Gas density monitor with reference chamber Model GDM-RC-100

EAC

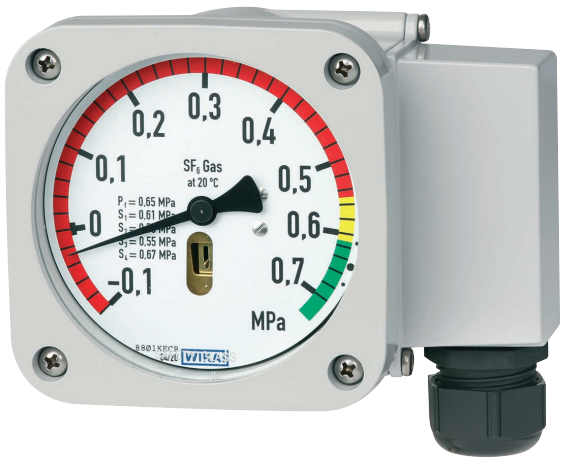
for further approvals, see page 6

Applications

- High-voltage equipment
- Gas density monitoring of SF_6 gas in closed gas tanks
- Raising an alarm when defined limit values have been reached

Special features

- Accurate isochore, temperature-compensated switching and display over the entire temperature range
- Complete local indication of the density and vacuum range on a 100-mm dial
- Increased plant safety through self-diagnostics
- Prepared for any alternative gases
- Very high long-term stability through welded reference gas volume



Gas density monitor with reference chamber, model GDM-RC-100

Description

Gas density monitoring of electrical equipment
Gas density is a crucial operating parameter for high-voltage plants. If the required gas density is not present, safe operation of the plant cannot be guaranteed.
The gas density monitor model GDM-RC-100 warns reliably when the gas density, due to leakage, drops below the established values, even under extreme ambient conditions.

Functional principle
The model GDM-RC-100 works according to the reference gas principle. The reference gas enables accurate isochore switching and display over the entire temperature range. Temperature changes and atmospheric pressure variations do not affect the measurement.

Everything at a glance
As in the case of the gas density monitor model GDM-100, for the model GDM-RC-100, WIKA also relies on the proven principle of a readily legible indication. The entire density and vacuum range can be displayed locally on only one dial with high accuracy. This increases safety during maintenance and service work on switchgear and simplifies implementation of this type of work.

Maximum plant safety through self-diagnostics
The welded reference chamber enables a very high long-term stability and eliminates drift. In the extremely unlikely case of leakage in the reference chamber, the plant manager is reliably warned by a switching signal of the instrument. The gas density monitor is maintenance-free.

Prepared for alternative gases
The model GDM-RC-100 can be used for any type of alternative gases and is capable of accurate isochore switching of these gases without any temperature effect.

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Data sheets showing similar products:
Hybrid gas density monitor with reference chamber; model GDM-RC-100-T; see data sheet SP 60.80
Gas density monitor; model GDM-100; see data sheet SP 60.02
Hybrid gas density monitor; model GDM-100-T; see data sheet SP 60.79

Specifications

Basic information	
Nominal size of the optical indication	100 mm [3.94 in]
Window	Laminated safety glass
Case and cover	Aluminium die-casting, powder-coated

Measuring element	
Type of measuring element	Bellows measuring system with reference chamber

Accuracy specifications		
Indication accuracy Calibration pressure established by means of reference isochore, generated by Prof. Bier		
-1 ... +5 bar at 20 °C [-14.50 ... +72.51 psi at 68 °F]	■ ±70 mbar [±1.01 psi] at calibration pressure at 20 °C [68 °F], gaseous phase ■ ±100 mbar [±1.45 psi] at calibration pressure at -30 … +50 °C [-22 ... +122 °F], gaseous phase	
-1 ... +9 bar at 20 °C [-14.50 ... +130.53 psi at 68 °F]	■ ±100 mbar [±1.45 psi] at calibration pressure at 20 °C [68 °F], gaseous phase ■ ±150 mbar [±2.17 psi] at calibration pressure at -30 … +50 °C [-22 ... +122 °F], gaseous phase	
-1 ... +11.5 bar at 20 °C [-14.50 ... +166.79 psi at 68 °F]	■ ±150 mbar [±2.17 psi] at calibration pressure at 20 °C [68 °F], gaseous phase ■ ±200 mbar [±2.90 psi] at calibration pressure at -30 … +50 °C [-22 ... +122 °F], gaseous phase	
Accuracies of the switch point		
-1 ... +5 bar at 20 °C [-14.50 ... +72.51 psi at 68 °F]	■ ±70 mbar [±1.01 psi] at calibration pressure at 20 °C [68 °F], gaseous phase ■ ±100 mbar [±1.45 psi] at calibration pressure at -30 … +50 °C [-22 ... +122 °F], gaseous phase	
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Switch hysteresis	**Measuring range**	**Hysteresis level**
	-1 ... +5 bar at 20 °C [-14.50 ... +72.51 psi at 68 °F]	Typically < 90 mbar [1)] [< 1.30 psi]
	-1 ... +7.5 bar at 20 °C [-14.50 ... +108.77 psi at 68 °F]	Typically < 150 mbar [1)] [< 2.17psi]
	-1 ... +11.5 bar at 20 °C [-14.50 ... +166.79 psi at 68 °F]	Typically < 220 mbar [1)] [< 3.19psi]
	Lower switch hysteresis on request	
Reference conditions		
Storage temperature	-50 ... +80 °C [-58 ... +176 °F]	
Relative humidity, condensation	≤ 95 % r. h. (non-condensing) Compensating diaphragm against condensation	

