

Transmitter

For gas density, temperature, pressure and humidity of SF₆ 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 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



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 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. 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 SF₆ 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_B

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 _B	Power 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 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

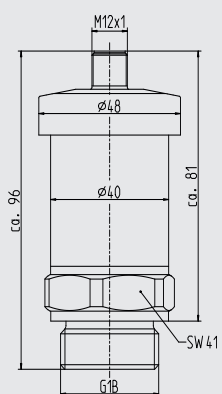
Manufacturer's declaration

RoHS conformity

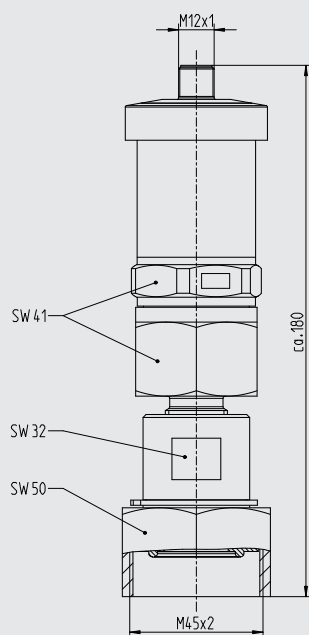
Directive 2002/95/EC

Dimensions in mm

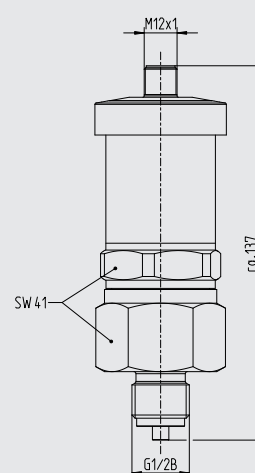
G 1 B, male thread



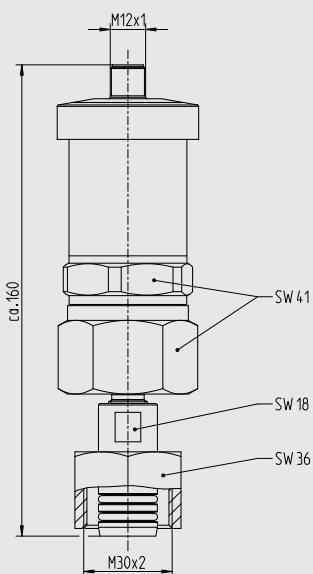
DN 20, female thread



