

Transmitter with Modbus® output

For density, temperature, pressure and humidity of insulating gases

Models GDHT-20, GDHT-20 eco

WIKA data sheet SP 60.14

Applications

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

Special features

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



Fig. left: Transmitter, model GDHT-20

Fig. right: Transmitter, model GDHT-20 eco

Model GDHT-20 eco available from 11/2026

Description

The model GDHT-20 transmitter is a multisensor 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 errors in switchgear and, with that, network outages, the permanent monitoring of the gas density and humidity 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. Changes in pressure 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 freely configured in percentage values by the user for any defined gas mixture consisting of SF₆, N₂, CF₄, O₂, CO₂, C₄-FN, He and Ar. The calculation of gas density is based on the partial pressure method of the individual gas components. The humidity values can be output for SF₆ gas, N₂ and CO₂.

Signal stability

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

Specifications

Basic information	
Case	Stainless steel
Ingress protection (IP code)	IP65, only when plugged in and using mating connectors with the corresponding ingress protection
Weight	Approx. 0.4 kg [0.88 lb]

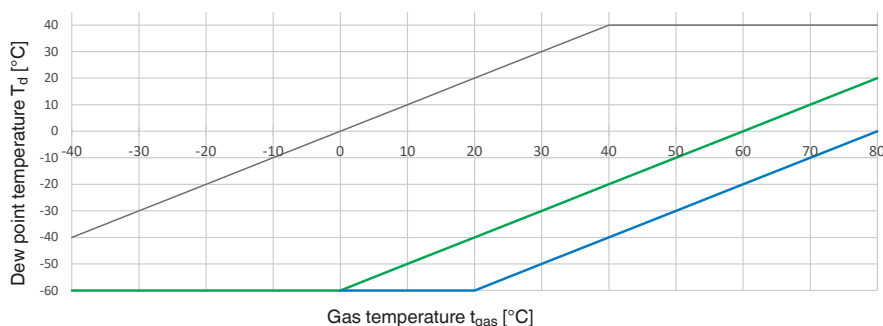
Accuracy specifications		
Accuracy	The specifications are only valid for pure, gaseous SF ₆	
Dew point GDHT-20	→ See graphic below the table	
	Span T _{gas} - T _d < 60 K	Measuring deviation < ±2 K
	Span T _{gas} - T _d < 80 K	Measuring deviation < ±3 K
Dew point GDHT-20 eco	Span T _{gas} - T _d < 45 K ¹⁾	Measuring deviation < ±2 K
	Span T _{gas} - T _d < 65 K ¹⁾	Measuring deviation < ±3 K
Density	±0.6 %, ±0.35 g/litre (-40 ... 80 °C [-40 ... +176 °F])	
Temperature	±1 K	
Pressure GDHT-20	-40 ... < 0 °C [-40 ... +32 °F]	±0.2 %
	0 ... 80 °C [32 ... 176 °F]	±0.06 %
Pressure GDHT-20 eco	-40 ... < 0 °C [-40 ... +32 °F]	±0.5 %
		±1.0 %
	0 ... 80 °C [32 ... 176 °F]	±0.25 %
		±0.5 %
Long-term drift per IEC 61298-2		
Temperature	≤ ±0.1 % of span/year	
Pressure	≤ ±0.05 % of span/year	
Dew point	≤ ±0.5 % of span/year	

1) Only for GDHT-20 eco with measuring range $0 \dots 4 \text{ bar abs.}$ [$0 \dots 58.01 \text{ psi abs.}$]

Dew point accuracy ¹⁾

Measuring deviation $< \pm 2 \text{ K}$ with span $T_{\text{gas}} - T_d < 60 \text{ K}$

Measuring deviation $< \pm 3 \text{ K}$ with span $T_{\text{gas}} - T_d < 80 \text{ K}$



— Upper limit (measuring deviation $< \pm 2 \text{ K}$)

— Lower limit (measuring deviation $< \pm 2 \text{ K}$)

— Lower limit (measuring deviation $< \pm 3 \text{ K}$)

1) For measuring range $-60 \dots +40 \text{ °C}$ [$-76 \dots 104 \text{ °F}$] T_d

Examples:

- If the gas temperature is $+30 \text{ °C}$ and the dew point is -20 °C , an accuracy of $< \pm 2 \text{ K}$ is achieved (since $T_{\text{gas}} - T_d < 60 \text{ K}$)
- If the gas temperature is $+40 \text{ °C}$ and the dew point is -30 °C , an accuracy of $< \pm 3 \text{ K}$ is achieved (since $T_{\text{gas}} - T_d < 80 \text{ K}$)

Measuring range	
Dew point at atmospheric pressure	■ -60 ... +40 °C [-76 ... +104 °F] T_d ■ -45 ... +40 °C [-49 ... +104] T_d¹⁾
Density ²⁾	0 ... 60 g/litre (8.87 bar abs. SF ₆ gas at 20 °C [68 °F])
Temperature	-40 ... +80 °C [-40 ... +176 °F]
Pressure at 20 °C [68 °F] ²⁾	0 ... 8.87 bar abs. SF ₆ gas
Pressure	
GDHT-20	■ 0 ... 16 bar abs. [0 ... 232.06 psi abs.] ■ 0 ... 25 bar abs. [0 ... 362.59 psi abs.]
GDHT-20 eco	■ 0 ... 4 bar abs. [0 ... 58.02 psi abs.] ■ 0 ... 13 bar abs. [0 ... 188.55 psi abs.]
Burst pressure	52 bar abs.
Overload limit	To 30 bar abs.
Pressure reference	Absolute

1) Only for GDHT-20 eco with measuring range 0 ... 4 bar abs. [0 ... 58.01 psi abs.]