1) In accordance with BS 6134:1991, rate of pressure change 1 % of end value per second.

Measuring range		
Measuring range	0 ... 12.5 bar abs. at 20 °C [0 ... 181.29 psi abs. at 68 °F] SF_6 gas	
Pressure limitation		
Minimum bursting strength	> 36 bar [522 psi]	
Maximum overpressure	1.43 times the measuring range	
Dial		
Scale range	End of measuring range	■ 1.3 bar or 1.8 bar [18.85 psi or 26.10 psi] above the first switch point below the filling pressure ■ Numbering: Ends at 900 mbar [13.05 psi] above the first switch point below the filling pressure
Scale graduation	■ Single scale (divided into sections of different colours) ■ Double scale (divided into sections of different colours) ■ Triple scale (divided into sections of different colours)	
Scale colour	Custom	
Pointer stop pin	Without	
Material	Aluminium	
Pointer	Aluminium, black	

Process connection	
Thread size/size	■ G ½ B per EN 837 ■ axial or radial ■ Stainless steel ■ Spanner flats 22 mm [0.86 in] Other connections and connection locations on request

Electrical connection			
Connection type	12-pin TTI plug-in terminal		
Wire cross-section	■ Min. 0.5 mm^2 ■ Max. 2.5 mm^2		
Grounding	Grounding in cable socket available		
Switch model	Potential-free change-over contacts		
Number	■ 1 switch contact ■ 2 switch contacts ■ 3 switch contacts ■ 4 switch contacts Up to 4 switch contacts possible as change-over contact		
Switching directions	■ Falling density ■ Rising density		
Switch points	In accordance with customer specification, maximum difference of lowest to highest contact: 4 bar [58.01 psi]		
Electrical characteristics	**Switching voltage [V]**	**Resistive load [A]**	**Inductive load [A]**
	≤ DC 30	5 1)	3 1)
	≤ DC 50	1	1
	≤ DC 75	0.75	0.75
	≤ DC 125	0.5	0.04
	≤ DC 250	0.25	0.03
	≤ AC 125	5 1)	2 1)
	≤ AC 250	5 1)	2 1)

1) Only to 70 °C [158 °F] ambient temperature.
At 70 ... 80 °C [158 ... 176 °F] ambient temperature, the contacts must be operated with a maximum of 1 A.

Electrical connection	
Minimum switching voltage and current	20 V, 10 mA
Calibration pressure	First switch point below filling pressure
Switching function	Change-over contact
Circuits	Galvanically isolated
Maximum number of cycles	10,000 mechanical and electrical
Insulation resistance of contact	> 100 MΩ

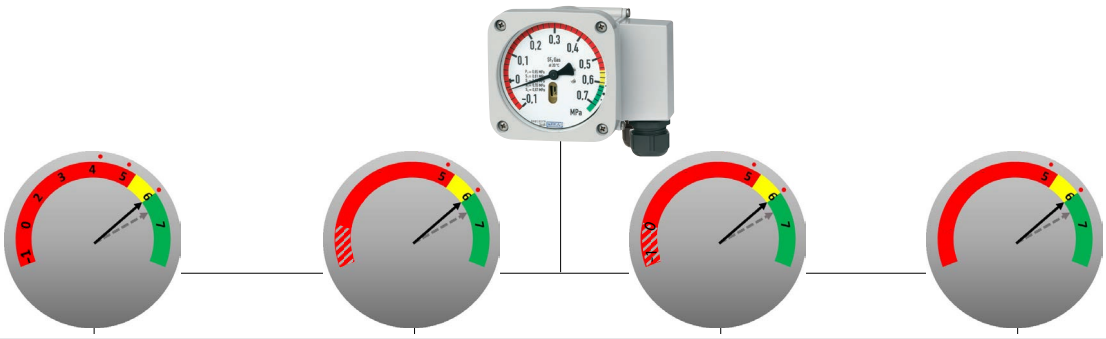
EMC testing	
Electric strength	■ 2 kV pin on grounding (case) ■ 2 kV pin on pin (switch contact to switch contact) ■ 1 kV pin on pin within the switch contact - 1 minute

