Gas density switch with reference chamber Model GDS-RC-HV

Applications

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

Special features

- Accurate isochore, temperature-compensated switching over the entire temperature range
- Increased plant safety through self-diagnostics
- Prepared for any alternative gases
- Very high long-term stability through welded reference gas volume

Gas density switch with reference chamber, model GDS-RC-HV

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 switch model GDS-RC-HV warns reliably when the gas density, due to leakage, drops below the established values, even under extreme environmental conditions.

Operating principle
The model GDS-RC-HV 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.

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 operator is reliably warned by a switching signal of the instrument. The gas density monitor is maintenance-free.

Prepared for alternative gases
The model GDS-RC-HV 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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Specifications

General	
Measurement principle	Reference gas measurement
Measuring range	■ 0 ... 10 bar abs. at 20 °C [68 °F] SF_6 gas ■ 0 ... 12.5 bar abs. at 20 °C [68 °F] SF_6 gas
Self-indication in case of malfunction	Integrated into the instrument, the switch contact is actuated in case of leakage in the reference chamber
Product label	Lasered onto the reference chamber, maximum weather resistance

Accuracy	
Switching accuracy	
-1 ... +5 bar at 20 °C [68 °F]	■ ±70 mbar at calibration pressure at 20 °C [68 °F], gaseous phase ■ ±100 mbar at calibration pressure at -30 … +50 °C [-22 ... +122 °F], gaseous phase
-1 ... +9 bar at 20 °C [68 °F]	■ ±100 mbar at calibration pressure at 20 °C [68 °F], gaseous phase ■ ±150 mbar at calibration pressure at -30 … +50 °C [-22 ... +122 °F], gaseous phase
-1 ... +11.5 bar at 20 °C [68 °F]	■ ±150 mbar at calibration pressure at 20 °C [68 °F], gaseous phase ■ ±200 mbar at calibration pressure at -30 … +50 °C [-22 ... +122 °F], gaseous phase

Switch contacts			
Switch model	Potential-free change-over contacts		
Electrical connection			
Electrical connection	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		
Quantity	■ 1 micro switch ■ 2 micro switches ■ 3 micro switches ■ 4 micro switches Up to 4 micro switches possible as change-over contact		
Switching directions	■ Falling density ■ Rising density		
Switch points	To customer specification, maximum difference of lowest to highest contact: 4 bar		
Electrical characteristics	**Switching voltage**	**Resistive load A**	**Inductive load A**
	≤ DC 30 V	5 [1)]	3 [1)]
	≤ DC 50 V	1	1
	≤ DC 75 V	0,75	0.75
	≤ DC 125 V	0,5	0.03
	≤ DC 250 V	0,25	0.03
	≤ AC 125 V	5 [1)]	2 [1)]
	≤ AC 250 V	5 [1)]	2 [1)]
Minimum switching voltage and current	12 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 contact	> 100 MOhm		

Switch contacts		
Switch hysteresis	**Measuring range**	**Hysteresis level**
	-1 ... +5 bar at 20 °C [68 °F]	Typical < 90 mbar [2]
	-1 ... +7.5 bar at 20 °C [68 °F]	Typical < 150 mbar [2]
	-1 ... +11.5 bar at 20 °C [68 °F]	Typical < 220 mbar [2]
	Lower switch hysteresis on request	

1) Only up to an ambient temperature of 70 °C [158 °F].
At an ambient temperature of 70 ... 80 °C [158 ... 176 °F] the contacts may be operated with a maximum of 1 A.
2) In accordance with BS 6134:1991, rate of pressure change 1 % of end value per second.

Permissible ambient conditions	
Permissible ambient temperature	
Operating temperature	-40 ... +80 °C [-40 ... +176 °F], gaseous phase
Storage temperature	-50 ... +80 °C [-58 ... 176 °F]
Maximum load	
Minimum bursting strength	> 36 bar
Maximum overpressure	1.43 times the measuring range
Ingress protection	IP65, IP67
Permissible air humidity	≤ 95 % r. h. (non-condensing) Compensating diaphragm against condensation
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
Vibration resistance	4 g at a distance of 50 mbar from the switch point, no contact bouncing (20 ... 80 Hz)

