

## PURA

### High Purity Gas Dewpoint Transmitter

An economical transmitter equipped with VCR fittings for measurement of dewpoint in high purity gases.

- Simple installation and operation
- High accuracy and repeatability
- Dewpoint range to  $-120^{\circ}\text{C}/-184^{\circ}\text{F}/<1\text{ppbv}$
- High integrity  $1/4$  inch male VCR fittings
- Fast Response
- 4-20 mA (standard) and RS485 (optional) output

### Simple Operation

The Pura is designed to measure dewpoints in high and ultra-high purity gases. Equipped with  $1/4$  inch VCR fittings, the Pura maintains the integrity of your process while providing the most accurate capacitive dewpoint measurement currently available.

The Pura is fully self-contained with integrated sensor and electronics. It is extremely easy to use with its  $1/4$  inch male VCR gas connection ports configured to fit into a standard mass flow controller footprint. A 3-wire transmitter, Pura operates from a 12-28 VDC power source (maximum 25 mA) and provides a 4-20 mA linear, analog output or optional RS485 output proportional to dewpoint.

### Fast Response

The Pura has been designed to respond quickly and accurately to changes in moisture level. The sensor provides a minimum flow path, reduced internal surface area, and contains no unnecessary sampling volume. Add to this the inherently fast response of the Kahn Advanced Ceramic Moisture Sensor and the result is a fast and precise measurement of process dewpoint.

Pura's sensor housing is fabricated from cold drawn stainless steel with an internal  $0.25\text{ Ra }\mu\text{m}$  electro-polished finish for minimal moisture adsorption and cleaned to oxygen standards. The  $1/4$  inch male VCR gas connection ports are supplied capped for cleanliness. Pura is delivered cleaned and double bagged to Class 100 clean room standards in a pure inert gas sealed environment (Pura Premium model).

The sensor body seal is rated to  $10^{-9}$  torr while the entire system will handle pressure up to the VCR coupling rated maximum of 24 MPa (3,500 PSIG).



### High Accuracy and Repeatability

The proprietary design of the Kahn Advanced Ceramic Moisture Sensor, combined with sensitive and stable electronics, provides high accuracy and excellent repeatability. With a standard dewpoint measurement range from  $-120$  to  $-40^{\circ}\text{C}$ , Pura offers measurement accuracy of:

- $\pm 1^{\circ}\text{C}$  dewpoint from  $-40$  to  $-60^{\circ}\text{C}$  dewpoint
- $\pm 2^{\circ}\text{C}$  dewpoint from  $-61$  to  $-100^{\circ}\text{C}$  dewpoint
- $\pm 4^{\circ}\text{C}$  dewpoint from  $-101$  to  $-120^{\circ}\text{C}$  Dewpoint

Pura is shipped ready to use, calibrated precisely at  $10^{\circ}\text{C}$  dewpoint intervals across its measurement range against transfer standards traceable to NIST. It has been developed for and tested by the semiconductor industry to measure trace moisture in the high purity gases used in the processing of silicon wafers in a semiconductor fabrication plant.

### Special Features

Pura offers special features adjustable in the field. The 4-20 mA output can be user set over any part of the operating range, with a minimum output span of  $1^{\circ}\text{C}$ . Also, the factory pre-set failure modes, 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.

## Models

### Pura Premium

- Stainless Steel Construction
- 0.25 Ra  $\mu\text{m}$  electro-polished surface finish
- Double bagged

### Pura OEM

- Stainless Steel Construction
- 0.25 Ra  $\mu\text{m}$  electro-polished surface finish
- Single bagged

### Pura Sensor

- Same as Pura OEM but without flow through sensor housing
- Probe configuration with  $1/2$  inch VCR
- Single bagged

## SPECIFICATIONS

### Measurement Range:

Dewpoint:  $-120$  to  $-40^{\circ}\text{C}$   
(Calibrated from:  $-100$  to  $-40^{\circ}\text{C}$ )

### Accuracy:

$\pm 1^{\circ}\text{C}$  from  $-40$  to  $-60^{\circ}\text{C}$  dewpoint  
 $\pm 2^{\circ}\text{C}$  from  $-61$  to  $-100^{\circ}\text{C}$  dewpoint  
 $\pm 4^{\circ}\text{C}$  from  $-101$  to  $-120^{\circ}\text{C}$  dewpoint  
(estimated)

### Resolution:

Dewpoint:  
•  $0.1^{\circ}\text{C}$  from  $-40$  to  $-79.9^{\circ}\text{C}$   
•  $1^{\circ}\text{C}$  from  $-80$  to  $-100^{\circ}\text{C}$   
•  $1$  to  $3^{\circ}\text{C}$  from  $-101$  to  $-120^{\circ}\text{C}$

