



Pura

Pure Gas Dew-Point Transmitter

From the Impedance Range

This economical transmitter is a rugged, self-contained hygrometer designed specifically for the measurement of trace moisture content in ultra high purity gases.



Pura

Pure Gas Dew-Point Transmitter

Features

- Easy to install
- High stability and repeatability
- Measurement range down to -120 °C dp equivalent to <1 ppbv
- Best accuracy of ± 1 °C dew point
- 4-20mA and RS485 text outputs
- Semiconductor industry surface preparation and cleanliness

Why measure trace moisture?

In many high purity gas applications, such as the semiconductor industry, the residual moisture content of the gas is critical to satisfactory operation of a process. Historically trace moisture measurement has been a difficult exercise, demanding the use of complex moisture analysers or expensive analytical techniques. Now Michell has brought to market a simple, economical and very effective solution for on-line measurement of dew-point temperatures down to -120 °C (equivalent to less than 1 part per billion). The PURA transmitter benefits from Michell's experience and expertise in the production and calibration of impedance dew-point sensors. Incorporation of industry standard materials and manufacturing processes gives the first low cost transmitter suitable for large-scale integration into a semiconductor fabrication plant or high purity gas line.

What makes PURA so good?

PURA's brilliance is in its simplicity. This self-contained transmitter module has been designed to fit seamlessly into your pure gas process and give you the measurement you need - continuously and reliably.

PURA's sensor housing is fabricated from cold drawn stainless steel with an internal 0.25 Ra μm electro-polished finish for minimal moisture adsorption and cleaned to oxygen standards. The $\frac{1}{4}$ " male VCR gas connection ports are supplied capped for cleanliness. PURA is delivered cleaned and double bagged to class 100 clean room specifications in a pure inert gas sealed environment. Furthermore, PURA is delivered fully calibrated and ready to use. The calibrated 4-20mA output can be connected to a process indicator or centralised control system, or the RS485 text output can be used to connect directly into a suitable computer system.

Internal volumes have been designed to a minimum. This ensures the fastest possible response speed in commissioning and also when a moisture event occurs.

The sensor body seal is rated to 10^{-9} torr whilst the whole system will handle pressure right up to the VCR coupling rated maximum of 24 MPa.

Customisable information

Whilst PURA is shipped ready to use, calibrated precisely at 10 °C dew point intervals across its measurement range against transfer standards traceable to NIST and NPL, it is also user-customisable. The 4-20 mA output can be user set over any part of the operating range, with a minimum output span of 1 °C. Also, the factory pre-set alarm signals, providing over-range, under-range and sensor fault conditions, can also be easily re-set to suit your own application and system needs. Adjustment of all these parameters is achieved through a simple PC-based user interface, supplied free of charge as a download at www.michell-instruments.com

Easy installation and operation

PURA is simple to install. The $\frac{1}{4}$ " male VCR gas connection ports are set at a pitch of 120mm to fit into a standard MFC footprint. The whole unit is only 150mm in height and weighs less than 500g. PURA is a three wire transmitter, providing ultimate flexibility in operation and powered by any regulated 12 to 28V dc source (max 25 mA).

MICHELL
Instruments



The Dew Point Specialists



Reliability and Support

When a critical measurement is to be made, there are two vital factors you need to consider when deciding on which instrument to use: reliability and support. Michell excels in both these areas. The sensor and measurement technologies used in PURA have been extensively developed over the last decade and have been proven in tens of thousands of demanding industrial applications, with high levels of contamination, corrosion, vibration and extremes of temperature. Michell's Ceramic Moisture Sensor technology is in use by major industrial equipment manufacturers worldwide. In the highly unlikely event that something does go wrong, you can be assured of the support from a world-wide network of branch offices and authorised distributors, many of whom maintain calibration facilities or instrument stocks and all of whom have the experience and determination to provide you with the very best support for your application.

Options

For OEM customers, we can supply PURA in either of two optional configurations for incorporation into other equipment: PURA OEM: physically exactly the same as the PURA Premium, with the same cold drawn stainless steel construction and 0.1 - 0.2 Ra μm electro-polished surface finish, but without class 100 clean room preparation and only single-bagged.

