

# Model SDT-Ex Intrinsically Safe Dewpoint Transmitter

*The Shaw Moisture Meters Model SDT-Ex* is a compact, 3 wire, 4-20 mA dewpoint transmitter designed to meet the stringent demands of industrial applications.

The Model SDT-Ex is certified intrinsically safe to ATEX: Ex II 1 GD Ex ia IIC T4 Ga (-20 °C ≤ Ta ≤ +60 °C) IECEx: Ex ia IIIC T200/135 °C Da (-20 °C ≤ Ta ≤ +60 °C) for use in hazardous areas using a signal isolator.

Incorporating advanced electronics, the Model SDT-Ex derives its power from a 7 - 28 V DC non-isolated power source and is configured to output a linear, isolated, 4 - 20 mA signal for distances up to 1,000 meters (3,280 ft).

Utilising the Ultra High Capacitance Shaw Moisture Sensor, various dewpoint ranges are available covering an overall range from -100 °C to +20 °C dewpoint. The 4 - 20 mA output is configurable in °C dewpoint, °F dewpoint, ppm(v), ppb(v), g/m<sup>3</sup> and lb/MMSCF.

The unit is fully self-contained within a robust housing, providing weatherproof protection to IP66/NEMA 4X.

The Model SDT-Ex dewpoint transmitter is supplied ready to use, with a Calibration Certificate traceable to National & International Humidity Standards, instruction manual and two metres (6.56 feet) of cable.



## Features

- 3 wire, 24 V, 4 - 20 mA dewpoint transmitter
- Intrinsically safe to ATEX and IECEx standards  
ATEX II 1 GD Ex ia IIC T4 Ga (-20 °C ≤ Ta ≤ +60 °C)  
IECEx Ex ia IIIC T200/135 °C Da (-20 °C ≤ Ta ≤ +60 °C)
- Overall range -100 °C to +20 °C dewpoint
- Output configurable in °C, °F dewpoint, ppm(v), ppb(v), g/m<sup>3</sup> and lb/MMSCF
- Accuracy ± 2 °C (±3.6 °F) dewpoint
- Weatherproof rating IP66 – NEMA 4X
- Open/short circuit detection
- Linear 4 - 20 mA output signal
- Self-contained, robust and reliable
- Supplied with Calibration Certificate traceable to National & International Humidity Standards



MOISTURE METERS

## Specifications

### DEWPOINT SENSOR

- **Sensing Element**  
Shaw Ultra High Capacitance Aluminium Oxide Sensor
- **Ranges**  
Dewpoint = 0.1 °C/0.2 °F resolution  
**ZD:** -100 °C to +20 °C (-148 °F to +68 °F) dewpoint  
**HD:** -65 °C to +20 °C (-85 °F to +68 °F) dewpoint  
**P (Purple):** -100 / 0 °C (-148 / +32 °F) dewpoint, 0-6,000 ppm(v)  
**G (Grey):** -80 / 0 °C (-112 / +32 °F) dewpoint, 0-6,000 ppm(v)  
**R (Red):** -80 / -20 °C (-112 / -4 °F) dewpoint, 0-1,000 ppm(v)  
**B (Blue):** -80 / +20 °C (-112 / +68 °F) dewpoint, 0-23,000 ppm(v)  
**MP:** 0.1 to 100.0 ppm(v) 0.1 ppm resolution  
**LP:** 0.01 to 10.00 ppm(v) 0.01 ppm resolution  
**GH:** 0.01 to 10.00 g/m<sup>3</sup> 0.01 g/m<sup>3</sup> resolution  
**LB:** 0.1 to 100.0 lb/MMSCF 0.1 lb/MMSCF resolution
- **AutoCal**  
Field calibration/span check facility. Activated and operated via potentiometer on the transmitter body.
- **Factory Calibration**  
Supplied with Certificate of Calibration traceable to National Physical Laboratory (NPL)
- **Accuracy**  
± 2 °C (±3.6 °F) dewpoint NPL traceable -90 °C to +20 °C (-130 °F to +68 °F)
- **Temperature Coefficient**  
Temperature compensated
- **Resolution**  
0.016 mA
- **Repeatability**  
Better than ±0.3 °C (±0.54 °F) dewpoint
- **Operating Temperature**  
-20 °C to +60 °C (-4 °F to +140 °F)
- **Storage Temperature**  
-20 °C to +70 °C (-4 °F to +158 °F)
- **Response Times**  
Wet to dry: -20 °C to -60 °C - less than 120 secs  
Dry to wet: -100 °C to -20 °C - less than 20 secs
- **Sample Flow Rate**  
Flow independent but ideally two to five litres per minute.  
Max: 25 litres/min.
- **Calibration Warranty**  
12 months from date of dispatch

### ELECTRICAL

- **Intrinsically Safe to ATEX II 1 GD Ex ia IIC T4 Ga** (-20 °C ≤ Ta ≤ +60 °C)  
**IECEx Ex ia IIIC T<sub>200</sub>135 °C Da** (-20 °C ≤ Ta ≤ +60 °C)
- **Electromagnetic Compatibility (EMC)**  
Immunity: complies with EN 61000-6-1:2001  
Emissions: complies with EN 61000-6-3:2000
- **Warm Up Time**  
10 seconds
- **Fault Conditions**  
Open circuit/under range: output drives to 20.5 mA  
Short circuit/over range: output drives to 20.75 mA
- **Isolation**  
Sensing element connected to the 4 - 20 mA loop but isolated from transmitter body.
- **Output Signal**  
4 - 20 mA Linear
- **Operating Voltage**  
7 - 28 V DC reverse polarity protected
- **Maximum Series Resistance**  
= {40 x (Supply Voltage - 7)} ohms

