Gas Density and Pressure Monitoring

Gas Density and Dew Point Transmitter for SF₆

Type: GD-DP

Gas density transmitters are used for monitoring the gas density and the dew point temperature in high voltage circuit breakers and systems (containing SF₆ gas).

- Pressure range 0.5 … 11 bar abs.
  7.25 … 159.5 psi
- Range dew point Temperature -30 … +40 °C
- Humidity range (absolute) 0 … 50 g/m³
- Digital output for pressure, temperature, SF₆ density, dew point and pressure @20 °C
- Compensation of pressure and temperature
- Rugged construction

IEC 60529: IP 65

Fields of Application

- Power supply facilities
- High voltage and gas insulated switchboards (GIS)
- Medium voltage systems
- Gas filled converters and generator switches as well as other applications, for indoor and outdoor use.

Gas density dew point transmitters in high voltage systems, in combination with gas density monitors or PCs as well as customer specified diagnostic systems are used for documentation, trend analysis and data transmission.

Compared to electromechanical density monitoring devices, which only feature several deactivation functions in case the SF₆ density drops or dew point changing below a certain level, the GD-DP transmitter allows the online monitoring of the gas density and dew point temperature.

This GD-DP transmitter consists of a piezoresistive pressure sensor and a particularly stable capacitive polymer dew point sensor and a build in analyzing unit for calculation of pressure, pressure @20 °C, SF₆ density, temperature and dew point.

The GD-DP transmitter is provided with an RS-485 output for pressure, temperature, SF₆ density, dew point and pressure @ 20°C.

Based on the piezoresistive sensor’s highly accurate, digitally compensated pressure and Temperature signals, the accurate gas density is determined by using an optimized formula for polynomial SF₆ gas density approximation. The correct density value data will be displayed with a cycle time of 64 ms.

With an appropriate programming of the built in analyzing unit this transmitter can also be used for the density monitoring of other gases.
## Technical Data  Gas Density Transmitter Type GD-DP

### Ranges
- **SF₆ density according to Beattie-Bridgeman formula**: 0 … 67 kg/m³
- **Pressure**: 0.5 ... 11 bar abs. / 7.25 ... 159.5 psi abs.
- **Temperature, dew point**: -30 ... +40 °C
- **Humidity (absolute)**: 0 … 50 g/m³
- **Overload pressure**: 16 bar / 232 psi

### Accuracy
- **Total error band, pressure**: < ± 0.5% FS
- **Total error band, temperature**: < ± 1% FS
- **Total error, dew point temperature**: < ± 2 K (1-3)
- **Total error, absolute humidity**: < ± 0.2 g/m³ (1-3)
- **Stability error, pressure**: < 0.1 % FS
- **Stability error, temperature**: < 0.3 % FS
- **Stability error, dew point temperature**: < 1.5 K (1-3)
- **Stability error, absolute humidity**: < 0.15 g/m³ (1-3)
- **Measurement response time**: < 10 sec

### Operation / store and transport conditions
- **Operating temperature**: -40 ... +80 °C / -58 ... 176 °F
- **Storage temperature**: -50 ... +85 °C / -58 ... 185 °F
- **Shock resistance test IEC 60068-2-29**: 100 x 20 g / 6 ms half sine
- **Switch impulse test**: 20 g / 5 x 20 ms sine

### Connectors
- **Pressure connection**: G 1/2" (standard)
- **Electrical connection**
  - **Connector**: M12 x 1 / 8 pins
  - **Supply voltage**: 8 ... 30 VDC
  - **Short circuit proof**: Yes
  - **Type of protection IEC 60947**: IP 65

### Interface
- **Digital output**: RS-485
- **Communication response time (typical)**: 1 ... 10 ms (2 ... 5 ms)

### Material / Weight
- **Housing material**: Stainless steel 1.4305
- **Weight**: Approx. 170 g

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1) calibration once a year  
2) for dew point ≥ -20 °C  
3) for temperature ≤ 20 °C

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![Dew point diagram](image-url)