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JES t/LUX Illuminance Meter

Features

• Photometer to measure the illuminance at the mounting point of the sensor
• Cosine correction
• V(λ) adaptation
• Delivered ready for operation
• Shock proof housing
• Optionally available in a heated housing with protection class IP 65

System

• Sensor to be mounted at the measuring point (in-situ)
• Connection either directly to tunnel control system or to a remote evaluation unit

Operation

The requirements for tunnel lighting are determined by the nature of the human eye. The tunnel lighting must be controlled such that users, both during the day and by night, can approach, pass through and exit the tunnel without changing direction or speed with a degree of safety equal to that on the approach road. Especially at daytime the human eye can only adapt slowly to the lower lighting levels in the tunnel. The lighting in the access zone has to be controlled such that drivers can perceive obstacles in the tunnel on time to stop. At night time it is sufficient to provide lighting levels in the tunnel at least equal to those outside the tunnel.
Several international and national guidelines and standard describe how to design and control tunnel lighting.
The Austrian RVS for instance describes a reduction of the lighting level in the interior zone based on illuminance levels that prevail in front of the portal.
The sensor measures the illuminance hemispheric. The measured value describes the luminous flux which impacts on the transparent hemisphere of the sensor.

Advantanges

• Specifically designed for application in tunnels
• Customisable measuring range
• Resistant against corrosion, UV, oil and acid

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

Illuminance measurement	
Measured value	Illuminance
Measuring range	Selectable, typically 0 .. 200 lx
Measurement accuracy	± 3% (5 to 200 lx) ± 6% (at 1 lx) not defined for measured values below 1 lx
Zero point drift	0.02 lx / °C
Reference temperature	20°C
Spectral range of photosensitivity	Adjusted by V-Lambda filter $V_{rel}(\lambda) \geq 80\%$ between 490 nm and 630 nm
Directional characteristic	Half ellipse, $E_{rel} = 0.8$ at ± 35°

Illuminance meter	
Name (Type)	t/LUX
Power supply	24 VDC via current loop
Housing material	Glass bead reinforced polyamide (PA 6 30% GK)
Temperature range	-25 °C to +60 °C
IP rating	IP 65
Dimensions	64 x 98 x 34 mm
Weight	300 g

Illuminance sensor heated housing	
Name	t/LUX-H
Power supply	230 VAC (other voltages on request)
Heating	100 W (controlled by thermostat)
Material	Glass fibre reinforced polyester, RAL 7035 or Stainless steel 1.4571 (AISI 316Ti) (optionally)
Temperature range	-40°C bis +60°C
IP rating	IP 65
Dimensions	250 x 300 x 140 mm
Weight	4,5 kg

Outputs	
Analogue output	1 x 4-20 mA, 2-wire, passive

Conformities	
Electrical engineering	2006/95/EC Low Voltage Directive (LVD) 2004/108/EC Electromagnetic compatibility (EMC) IEC 61326-1:2012 IEC 61010-1:2010
Tunnel safety	AT: RVS 09.02.41 DE: RABT 2006, DIN 67542-2