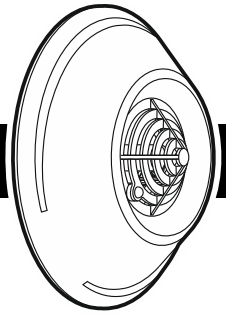
DG-1

DIGITAL GAS DETECTORS



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The DG-1 detectors are designed to detect dangerous concentrations of:

DG-1 CO – carbon monoxide,

DG-1 LPG – propane-butane gas,

DG-1 ME – natural gas (methane),

DG-1 TCM – soporific gases (e.g. chloroform vapors).

The detectors are intended to be used as part of a security system. This manual applies to the detectors with electronics version 2.0.

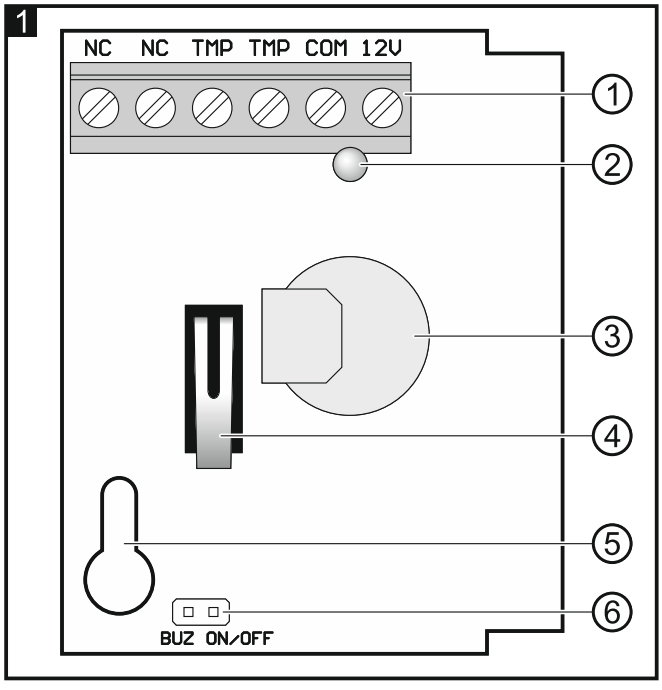
1. Features

- Digital algorithm of gas detection.
- Digital temperature compensation.
- Prealarm feature (DG-1 LPG and DG-1 ME only).
- LED for optical signaling.
- Sounder for acoustic signaling.
- Supervision of gas sensor (not applicable to DG-1 CO) and supply voltage.
- Tamper protection against cover removal.

2. Description

Electronics board

Fig. 1 shows the electronics board of DG-1 CO detector.



① terminal block:
- **NC** - alarm output (NC relay),
- **TMP** - tamper output (NC),
- **COM** - common ground,
- **12V** - power input.

② LED indicator. LED color depends on the detector:
DG-1 CO: red,
DG-1 LPG: green,
DG-1 ME: yellow,
DG-1 TCM: blue.

③ gas sensor. Sensor type depends on the detector (the sensors differ in shape):
DG-1 CO: TGS5141,
DG-1 LPG: TGS2610,
DG-1 ME: TGS2611,
DG-1 TCM: TGS832.

④ tamper switch.

⑤ fixing screw hole.

⑥ pins for enabling/disabling sound signaling (jumper installed – signaling enabled; jumper removed – signaling disabled).

Detecting dangerous gas concentrations

The detector will alarm when it senses a dangerous gas concentration. For information about the gas concentrations that trigger an alarm, please refer to Table 1. The alarm is signaled by sound and by LED indicator (repeating sequence: sound/LED ON for 1 second followed by 1-second pause, etc.). When the alarm is being signaled, the alarm output is active (relay contacts are open). The detector will stop alarming when the gas concentration drops below the dangerous level. **The gas sensor reaction to a decrease in the dangerous gas concentration is delayed, hence the alarm signaling can stop even a few minutes after the gas concentration has dropped below the alarm level.**

	DG-1 CO	DG-1 LPG	DG-1 ME	DG-1 TCM
Gas concentration to trigger alarm	50 ppm for 75 minutes 100 ppm for 25 minutes 300 ppm for 1 minute	20% lower explosive limit		6000 ppm $CHCl_3$
Gas concentration to trigger prealarm	-	10% lower explosive limit		-

Table 1.

The DG-1 LPG and DG-1 ME detectors signal prealarm. For information about the gas concentrations that trigger a prealarm, please refer to Table 1. Prealarm is signaled by sound and by LED indicator (repeating sequence: sound/LED ON for 0.25 second followed by 1-second pause, etc.). Prealarm does not affect the state of alarm output. The detector keeps signaling prealarm as long as the methane/propane-butane concentration remains above the 10% and below the 20% lower explosive limit.

Supervision of gas sensor and supply voltage

The detector will report trouble in the event of sensor defect (not applicable to DG-1 CO) or when the supply voltage drops below 9 V (±5%) for longer than 2 seconds. Troubles are signaled by sound and by LED indicator (repeating sequence: sound/LED ON for 0.25 second followed by a 0.25 second pause, etc.). When the alarm is being signaled, the alarm output is active (relay contacts are open).

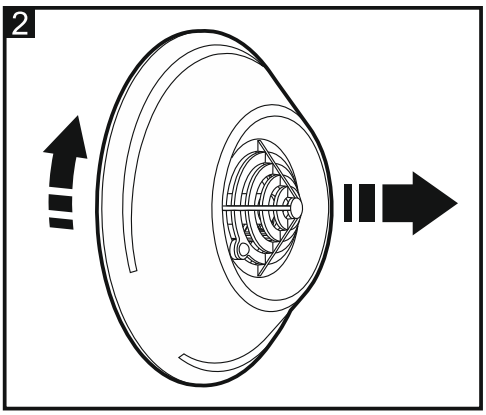
3. Installation and commissioning

Disconnect power before making any electrical connections.

