

ДАТЧИКИ ТОЧКИ РОСЫ

DPT 145, 146

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DPT145 Multiparameter Transmitter for SF6 Gas



The Vaisala Multiparameter Transmitter DPT145 with the DILO DN20 connector.

The Vaisala Multiparameter Transmitter DPT145 for SF6 Gas is a unique innovation that enables online measurement of dew point, pressure, and temperature. It also calculates four other values, including SF6 density. The DPT145 is especially well suited for integration into OEM systems.

Online Reliability

Online dew point measurement combined with pressure measurement provides an excellent assessment of the condition of the SF6 insulation. Sudden and minor leakages are immediately detected by the direct normalized pressure measurement, while online dew point measurement alerts the user to moisture issues, which can weaken the insulation properties of SF6 and cause rapid deterioration. With the DPT145, it is also easy to build a redundant solution for multiple parameters.

Savings Across the Board

A single transmitter, instead of several, saves time and money across the board, from investment to installation,

operation and servicing. Lower assembly costs, fewer cables and connectors, minimized need for on-site visits and field operations - all these translate into cumulative savings. The long calibration interval results in further savings.

Risk-Free, Greener Solution

Online measurement enables gas trends to be followed via a data collection system, making monitoring fast, risk-free, and accurate. Using one instrument for monitoring seven different parameters means also fewer mechanical connections and reduces the risk of leaks. Monitoring



The DPT145 with the weather shield.

Features/Benefits

- First transmitter to offer online measurement of seven SF6 parameters in one unit
- Measured parameters: dew point, pressure, temperature
- Calculated parameters: SF6 density, normalized pressure, dew point in atmospheric pressure, ppm
- Saves time and money across the board, from investment and installation to operation and servicing
- More reliable assessment of the condition of SF6 insulation due to online measurement
- Long calibration interval of years
- Digital output RS-485 with MODBUS

is environmentally friendly because there is no need for sampling - no SF6 gas is released into the atmosphere.

The Fruit of Experience

Vaisala has over 70 years of extensive measurement experience and knowledge. The DPT145 brings together the proven DRYCAP® dew point sensor technology and BAROCAP® pressure sensor technology in one package, providing an innovative and convenient solution for monitoring SF6 gas.

Technical Data

Measured Parameters

Dewpoint	-50 ... +30 °C (-58 ... +86 °F)
Pressure, absolute	1 ... 12 bar (14.5 ... 174 psi)
Temperature	-40 ... +80 °C (-40 ... +176 °F)

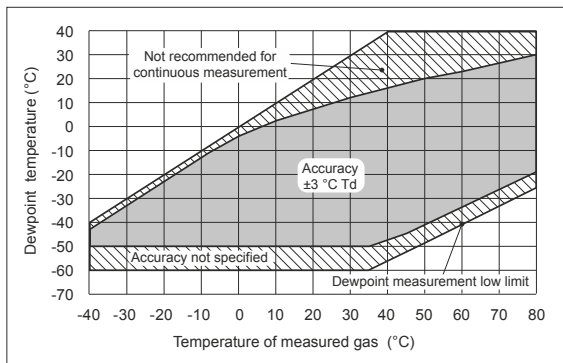
Calculated Parameters

Pressure, normalized to 20 °C (68 °F)	1 ... 12 bar (14.5 ... 174 psi)
SF6 or SF6/N2 mixture density	0 ... 100 kg/m ³
ppm moisture, by volume	40 ... 40 000 ppm
Dewpoint, converted to atmospheric pressure	-65 ... +30 °C (-85 ... +86 °F)

Performance

Dewpoint accuracy	±3 °C (±5.4 °F), see graph below
Dewpoint stability	typical drift < 2 °C (3.6 °F) /5 years
Pressure accuracy at 23 °C (73.4 °F)	±0.4 %FS
Pressure temperature dependence	±0.01 bar/10 °C (18 °F)
Pressure stability	typical drift < 1 %FS /5 years
Temperature accuracy	
0 ... 40 °C (+32 ... +104 °F)	±0.5 °C (± 0.9 °F)
-40 ... 80 °C (-40 ... +176 °F)	±1 °C (± 1.8 °F)
Density accuracy (pure SF6, 1 ... 12 bara)	
0 ... 40 °C (+32 ... +104 °F)	±1 %FS
-40 ... +60 °C (-40 ... +140 °F)	±2.2 %FS
PPM accuracy, typical (5...1000 ppm, 7 bar)	±(7 ppm + 15% of reading)
Sensor response time:	
Pressure response time	< 1 s
Dewpoint response time* 63% [90%] at 20°C and 1 bar	
-50 -> -10 °C Tdf	5 s [10 s]
-10 -> -50 °C Tdf	10 s [2.5 min]

