Hygrophil F5672

Fibre Optic Dewpoint Analyser

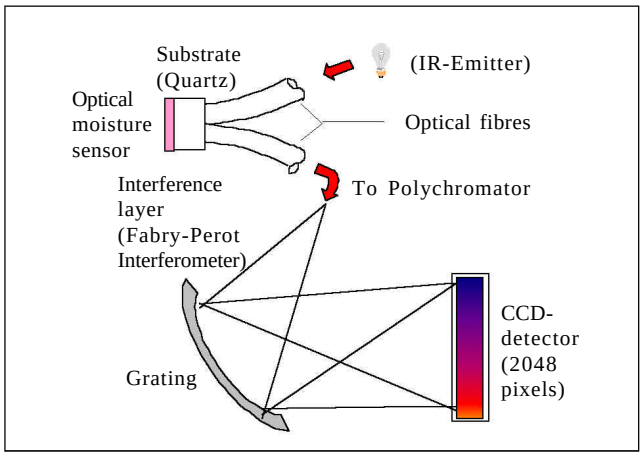
Introduction

The ***Hygrophil F moisture sensor*** is one of the most recent developments in fibre optic technology, using light as a source for characterisation. This product is specially designed for industrial applications.

The optical detector provides reliable performance in the analysis of trace moisture contents in air, gases, liquids and fluids, even under severe conditions.
The sensor is suitable for direct insertion in the process and is not influenced by contaminants, corrosive environments, strong magnetic fields, chemicals, compressor oil or heavy hydrocarbons.

Measuring principle

The moisture-sensitive element uses a thin-layer Fabry-Perot Interferometer consisting of vacuum-metallized dielectric optical layers which change their spectral optical properties when they come in contact with water vapour. This is because the vapour molecules become embedded in the micro pores of these layers, causing their optical refractive index to change (n_{air}= 1,0; n_{water} = 1,33).



Measuring principle

The water molecules in the pores of the sensor equilibrate with the moisture content of the media.
The fibre optic measuring principle makes use of this effect by deriving the sorption from a spectro-optical measurement of the shift in the reflection spectra. The light from a source is fed through a fibre optic cable to the sensor and back to a polychromator. The change in refractive index is measured and converted into an electrical signal related to the moisture concentration.

Features and Benefits

Fibre Optic Moisture sensors have many advantages compared to traditional moisture measuring techniques, such as metal oxide capacitive sensor and quartz crystal sensors:

- Smaller diameter sensor, suitable for direct process insertion;
- Fast response time;
- Unaffected by contaminants such as glycol, methanol, compressor oil and heavy HC's;
- Stronger resistance to chemical attack;
- Suitable for process pressures up to 25.000 kPa (250 barg);
- Easier to operate;
- Suitable for use in the highest classification of explosion zones (CENELEC Zone 0);
- User cleanable without need for recalibration.

Technical Data

General

Measuring principle	Optical Fabry-Perot Interferometer
Measuring range	-70...20°C DT
Media	Air, gases and fluids
Accuracy / reproducibility	± 1.5°C / ± 0.5°C
Measurement rate	7 sec per measurement
Process conditions	Gas pressure: up to 25.000 kPa (250 barg) Gas temperature: -30 to + 95°C Flow rate: not critical

Sensor

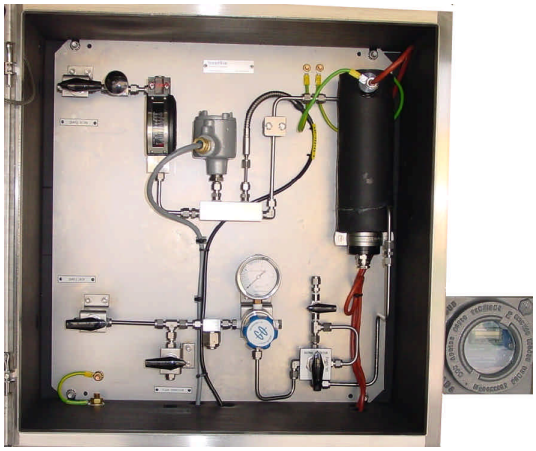
Sensor size	6mm OD with compression-type fittings (Swagelok or others)
Immersion depth	50, 100 or 150mm with 2 meter cable
Fiber optic cable	2 meter field-compatible
Optional	Flexible metal conduit

Interconnection

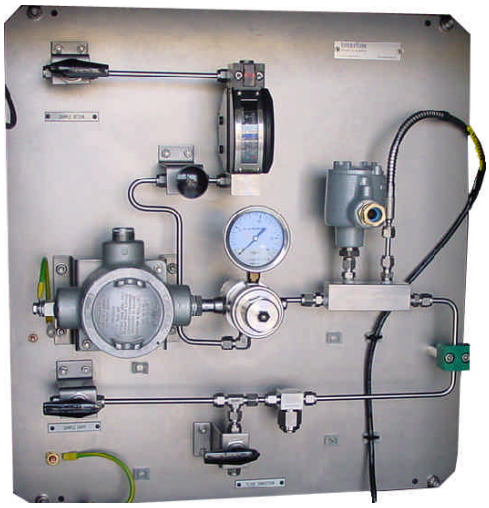
Sensor – Control unit	Fiber-optic extension cable with standard lengths: 5, 10, 25 or 100m Optional: Sensor with fixed fiber-optic cable up to 500m

Control unit

Inputs	Fiber-optic moisture sensor, analog inputs for Pressure and Temperature
Outputs	Analog: Isolated 0/4…20 mADC at max. 550 Ohm load. Digital: RS 232
Alarms	System failure, range limit
Display	LCD display with 2 x 16 characters, illuminated, 8mm high
Read out	Dewpoint temperature DT: -100 ... +100°C Moisture concentration in ppmv, lb/mmscf, percent by volume. Relative humidity RH: 0...30% Water vapour partial pressure, Mixing ratio, Specific air humidity, Gas temperature, Gas pressure. Water content according IGT, Research bul. #8
Auxiliary input variables	Temperature (TT) and Pressure (SP) at the measuring point can be entered manually or automatically via transmitters
Ambient temperature limits	Operating temperature: 5 … 50°C Storage temperature: -25 … 50°C
Voltage/power requirements	115 / 230 VAC 50/60 Hz, 15 VA
Dimensions	19" / Desktop version: 340 x 132 x 359 mm Wall-mounted version: 340 x 300 x 132 mm Protection type: IP30 Weight: 8 kg



Typical liquid sample system



Typical natural gas sample system

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