



Smoke detection Scattered light

Smoke detection for earlier fire detection

Features

- Mounting on wall, ceiling, false ceiling or integration in ventilation damper
- Air supply through air flow in the tunnel
- Visibility metering by scattered light
- Optional heater to compensate fog
- Connections boxes to connect to the tunnel control system either by
 - 4-20 mA / 2 relays
 - MODBUS RTU
 - Profibus DP
- Optional hand-held operating unit
- Delivered ready for operation

System setup

- Sensor to be mounted directly in the tunnel's driving area (power supply by system cable from connection box)
- Connection to tunnel control system through connection box (MODBUS RTU, Profibus DP, 4-20 mA and relays)
- Optional hand-held touch operating unit

Operation

Smoke detection allows a reliable and early detection of tunnel fires. An early detection is essential to maximise time for self-rescue.

Air in the tunnel flows through the sensor's measuring chamber. The sensor then detects the intensity of light scattered by this sample. Thereby emerging fires can be detected at an early stage (cold smoke) long before fire alarm cables can detect the event. Individual thresholds can be set to trigger alarms or respectively the measured values can be used to do such in the tunnel control system.

Any influence caused by fog will be compensated by optional heating elements. The measurement is not affected by extraneous light, reflexes or other influences as is the case for video detection. Individual setting of parameters allows an optimal object and location related setting of alarms:

- More time for self-rescue
- No false alarms
- Reduction of a possible damage to the object and of subsequent costs

Advantages

- Rapid, reliable smoke detection without false alarms
- Compact design, no moving parts
- Fog compensation by optional heating elements
- LED light source, very low power consumption
- Permanent instrument monitoring in the background
- Simple recalibration with recalibration plug
- Flexible system integration
- Simple recalibration with checking rod
- No consumables
- Extremely low maintenance costs

Application

Tunnels are important infrastructure elements in road networks and facilitate the connection of regions.

Environmental conditions in tunnels are influenced by fog, particles and emissions and need to be monitored to protect people on their passage through the tunnel from danger and impacts on their health. Accidents in tunnels, and particularly fires, can have dramatic consequences and can prove extremely costly in terms of human life, increased congestion, pollution and repair costs.

At every time people in the tunnel need to be supplied with breathable air and sufficient visibility.

Since 1990 JES Elektrotechnik GmbH develops, installs and maintains systems to monitor air quality and lighting conditions in tunnels. Our systems are robust, durable and resistant against the corrosive atmosphere in a tunnel. They operate reliably and have a high accuracy in measurement.

All systems fulfil the requirements of the EC guideline 2004/54/EC (Minimum safety requirements for tunnels in the trans-European road network) and the more precise national guidelines and provisions:

- Austria: RVS 09.02 Tunnelausrüstung
- Germany: RABT Richtlinien für die Ausstattung und den Betrieb von Straßentunneln
- Switzerland: ASTRA Richtlinien und Fachhandbuch Betriebs- und Sicherheitsausrüstungen (BSA)

Our range of products for tunnel covers systems for monitoring of

- Toxic gases like CO, NO, NO₂ (extractive or in-situ)
- Visibility (extractive or in-situ)
- Air speed, direction and temperature
- Luminance (access, threshold and interior zone)
- Illuminance

Technical Data

Smoke detection	
Measuring method	120° forward light scattering
Measuring range	0 .. 3 m ⁻¹
Resolution	0.001 m ⁻¹
Response time	5 s (at an air speed of 1.5 m/s)

Sensor	
Type	FireGuard 2
Power supply	24 VDC
Power consumption	4 W
Heater (optional)	13 W
Housing material	Polycarbonate / stainless steel 1.4571
Protection class	IP 66 (only electronics)
Dimensions	Ø 107 x 283 mm
Weight	0.9 kg

Connection box	
Type	SIPORT 2
Power supply	85 .. 264 V / 47 .. 63 Hz
Power consumption	max. 25 W
Housing material	Polyester (glass fibre reinforced)
Protection class	IP 66
Dimensions	220 x 120 x 95 mm
Weight	1.3 kg
Output modules	<ul style="list-style-type: none">• Profibus DP or• MODBUS RTU or• 2 x 0/4-20 mA, 2 configurable relays

Operating unit with display	
Type	SICON-C
Power supply	24 VDC (via system cable from SIPORT 2)
Display	Graphic TFT with touch operation
Housing material	Plastic (ABS)
Protection class	IP 65
Dimensions	130 x 160 x 60 mm
Weight	0.6 kg

Conformities	
Electrical standards	2006/95/EC Low voltage directive (LVD) 2004/108/EC Electromagnetic compatibility (EMC)



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