

## SMOTEC450

Fast and reliable smoke detection  
for every type of tunnel

Highly efficient smoke  
detection for every type of  
tunnel

- Early and reliable warning  
for optimum efficiency dur-  
ing self-rescue phase



# Highly efficient smoke detection for every type of tunnel

## When seconds count

Fast and reliable detection of smoke in tunnels saves human life and avoids material damage. This highly effective solution: the SMOTEC450. Using scatter light measurement, this innovative tunnel smoke detector device is able to register smoke particles within seconds and gives out the alarm immediately. The same applies in conditions with high air velocity and "cold" fires.

## Easy integration into existing systems

It is simple to integrate SMOTEC450 in a wide range of installations on site, because the control unit MCU is not only upgradeable with standard interfaces (analog and digital) but also optionally with additional modules, such as PROFIBUS or Ethernet. The distance between 2 measurement points must not exceed 150 m (see regulations, e.g. RABT, ASTRA). There are no restrictions to the height of the installation point.

## Flexible, durable and robust

SMOTEC450 is suitable for installation in operation areas, at tunnel walls or in air passages. The air is either sucked in with a suction pipe, that can measure up to 15 metres or directly at the device. The robust housing, made of stainless steel, 1.4571, meets protection class IP 66 and is suitable for long-lasting operation in harsh tunnel environment.

## When seconds count

There are thousands of transmissiometers, that have been installed in tunnels all over the world to measure visibility. The rate for false alarm is 0.05/device per year. The SMOTEC450 achieves even lower rates, achieved by cutting out perturbations, such as:

- Fog – gets evaporated in a heating chamber.
- Animals (birds and spiders) – are scarcely able to penetrate the measuring volume.
- Contamination of optics – compensated by control cycles.

It's a very convincing answer: an all-time record of low false alarms and at the same time a high detection ratio.

## Double safety

How frequently do smoke detector need to be checked? What is the expense for tunnel closure, service personnel and tools? It's simple with the SMOTEC450: one test a day, no tunnel closure, no other costs. The automatic control cycle monitors each important component (transmitter LED, receiver, contamination of optics).

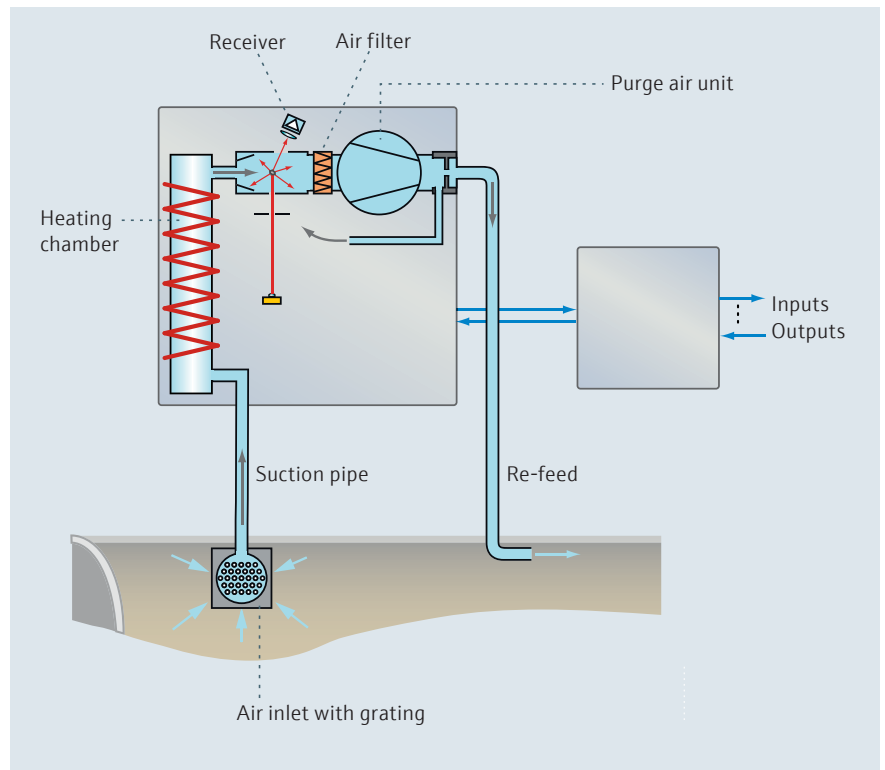
## Simple to start-up and to operate

The start-up of the SMOTEC450 is straight forward: simply check and enter a few parameters, that have been factory-set with standard values – finished. Cost- and time efficient maintenance during operation due to:

- Signal for maintenance requirement
- An optional blower control (increased service time of air filter)
- An integrated purge-air for optical boundary surfaces
- Use of top-quality components.