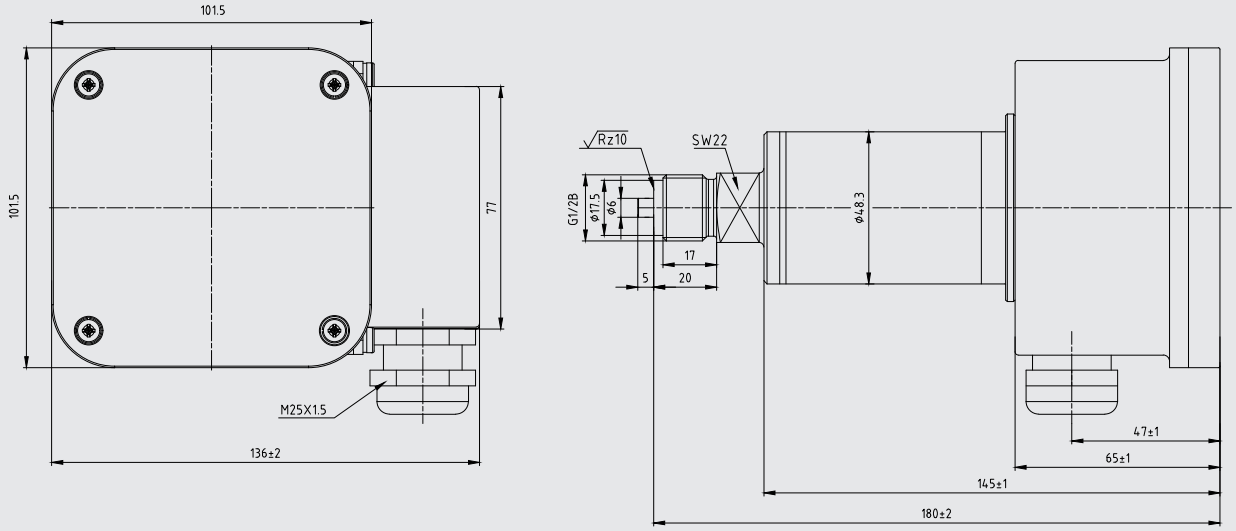
EMC tests	
Dielectric strength	■ 2 kV pin on grounding (case) ■ 2 kV pin on pin (micro switch on micro switch) ■ 1 kV pin on pin within micro switches - 1 minute
Lightning	7 kV x 1.2/50 µs

Leak tightness	
Process connection	≤ 1 x 10^{-8} mbar x l/s
Bellows sealing	≤ 1 x 10^{-8} mbar x l/s

Materials	
Wetted materials	
Reference chamber (pressure element)	Stainless steel, filling with reference gas
Process connection	G ½ B per EN 837, axial or radial, stainless steel, spanner flats 22 mm
	Other connections and connection locations on request
Non-wetted materials	
Case and cover	Aluminium die-casting, powder-coated
Cable gland M25 x 1.5	Plastic, sealing range 5 ... 13 mm; (optional 8 ... 17 mm) Tightening torque: 8 Nm

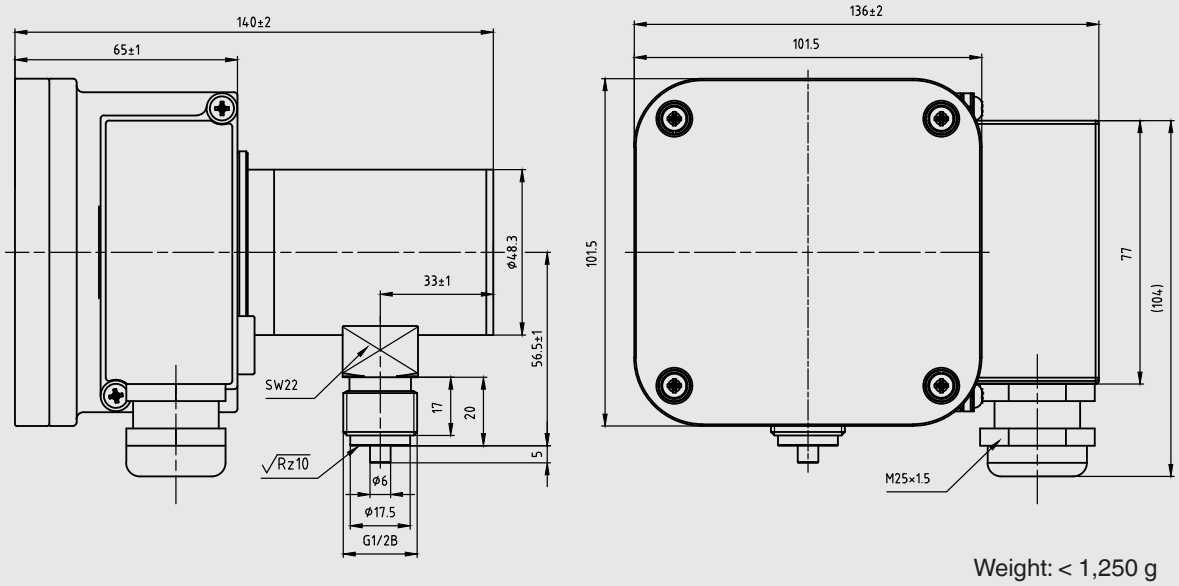
Dimensions in mm

Back mount version



Weight: < 1,250 g

Vertical version



Weight: < 1,250 g

Approvals

Logo	Description	Country
CE	**EU declaration of conformity** ■ Low voltage directive ■ RoHS directive	European Union

Manufacturer‘s information and certifications

Logo	Description
-	China RoHS directive

Ordering information

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

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ICS Schneider Messtechnik GmbH
Briesestrasse 59
D-16562 Hohen Neuendorf / OT Bergfelde
Tel.: +49 3303 5040-66
Fax: +49 3303 5040-68
E-Mail: info@ics-schneider.de

WIKA Alexander Wiegand SE & Co. KG
Alexander-Wiegand-Straße 30
63911 Klingenberg/Germany
Tel. +49 9372 132-0
Fax +49 9372 132-406
info@wika.de
www.wika.de