

Gas density switch with reference chamber

Model GDS-RC-HV

WIKA data sheet SP 60.28

Applications

- High-voltage equipment
- Monitoring of SF₆ 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.

Specifications

| General | |
|--|--|
| Measurement principle | Reference gas measurement |
| Measuring range | <ul style="list-style-type: none"> ■ 0 ... 10 bar abs. at 20 °C [68 °F] SF₆ gas ■ 0 ... 12.5 bar abs. at 20 °C [68 °F] SF₆ 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] | <ul style="list-style-type: none"> ■ ±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] | <ul style="list-style-type: none"> ■ ±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] | <ul style="list-style-type: none"> ■ ±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 | <ul style="list-style-type: none"> ■ Min. 0.5 mm² ■ Max. 2.5 mm² | | |
| Grounding | Grounding in cable socket available | | |
| Quantity | <ul style="list-style-type: none"> ■ 1 micro switch ■ 2 micro switches ■ 3 micro switches ■ 4 micro switches Up to 4 micro switches possible as change-over contact | | |
| Switching directions | <ul style="list-style-type: none"> ■ 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 | <ul style="list-style-type: none"> ■ 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 | <ul style="list-style-type: none"> ■ 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 |

Approvals

| Logo | Description | Country |
|---|--|----------------|
|  | EU declaration of conformity <ul style="list-style-type: none">■ 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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