Material	
Material (wetted)	Stainless steel
Material (in contact with the environment)	■ Stainless steel ■ Aluminium die-casting with powder coating

Operating conditions	
Place of use	Indoor/Outdoor
Altitude	Up to 2,000 m [6,562 ft] above sea level
Medium temperature range / limit	-40 ... +80 °C [-40 ... +176 °F], gaseous phase
Operating temperature	-40 ... +80 °C [-40 ... +176 °F], gaseous phase
Ambient temperature range / limit	-40 ... +80 °C [-40 ... +176 °F], gaseous phase
Storage temperature range	-50 ... +80 °C [-58 ... +176 °F]
Relative humidity, condensation	≤ 95 % r. h. (non-condensing)
Helium leak test	< $1*10^{-8}$ mbar*l/s
Shock resistance	■ 50 g/11 ms no contact bouncing at a distance of 200 mbar from the switch point ■ 150 g: no damage in all axes and directions
Ingress protection of the complete instrument	■ IP65 ■ IP67
Permissible pollution degree	2 (per EN 61010-1)
Weight in kg	< 1.25 kg [2.75 lb]

Packaging and instrument labelling	
Product label	Lasered onto the reference chamber, maximum resistance to weathering

Dial layouts



V1: full scale

- Full scale
- Vacuum indication

V2: partial scale

- Full scale
- Vacuum indication

V3: partial scale +

- Full scale
- Vacuum indication

V4: exploded scale

- Exploded scale

Cable gland versions

Model	Material	Thread	Sealing range	Tightening torque	Order number
Switch contacts	Plastic	M25 x 1.5	5 ... 13 mm [0.19 ... 0.51 in]	8 Nm	2196018
	Plastic	M25 x 1.5	8 ... 17 mm [0.31 ... 0.66 in]	8 Nm	64419018
	Metal	M25 x 1.5	9 … 17 mm [0.35 ... 0.66 in]	10 Nm	64419009
	Metal	M25 x 1.5	7 … 12 mm [0.27 ... 0.47 in]	10 Nm	64423057

Approvals

Logo	Description	Region
CE	**EU declaration of conformity**	European Union
	Low Voltage Directive	
	RoHS directive	
EAC	**EAC**	Eurasian Economic Community
	Low Voltage Directive	

