

## Transmitter

# For gas density, temperature, pressure and humidity of SF<sub>6</sub> gas Model GDHT-20, with MODBUS® output

WIKA data sheet SP 60.14

### Applications

- Permanent monitoring of the relevant gas condition parameters in closed tanks
- For indoor and outdoor SF<sub>6</sub> 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



Transmitter, model GDHT-20

### Description

The model GDHT-20 transmitter is a multi-sensor system with digital output for the measurement parameters 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 online, which enables monitoring within the terms of the Cigré guidelines and IEC standards.

#### 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 GDHT-20 transmitter can be configured later by the customer for each defined SF<sub>6</sub> gas mixture with N<sub>2</sub> or CF<sub>4</sub>.

#### Signal stability

Due to its high long-term stability, the transmitter is maintenance-free and requires no recalibration. Through 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.
Overpressure limit:	up to 30 bar abs.
Pressure reference:	Absolute

### Accuracy

Specifications only valid for clean SF<sub>6</sub> gas

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

Selectable versions	Operation	Storage
Standard	-40 ... +80 °C -40 ... +176 °F	-40 ... +80 °C -40 ... +176 °F
Option	-60 ... +80 °C -76 ... +176 °F	-60 ... +80 °C -76 ... +176 °F

### Power supply U<sub>B</sub>

DC 17 ... 30 V

### Power consumption

max. 3 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	U <sub>B</sub>	Power supply
3	GND	Ground
4	A	Signal RS-485
5	B	Signal RS-485

### Functionality MODBUS®

Mixture ratio of SF<sub>6</sub> to N<sub>2</sub> or CF<sub>4</sub> (default 100 % SF<sub>6</sub> gas)

Customer-specific sensor name

Measured values with alternative units can be retrieved directly in the MODBUS® register.

- Density: g/litre, kg/m<sup>3</sup>
- Temperature: °C, °F, K
- Pressure: mbar, Pa, kPa, MPa, psi, N/cm<sup>2</sup>, bar (at 20 °C)

### Process connections

#### Selectable versions

G 1" B, male thread, stainless steel
DN 20, female thread
G ½ B, male thread
Malmkvist®
Via measuring chamber (see page 5)

### 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: 96 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
- **Impulse voltages 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

