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

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

Special features
- High-accuracy sensor technology
- MODBUS® output protocol via RS-485 interface
- Ingress protection IP65
- Very good long-term stability and EMC characteristics
- Compact dimensions

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

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

The GDHT-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.

In addition, the GDHT-20 transmitter delivers humidity or dew point information, which enables monitoring within the terms of the Cigré directives and IEC standards.

MODBUS® fieldbus
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 GDHT-20 transmitter 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
Dew point: -50 ... +30 °C
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.
Overload safety: up to 30 bar abs.
Pressure reference: Absolute

Accuracy
Specifications only valid for clean gaseous SF₆
Dew point: ±3 K
Density: ±0.60 %, ±0.35 g/litre (-40 ... 80 °C)
Temperature: ±1 K
Pressure: ±0.20 %, ±32 mbar (-40 ... < 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
Dew point: ≤ ±0.50 % of span/year

Refresh rate
Density: 20 ms
Temperature: 20 ms
Pressure: 20 ms
Dew point: 2 s (typical), auto-adjustment cycle every 30 min.

Permissible ambient temperature

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

Power supply UB
DC 17 ... 30 V

Power consumption
max. 0.5 W (max. 3 W during the heating phase of the humidity sensor)

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

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® registers.
- Density: g/litre, kg/m³
- Temperature: °C, °F, K
- Pressure: mbar, Pa, kPa, MPa, psi, N/cm², bar (at 20 °C)

Process connections

<table>
<thead>
<tr>
<th>Selectable versions</th>
</tr>
</thead>
<tbody>
<tr>
<td>G 1 B, male thread, stainless steel</td>
</tr>
<tr>
<td>DN 20, female thread</td>
</tr>
<tr>
<td>G ½ B, male thread</td>
</tr>
<tr>
<td>Malmkvist®</td>
</tr>
<tr>
<td>Via measuring chamber (see page 5)</td>
</tr>
</tbody>
</table>

Case
Stainless steel

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

Ingress protection
IP65, 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: 96 mm

Weight
approx. 0.40 kg

EMC tests
- 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:
  1 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:
  3 V

Functionality MODBUS®
## Approvals

<table>
<thead>
<tr>
<th>Logo</th>
<th>Description</th>
<th>Country</th>
</tr>
</thead>
</table>
| ![CE](image) | EU declaration of conformity  
- EMC directive, EN 61326 emission (group 1, class B) and immunity (industrial application)  
- RoHS directive | European Union |
| ![EAC](image) | EAC  
EMC directive | Eurasian Economic Community |

Approvals and certificates, see website

## Dimensions in mm

- **G 1 B, male thread**

- **DN 20, female thread**

- **G ½ B, male thread**

- **Malmkvist®**
## Accessories

<table>
<thead>
<tr>
<th>Designation</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modbus® startup kit for configuration, consisting of:</td>
<td>14075896</td>
</tr>
<tr>
<td>- Power supply unit for transmitter</td>
<td></td>
</tr>
<tr>
<td>- Cable with M12 x 1 connector</td>
<td></td>
</tr>
<tr>
<td>- Interface converter (RS-485 to USB)</td>
<td></td>
</tr>
<tr>
<td>- USB cable type A to type B</td>
<td></td>
</tr>
<tr>
<td>- Modbus® tool software on USB stick</td>
<td></td>
</tr>
</tbody>
</table>

## Ordering information

Model / Permissible ambient temperature / Process connection / Accessories