

Pura Transmitters

Ultra-Pure Moisture Transmitter

This small transmitter is a rugged dew-point sensor for the measurement of trace moisture in ultra-high purity gases.

Simple to use and install, the Pura features analog and digital outputs with optional I.S. approvals, plus there is a range of VCR process connections and electrical connections. A service exchange program is also available, reducing the cost of maintenance.

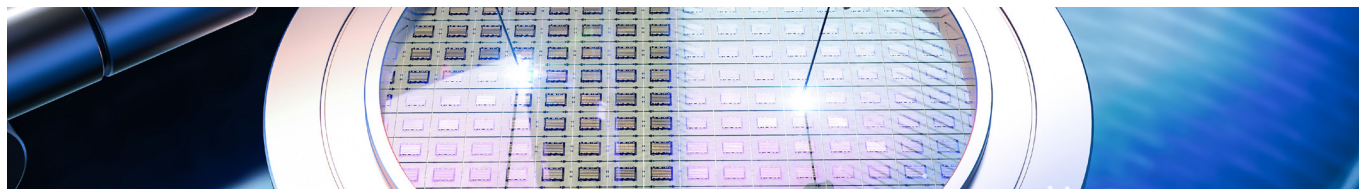


Highlights

- Measures down to $-120\text{ }^{\circ}\text{Cdp}$ ($-184\text{ }^{\circ}\text{Fdp}$) (1ppb_v)
- Stable and repeatable measurement
- Fast response
- Modbus RTU over RS485 communication
- 4...20 mA 2 wire
- Traceable 7-point calibration certificate
- 1/2", 1/4" male VCR process connections
- Optional monitor/controller
- MiniDIN 43650 C, M12 electrical connectors
- Optional hazardous area approval
- Service exchange program

Applications

- Gas purification systems
- Semiconductor manufacture
- Pure gases
- Fibre optic production
- Optical coating processes
- Electronic component manufacture
- Speciality gas production and distribution



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The Pure Gas Moisture Transmitter

In many high-purity gas applications, such as the semiconductor industry, the residual moisture content of the gas is critical to the satisfactory operation of a process.

Historically, trace-moisture measurement has been problematic, demanding the use of complex moisture analyzers or expensive analytical techniques. Michell Instruments has introduced a simple, economical solution for online measurement of dew-point temperatures down to $-120\text{ }^{\circ}\text{C}$ ($-184\text{ }^{\circ}\text{F}$) (less than 1 part per billion).

The Pura transmitter benefits from Michell's experience and expertise in the production and calibration of the ceramic metal-oxide dew-point sensor. 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.

The Pura family of pure gas transmitters provides a stable, reliable and repeatable moisture measurement for all pure gas trace moisture applications.

Ease of Installation

Flexible product design ensures the unit can be quickly and economically installed.

- 1/4" male or 1/2" male VCR process connections
- MiniDIN 43650 form C or M12 5-pin electrical connectors
- Cold drawn stainless steel, 0.1...0.2 Ra μm electro-polished internal sample block finish
- Clean room double-bagged or industrial single-bagged product packaging
- On-site configuration and diagnostic communication tool

Service Exchange/Recalibration Program

Michell offers 2 services for customers who want minimum downtime and sensor traceability, while maintaining the reliability of their system:

- **Sensor Exchange** – Customers place an order for a guaranteed, reconditioned 1/2" male VCR sensor. When it arrives, they exchange it for the installed sensor which is returned to Michell, resulting in zero process downtime.
- **Recalibration** – Customers return their installed sensor to Michell, where they are inspected, checked and recalibrated before being returned. This provides on-going sensor traceability for the process.

Global Certifications

The Pura series has a broad range of certifications to ensure a single stocked unit can be used in any global application.

- Pura I.S. – ATEX, UKCA & IECEx
- Pura I.S. – cQPSus (US and Canada)

- Pura I.S. – EX-TR CU
- Pura – UL approval

Michell has a team of experienced application engineers, based both in field and factory, who are available to assist with any dew-point sensor application.

Optional Monitor

If the application calls for the dew-point or moisture content to be displayed, the Pura can be supplied as a hygrometer system, with an Online Monitor or Advanced Online Monitor. Our monitors are simple to connect and provide power to the Pura Transmitters.

Measurement Performance

The transmitter uses Michell's market-leading ceramic metal-oxide moisture sensor technology, coupled with the latest-generation sophisticated microcontroller electronics, to provide accurate and stable measurement across the transmitter's product life.

