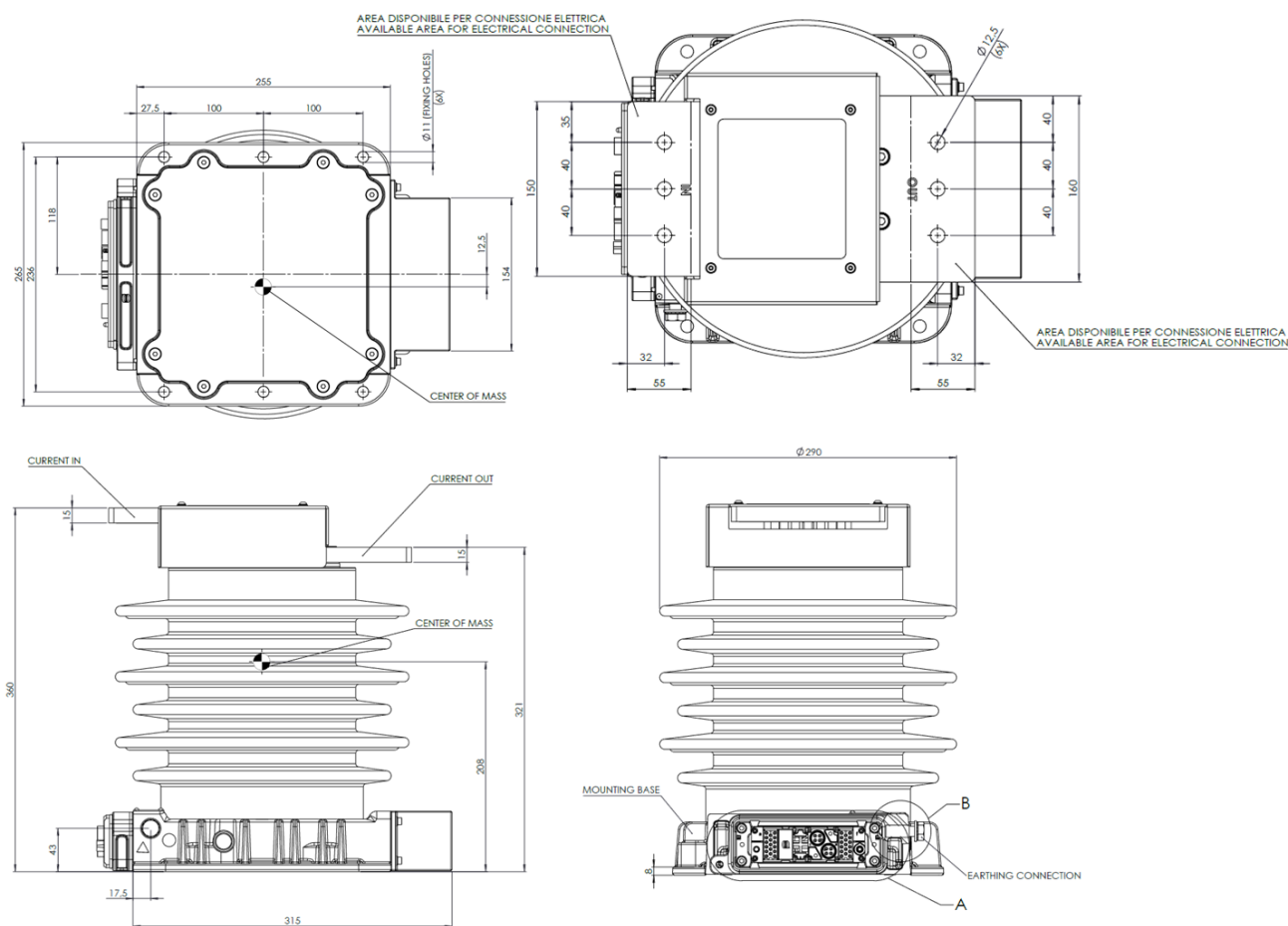
Harmonic Detection

Harmonic detection function is one of the main features of the ECOMeter VI, different software filter can be implemented with order up to 8th to detect the harmonics according to the specific national standards.

Dimension ECOMeter VI170



Dimension ECOMeter VI125



For further technical information on our products visit www.microelettrica.com

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