LUMASENSE™ TECHNOLOGIES

Humidity Transducer – INNOVA MM0037

Uses:

- Measures absolute humidity of air
- Enables relative humidity to be calculated
- Provides input for thermal comfort evaluations

Features:

- Measurements are stable and accurate
- Results are available quickly
- Resistant to chemical interferents in air
- Complies with ISO7726

Introduction

The Humidity Transducer MM0037 measures the absolute humidity of air. If the humidity is to be expressed as Relative Humidity (RH), then this can be easily calculated when the air temperature is also measured. The transducer is designed for use with Thermal Comfort Data Logger – INNOVA 1221.

Transducer Design

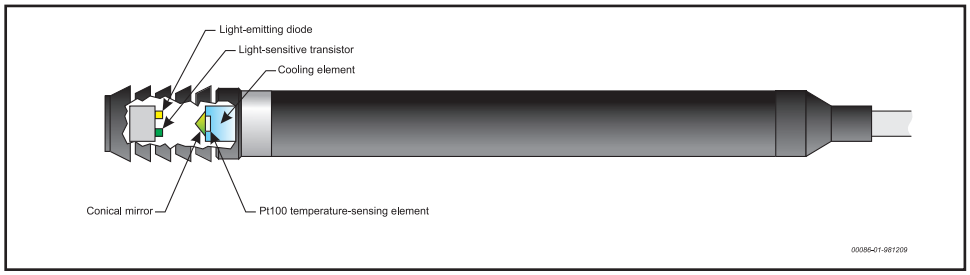
The design provides a robust and stable transducer for field use. The transducer is not affected by chemicals in the air that can cause problems when measuring with other types of transducers.

The transducer comprises a Light Emitting Diode (LED), a light sensitive transistor, a mirror, a cooling element and a Pt100 temperature sensor. The mirror is easily accessible for cleaning when necessary, while the other components are maintenance-free.

Measurement Principle

A cooling element is attached to the conical mirror. When the humidity measurements are started, the cooling element is activated and the temperature of the mirror begins to drop. Control of the transducer now moves to the LED and light-sensitive transistor.

The LED emits a constant beam of light which is reflected by the conical mirror. Under normal circumstances, the light-sensitive transistor does not receive any of the light being emitted, however, as the temperature of the mirror drops condensation forms on its surface. The light being reflected by the mirror now becomes scattered and is detected by the light-sensitive transistor. This transistor now controls the temperature of the mirror so that there is a constant film of dew on the mirror's



surface. The Pt100 sensor registers this dew- point temperature.

The accuracy with which the humidity can be measured is dependent on the stability of the sensor measuring the mirror's temperature. A Pt100 sensor is used here to provide the necessary stability.

Pt100 Sensor

This is a resistor sensor (resistance of 100W at 0˚C) made of platinum, which provides excellent stability and accuracy.

The actual sensors chosen for this transducer provide results within a narrow tolerance range. This enables the transducer to be moved around and connected to other instruments without requiring any pre- measurement adjustments to be made.

The transducer will operate without ever requiring recalibration. The only maintenance required is a regular inspection of the conical mirror. When necessary, the mirror can be cleaned with a lint-free cloth and some alcohol.

Specifications – INNOVA MM0037

HUMIDITY TRANSDUCER:

Dew-point Range:
$t_a - t_d < 25^{\circ}C$ (45°F)
(where t_a is the air temperature and t_d is the dew- point temperature)

Accuracy:
$t_a - t_d < 10K$: ±0.5K or ±0.05 kPa
$10K < t_a - t_d < 25K$: ±1.0K or ±0.1 kPa

Measuring Time:
Typically 1 minute

Measuring Interval:
3 minutes with the 1221

Integral Connection Cable:
Length 2.5m; connected to associated equipment via a 8-pin DIN plug

WEIGHT:
Approximately 243g (including cable)

DIMENSIONS:
Length: 150mm

CE	**COMPLIANCE WITH STANDARDS** CE-mark indicates compliance with EMC Directive and Low Voltage Directive.
Safety	EN 61010-1 (1993) & IEC 1010-1 (1990): Safety requirements for electrical equipment for measurement, control and laboratory use.
EMC Emission	EN 50081-1 (1992) : Generic emission standard. Part 1: Residential, commercial and light industry. EN 50081-2 (1993): Generic emission standard. Part 2: Industrial environment. CISPR 22 (1993): Limits and methods of radio disturbance characteristics of information technology equipment. Class B Limits. FCC Class B limits.
EMC Immunity	EN 50082-1 (1992): Generic immunity standard. Part 1: Residential, commercial and light industry. EN 50082-2 (1995): Generic immunity standard. Part 2: Industrial environment. **Note:** The above is guaranteed using accessories listed in this Product Data sheet only.
Temperature	IEC 68-2-1 & IEC 68-2-2: Environmental Testing. Cold and Dry Heat. Operating Temperature: 5 to 40°C (41 to 104°F). Storage Temperature: -25 to 70°C (-13 to 158°F).
Humidity	IEC 68-2-3: 90% RH (non-condensing at 40°C).
Mechanical	IEC 68-2-6: Vibration: 0.3 mm, 20m/s², 10-500 Hz. IEC 68-2-27: Shock: 1000 m/s². IEC 68-2-29: Bump: 1000 bumps at 250m/s².

Ordering Information

MM0037 Humidity Transducer

Optional Accessories

1221	Thermal Comfort Data Logger with UA1276 Thermal Comfort Module
DH0492	Tripod Mounting Adaptor for 3 Transducers
UA1347	Tripod Mounting Adaptor for 4 Transducers
KE0357	Transducer Carrying Case
UA0803	Tripod
UA1348	Tripod Extension Rods (3)
UA0588	Transducer Mounting Adaptor
WL0692	Extension Cable (std. length 6m)
WL0692/y	Extension Cable (definable length up to 20m; y is length in meters)

LumaSense Technologies reserves the right to change specifications and accessories without notice.

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3033 Scott Blvd., Santa Clara, CA 95054 Ph: +1.408.727-1600 Fx: +1.408.727.1677
Energivej 30, 2750 Ballerup, Denmark Ph: +45 4420 0100 Fx: +45 4420 0101 www.lumasenseinc.com

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