### MECHANICAL

- **Operating Pressure**  
From 1kPa (0.01 barA) to maximum 35,000kPa (350 barA)
- **Operating Humidity (External)**  
Maximum - 95% RH non-condensing
- **Cable Terminations**  
IP66/NEMA 4X rated, size C, DIN EN 175301 connector at the transmitter and other end terminated with bootlace ferrules
- **Cable**  
Supplied with 2 m standard cable. Nominal diameter 3.4 mm, 92 ohms/km at 20 °C
- **Transmitter Enclosure**  
Hard anodised aluminium body with size C, DIN EN 175301 connector.
- **Sensor Protection**  
316 sintered stainless steel filter - 50 micron
- **Probe Material (Wetted Parts)**  
316 stainless steel
- **Weatherproof Classification**  
IP66/NEMA 4X when connector mated to transmitter.
- **Mechanical Connection**  
¾" UNF (16tpi) with integral Viton "O" ring seal.
- **Mechanical Warranty**  
24 months in case of faulty workmanship and defective parts.
- **Weight**  
250 grams (0 lb 8.8 oz) includes connector

## Ordering Information

### To order a Model SDT-Ex Dewpoint Transmitter

#### Model SDT-Ex - (Range)

##### R - Choose required range:

<b>ZD:</b>	-100 °C to +20 °C (-148 °F to +68 °F) dewpoint	
<b>HD:</b>	-65 °C to +20 °C (-85 °F to +68 °F) dewpoint	
<b>P (Purple)</b>	-100 / 0 °C (-148 / +32 °F) dewpoint	0 - 6,000 ppm(v)
<b>G (Grey)</b>	-80 / 0 °C (-112 / +32 °F) dewpoint	0 - 6,000 ppm(v)
<b>R (Red)</b>	-80 / -20 °C (-112 / -4 °F) dewpoint	0 - 1,000 ppm(v)
<b>B (Blue)</b>	-80 / +20 °C (-112 / +68 °F) dewpoint	0 - 23,000 ppm(v)

<b>MP:</b>	0.1 to 100.0 ppm(v)
<b>LP:</b>	0.01 to 10.00 ppm(v)
<b>GH:</b>	0.01 to 10.00 g/m <sup>3</sup>
<b>LB:</b>	0.1 to 100.0 lb/MMSCF

##### Example:

To order a Model SDT-Ex with a measuring range of -80 °C to 0 °C (-112 °F to +32 °F) dewpoint (grey sensor), please order as **SDT-Ex-G**

### To order a Sensor Holder for use with SDT-Ex

##### F - Choose fitting size for sensor holder:

**4:** ¼"    **8:** ⅜"    **6:** 6 mm

##### Example:

To order a Sensor Holder with ¼" fitting please order as **SH-SDT-4**

## Related Products

### Model SU4 - Sample Conditioning Unit

The Model SU4 sample conditioning unit will reduce the pressure from the dryer to give a pressure and flow suitable for measurement. It combines a pressure reduction control, sensor holder and a flow meter for up to 10 litres per minute, (1 - 2 litre is usual for continuous use), mounted on a stove enamelled back plate.



Moisture measurement under pressure will not give the correct answer but room pressure used in the Model SU4 will read correctly.

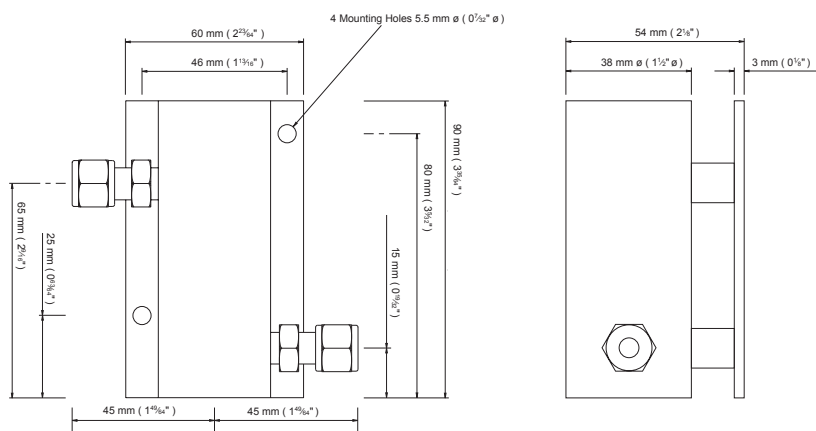
The Model SU4 comes with pneumatic connections with a choice of ½", ¼" or 6 mm compression fittings if required for inlet and outlet.

#### [SU4 Specification Sheet](#)

##### Also available:

- Signal isolator
- Loop powered display
- Screwdriver
- Pressure calculator
- Instruction manual
- Calibration certificate

## Sensor Holder Assembly Diagram



NOTE:  
The assembly is shown with 6.35 mm (¼ inch) OD tube fittings.  
The dimension across the tube fittings will vary for all other size fittings.

## Dewpoint Transmitter

