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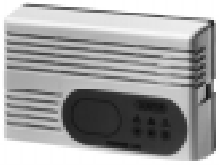
DOMESTIC GAS DETECTORS WITH MICROPROCESSOR INCLUDING SOLENOID VALVE

RGM 148 - 248 C1 Eng.

DISCONTINUED PRODUCT



- Power supply 220/240 V ac. Protection IP 42
- Includes internal monitoring sensor for methane (natural gas), propane - LPG
- Possibility of connecting 1 or 2 remote sensors for methane (natural gas), propane - LPG or carbon monoxide
- 20 V dc output with impulses to operate EVG 841 solenoid valve
- Alarm threshold below 25% LEL (lower explosive limit)
- Pre-alarm threshold about 60% of alarm threshold
- Pre-alarm, alarm and sensor fault LEDs
- Construction and operation according to BSI 7348, EN 50054 and CEI-UNI/ CIG 70028

CE

APPLICATION

RGM 148 and 248 gas detectors are designed to guarantee the safe use, in non-industrial premises, of domestic gas appliances such as : cookers, boilers and calorifiers.
They are able to monitor, by means of an internal sensor, and, optionally, one or two remote sensors, the concentration in the air of the most common types of combustible gas such as : methane (natural gas), propane - LPG. By means of remote sensors it is possible to monitor also the concentration of carbon monoxide.
The 20 V dc output with impulses can operate only the EVG 841 gas shut-off valve supplied with the detector.

MODELS

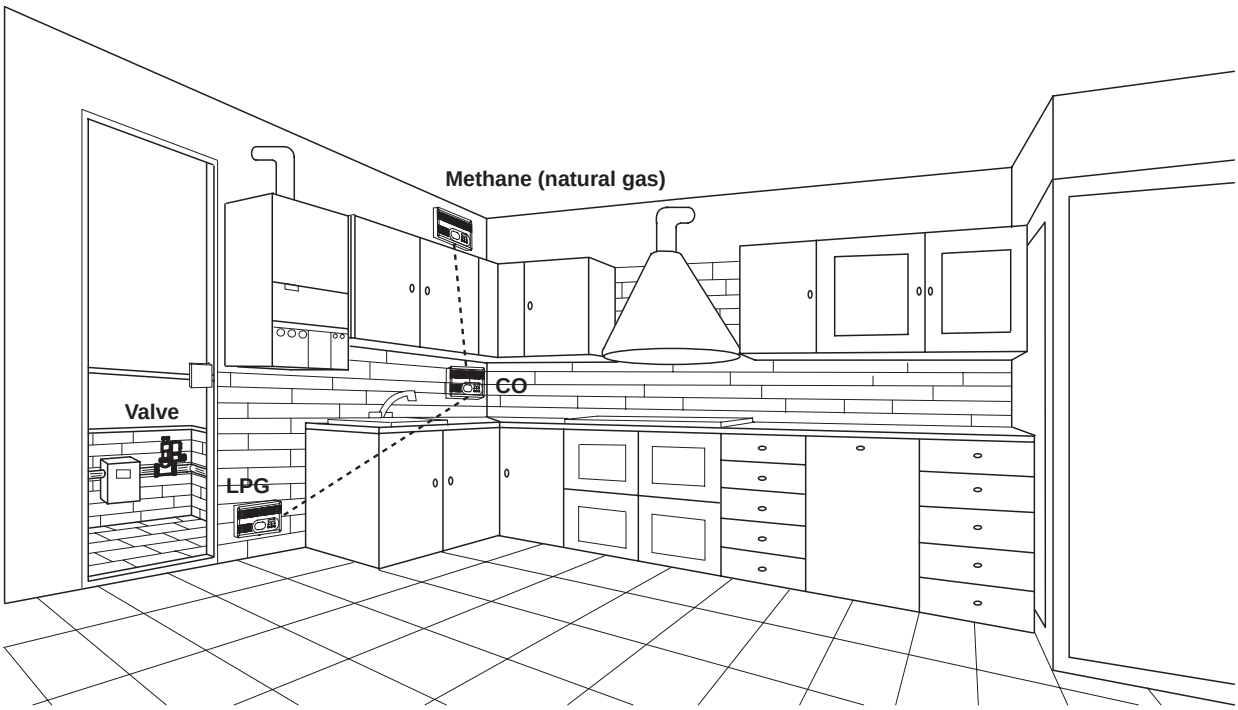
Code	Power supply	Type of gas	Internal sensor	Output	Valve supplied
RGM 148	220/240 V ac	methane (natural gas)	TGS 842	electric impulses of 20 V dc	**EVG 841** da 3/4"
RGM 248	220/240 V ac	propane - LPG	TGS 813	electric impulses of 20 V dc	**EVG 841** da 3/4"