G 1/2 B, male thread

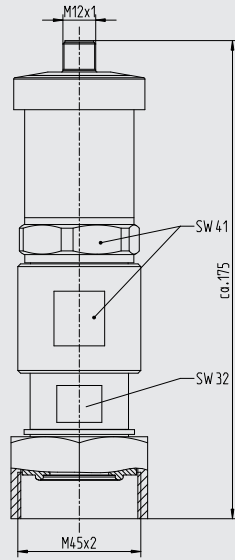


Malmkvist®

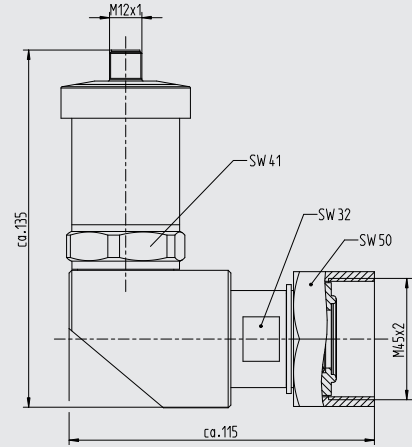


Measuring chambers see page 5

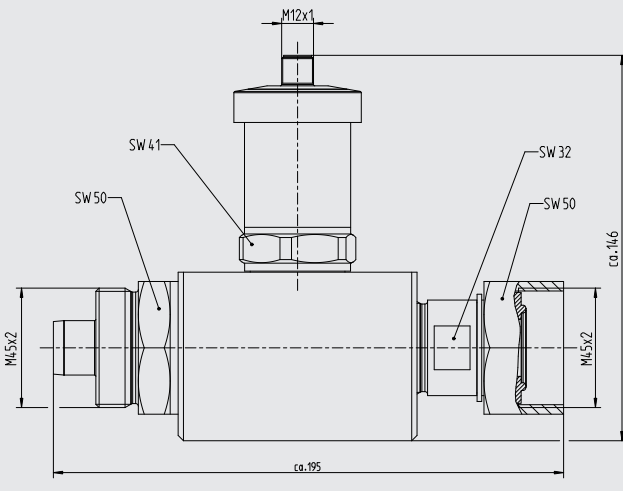
Measuring chamber, DN 20



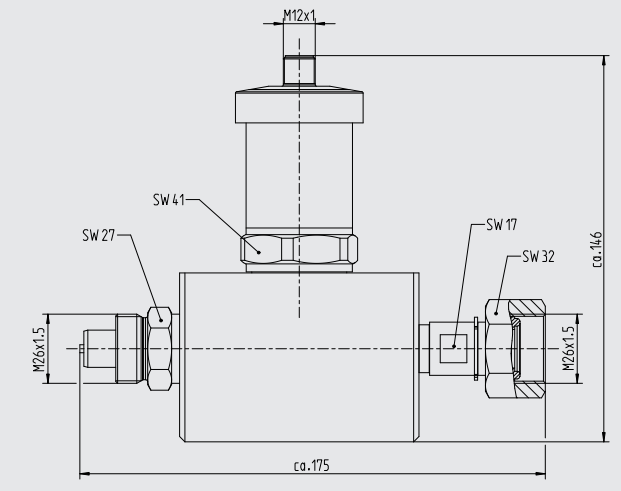
Measuring chamber, DN 20, 90° angled



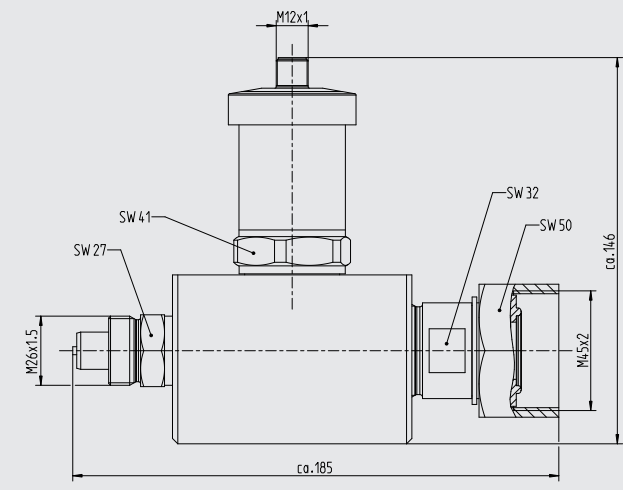
Measuring chamber, DN 20 male thread / DN 20 female thread



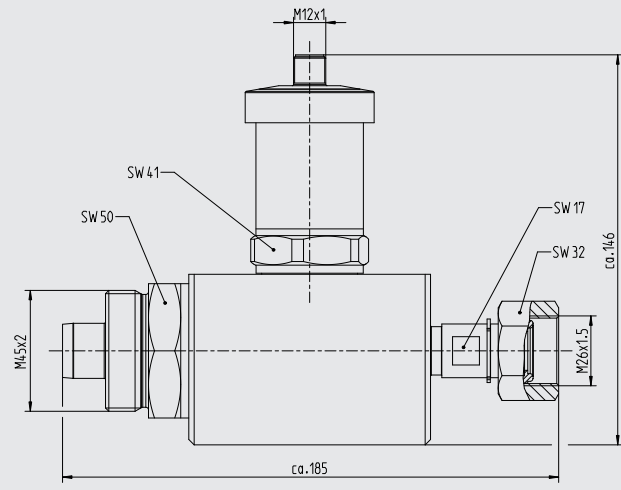
Measuring chamber, DN 8 male thread / DN 8 female thread



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">■ Power supply for transmitter■ Cable with M12 x 1 connector■ Interface converter (RS-485 to USB)■ USB cable type A to type B■ MODBUS® tool software on USB stick	14075896

Ordering information

Model / Permissible ambient temperature / Process connection / Accessories

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