DPT145 Multiparameter Transmitter for SF6 Gas

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.

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
## Technical Data

### Measured Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dewpoint</td>
<td>-50 ... +30 °C (-58 ... +86 °F)</td>
</tr>
<tr>
<td>Pressure, absolute</td>
<td>1 ... 12 bar (14.5 ... 174 psi)</td>
</tr>
<tr>
<td>Temperature</td>
<td>-40 ... +80 °C (-40 ... +176 °F)</td>
</tr>
</tbody>
</table>

### Calculated Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure, normalized to 20 °C (68 °F)</td>
<td>1 ... 12 bar (14.5 ... 174 psi)</td>
</tr>
<tr>
<td>SF6 or SF6/N2 mixture density</td>
<td>0 ... 100 kg/m² ppm moisture, by volume 40 ... 40 000 ppm</td>
</tr>
<tr>
<td>Dewpoint, converted to atmospheric pressure</td>
<td>-65 ... +30 °C (-85 ... +86 °F)</td>
</tr>
</tbody>
</table>

### Performance

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dewpoint accuracy</td>
<td>±3 °C (±5.4 °F), see graph below</td>
</tr>
<tr>
<td>Dewpoint stability</td>
<td>typical drift &lt; 2 °C (3.6 °F) /5 years</td>
</tr>
<tr>
<td>Pressure accuracy at 23 °C (73.4 °F)</td>
<td>±0.4 %FS</td>
</tr>
<tr>
<td>Pressure temperature dependence</td>
<td>±0.01 bar/10 °C (18 °F)</td>
</tr>
<tr>
<td>Pressure stability</td>
<td>typical drift &lt; 1 %FS /5 years</td>
</tr>
<tr>
<td>Temperature accuracy</td>
<td>0 ... 40 °C (+32 ... +104 °F) ±0.5 °C (± 0.9 °F)</td>
</tr>
<tr>
<td></td>
<td>-40 ... 80 °C (-40 ... +176 °F) ±1 °C (± 1.8 °F)</td>
</tr>
<tr>
<td>Density accuracy (pure SF6, 1 ... 12 bara)</td>
<td>0 ... 40 °C (+32 ... +104 °F) ±1 %FS</td>
</tr>
<tr>
<td></td>
<td>-40 ... +60 °C (-40 ... +140 °F) ±2.2 %FS</td>
</tr>
<tr>
<td>PPM accuracy, typical (5...1000 ppm, 7 bar)</td>
<td>±(7 ppm + 15% of reading)</td>
</tr>
</tbody>
</table>

**Sensor response time:**
- Pressure response time: < 1 s
- Dewpoint response time*: 63% [90%] at 20°C and 1 bar
  - -50 to -10 °C Tdf: 5 s [10 s]
  - -10 to -50 °C Tdf: 10 s [2.5 min]
* System equilibrium related response time is typically longer.

---

### 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:** SF6, SF/N 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
- **Supply current, during normal measurement:** 20 mA
- **Supply current, during self-diagnostics:** max. 300 mA pulsed
- **Housing material:** AISI316L
- **Housing classification:** IP66
- **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 line to ground and ±1kV signal line to ground and power line to line
  - 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
  - EN/IEC 61000-4-7, Immunity: and digital output
- **Mechanical vibration:** 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 line to ground and ±1kV signal line to ground and power line to line
- **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
- **EN/IEC 61000-4-7, Immunity:** and digital output

### 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:** 226903SP
- **Weather shield:** ASM210326SP