2) Only for measuring range 16 bar abs. [232.06 psi abs.]

Process connection	
Process connection	■ G 1 B, male thread, stainless steel ■ DN 20, female thread ■ G ½ B, male thread ■ M30 x 2 (Malmkvist) ■ Flange D40 ■ Via measuring chamber ■ DN 8, female thread
	■ Other connections on request

Output signal	
Signal type	Modbus® output
Retrievable measured values	Measured values with alternative units can be retrieved directly in the Modbus® registers.
Density	■ g/litre ■ kg/m³
Temperature	■ °C ■ °F ■ K
Absolute pressure	■ mbar ■ Pa ■ kPa ■ MPa ■ psi ■ N/cm² ■ bar
Humidity	■ ppm_v ■ ppm_w
Dew point	■ °C at tank pressure ■ °C at atmospheric pressure
Frost point	■ °C at tank pressure ■ °C at atmospheric pressure
Relative humidity	■ %
Absolute pressure at 20 °C [68 °F]	■ bar ■ MPa
Gauge pressure at 20 °C [68 °F] (based on 1,013 mbar)	■ bar ■ MPa

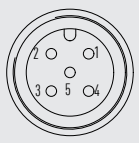
Output signal	
Alternative insulating gases	Gas mixtures and components can be freely configured and combined from the gases SF ₆ , N ₂ , CF ₄ , O ₂ , CO ₂ , C4-FN, He and Ar via Modbus® ¹⁾ . The calculation is based on the physical principle of the partial pressure method.
Voltage supply	
Auxiliary power U _{B+}	DC 17 ... 30 V
Power consumption	Max. 0.5 W (max. 3 W during the heating phase of the humidity sensor)
Refresh rate	
Density	20 ms
Temperature	20 ms
Pressure	20 ms
Dew point	2 s (typical) Auto-adjustment cycle, every 30 min, adjustable

1) Not for GDHT-20 eco with measuring range 0 ... 13 bar abs. [0 ... 188.55 psi abs.]

Communication	
Interface	RS-485
RS-485	
Baud rate	1200 ... 115200
Protocol	Modbus®
Modbus®	
Parity	None, even
Addresses	1 ... 247
Byte format	6 byte ASCII

Electrical connection	
Connection type	Circular connector M12 x 1 (5-pin)
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

Pin assignment

Circular connector M12 x 1 (5-pin)			
	1	-	-
	2	U _{B+}	Auxiliary power
	3	U _{B-}	Ground
	4	A	RS-485 signal
	5	B	RS-485 signal

Material	
Material (in contact with the environment)	
Case	Stainless steel

Operating conditions	
Ambient temperature range	-40 ... +80 °C [-40 ... +176 °F]
Humidity	≤ 90 % relative humidity
Condensation	Non-condensing
Dimensions	
Diameter	47 mm [1.85 in]
Height	96 mm [3.78 in]
EMC (HF field)	
Immunity per IEC 61000-4-3	30 V/m (80 MHz ... 6 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
Conducted HF signals in accordance with IEC 61000-4-6	10 V (0.15 kHz ... 80 MHz)

Approvals

Logo	Description	Country
CE	EU declaration of conformity	European Union
	EMC Directive, EN 61326 emission (group 1, class B) and immunity (industrial environment)	
	RoHS directive	

→ For approvals and certificates, see website

Accessories and spare parts

Designation	Order number
Modbus® start-up kit for measured value recording and configuration, consisting of: ■ Power supply unit for transmitter ■ Cable with M12 x 1 connector ■ Interface converter (RS-485 to USB) ■ USB cable type A to type B ■ Modbus® tool software	14075896
WIKAsoft-GD for configuration and testing of the sensor	Free download from: www.wika.com/Download
Seal for G 1 B male thread process connection (included in the scope of delivery)	14046738

Shielded cable, M12 x 1, AWG20	Order number
Length	
1 m [3.28 ft]	14430138
2 m [6.56 ft]	14430140
3 m [9.84 ft]	14430141
4 m [13.12 ft]	14430142
5 m [16.40 ft]	14297684
6 m [19.68 ft]	14430143
7 m [22.96 ft]	14430144
8 m [26.24 ft]	14430145
9 m [29.52 ft]	14430148
10 m [32.80 ft]	14297685
15 m [49.21 ft]	14430149
20 m [65.61 ft]	14430150
25 m [82.02 ft]	14430151
30 m [98.42 ft]	14430152
50 m [164.04 ft]	14430153

Modbus® is a registered trademark of Schneider Electric.

Ordering information

Model / Permissible ambient temperature / Process connection / Accessories

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