### Principle of operation

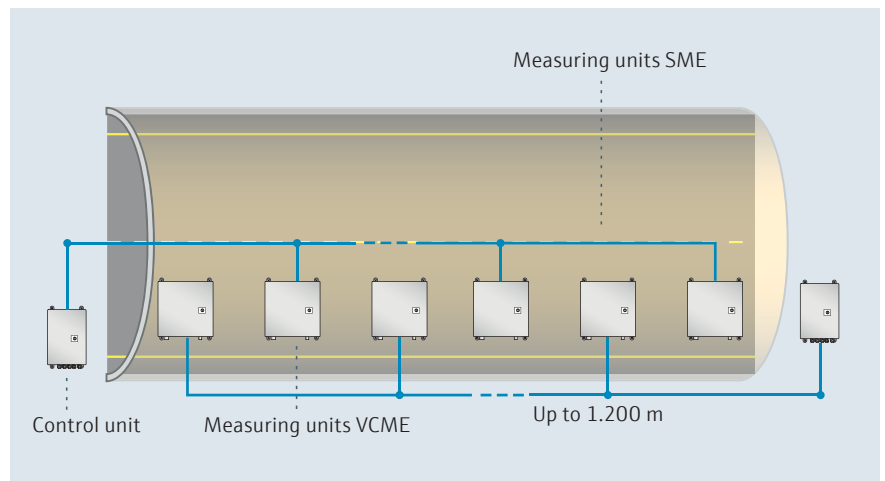
The SMOTEC450 extracts air from the tunnel tube, heats it up and determines smoke density by using scatter light measurement, which is highly effective in detecting the most minute quantities of particles. The air flowing through the device and the heating chamber are monitored continuously.



### Bus configuration

The SMOTEC450 offers you a choice:

- installing the control unit directly at each measuring point
- using control unit centrally, via RS485-Bus where up to 8 measurement units can be connected.



# SMOTEC450: Fast and reliable smoke detection for every type of tunnels



## Product description

Fast and reliable detection of smoke in tunnels delivers information which helps to save human lives and avoid material damage. The SMOTEC450 detects smoke particles in tunnels within seconds and alerts the control system immediately – long before visibility is reduced too much by dense smoke. False alarms caused by fog

are avoided by heating up the drawn air. Double safety, because the device monitors itself. The automatic check cycle of the SMOTEC450 checks all important components of the system each day without the tunnel having to be closed and without incurring personnel costs.

## At a glance

- Very fast and accurate scattered light measurement
- Automatic control functionalities
- Contamination check
- Heated chamber for evaporation of fog droplets
- Rugged enclosure made of stainless steel

## Your benefits

- Very reliable operation due to full Early and reliable warning for optimum efficiency during self-rescue phase

## Fields of application

- 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/smotec450](http://www.endress.com/smotec450)



