HSS VF-500
Visibility / Fog Sensor



Features

- Measures visibility and fog density
- Proven accuracy, reliability and repeatability
- Fog warning system for switching alarms and lights
- Suitable for portable or fixed installation
- Low power requirements (mains, battery, solar)
- EEx zone I and II configuration available

The HSS VF-500 Visibility / Fog Sensor is ideal for automatic switching of warning lights and alarms as well as for datalogging purposes. The sensor is configured for accurate measurement of visibility in the densest of fogs to very clear air conditions and is the refinement of 2 decades of experience and technology resulting in a compact, robust instrument with excellent performance.

Measurement Principle

The VF-500 sensor uses forward scatter meter technology to measure visibility in all weather conditions. The sensor measures the amount of light scattered by small suspended particulates (ie fog, haze and smoke aerosols) or larger particles (ie rain, snow, ice pellets, drizzle and mist) passing through the sample volume. The sensor calculates the atmosphere **EX**tinction **CO**efficient (**EXCO**) from which the **M**eteorological **O**ptical **R**ange (**MOR**) is calculated. Using an infra-red light source and intelligent sensing technology the measurements are unaffected by other light-sources.

Construction

The HSS VF-500 is lightweight and can easily be installed by one person and consists of a sensor head which makes the measurements and a control box housing the electronics. The sensor head is constructed of dip brazed high grade aluminium. All components that are exposed to weather are hard-coat anodised for protection against corrosion. The sensor head and control box can be sited up to 20 metres apart for safe and convenient access.

Maintenance and calibration

The sensor is fully calibrated at the time of manufacture. Routine maintenance, including a check on calibrations, can be performed easily by one person in a matter of a few minutes and a re-calibration (although this should never be required) takes only slightly longer.

Operation in temperature extremes

The sensor operates in temperatures ranging from -50^{0}C to +60^{0}C. For operation below - 3^{0}C the heated version is recommended (please refer to the variants overleaf).

The VF-500 Visibility Sensor comes with 2 years warranty as standard.

NB Mounting pole not included

<u>The sensor includes as standard:</u>

- Sensor head of high quality aluminium construction which is hard anodised to give a superior finish that does not require painting.
- Power control unit
- 0-10 V analogue output
- Window de-misters
- Power line surge arrestors
- Signal line surge arrestors
- Electro magnetic interference protection
- 6 metre interconnect cable
- Calibration reference certificate
- Manual

<u>Available VARIANTS</u> *see overleaf*

- Fog warning system
- Heating
- Output 0-20 mA or 4-20 mA as well as the standard 0-10 V

<u>Available ACCESSORIES</u> *see overleaf*

- Stainless steel mounting kit
- Calibration kit
- Transit case

For sensor specifications please refer to HSS brochure

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HSS VF-500

VARIANTS

Fog warning system - the fog warning system allows an external device such as a fog horn, road warning sign or ventilation fan to be switched automatically at a given visibility range, and the monitoring and adjustment of the intensity of warning lights.

The system features user adjustable activation and de-activation delays ensuring smooth and effective switching. For example, the delays could be set for 5 minutes so that a device would only be activated after 5 minutes of continuous reduced visibility. This allows for local transient events such as fumes from passing vehicles or vessels thus avoiding false alarms. Additionally power is used more effectively as the device is only turned on when necessary.

Heated version - the sensor comes with window de-misters as standard allowing operation of the sensor in temperatures down to -3^{0}C. However, where the temperature drops below -3^{0}C for more than a couple of hours a day the heated version is recommended. This version will provide error free operation in conditions down to -50^{0}C.

Additional Analogue Outputs - in addition to the standard 0-10 V output the sensor can be ordered with either 0-20 mA or 4-20 mA output.

ACCESSORIES

Calibration reference kit - recommended for end-user confidence checks and re-calibration. The kit contains a carrying case, zero plugs and a calibration plaque to a specific EXCO value. One kit can be used on any number of sensors of the same range.

Stainless steel mounting kit - includes U-bolts, fasteners and adaptors to secure the sensor and power control unit to any pole with a diameter between 45 - 75 mm.

Transit case - scientific case lined with 3 inch foam to hold the sensor securely in place in extreme handling conditions.

The HSS range is in continuous development therefore specifications may change without prior notice.

MEASUREMENT AND SWITCHING RANGES

At the time of manufacture each sensor is scaled to provide the greatest possible resolution for your specific application i.e. the best useable data. We have 3 standard ranges and these are shown below in Figures 1 and 2 (the information is the same in both but one is a diagrammatic representation and the other tabular). If you would like advice as to the best setting for your application or would like an alternative range please contact us.

Guide to selecting the correct scale when ordering:

- If you will be using the sensor with the Fog Warning System to switch equipment and do not wish to send the output to a data logger then please select from the **Fog Warning Switching Range** (▬▬).
- If you will be using the sensor to send data to a logger please select the **Total Measurement Range** (▬ ▬ ▬).
- If you will be using the sensor for both then please select the scale with the most suitable combination of both ranges.

NB In the measurement range 0.1 V - 0 V the signal resolution will be quite low and we would not recommend using the sensor within this range with a data logger or where the cable lengths are in excess of 100 m. These ranges are indicated by the Low Signal Range (••••).

Figure 1 diagrammatic

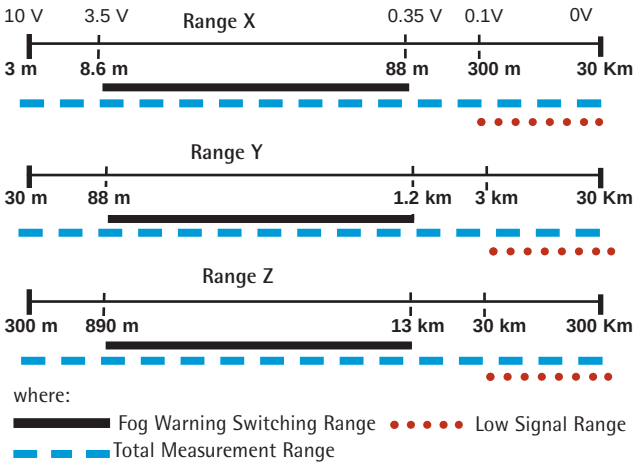

Figure 2 tabular

	Fog Warning Switching Range	Total Measurement Range	Low Signal Range
Range X	8.6 m - 88 m	3 m - 30 km	300 m - 30 km
Range Y	88 m - 1.2 km	30 m - 30 km	3 km - 30 km
Range Z	890 m - 13 km	300 m - 300 km	30 km - 300 km

HSS Sensors are manufactured by Biral to rigorous ISO 9001:2000 quality standards.

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