Transmitter
For gas density, temperature and pressure of SF₆ gas
Model GDT-20, with MODBUS® output

Applications
- Permanent monitoring of the relevant gas condition parameters in closed tanks
- For indoor and outdoor SF₆ gas-insulated equipment

Special features
- High-accuracy sensor technology
- MODBUS® output protocol via RS-485 interface
- Ingress protection IP 65
- Very good long-term stability and EMC characteristics
- Compact dimensions

Description
The model GDT-20 transmitter is a multi-sensor system with digital output for the measurement parameters of pressure and temperature. Based on these measured values, the condition-related data can be determined.

Permanent monitoring
In order to prevent system failures in switchgear and network outages, the permanent monitoring of the gas density is essential.

The GDT-20 transmitter calculates the current gas density from the pressure and temperature using a complex virial equation in the transmitter's powerful microprocessor. Pressure changes resulting from thermal effects will be compensated by this and will not affect the output value.

MODBUS® field bus
The RS-485 interface communicates using the MODBUS® RTU protocol. The instrument's output parameters and their units can be configured and read according to requirements. The GDT-20 can be configured later by the customer for each defined SF₆ gas mixture with N₂ or CF₄.

Signal stability
Due to its high long-term stability, the transmitter is maintenance-free and requires no recalibration. Due to the hermetically sealed weld seam and a measuring cell design without sealing elements, the permanent sealing of the measuring cell is ensured.

The EMC characteristics fulfil the IEC 61000-4-2 through to IEC 61000-4-6 standards and guarantee an interference-free data output.
Specifications

Measuring ranges
Density: 0 ... 60 g/litre (8.87 bar abs. at 20 °C)
Temperature: -40 ... +80 °C
Pressure: 0 ... 16 bar abs.
Burst pressure: 52 bar abs.
Overpressure limit: up to 30 bar abs.
Pressure reference: Absolute

Accuracy data
Specifications only valid for clean, gaseous SF₆
Density: ±0.60 %, ±0.35 g/litre (-40 ... +80 °C)
Temperature: ±1 K
Pressure: ±0.20 %, ±32 mbar (-40 °C < 0 °C)
±0.06 %, ±10 mbar (0 ... 80 °C)

Long-term stability at reference conditions
Temperature: ≤ ±0.10 % of span/year
Pressure: ≤ ±0.05 % of span/year

Refresh rate
Density: 20 ms
Temperature: 20 ms
Pressure: 20 ms

Permissible ambient temperature

<table>
<thead>
<tr>
<th>Selectable versions</th>
<th>Operation</th>
<th>Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>-40 ... +80 °C</td>
<td>-40 ... +80 °C</td>
</tr>
<tr>
<td>-40 ... +176 °F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option</td>
<td>-60 ... +80 °C</td>
<td>-60 ... +80 °C</td>
</tr>
<tr>
<td>-76 ... +176 °F</td>
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<td></td>
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</tbody>
</table>

Voltage supply Uᵦ
DC 17 ... 30 V

Power consumption
max. 0.5 W

Electrical connection
Circular connector M12 x 1 (5-pin)
MODBUS® RTU via RS-485 interface

Circular connector M12 x 1 (5-pin)
1 C Reference potential RS-485 (common)
2 Uᵦ Voltage supply
3 GND Ground
4 A Signal RS-485
5 B Signal RS-485

Functionality MODBUS®
Mixture ratio of SF₆ to N₂ or CF₄ (Default 100 % SF₆ gas)
Customer-specific sensor name

Measured values with alternative units can be retrieved directly in the MODBUS® register.
- Density: g/litre, kg/m³
- Temperature: °C, °F, K
- Pressure: mbar, Pa, kPa, MPa, psi, N/cm², bar (at 20 °C)

Process connection
G ½ B (male), stainless steel
Transmission fluid: synthetic oil

Case
Stainless steel

Permissible humidity
≤ 90 % r. h. (non-condensing)

Ingress protection
IP 65, only when plugged in and using mating connectors with the corresponding ingress protection

Electrical safety
Protected against reverse polarity, protected against overvoltage

Dimensions
Diameter: 48 mm
Height: 103 mm

Weight
approx. 0.40 kg

CE conformity

EMC directive
2004/108/EC, EN 61326 emission (group 1, class B) and interference immunity (industrial application)

EMC tests
- Interference immunity per IEC 61000-4-3:
  30 V/m (80 MHz ... 2.7 GHz)
- Burst per IEC 61000-4-4:
  4 kV
- Surge immunity per IEC 61000-4-5:
  2 kV conductor to ground, 1 kV conductor to conductor
- ESD per IEC 61000-4-2:
  8 kV/15 kV, contact/air
- High-frequency fields per IEC 61000-4-6:
  10 V

Manufacturer’s declaration

RoHS conformity
2002/95/EC
Dimensions in mm

Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Order no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODBUS® Startup-Kit for configuration, consisting of:</td>
<td>14075896</td>
</tr>
<tr>
<td>■ Power supply for transmitter</td>
<td></td>
</tr>
<tr>
<td>■ Cable with M12 x 1 connector</td>
<td></td>
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<tr>
<td>■ Interface converter (RS-485 to USB)</td>
<td></td>
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<tr>
<td>■ USB cable type A to type B</td>
<td></td>
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<tr>
<td>■ MODBUS® tool software on USB stick</td>
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</tr>
</tbody>
</table>

Ordering information

Model / Permissible ambient temperature / Accessories