## 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.

### SMOTEC450

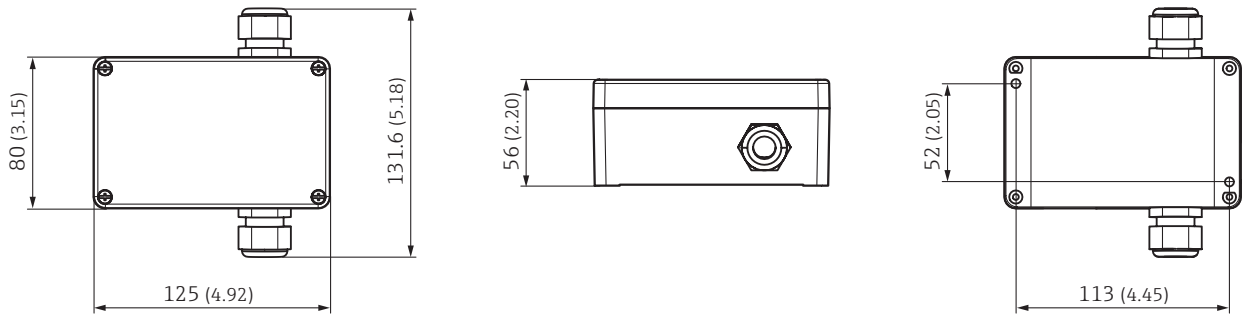
Measured values	Visibility (K-value)
Measurement principles	Scattered light forward
Spectral range	640 nm ... 660 nm Laser, protection class 2, power < 1 mW
Gas flow rate	30 l/min ... 35 l/min
Measuring ranges	
	K-value 0 ... 150 km <sup>-1</sup> / 0 ... 2,000 km <sup>-1</sup>
	Temperature -50 ... +250 °C
	Limit value for smoke detection: 15/km
Response time (t <sub>90</sub> )	0 s ... 600 s, freely adjustable; without measuring delay due to suction line
Resolution	± 2 km <sup>-1</sup>
Repeatability	± 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 VA
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**

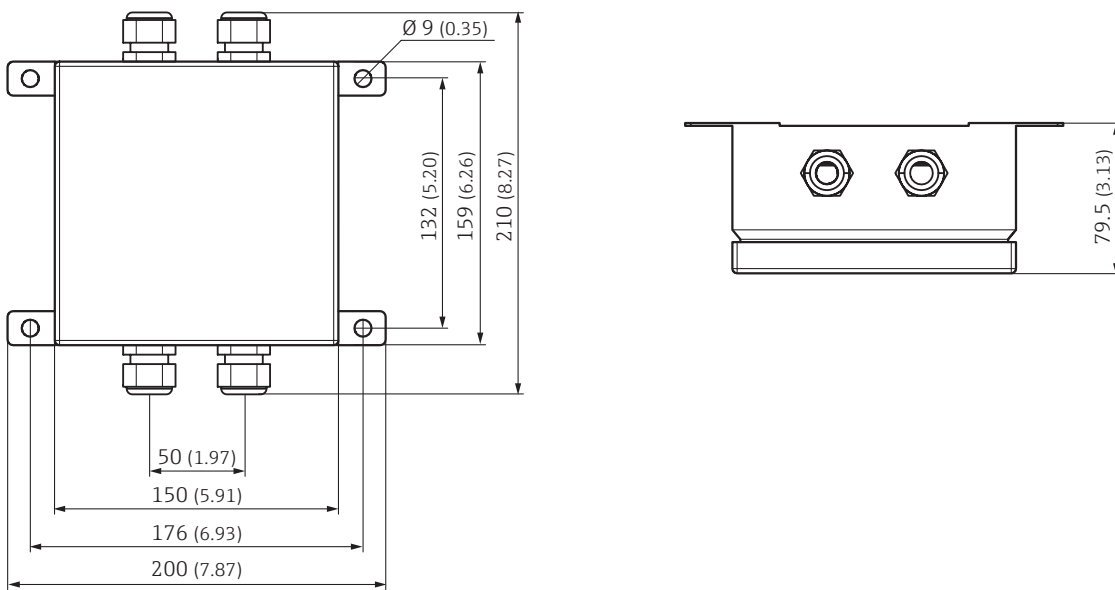
Description	Unit to control the system components and to evaluate and output the data provided by them
Electrical safety	CE
Enclosure rating	IP 66
Analog outputs	1 output: 0/2/4 ... 20 mA, 750 Ω Electrically isolated; additional outputs if using I/O modules (option)
Analog inputs	2 inputs: 0 ... 20 mA 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)
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)



