



Applications

- Early fire warning by cold smoke detection in road tunnels
- Smoke detection in environments with corrosive atmospheres

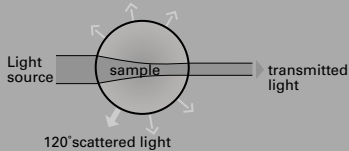
Advantages

- Continuous measurement of smoke concentration
- No moving parts
- Fog suppression by heating
- Temperature sensor for locating fires
- Signal output via relay contacts or Profibus

SMOKE DETECTOR FIREGUARD

SMOKE DETECTOR FIREGUARD

Smoke detection



Measuring method

The capability to detect fires in tunnels as rapidly as possible is crucial to ensuring the safety of road users and increasing the chance of rescue. Visibility measurement has proven to be an important aid in this area in recent years, since smoke detection is able to detect and signal hot and cold fires in the incipient stages. FireGuard is based on the same principle but is optimized for smoke and fire detection with regard to scattering angle, measuring range, response threshold, and signal processing. The absolute value as well as the gradient of the visibility can be used for the alarm.

FireGuard measures inside the instrument the scattered light intensity of the air flowing through the tunnel. This design makes it easy to install without alignment, and it guarantees reliable checking and adjustment of zero and reference points without ambient air influences. An optional heater on the sampling inlet reliably eliminates the effects of fog and mist.

FireGuard uses a variant of SIGRIST's tried and proven dual-beam method. With this method the back-scattered light under 120° is set in relation to the light source intensity. This is a simple method for compensating light source fluctuations as well as the aging effects and temperature dependencies of the electronics.

Temperature measurement

In addition to measuring visibility, FireGuard also measures the temperature of the ambient air. This facilitates pinpointing the location of a fire when several smoke detectors are actuated. Here, too, the absolute value and gradient can be used for the alarm.

Sample handling

When air flows with a minimum velocity of 1 m/s through the tunnel, it suffices to supply a representative sample volume for the measuring chamber inside the instrument independently of the flow direction and without active components. The construction of the measuring cell effectively prevents the measuring optics from soiling. Intelligent software monitors the continuous throughput and compensates any possible drift by comparisons to the zero signal.

Calibration

Calibration of the SIGRIST FireGuard is performed at the factory using E/m visibility units. A checking rod available for the annual calibration check makes adjustment fast and easy.

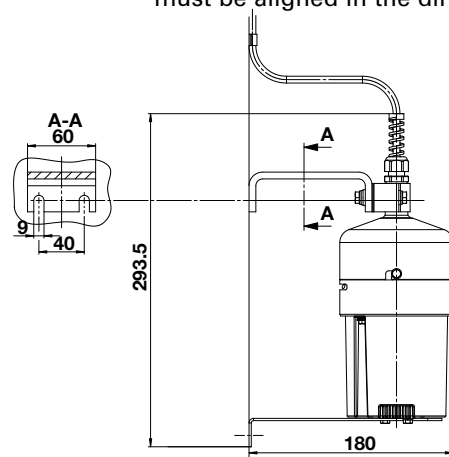
Operation and communication

Signal output is via the SIPORT connection box. There is one version with two binary coded (if needed) relay contacts (normal state, pre-alarm, alarm, fault) and one version with a PROFIBUS DP connection. Optionally, a SIREL with two 4..20 mA outputs for temperature and visibility can also be connected. For operation, configuration and maintenance on site, a handheld control unit with a two-line LC display and plain text operation is available.

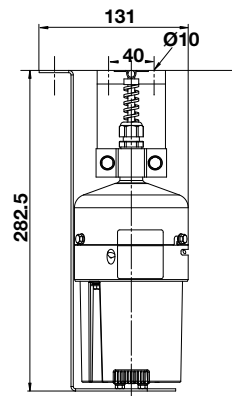
Installation and mounting

The FireGuard can be mounted on the tunnel wall, under the tunnel ceiling or in the intermediate ceiling of the air supply duct. The instrument's axis must always be vertical to the tunnel axis and the supply and exhaust air openings must be aligned in the direction of air flow.