MONITORING SENSORS

Code	Power supply	Type of gas	Internal sensor	% gas at 2.5 V dc	Length connections 4x1mm²	4x1,5mm²	Data sheet
SRC 158	220/240 V ac	methane (natural gas)	TGS 842	0.8 %	50 m	75 m	N 811
SRC 258	220/240 V ac	propane - LPG	TGS 813	0.35 %	50 m	75 m	N 811
SRC 358	220/240 V ac	carbon monoxide	TGS 812	0.05 %	50 m	75 m	N 811

TYPICAL INSTALLATION

fig. 1



OPERATION

All functions of the detector are processed by a CMOS microprocessor.
When powered the detector does not signal alarms for a period of two minutes so as to give time to the sensor, and to any remote sensors used, to become stabilised. This condition is indicated by the green LED flashing.
Following this period it is ready to signal an alarm.
The internal sensor, and any remote sensors used, monitor the gas concentration level in the surrounding air and, in the event that one of the sensors detects that pre-alarm threshold has been exceeded, the detector causes the red alarm LED (fig. 2.4) to flash; in the event that alarm level is exceeded, the red LED lights up and stays lit and, after 30 seconds, detector switches on audible alarm and sends a signal to close EVG 841 valve.
To re-start normal functioning, the valve must be opened manually using the reset knob (fig. 2.6).
The alarm threshold is equal to a concentration of 0.8% (8,000 ppm) of methane (natural gas) in the air and 0.35% (3,500 ppm) of propane - LPG, which corresponds to about 16% of LEL (lower explosive limit). The regulations require that the alarm threshold is below 25% of LEL.
LEL methane (natural gas) = 5 % (50,000 ppm);
LEL propane = 2.1 % (21,000 ppm).
Consequently, in the event of a gas leak, the RGM detectors are able to intervene in conditions of maximum safety.

DETECTION OF CARBON MONOXIDE

By connecting remote sensor SRC 358 to detector it is possible to detect the presence of carbon monoxide. The danger of carbon monoxide does not derive from its flammability but from its high toxicity for humans and this depends on its concentration level and time of exposure to this gas.

Concentration	Time	Effects
0.01 % (100 ppm)		Irrelevant
0.03 % (300 ppm)	60 min.	Lethargy
0.05 % (500 ppm)	90 min.	Headache, nausea
0.06 % (600 ppm)	90 min.	Loss of senses
0.07 % (700 ppm)	120 min.	Coma, death

The alarm threshold is equal to a concentration of 0.05 % (500 ppm) of carbon monoxide in the air and the pre-alarm threshold is 0.03 % (300 ppm).

WARNING LEDS

- Green LED - Line (fig. 2.5) : When detector is powered, LED flashes for two minutes and then remains lit.
- Red LED - Alarm (fig. 2.4) : When gas concentration reaches pre-alarm threshold LED flashes and, when it reaches alarm threshold, remains lit.
- Yellow LED - Sensor fault (fig. 2.3) : Lights up when one of sensors is faulty.

