

VICOTEC450

Visual range measuring device for extractive visibility measurement

Visibility measurement for increased safety in tunnels

- Very reliable operation due to full self-test
- Cost saving and fast commissioning (compact system, no optical alignment on site required)
- Flexible electrical integration due to optional interfaces and I/O modules

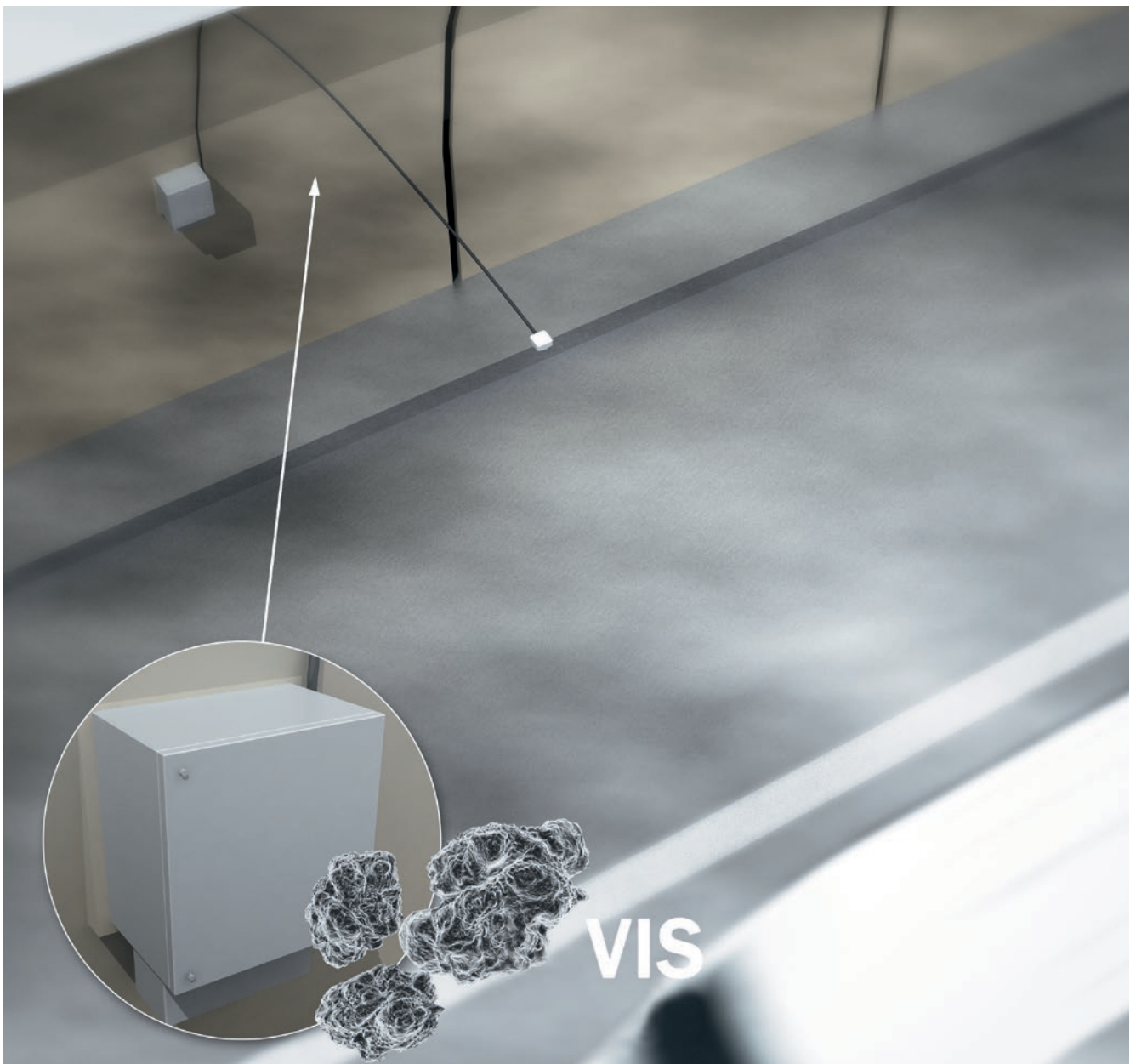


Extractive visibility measurement for increased safety in tunnels

Continuously monitoring the quality of the air in tunnels is an essential factor in ensuring road safety. We provide solutions that detect even the smallest concentrations of particles and measure visibility extremely reliably in foggy conditions. These measured values allow for effective and cost-efficient control of ventilation in tunnels.