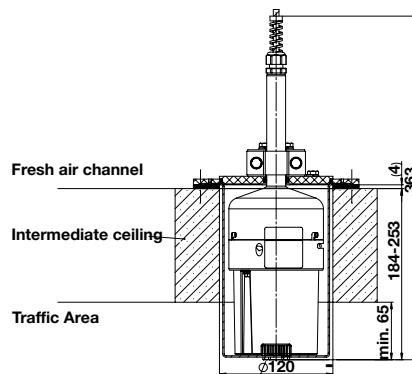
Dimensions



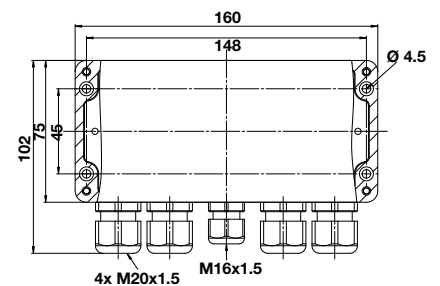
Wall mounting



Under ceiling mounting

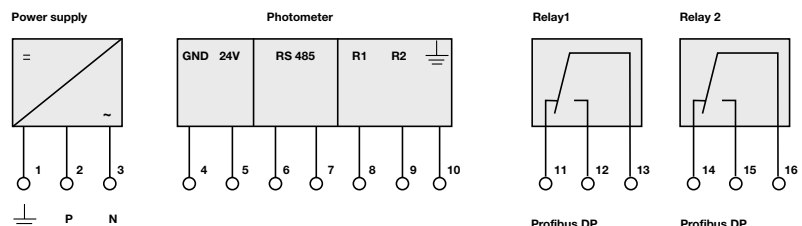


Intermediate ceiling mounting

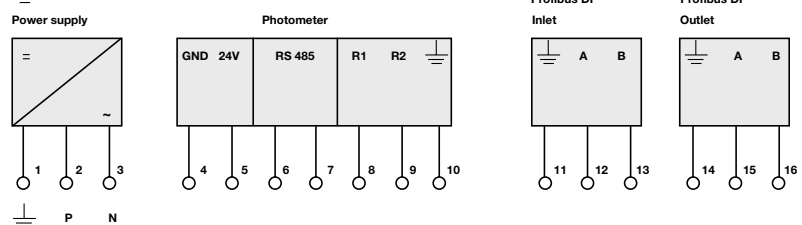


SIPORT

Connecting diagram SIPORT-R (relay)



Connecting diagram SIPORT-PB (Profibus DP)



SPECIFICATIONS

Scattered light measurement

Measuring principle:	120° scattered light measurement
Measuring span:	0 .. 3 E/m
Resolution:	0.001 E/m
Measuring wavelength:	670 nm

FireGuard sensor

Enclosure material:	Stainlees steel 1.4571 (316L) / ABS
Ambient temperature:	-30°C .. +55°C
T₉₀ time sensor:	5 s (at a wind velocity of 1.5 m/s)
Relay input delay:	6 s (default; recommended to avoid false alarm)
Degree of protection:	IP66 (electronics)
Weight:	0.85 kg .. 2.6 kg (depending on version; incl. heater and fastening)
Mounting depth from wall:	180 mm (wall mounting version)
Mounting depth from ceiling:	283 mm (ceiling mounting version)

Connection box SIPORT

Power supply:	85 .. 264 V / 47 .. 63 Hz
Power consumption:	10 W / 25 W (with heater)
Contacts (version R):	2 separately configurable relay contacts 250 V AC, 4 A
Bus (version PB):	Profibus DP
Degree of protection:	IP66
Material:	Polyester, glass-fiber reinforced
Weight:	0.85 kg
Connection to FireGuard:	Standard cable: 4x2x0.41 mm ² Cat 5e data cable Without heater up to 160 m; with heater up to 45 m

Represented by:

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