JES w/MOR-020 Visibility Sensor (Meteorological Optical Range)

Features

• Visibility sensor using forward scattering to measure the meteorological optical range
• 10 m to 40 km measuring range
• Hood and windows heated
• Comprehensive self-test and maintenance data
• Optical windows monitored for contamination
• Optional ambient light sensor
• RS-232, RS-422 and RS-485 interface
• Automatic or polled mode
• Optional analogue output
• Optional relays
• Optional smart/HUB IoT operating and control unit with touch display
• Plug-in for ASFINAG openWIS weather information system

System

• Visibility sensor to be mounted on pole or wall
• Optional terminal box with 24 VDC power supply for connection of supply and signal cables
• Optional smart/HUB with touch display

Operation

The sensor uses the forward scatter measuring method to determine the meteorological optical range.
The transmitter on one side emits light which is scattered by particles in the air. The receiver on the other side receives the share of the light which is scattered at an angle 39° to 51°. The intensity of the received light is used to calculate the meteorological optical range.
The unique design ensures that the output is both accurate and reliable in all weather conditions and will not be influenced by local lights sources, even those that flash.
With a measuring range of 10 m to 40 km the sensor is suitable for use in road and aviation applications as well as meteorological observation networks. Whilst the measurement accuracy easily exceeds that specified by ICAO for visibility sensors used in METAR and RVR applications.
Heating of the optical windows and sensor hoods is provided as standard allowing use in the harshest of conditions. Both optical windows are monitored for contamination and the visibility output is automatically compensated to reduce maintenance requirements.

Advantanges

• Compact forward scatter design
• Not affected by local lights
• Easily installed by one person
• Hood heating for use in extreme environments
• Flexible integration into control system
• openWIS compatible

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

Technical Specifications

Visibility sensor w/MOR-020	
Type	w/MOR-020
Measuring method	Forward light scattering with 39° to 51°angle
Measured values	Visibility (MOR) in Meters Extinction coefficient
Measuring range	10 m .. 7.5 km
Resolution	1 m or 10 m (default)
Accuracy	≤ 10% at 7.5 km
Operating voltage (sensor)	9 .. 36 VDC
Operating voltage (hood heating)	24 VDC or 24 VAC
Power consumption	3.5 W (sensor) 1.7 W (window heaters) 24 W (hood heaters)
Appliance class	Class III (PELV)
Housing material	Powder coated aluminium Grey - RAL 7045
IP rating	IP 67
Dimensions	811 x 315 x 329 mm
Weight	approx. 4.3 kg
Digital interfaces	RS-232, RS-422 or RS-485 Polled or automatic mode
Analogue outputs (option)	0-10 V, 4-20 mA
Relay outputs (option)	1 x fault, 2 x threshold
Operating temperature	-40 .. +60 °C
Operating humidity	0 .. 100% relative humidity, non-condensing

Conformities	
Markings	
Electrical standards	2014/35/EU Low Voltage Directive (LVD) 2014/30/EU Electromagnetic compatibility (EMC) EN IEC 61326 Electrical equipment for measurement, control and laboratory use - EMC requirements
Road safety standards	Austria: RVS 12.04.14 Straßenzustandsinformationssysteme für den Winterdienst (November 2014) Germany: Technische Lieferbedingungen für Streckenstationen Ausgabe 2012 (TLS 2012)