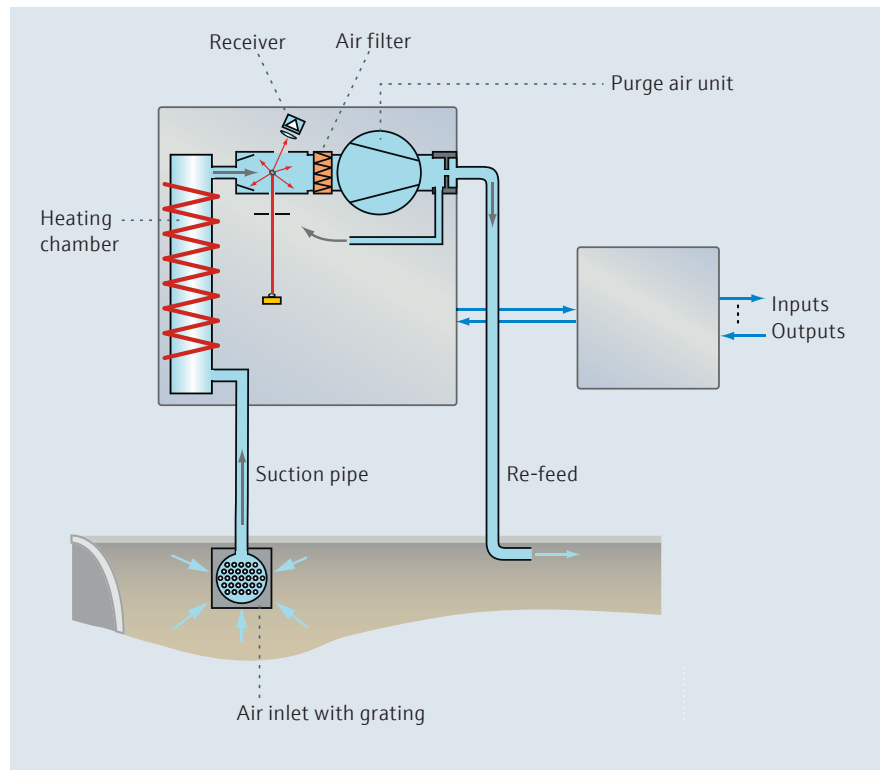
Extractive visibility measurement

The VICOTEC450 visibility measuring devices can be installed away from the driving space, meaning they can even be accessed during operation. The VICOTEC450 is extremely rugged and resistant to external influences, such as fog, contamination, and small animals. The measured values are used to control ventilation in tunnels precisely and reliably.



Principle of operation

The VICOTEC450 sucks air from the driving space in the tunnel, heats it up, and then determines the visibility using a scattered light measurement system, which can reliably detect even the smallest volumes of dust particles.



VICOTEC450:

Extractive visibility measurement for increased safety in tunnels



Product description

The VICOTEC450 provides an optimal solution for visibility measurement if fixtures in the tunnel tube are not permitted or not possible due to lack of space. Fog should not be included in the visibility measurement. The VICOTEC450 draws air from inside the tunnel, heats it above the dew point and determines accurately the visibility by using scattered light technology.

Regularly and automatically it carries out a functional test including the function of the laser and receiver as well as the contamination of the optical surfaces. Maintenance requirements for cleaning and filter exchange are automatically registered and signalled in time by the VICOTEC450 due to contamination check and measurement of the air flow rate (optional).

At a glance

- Functional tests with contamination measurement
- Manual linearity test with filter set possible
- Internal purge air for increased intervals between cleaning
- Maintenance signal (filter and cleaning)
- Logbook function
- Extendable with various interfaces or I/O modules (e.g. PROFIBUS, Ethernet, analog module etc.)

Your benefits

- Very reliable operation due to full self-test
- Cost saving and fast commissioning (compact system, no optical alignment on site required)
- Flexible electrical integration due to optional interfaces and I/O modules

Fields of application

- Visibility monitoring in tunnels for ventilation control
- Smoke detection in tunnels



More Information online

For more information, enter the link or scan the QR code to get direct access to technical data, operating instructions, software, application examples, and much more.

www.endress.com/vicotec450



Detailed technical data

The exact device specifications and performance data of the product may deviate from the information provided here, and depend on the application in which the product is being used and the relevant customer specifications.