### Sensor Block:

Cold Drawn Stainless Steel  
0.25 Ra  $\mu\text{m}$  electro-polished  
internal finish

### Sensor:

Kahn Advanced Ceramic Moisture  
Sensor

### Gas Connection:

$1/4$  inch Male VCR Fittings (Premium and  
OEM versions)

### Power Requirement:

12-28 VDC

### Operating Pressure:

$10^{-9}$  torr minimum;  
24 MPa (3500 PSIG) maximum

### Operating Temperature:

$-40$  to  $+60^{\circ}\text{C}$ ;  $-20$  to  $+40^{\circ}\text{C}$  temperature  
compensated

### Outputs:

4-20 mA with 500 ohms compliance at  
24V, minimum 200 ohms at 12V.  
Maximum cable length 1600 feet;  
Optional RS485 text output with  
corresponding maximum cable length  
of 4000 feet.

### Output range:

4-20 mA output adjustable from 1 to  
 $80^{\circ}\text{C}$  span using interface software.

### 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.

### Installation Profile:

Premium and OEM versions: 4.73 inch  
pitch, drop in across gas port face  
seals. Zero tubing clearance required.  
Quantity 2 M4 x 0.028, 0.28 inch deep  
mounting holes in block, diagonally  
opposed at 0.79 x 0.79 inch pitch.

Pura Sensor version: Fits into user's  $1/2$   
inch VCR configured port.

### Flow Rate:

2-10 SCFH (1 to 5 l/min)

### Overall Dimensions:

Premium and OEM versions:  
4.72 x 1.38 x 5.97 inches.  
Pura Sensor version:  
5.24 x 1.23 diameter inches

### Weight:

Premium and OEM versions: 1 lb.  
Pura Sensor version: 0.4 lb.

### Packaging:

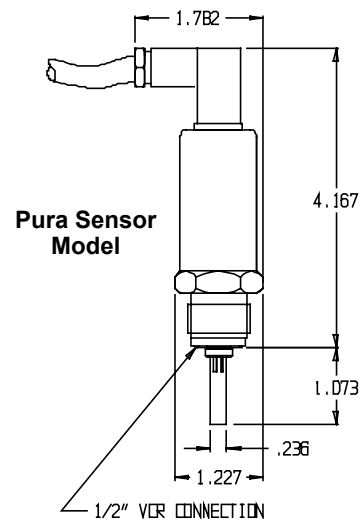
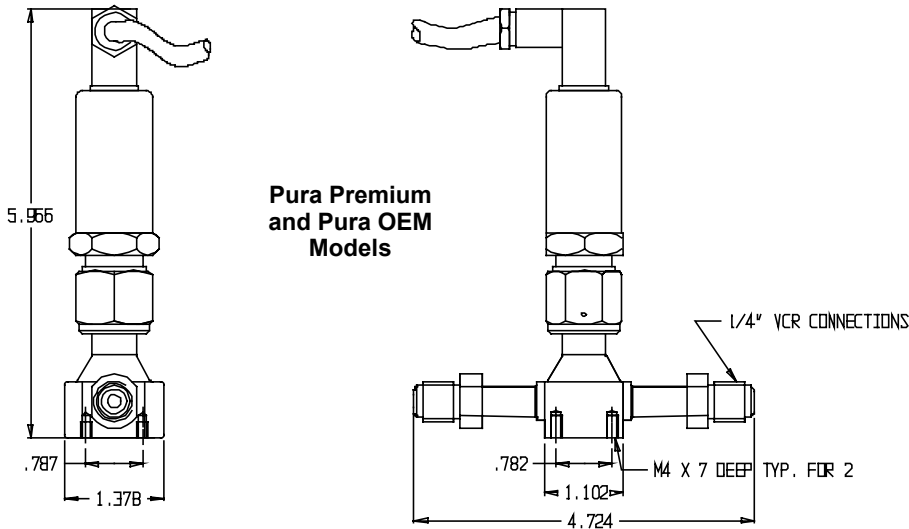
Pura Premium: Double bagged and  
sealed in UHP inert gas.  
Pura OEM and Pura Sensor: Single  
bagged in 1000 gauge polyethylene.  
All options: Shipped individually in  
foam protection and carton.  
Supplied with protective steel guard  
over sensor surface for transportation  
and handling.

### Traceable Certification:

$-75$  to  $+20^{\circ}\text{C}$  dewpoint traceable to NIST.  
For dewpoints  $< -75^{\circ}\text{C}$ : Direct reference  
to a fundamental optical hygrometer.

### Options:

- Display unit
- Power supply module
- Intrinsically safe version



### NOTE:

The information included herein was correct at the time of  
publication and supersedes all previously published data. However,  
it is our policy to continually improve our products to ensure ever  
better performance. Consequently, current Kahn products may  
incorporate modifications not shown or described on these pages.

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