

Vaisala FS11 Visibility Sensor for RVR Applications

- **Specially built for Runway Visual Range (RVR) applications**
- **Meets FAA and ICAO specifications for visibility measurement**
- **Accurate and traceable measurement**
- **Mechanical design and high-power heating follow FAA guidelines**
- **Range up to 75 km**
- **Can also be used for aeronautical and SYNOP visibility measurements**
- **Composite fiber mast meets the frangibility requirements of airports**

SCIENTIFICALLY VALID CHAIN OF CALIBRATION

Every Vaisala FS11 is calibrated through a scientifically valid chain of reference. The scattering response of the calibration device can be clearly traced to a reference FS11 visibility sensor, which is in continuous operation at Vaisala's outdoor test field along with reference transmissometers and other instrumentation.

LOW MAINTENANCE REQUIREMENTS

The FS11 incorporates a new technique that measures and compensates for the attenuation effect of window contamination. It ensures that measurement accuracy is maintained throughout the recommended interval between window cleanings and lengthens the interval. The system works by monitoring the total reflectance of the window surface. It automatically compensates for visibility measurement errors caused by window contamination.

The sophisticated self-diagnostics and modular design allow for very short service times. The measurement fork and optional background luminance meter (LM21) are independent instruments that can be replaced quickly as pre-calibrated spare parts.



RELIABLE OPERATION IN THE HARSHTEST WEATHER

Four main design features are combined in the FS11 to ensure that it operates reliably in the harshest weather. The first is the window contamination compensation technique. The second is the "head-down" design of the optical heads, which protects them against virtually all windblown particles (even those flying horizontally). High-power heaters are the third feature, each with its own temperature monitoring and control mechanism to prevent snow accumulation during the heaviest snowstorm. As a final measure, there is optical path clearance monitoring circuitry to verify that measurement is not affected by obstructions.

TECHNICAL INFORMATION

OPERATIONAL

Measurement range (MOR)	
5...75,000 m with 1, 3 and 10 minute averaging	
Accuracy	+ 10 % range 5 ... 10,000 m
	+ 20 % range 10,000 ... 75,000 m
Scatter measurement accuracy	+ 3%

OPTICAL

Operating principle	Forward scatter measurement
Scattering angle	42°
Light source	Near infrared Light Emitting Diode
Optical monitoring	Window contamination measurement and compensation circuitry
	Optical path blockage measurement
	Light source stability control

ELECTRICAL

Mains supply	100/115/230 VAC +/- 10 %, 50-60 Hz
Power consumption	300 VA maximum (60 VA + 240 VA defrosting heaters)
Outputs	Serial line RS-232 or opto-isolated RS-485 (2-wire) or optional data modem
	Separate RS-232 Maintenance line

MECHANICAL

Dimensions (HxWxD)	2.8m x 0.9m x 0.5m
Weight	37 kg
Mast	Frangible and hinged composite fiber mast

ENVIRONMENTAL

Operating temperature	-40...+65 °C, optional -55...+65 °C
Operating humidity	0...100 %
Wind speed	Up to 60 m/s

ELECTROMAGNETIC COMPATIBILITY

CE-compliant
Compliance has been verified according to the following EMC directives

Verification subject	Standard
Radiated emissions	EN55022
Radiated susceptibility	IEC 1000-4-3, 10 V/m
Conducted emissions	EN55022
Conducted susceptibility	IEC 1000-4-6
EFT immunity	IEC 1000-4-4
ESD immunity	IEC 1000-4-2
Surge	IEC 1000-4-5
Harmonics to the mains network	IEC 1000-3-2

ACCESSORIES/OPTIONS

Calibration set	FSA11
Background luminance sensor	LM21
Battery back-up	FSB101
	Typical back-up time 30 mins at 25 °C
Modem for long distance (>1km) communication	DMX501
Obstruction light	FS11OBS