Manufacturer's declaration

Logo	Description
-	**China RoHS directive**

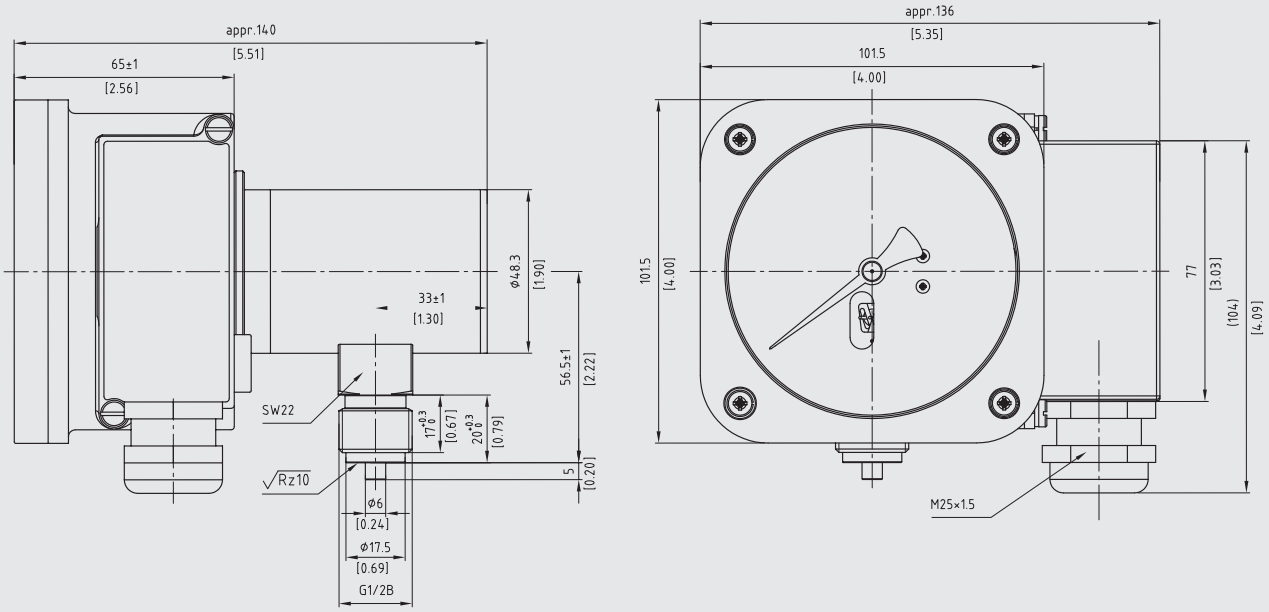
Certificates

Certificates	
Certificates	■ 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, material proof, indication accuracy) ■ 3.1 inspection certificate per EN 10204 (e.g. material proof for wetted metal parts, indication accuracy, calibration certificate)
Calibration	Factory calibration certificate
Recommended calibration interval	At least every 6 years in accordance with Regulation (EU) No. 517/2014 on fluorinated greenhouse gases

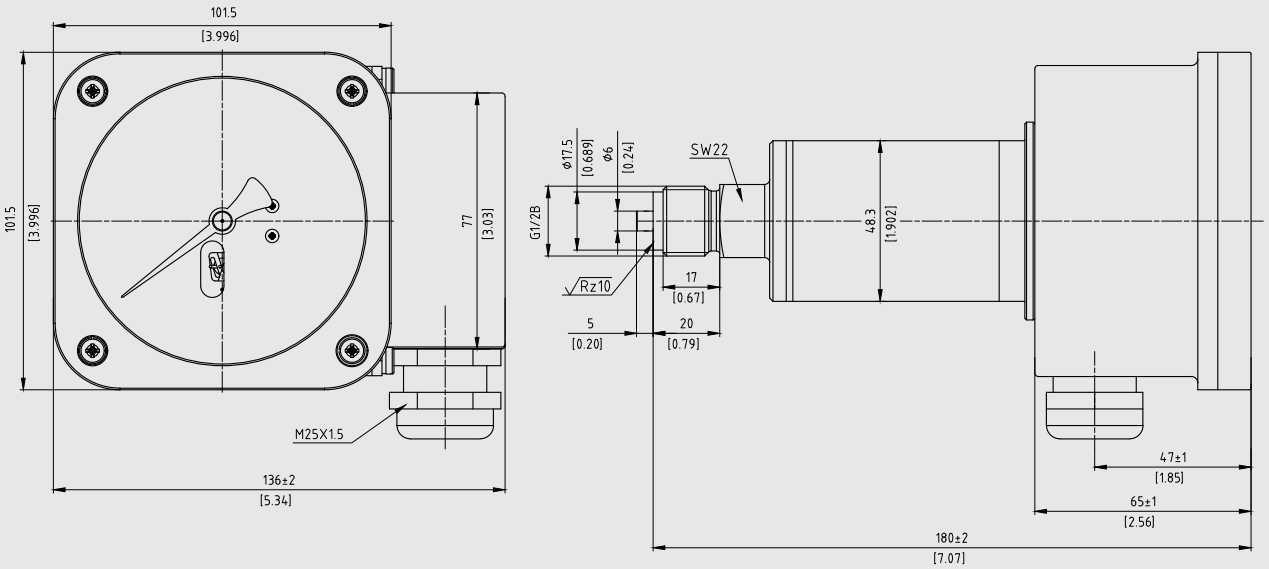
→ For approvals and certificates, see website

Dimensions in mm [in]