* system equilibrium related response time is typically longer



DPT145 Dewpoint Measurement Accuracy

Operating Environment

Operating temperature of electronics	-40 ... +60 °C (-40 ... +140 °F)
Operating Pressure	0 ... 50 bar (0...725 psi)
Relative humidity	0...100 %
Measured gases	SF ₆ , SF ₆ /N ₂ mixture

Outputs

Digital output	RS-485, non-isolated, Vaisala protocol, MODBUS RTU protocol
Connector	4-pin M8

General

Sensor	Vaisala MPS1 multiparameter sensor
Operating voltage	15 ... 28 VDC
	20 ... 28 VDC in cold temperatures (-40 ... -20 °C (-40 ... -4 °F))
Supply current, during normal measurement	20 mA
	during self-diagnostics max. 300 mA pulsed
Housing material	AlSi316L
Housing classification	IP66
	Weather shield to be used for continuous outdoor installations
Storage temperature range	
transmitter only	-40 ... +80 °C (-40 ... +176 °F)
shipment package	-20 ... +80 °C (-4 ... +176 °F)
Mechanical connection	DILO DN20, DILO DN8, ABB Malmkvist, or Alstom G1/2" compatible connector
	Every connection is helium leak tested at the factory.
Dimensional drawings	See the document B211165EN-B
Weight (with DILO adapter)	765 g (27.0 oz)
Complies with EMC standard EN61326-1, Electrical equipment for measurement, control and laboratory use - EMC requirements;	
Industrial environment, Tested levels	
EN/IEC 61000-4-2, Electrostatic Discharge	8kV con / 15kV air
EN/IEC 61000-4-3, RF field immunity	10V/m (80MHz-4.2GHz)
EN/IEC 61000-4-4, Electric Fast Transient	±2kV power and signal
EN/IEC 61000-4-5, Surge	±2kV power line to ground / ±1kV signal line to ground and power line to line
EN/IEC 61000-4-6, Conducted RF	10Vemf power line and digital output
Immunity	
Mechanical vibration	
EN/IEC 60068-2-6, Fc Sinusoidal vibration	± 6 g, 5-500 Hz sweep 60 min/axis, 3-axis

Accessories

Connection cable for the MI70/DM70 hand-held	219980
USB connection cable	219690
Protection plug for connector	218675SP
1.5 m Shielded PUR cable with 90° connector	231519SP
3m Shielded PUR cable with 90° connector	231520SP
5 m Shielded PUR cable with 90° connector	231521SP
10 m Shielded PUR cable with 90° connector	231522SP
3.0m Shielded FEP cable with straight connector	226902SP
Weather shield	ASM210326SP

DPT146 Dewpoint and Pressure Transmitter



The DPT146 measures both dew point and process pressure. Monitoring compressed air is simpler and quicker, helping you to make more informed decisions.

The Vaisala Dewpoint and Pressure Transmitter DPT146 for Compressed Air makes monitoring compressed air simple and convenient. The DPT146 measures both dew point and process pressure simultaneously, and is the ideal choice for anyone using or monitoring compressed air.

Simple and Efficient Installation

One transmitter providing two of the most important compressed air measurements means reduced installation costs and a much easier setup – with only one instrument needing connection and wiring.

Make More Informed Decisions

Dew point measurement combined with process pressure measurement offers further unique advantages. When dew point data is coupled with live pressure input, conversions to atmospheric pressure or ppm are available online, leaving no ambiguity

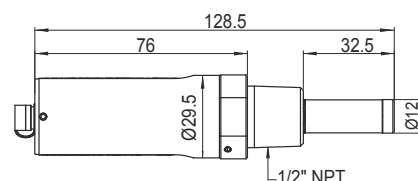
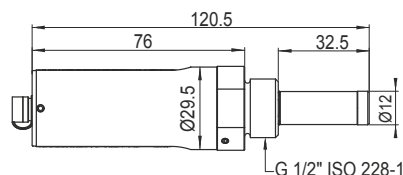
in the information. As an example, regulative requirements of medical gas can be fulfilled easily and quickly.

A Unique Combination of Two World-Class Sensors

The DPT146 combines the knowledge of more than 20 years of sensor-technology development. Proven measurements from the DRYCAP® sensor for dew point and the BAROCAP® sensor for pressure are now combined into one easy-to-use transmitter.

Dimensions

Dimensions in mm (inches)

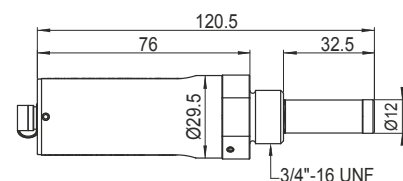
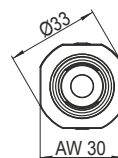


Features/Benefits

- The first transmitter that monitors both dew point and process pressure
- A simple and convenient transmitter for monitoring of compressed air
- Highly accurate humidity information thanks to dew point data coupled with live pressure input
- Proven sensor technology
- Compatible with the Vaisala Hand-Held DM70 for easy spot checking, local display and data logging
- Pressure: 1 ... 12 bar
- Dew point: -70 ... +30 °C (-94 ... +86 °F)
- Digital output RS-485 with MODBUS

Convenience with Proven Performance

Well-developed technology brings both proven results and convenience. Spot-checking and verification of dew point is easy thanks to fully compatible Vaisala DRYCAP® Hand-Held Dewpoint Meter DM70. The DM70 can also be used as a local display and data logger. Temperature measurement is available when the RS485 is in use.