CONSTRUCTION

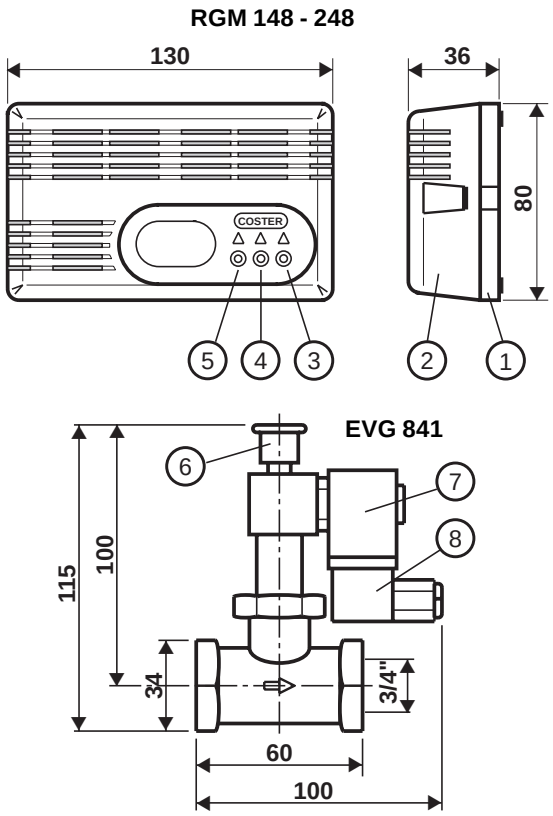
DETECTORS

RGM 148-248 consist of two parts :

- Base module (fig. 2.1 and fig. 3.1) in shockproof plastic material, suitable for wall mounting, which houses :
  – Printed circuit (fig. 3.2), constructed according to Italian Electrotechnical Committee (CEI) standards, on which are located : terminal block for electrical connections (fig. 3.8), programmer (fig. 3.11), microprocessor (fig. 3.12) alarm buzzer (fig. 3.10), sensing element (fig. 3.9) and transformer (fig. 3.7).
  – Cutout for passage of leads from rear (fig. 3.4).
  – Mounting holes (fig. 3.3), which are a standard distance apart and therefore suitable for fixing to a flush-mounting pattress if required.
  – Hinge elements (fig. 3.5).
- The two modules are attached to each other by engaging the corresponding hinge elements and by means of securing clip on base module (fig. 3.6) and catch on cover module.

COVER MODULE/OVERALL DIMENSIONS

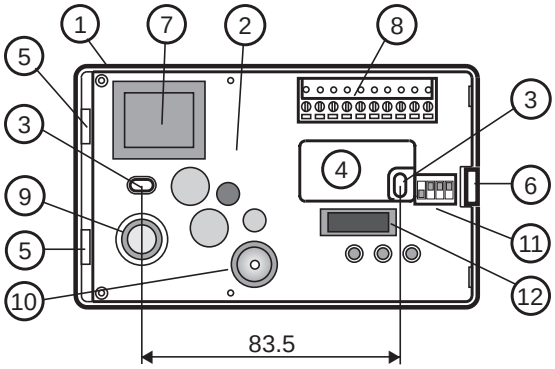
fig. 2



1 – Base module
2 – Cover module
3 – Sensor fault LED
4 – Alarm LED
5 – Line LED
6 – Valve reset knob
7 – Coil
8 – Union

BASE MODULE

fig. 3



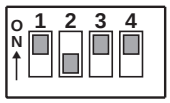
1 – Base module
2 – Printed circuit
3 – Mounting holes
4 – Cutout for leads
5 – Hinge elements
6 – Securing clip
7 – Transformer
8 – Terminal block
9 – Sensing element
10 – Alarm buzzer
11 – Programmer
12 – Microprocessor

EVG 841 SOLENOID VALVE

It is of the normally-open type with manual re-set.
The body is in OT 58 nickel-plated brass with 3/4" female screwed gas joints.
The closure mechanism is attached to the valve by means of a union and is sealed by a gasket. The mechanism itself consists of a brass plug with a thrust spring and rubber sealing gland. The release block is mounted perpendicularly to the plug and is operated by a coil (fig. 2.7) with direct current at very low voltage.

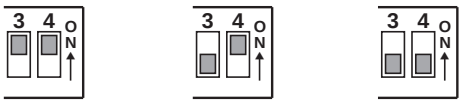
PROGRAMMER

fig. 4



Factory setting (fig. 3.11)

Sensor connections

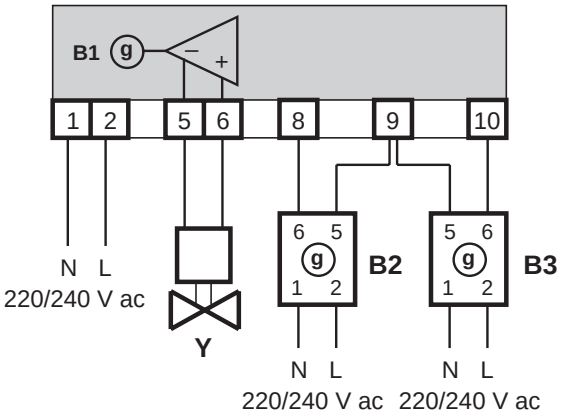


Internal sensor only — With B2 — With B2 and B3

If programmer is not adapted to actual situation of sensors detector signals fault state with yellow LED (fig. 2.3).