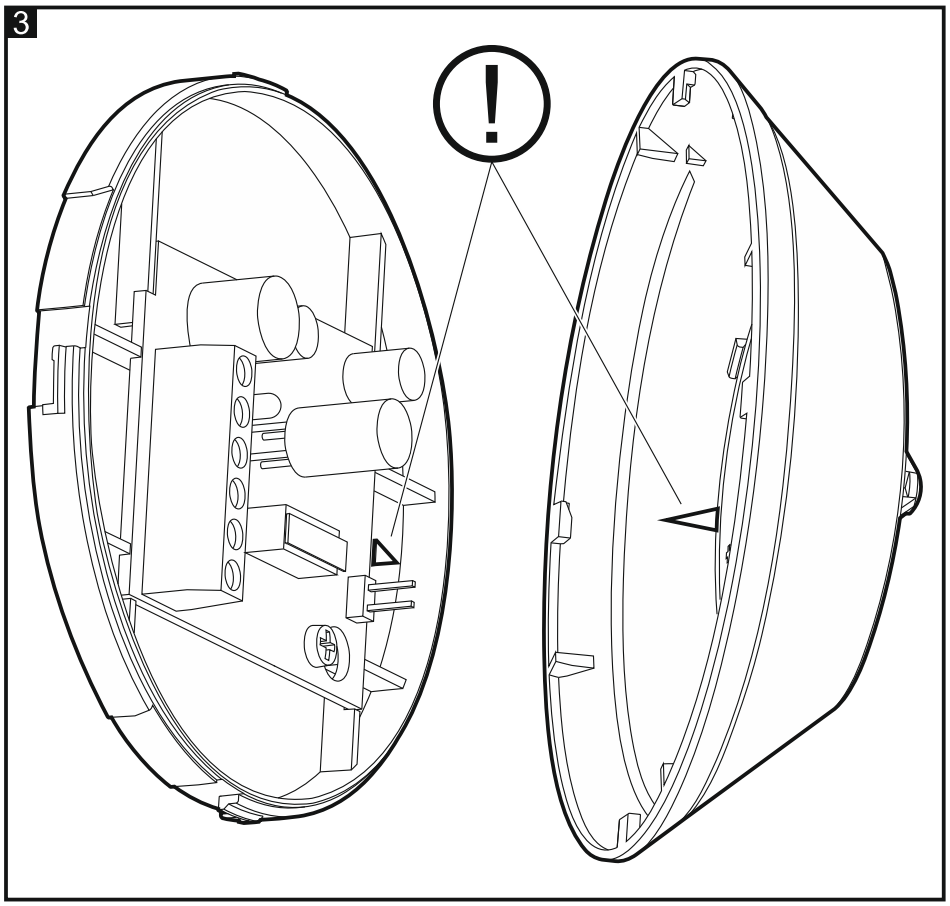
The DG-1 digital gas detectors are designed for indoor installation.

Considering specific character of the gases to be detected, the DG-1 TCM and DG-1 LPG detectors should be mounted in low position, just above the floor, the DG-1 ME detector in high position, just under the ceiling, and DG-1 CO detector at a height of about 1.5 meter.

1. Open the detector enclosure (Fig. 2).



2. Remove the electronics board.
3. Make suitable openings for screws and cable in the enclosure base.
4. Pass the cable through the opening prepared.
5. Secure the enclosure base to the wall.
6. Fasten the electronics board.
7. Connect the leads to corresponding terminals.
8. Using the jumper, decide whether the sound signaling is to be enabled, or not.
9. Close the detector enclosure, making sure that the matchmarks on the cover and on the enclosure base are aligned (Fig. 3).



10. Switch on power supply of the security system. Putting the detector into operation is signaled by three short sounds, accompanied by blinking of the LED.

Notes:

- *It is not recommended to install the detector in spaces where industrial type equipment is working.*
- *During the detector operation the gas sensor heats up.*

- *The DG-1 detectors are tested during production process with special gas mixtures. It is not allowed to test the detector by any improvised methods (e.g. by using gas lighter gas).*
- *The DG-1 TCM detector does not work selectively. Alarm may be triggered not only by chloroform vapors, but also by vapors of paints, lacquers, or alcohol, as well as by other organic compounds (e.g. refrigerants, like freon (chlorofluorocarbon), tetrafluoroethane, or chlorodifluoromethane, but also by cat urine).*
- *In the first five minutes after power-up, the DG-1 TCM detector is stabilizing and can alarm during that time.*

4. Specifications

Supply voltage		12 V DC (±15%)
Standby current consumption:	DG-1 CO	7 mA
	DG-1 LPG	35 mA
	DG-1 ME	35 mA
	DG-1 TCM	85 mA
Maximum current consumption:	DG-1 CO	16 mA
	DG-1 LPG	45 mA
	DG-1 ME	45 mA
	DG-1 TCM	105 mA
Relay contacts rating (resistive load)		40 mA / 16 V DC
Operating temperature range		-10...+55 °C
Dimensions		ø 97 x 36 mm
Weight:	DG-1 CO	63 g
	DG-1 LPG	62 g
	DG-1 ME	63 g
	DG-1 TCM	64 g

The average life time of DG-1 detector sensors is 5 years.

The declaration of conformity may be consulted at www.satel.eu/ce

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