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DPT145 Multiparameter Transmitter for SF6 Gas

The Vaisala Multiparameter Transmitter DPT145 with the DILO DN20 connector.

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

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 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.

The DPT145 with the weather shield.

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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)

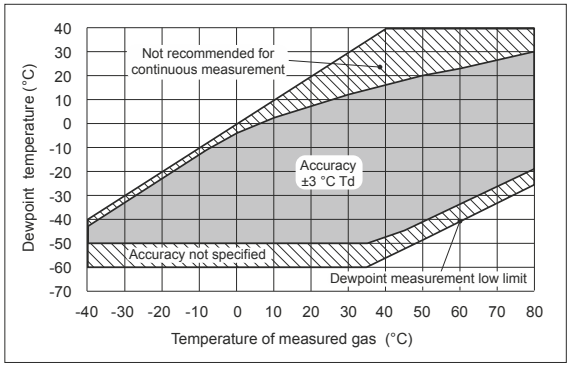
Calculated Parameters

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	AISI316L
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 Immunity	10Vemf power line and digital output
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

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