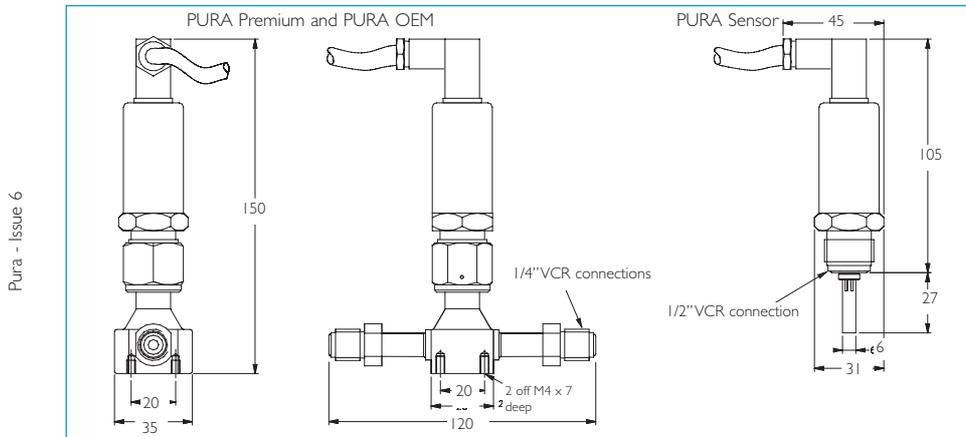
PURA Sensor: As PURA OEM, but without the flow through sensor housing. PURA Sensor is delivered in a probe configuration with an integrated 1/2" VCR connection, as shown in the diagram below. PURA Sensor is delivered with a transit guard to protect the active sensor surface. This should be removed in use to allow a minimum volume sample housing to be used, to maximise response speed.

An intrinsically safe version of PURA is available, based on Michell's Transmet IS Dew-point Transmitter. PURA IS provides a 4-20mA output only. Please consult Michell's Technical Department for further details.

Technical Specifications

Sensor	
Type	Michell Ceramic Moisture Sensor
Range	-120 to -40 °C dew point (calibrated -100 to -40)
Accuracy	+/- 1 °C from -40 to -60; +/- 2 °C from -61 to -100; +/- 4 °C from -101 to -120 (estimated)
Resolution	0.1 °C from -40 to -79.9; 1 °C from -80 to -100; 1 to 3 °C from -100 to -120
Pressure rating	Minimum 10 ⁻⁹ torr; Maximum 24 MPa
Gas flow rate	1 to 5 Nlmin ⁻¹
Electronics/Electrical	
Power supply	Nominal 24V dc, 10V min to 28V max, current max 25mA
Output	4-20mA output adjustable from 1 to 80 °C span using interface software (supplied) Max load = 1k ohms @28Vdc source, reducing to 200 ohms @10Vdc (50 ohms/V)
Output Error Status	Standard output error conditions as supplied: 23mA = sensor fault; 20mA = over range; 4 mA = under range. These settings are adjustable using the interface software (supplied)
Mechanical	
Sensor block	Cold drawn stainless steel, 0.1 - 0.2 Ra μm electro-polished internal finish
Gas connection ports	Premium and OEM versions: 1/4" male VCR connections PURA Sensor version: 1/2" male VCR connection
Installation profile	Premium and OEM versions: 120.00 mm pitch, drop in across gas port face seals. Zero pipe clearance required. 2 off M4 x 0.7, 7mm deep mounting holes in block, diagonally opposed at 20 x 20 mm pitch PURA Sensor version: fits into user's 1/2" VCR configured port
Overall dimensions	Premium and OEM versions: 120 x 35 x 150 mm PURA Sensor version: 132 x 35 dia mm
Weight	Premium and OEM versions: 450g PURA Sensor version: 180g
Packaging	PURA: Double bagged and sealed in UHP inert gas PURA OEM and Pura Sensor: Single bagged in 1000 gauge polythene All options: shipped individually in profiled sponge protection and carton Sensor version supplied with protective guard over sensor surface for transportation and handling

Dimensions



Dimensions mm

Michell Instruments Ltd
Nuffield Close, Cambridge CB4 1SS UK
Tel: +44 (0)1223 434800 Fax: +44 (0)1223 434895
e-mail: info@michell.co.uk
www.michell-instruments.com



The Dew Point Specialists



Q6284 (UK)



0179 (UK)