- Accuracy $\pm 1\text{ }^{\circ}\text{C}$ from -40 to $-60\text{ }^{\circ}\text{Cdp}$ (refer to page 3 for further details)
- Fast response

Flexibility of Ownership

The Pura transmitter has a RS485 communication system, giving customers the opportunity to re-range and re-scale with a communication kit for a variety of moisture measurements.

- Re-ranging 4...20 mA within the -120 ... $-40\text{ }^{\circ}\text{Cdp}$ (-184 ... $-40\text{ }^{\circ}\text{Fdp}$) range
- Moisture scaling – dew point, ppm_v , ppb_v

Speed of Supply

The transmitter is manufactured within Michell's world-leading high-volume moisture transmitter manufacturing center in the United Kingdom, which ensures reliability and repeatability of delivery and field supported by a network of Michell's global service centers.

- Calibration manufacturing system is traceable to globally recognized NPL and NIST ISO 17025 standards

Installation Accessories

Transmitters are available with a range of practical accessories.

- Mating 1/4" female VCR Swagelok adaptors
- 1/4" VCR electropolished sample blocks
- Mating electrical connector and cables

Customization

If your application requires a customized sensor, we have specialized design and manufacturing capability to cover your requirements.

Technical Specifications

Product	Pura 2-wire, 3-wire & Digital Transmitters	Pura I.S. Transmitter
Performance Specifications		
Measurement Range	-120...-40 °Cdp (-184...-40 °Fdp); non-standard ranges available on request	
Accuracy	±1 °C from -40 to -60 °Cdp (±1.8 °F from -40 to -76 °Fdp) ±2 °C from -60 to -100 °Cdp (±3.6 °C from -76 to -148 °Fdp) ±4 °C from -100 to -120 °Cdp (±7.2 °C from -148 to -184 °Fdp (extrapolated))	
Calibration	Traceable 7-point calibration certificate	
Electrical Specifications		
Output Signal	4...20 mA (2-wire connection, current source) 4...20 mA (3-wire connection, current sink) Pura M12: Modbus RTU over RS485 Pura 3-wire PUR-AOL-SEN-D: Michell Mnet digital	4...20 mA (2-wire connection, current source)
Output	Dew point or moisture content (ppm _v , ppb _v)	
Analog Output Scaled Range	Dew point: -120...-40 °C (-184...-40 °F); Moisture content in gas: 0...127 ppm _v	
Supply Voltage	Pura 2-wire/3-wire & Pura I.S.: 12...28 V DC Pura M12: 5...28 V DC (digital)*	
Load Resistance	Max 250 Ω @ 14 V (500 Ω @ 24 V)	
Current Consumption	23 mA max, depending on output signal	
Compliances	CE & UKCA	
Operating Specifications		
Operating Temperature	-40...+60 °C (-40...+140 °F)	
Compensated Temperature Range	-20...+50 °C (-4...+122 °F)	
Storage Temperature	-40...+60 °C (-40...+140 °F)	
Operating Pressure	Minimum 10 ⁻⁷ Pa (10 ⁻⁹ torr); Maximum 24 MPa (240 barg/3481 psig)	
Flow Rate	1...5 Nl/min mounted in standard sampling block; 0...10 m/sec direct insertion	
Mechanical Specifications		
Ingress Protection	IP66 in accordance with standard BS EN 60529:1992; NEMA 4 protection in accordance with standard NEMA 250-2003 Pura M12: IP65	
Intrinsically Safe Area Certificates	ATEX/UKCA: II 1 G Ex ia IIC T4 Ga (-20...+70 °C) IECEX: Ex ia IIC T4 Ga (-20...+70 °C) TR CU: 0Ex ia IIC T4 Ga (-20...+70 °C) cQPSus: Class I, Division 1, Groups A, B, C & D, T4 Class I, Zone 0, AEx ia IIC T4 Ga, Ex ia IIC T4 Ga Tamb +70 °C	
Housing Material	316 stainless steel	
Dimensions	Please refer to the dimensional drawings on page 4 of this datasheet	
Packaging	Pura Premium: Double bagged and sealed in UHP inert gas Pura OEM and Pura Sensor: Single bagged in 1000 gauge polythene All options: shipped individually in a profiled cardboard carton Sensor version supplied with protective guard over sensor technology for transportation and handling	
Process Connection	Pura Premium (PRM): 2 x 1/4" male VCR Pura OEM (OEM): 2 x 1/4" male VCR Pura Sensor (SEN): 1/2" male VCR	
Weight	PRM and OEM versions: 450 g (0.99 lb) SEN version: 180 g (0.4 lb)	
Electrical Connections	Pura: MiniDIN 43650 form C Pura M12: M12 5 Pin (A coded)	MiniDIN 43650 form C
Mating Electrical Connectors	Mating connector supplied as standard Pura M12: optional 0.8, 2, 5 metre (2.62, 6.56, 16.4 foot) M12 A coded connector/cable available	
Diagnostic Conditions (factory programmed)	Sensor fault: 23 mA Under-range dew point: 4 mA Over-range dew point: 20 mA	
Approved Galvanic Isolators	KFD2-CR-EX1.20200 KFD2-CR-EX1.30200 KFD0-CS-EX1.50P KFD0-CS-EX2.50P KFD2-STC4-EX1.H MTL5041 MTL5040	

