Pura

Pure Gas Dew-Point Transmitter

This small pure gas transmitter is a rugged, self-contained instrument designed specifically for the measurement of trace moisture content in ultra high purity gases

Features

→ Measurement range down to -120°C dew point ($1ppb_V$)

→ Stable and repeatable measurement

→ High integrity sampling system

→ Analogue and digital output

→ Simple installation

→ VCR process connections

→ Compact design

→ Optional display / alarm unit

Applications

→ Pure gases

→ Semiconductor manufacture

→ Fibre optic production

→ Electronic component manufacture

→ Industrial gases

→ ... and many more

Pura

→

MICHELL
Instruments

Pura

Pure Gas Dew-Point Transmitter

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 problematic, 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. Pura is delivered cleaned and double bagged to class 100 clean room specifications in a pure inert gas sealed environment. The ¼" male VCR gas connection ports are supplied capped for cleanliness. The transmitter is delivered fully calibrated and ready to use. The calibrated 4-20 mA 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 (240 Barg).

Customisable Information

Whilst Pura is shipped ready to use, calibrated 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

www.michell.com

High integrity sampling system

¼" male VCR gas connection port

Simple installation

Related Products

Cermet II

Cermax

MICHELL Instruments

Measurement range down to
-102°C dew point ($1ppb_V$)

Stable and repeatable
measurement

Optional monitor provides
analogue and digital output

Easy Installation and Operation

Pura is simple to install. The ¼" male VCR gas connection ports are set at a pitch of 120 mm to fit into a standard MFC footprint. The whole unit is only 150 mm in height and weighs less than 500 g. Pura is a three wire transmitter, providing ultimate flexibility in operation and powered by any regulated 12 to 28 V dc source (max 25 mA).

Optional Monitor

If the application calls for the dew point or moisture content to be displayed then the Pura can be supplied as a hygrometer, with 1/8 DIN panel mounted monitor. This monitor is simple to connect and also acts a power supply for the Pura Transmitter. The monitor can be programmed by the user to display dew point in °C or moisture content in ppm_V or ppb_V. The measurement is shown on an easy to read 5 digit LED display. The Pura Monitor also provides 2 user settable alarm relays as standard with a further 2 available as an option. Finally the Pura Monitor can provide both analog and digital (RS232 or 485) outputs.

Other Options

For OEM customers, Pura can be supplied 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 ½" 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 I.S. Dew-point Transmitter. Pura I.S. provides a 4-20 mA output only. Please consult Michell's Technical Department for further details.

Pura Plus: Michell's new real time in-line trace moisture event sensor for UHP and semiconductor applications. For more information, see datasheet, reference: PPL-0707.

S4000 TRS

Pura Plus

Pura

Pure Gas Dew-Point Transmitter

Technical Specifications

Sensor

Type	Michell Ceramic Moisture Sensor
Range	-120 to -40ºC dew point (calibrated -100 to -40ºC)
Accuracy	±1ºC from -40 to -60ºC ; ±2ºC from -60 to -100ºC ; ±4ºC from -100 to -120ºC (estimated)
Resolution	0.1ºC from -40 to -79.9ºC ; 1ºC from -80 to -100ºC ; 1 to 3ºC from -100 to -120ºC
Pressure rating	Minimum 10^{-9} torr; Maximum 24 MPa (240 Barg)
Gas flow rate	1 to 5 Nlmin^{-1}

Electronics

Power supply	Nominal 24 V dc, 10 V min to 28 V max, current max 25 mA
Output	4-20 mA output adjustable from 1 to 80°C span using interface software (supplied) Max load = 100 Ω + 50 Ω x (Vsupply - 8)
Output error status	Standard output error conditions as supplied: 23 mA = sensor fault; 20 mA = 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: ¼" male VCR connections Pura Sensor version: ½" 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, 7 mm deep mounting holes in block, diagonally opposed at 20 x 20 mm pitch Pura Sensor version: fits into user's ½" VCR configured port
Overall dimensions	Premium and OEM versions: 120W x 35D x 150H mm Pura Sensor version: 132 x 35 dia
Weight	Premium and OEM versions: 450 g Pura Sensor version: 180 g

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

Monitor

Measurement units	°C, °F dew point; ppm$_V$ and ppb$_V$ with user selectable range and resolution
Secondary measurement variable	Pressure via external transducer 0-30 MPa (300 Barg). Completely user configurable for any industry standard transducer. Automatic compensation for ppm$_V$ and ppb$_V$
Power supply	Universal 85 to 265 V AC; 95 to 370 V DC
Inress protection	IP54 (NEMA 12); IP66 (NEMA 4X) for front panel only with optional cover
Operating temp	-20 to +50°C
Relays	2 off 10 A/240 V c/o fully user configurable: can accommodate full range for selected engineering unit + sensor fault alarm functions
Outputs: analogue	4-20 mA fully user configurable and scaleable for range
digital	RS232: provides 2-way communication - full data access to user + total availability of all set-up

Other Options

Power supply	18 to 36 V AC; 9 to 60 V DC
Relays	1 or 2 further 5 A relays (max 4 in total) n/o type fully user configurable: can accommodate full range + full unit choice + sensor fault alarm functions
Outputs: analogue:	0-10 V fully user configurable and scaleable for range
digital:	RS485: provides 2-way communication - full data access to user and total availability of all set-up and configuration
Cable	Standard 2 metres (1200 metres max)

Dimensions
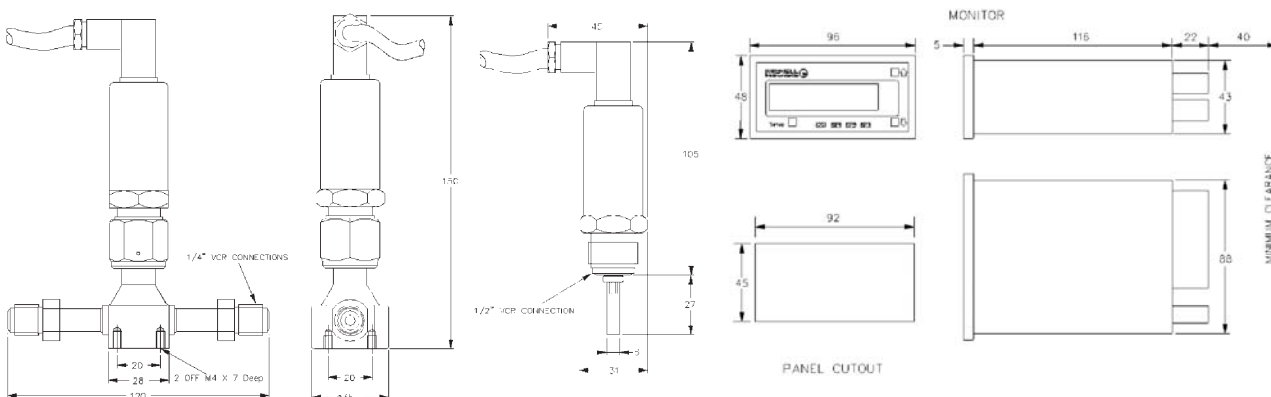
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