VICOTEC450

Measured values	Visibility (K-value)
Measurement principles	Scattered light forward
Spectral range	640 nm ... 660 nm Laser, protection class 2, power < 1 mW
Gas flow rate	30 l/min ... 35 l/min
Measuring ranges	
	K-value 0 ... 15 km ⁻¹ / 0 ... 5,000 km ⁻¹
	Temperature -50 ... +250 °C
	Limit value for smoke detection: 15/km
Response time (t ₉₀)	0 s ... 600 s, freely adjustable; without measuring delay due to suction line
Accuracy	
	Temperature: ± 2 °C
Resolution	
	Visibility (K-value): 0.1 km ⁻¹
Repeatability	
	Visibility (K-value): ± 2 % of measuring range full scale
Ambient temperature	-30 °C ... +55 °C
Storage temperature	-40 °C ... +60 °C
Electrical safety	CE
Enclosure rating	IP 66
Dimensions (W x H x D)	300 mm x 340 mm x 215 mm (for details see dimensional drawings)
Weight	12 kg
Power supply	
	Voltage 90 ... 250 V
	Frequency 50 Hz / 60 Hz
	Power consumption ≤ 35 W
Test functions	Automatic self-test Contamination limits: at 30% warning, at 50% failure Manual linearity check with reference filter
Options	Temperature measurement

MCU control unit

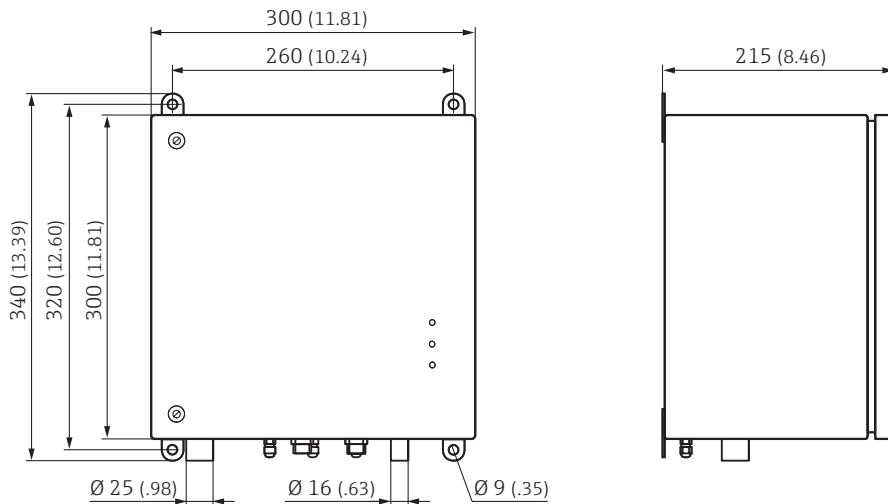
Description	Unit to control the system components and to evaluate and output the data provided by them
Electrical safety	CE
Enclosure rating	IP 66
Analog outputs	1 output: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; additional outputs if using I/O modules (option)
Analog inputs	2 inputs: 0 ... 20 mA Not electrically isolated; additional inputs if using I/O modules (option)
Digital outputs	5 relay contacts: 48 V AC, 1 A Potential-free; for status signals; extendible by additional I/O modules
Digital inputs	4 potential-free contacts: Additional inputs if using I/O modules
Modbus	✓
Type of fieldbus integration	TCP (via optional interface module, only one module possible per MCU) RTU RS-485 (via optional interface module, only one module possible per MCU)
PROFIBUS DP	✓
Type of fieldbus integration	Via optional interface module (only one module possible per MCU)
Ethernet	✓
Type of fieldbus integration	Via optional interface module (only one module possible per MCU)
Function	Connection to SOPAS ET software or OPC server
Serial	
Type of fieldbus integration	RS-485 (via optional interface module, only one module possible per MCU)
Function	Connection to SOPAS ET software
USB	
Function	Connection to SOPAS ET software
Indication	LC display Status LEDs: "Power", "Maintenance" and "Failure"
Operation	Via LC-display or software SOPAS ET
Dimensions (W x H x D)	Dimensions may vary. For details, see the dimensional drawings.
Weight	5 kg
Power supply	
Voltage	90 ... 250 V AC
Frequency	50 Hz / 60 Hz
Power consumption	≤ 50 VA
Options	Interface module(s) I/O module(s)

Ordering information

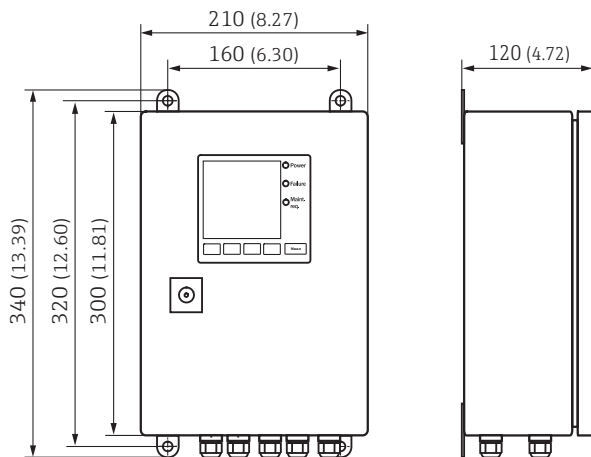
Our regional sales organization will help you to select the optimum device configuration.