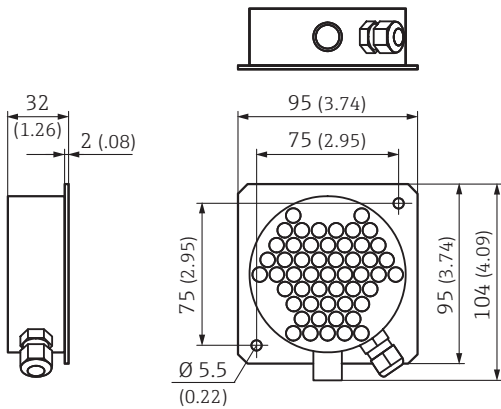
Connection unit; standard version (dimensions in mm (inch))



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

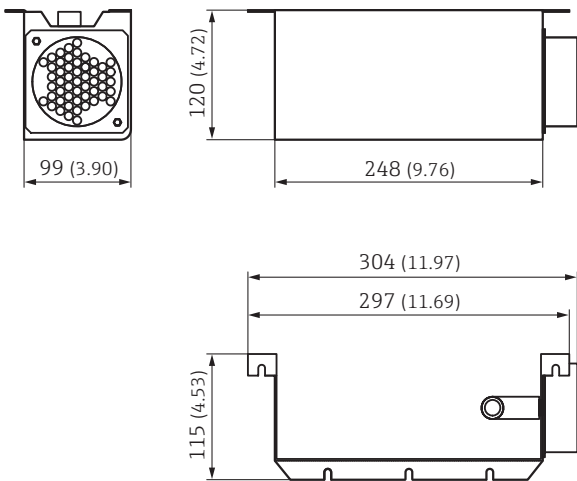


Air inlet with protective grating for wall mounting (dimensions in mm (inch))

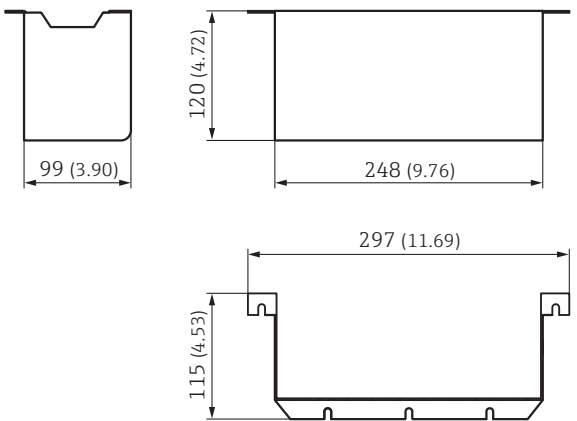




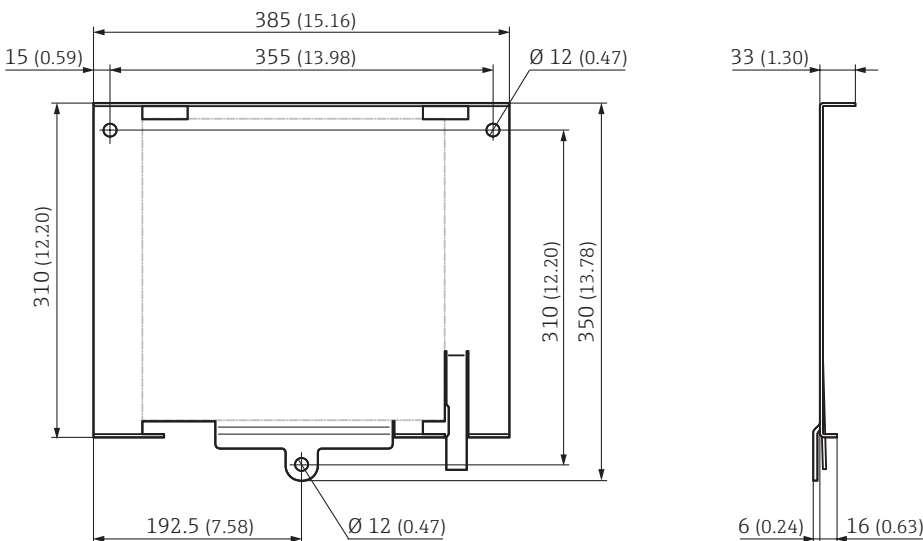
Cover for connections; with air inlet at the side (dimensions in mm (inch))



Cover for connections (dimensions in mm (inch))



Mounting plate (dimensions in mm (inch))







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