Technical Data

Measured Parameters

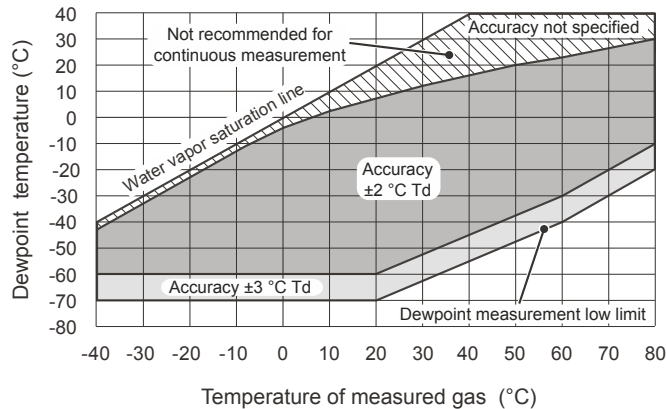
Dew point	-70 ... +30 °C (-94 ... +86 °F)
Pressure, absolute	1 ... 12 bar (14.5 ... 174 psi)
Temperature (available if output RS-485 only selected)	-40 ... +80 °C (-40 ... +176 °F)

Calculated Parameters

ppm moisture, by volume	1 ... 40 000 ppm
Dew point, converted to atmospheric pressure	-75 ... +30 °C (-103 ... +86 °F)

Performance

Dew point accuracy	±2 °C (±3.6 °F)
Pressure accuracy at 23 °C (73.4 °F)	±0.4 %FS
Pressure temperature dependence	±0.01 bar / 10 °C (18 °F)
Temperature accuracy	
0 ... 40 °C (+32 ... +104 °F)	±0.5 °C (± 0.9 °F)
-40...80 °C (-40 ... +176 °F)	±1 °C (± 1.8 °F)
PPM accuracy (7 bar)	±(14 ppm + 12% of reading)
Sensor response time:	
Pressure response time	< 1 s
Dew point response time 63% [90%] at 20°C and 1 bar	
-50 -> -10 °C Tdf	5 s [10 s]
-10 -> -50 °C Tdf	10 s [2.5 min]



DPT146 Dewpoint Measurement Accuracy

Operating Environment

Operating temperature of electronics	-40 ... +60 °C (-40 ... +140 °F)
Operating Pressure	0 ... 50 bar (0...725 psi)

Relative humidity	0...100 %
Measured gases	Air/ non-corrosive gases
Sample flow rate	no effect on measurement accuracy

Outputs

Analog Outputs (2 channels)	
current output	0 ... 20 mA, 4 ... 20 mA
voltage output	0 ... 5V, 0 ... 10V
Accuracy of analog outputs	± 0.01 V / ± 0.01 mA
Digital output	RS-485, non-isolated, Vaisala protocol, MODBUS RTU protocol
Connector	4-pin M8

General

Sensor	Vaisala MPS1 multiparameter sensor
Operating voltage	21 ... 28 VDC, current output 20 ... 28 VDC, voltage output and/or use in cold temperatures (-40 ... -20 °C (-40 ... -4 °F)) 15 ... 28 VDC, RS485 only
Supply current	
during normal measurement	20 mA + load current
during self-diagnostics	300 mA + load current
External load for	
current output	max. 500 Ohm
voltage output	min. 10 kOhm
Housing material	AISI316L
Housing classification	IP66
Sensor protection	Mesh filter AISI303, grade 18 µm
Storage temperature range	
transmitter only	-40 ... +80 °C (-40 ... +176 °F)
shipment package	-20 ... +80 °C (-4 ... +176 °F)
Mechanical connection	ISO G1/2", NPT 1/2", UNF 3/4"-16
Recommended calibration interval	2 years
Weight (ISO1/2")	190 g (6.70 oz)
Complies with EMC standard EN61326-1, Electrical equipment for measurement, control and laboratory use - EMC requirements;	
Industrial environment	

Accessories

Connection cable for MI70 indicator /DM70 meter	219980
USB connection cable	219690
Sampling cells	DMT242SC, DMT242SC2, DSC74, DSC74B, DSC74C
Flange	DM240FA
Loop-powered external display	226476
ISO 1/2" plug	218773
NPT 1/2" plug	222507

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