Dimensional drawings

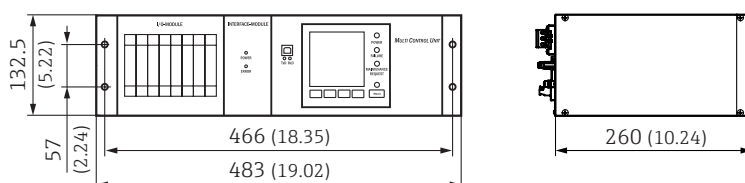
VICOTEC450 measuring unit (dimensions in mm (inch))



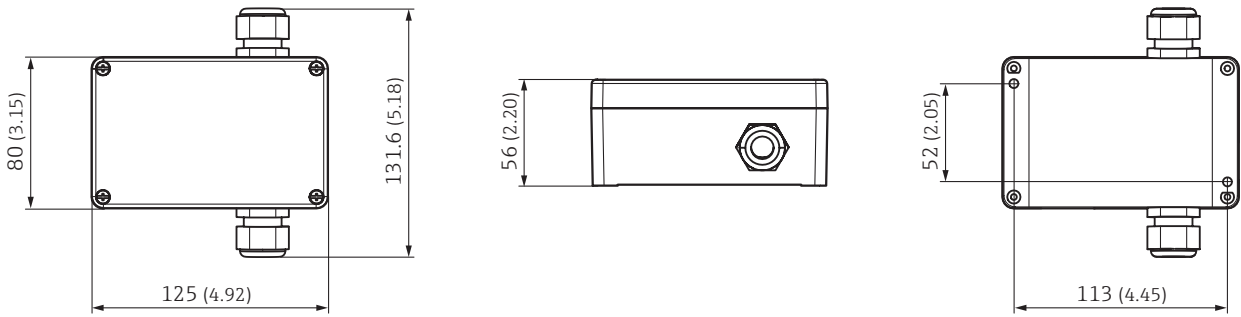
MCU-N control unit; wall-mounting enclosure, compact version (for non-hazardous areas only) (dimensions in mm (inch))



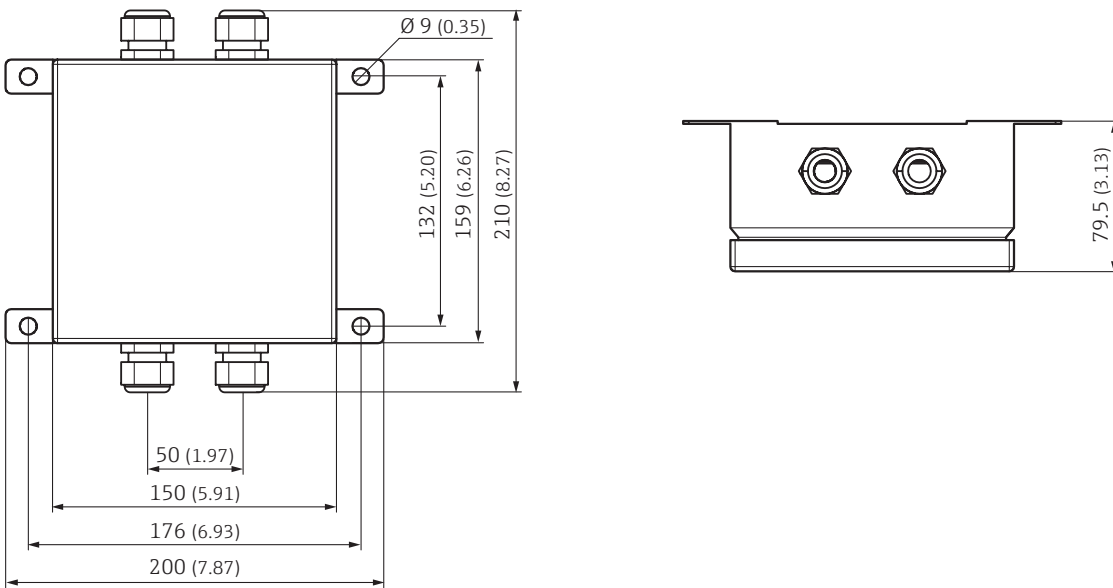
MCUP control unit; 19"-rack enclosure (for non-hazardous areas only) (dimensions in mm (inch))