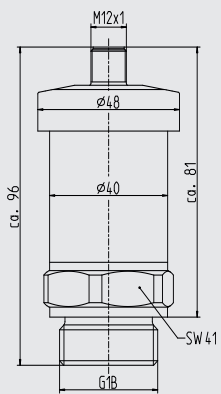
## Manufacturer's declaration

### RoHS conformity

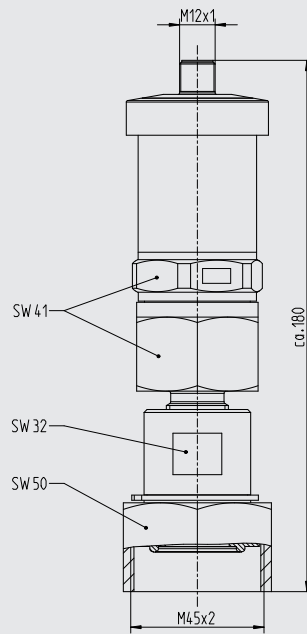
Directive 2002/95/EC

## Dimensions in mm

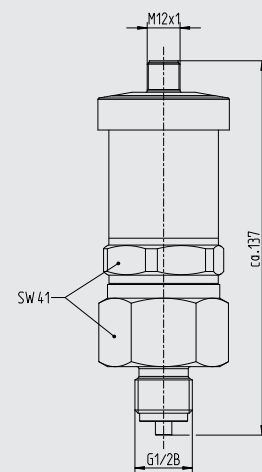
G 1 B, male thread



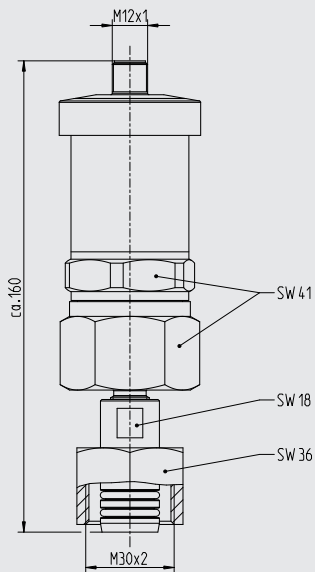
DN 20, female thread



G 1/2 B, male thread

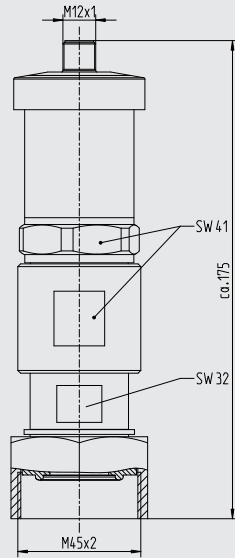


Malmkvist®

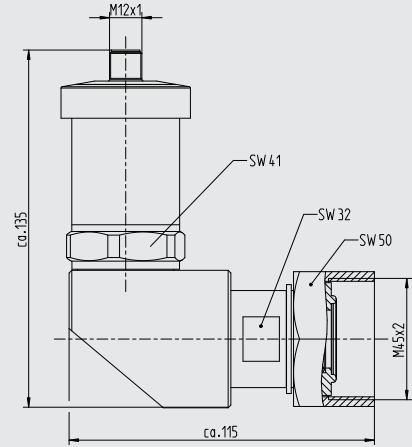


Measuring chambers see page 5

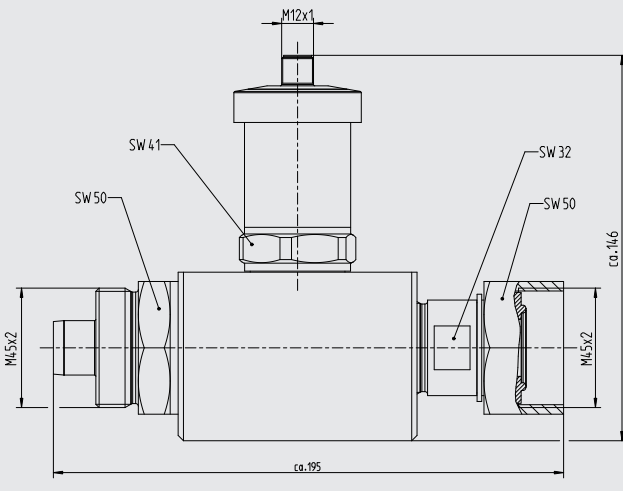
Measuring chamber, DN 20



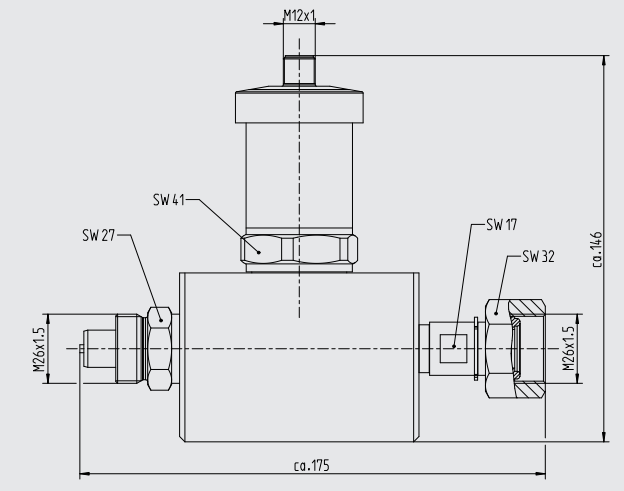
Measuring chamber, DN 20, 90° angled



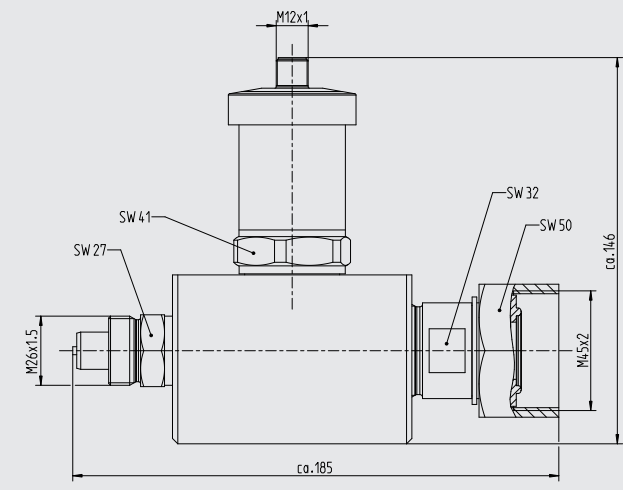
Measuring chamber, DN 20 male thread / DN 20 female thread



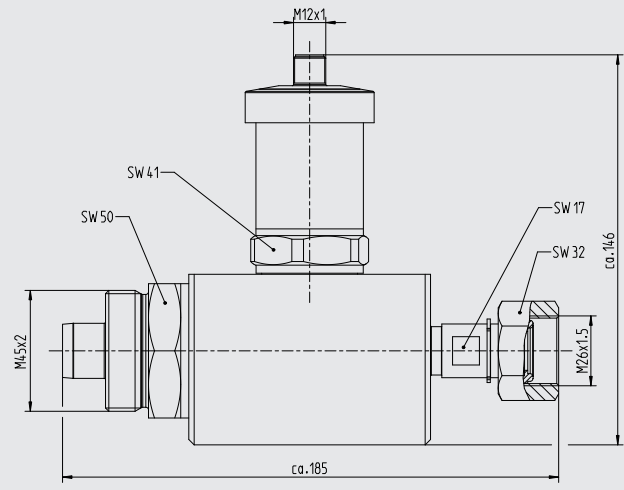
Measuring chamber, DN 8 male thread / DN 8 female thread



Measuring chamber, DN 8 male thread / DN 20 female thread



Measuring chamber, DN 20 male thread / DN 8 female thread



## Accessories

Description	Order no.
MODBUS® Startup-Kit for configuration, consisting of: <ul style="list-style-type: none"><li>■ Power supply for transmitter</li><li>■ Cable with M12 x 1 connector</li><li>■ Interface converter (RS-485 to USB)</li><li>■ USB cable type A to type B</li><li>■ MODBUS® tool software on USB stick</li></ul>	14075896

### Ordering information

Model / Permissible ambient temperature / Process connection / Accessories

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