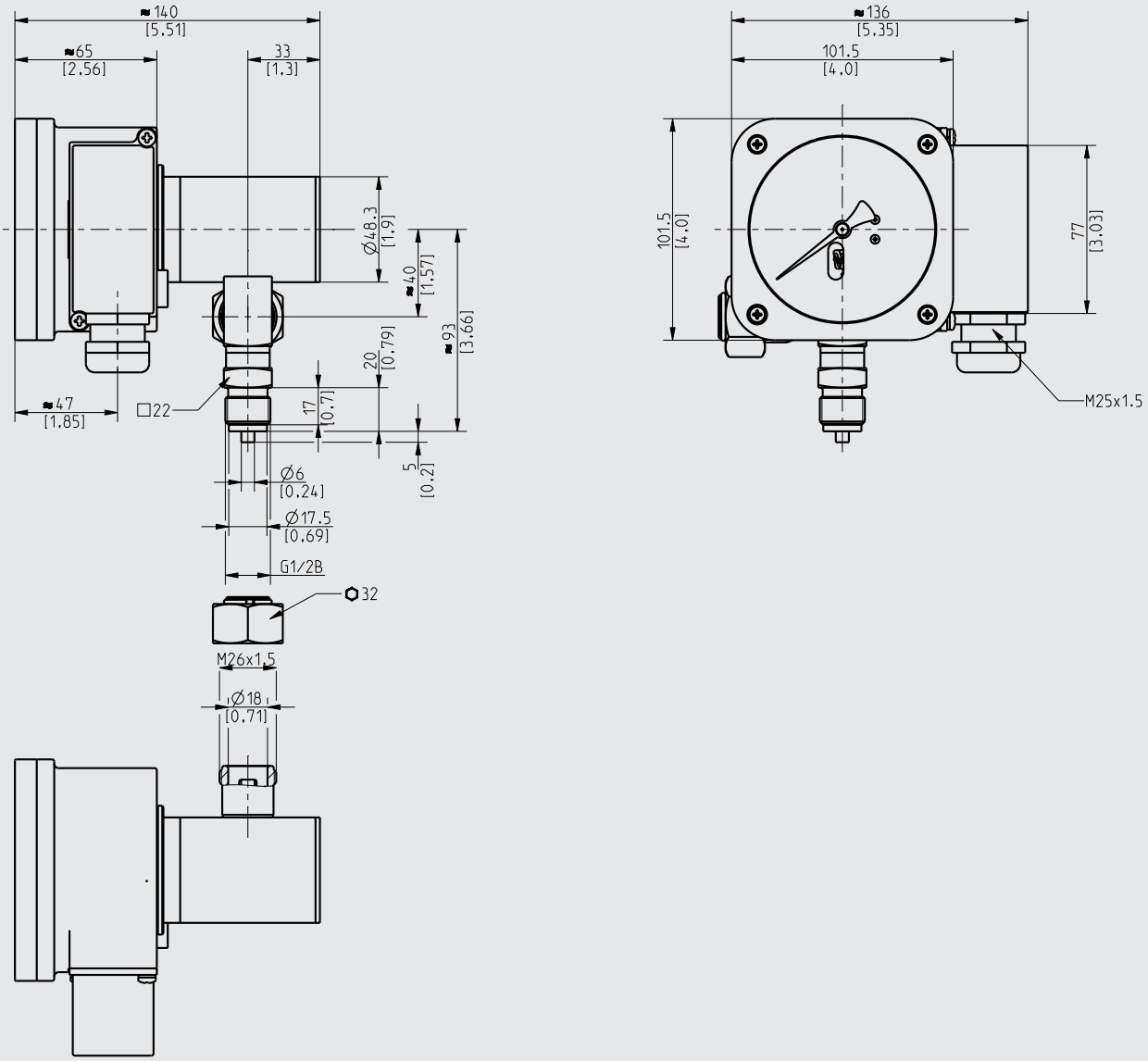
Vertical version



Back mount version



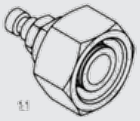
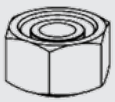
Model GDM-RC-100-T with vertical process connection G ½ B and recalibration valve



Accessories and spare parts

Model	Description	Order number
Optional accessories		
Recalibration valve 	Model GLTC-CV ■ Enables easy recalibration of the gas density monitor without dismounting ■ Welded permanently to the instrument or available as loose valve for retrofitting	-
Connection cable for switching outputs	■ Terminal without wiring ■ Connector mounted on the instrument side, cable with loose ends ■ Various cable lengths on request	-

Accessories for version with calibration valve

	Description	Order number
	Adapter from test connection (M26 x 1.5) to quick coupling	14146937
	Protective cap for test connection (M26 x 1.5)	14193772
	Calibration system for SF_6 gas density measuring instruments, model BCS-10 See WIKA data sheet SP 60.08	-
	Calibration system for SF_6 gas density measuring instruments, model ACS-10 See WIKA data sheet SP 60.15	-

Ordering information

Model / Process connection and connection location / Pressure unit at 20 °C [68 °F] / Filling pressure / Number of switch points / Switch configuration at 20 °C [68 °F] / Gas mixture / Dial layout / Optional accessories

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