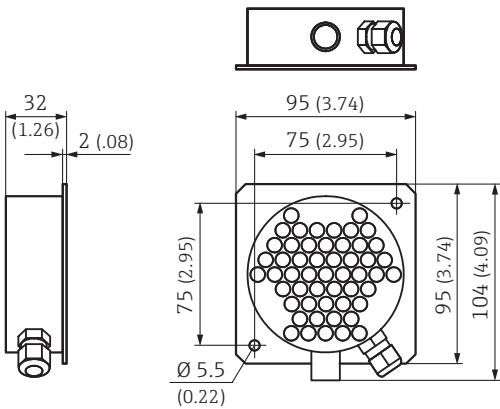
Connection unit; standard version (dimensions in mm (inch))



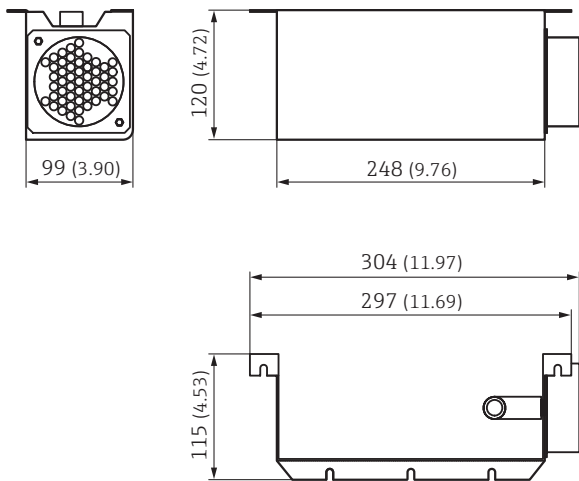
Connection unit; stainless steel version (dimensions in mm (inch))



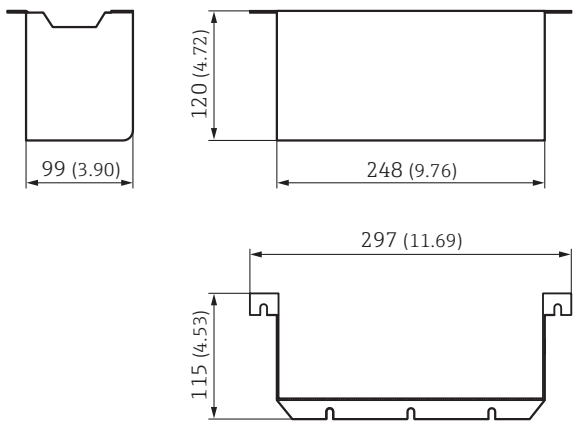
Air inlet with protective grating for wall mounting (dimensions in mm (inch))



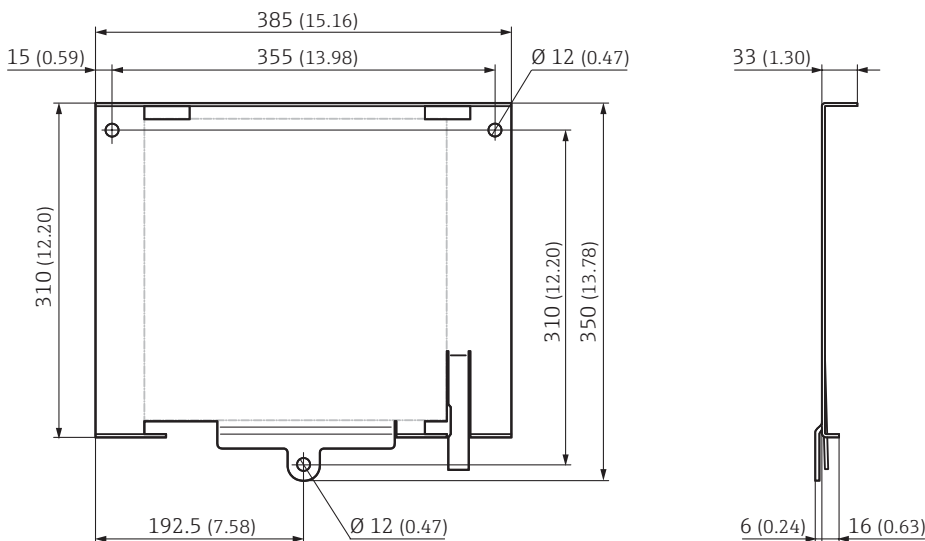
Cover for connections; with air inlet at the side (dimensions in mm (inch))



Cover for connections (dimensions in mm (inch))



Mounting plate (dimensions in mm (inch))



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