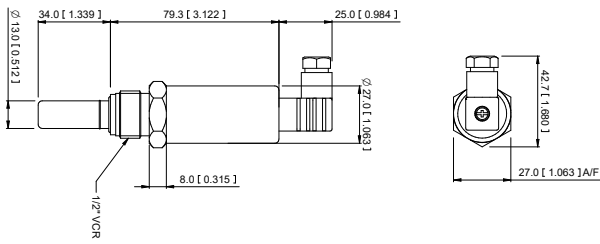
* Applicable on digital Modbus RTU output only

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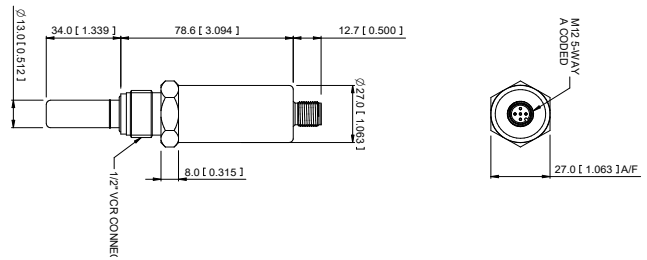
Product Dimensions

Pura 2-wire, 3-wire and Pura I.S.

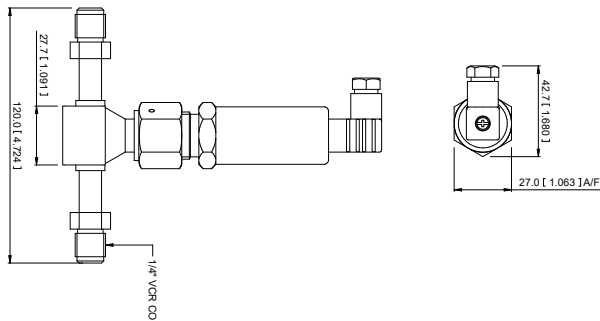
1/2" VCR (SEN)



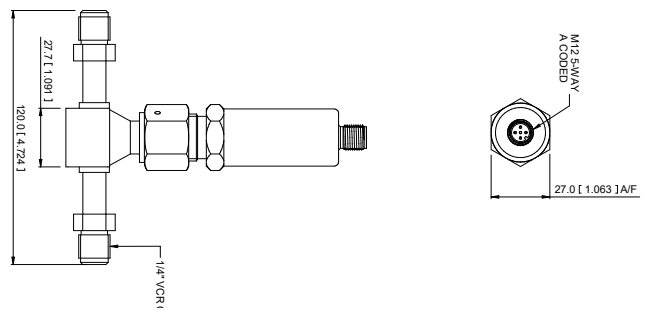
Pura 2-wire M12



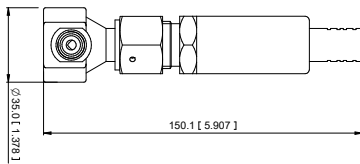
1/4" VCR Sample Block (PRM & OEM)



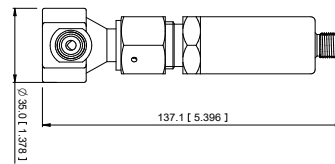
1/4" VCR Sample Block (PRM & OEM)



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1/4" VCR Sample Block (PRM & OEM)



Related Process Products



Pura Advanced Online 2
Advanced Dew-Point Hygrometer



Easidew Online
Universal Dew-Point Hygrometer



Easidew Transitter
Industrial Dew-Point Transmitters



Senz-TX
Oxygen Transmitter



S8000 -100
High-Precision Chilled Mirror Hygrometer



QMA401
Trace Moisture Analyzer



LD8000+
PPB Ultra Trace Nitrogen Analyzer



MultiDetek 3
Modular Process Gas Chromatograph

Michell Instruments adopts a continuous development programme which sometimes necessitates specification changes without notice.
Issue no: Pura Transmitters_99208_V1_EN_0123