WIRING DIAGRAM

fig. 5



B1 – Internal sensor
B2-3 – SGR ... remote sensors

Y – EVG 841 solenoid valve

INSTALLATION

DETECTOR

The exact siting of detector is essential for its correct functioning and depends on type of gas to be monitored and its density in respect of air :

Methane (natural gas) (light) : 10 to 50 cm. from ceiling
LPG (heavy) : 10 to 50 cm. from floor
Carbon monoxide : 150 to 200 cm. from froor

It is advisable to site detector at a certain distance from domestic appliances in order to avoid unnecessary alarms :

Burners and calorifiers : 1 to 2 metres
Cookers : 2 to 3 metres

EVG 841 SOLENOID VALVE

This must be installed on the gas inlet pipe, if possible **outside the premises to be controlled, in an easily accessible place protected from the weather.**

In LPG installations with an external tank, it must be installed downstream of the low pressure reducing valve (30 to 40 mbar).

In LPG installations with cylinders, it must be installed downstream of the pressure reducing valve and, if possible, connected directly to the latter by means of a screwed connector.

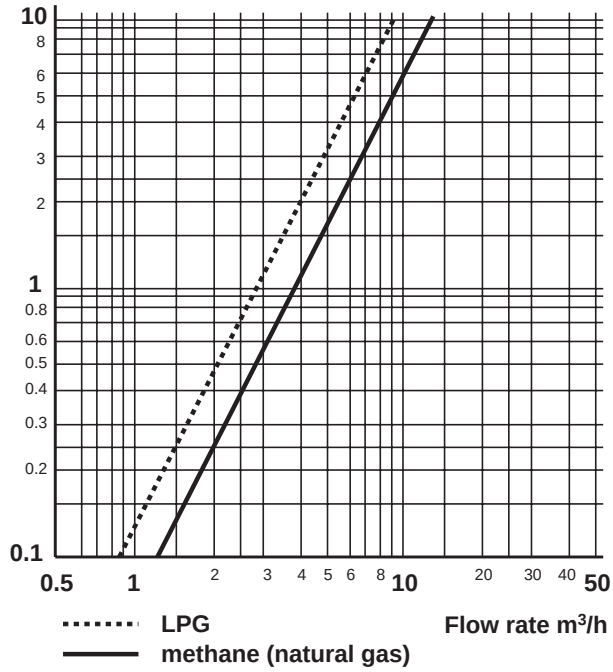
ELECTRICAL CONNECTIONS

The power supply leads for SRC... sensors can be parallel to those of detector or taken separately from another point of mains network.

The electric signal leads (sensor contacts 5 and 6) must have a cross section of 1 mm² for distances up to 50 metres and 1.5 mm² for distances up to 70 metres.

EVG 841 SOLENOID VALVE - PRESSURE DROP

fig. 6



1 mbar = 10 mmWG = 100 Pa

TECHNICAL DATA

DETECTORS

Power supply	220/240 V ac.
Frequency	50 to 60 Hz
Consumption	2.5 VA
Electromagnetic compatibility	EEC 93/68
Output :	
– type	by impulses
– voltage	~ 20 V dc
– rated capacity	1 EVG 841solenoid valve
Audible warning	85 db
Sensing element :	
– methane (natural gas) (RGM 148)	Figaro TGS 842
– propane - LPG (RGM 248)	Figaro TGS 813
Sensor heating time	120 s
Suitable monitoring sensors :	
– methane (natural gas)	SRC158 (220/240 V ac), SRC152 (12 V dc)
– propane - LPG	SRC 258 (220/240 V ac), SRC 252 (12 V dc)
– carbon monoxide	SRC 358 (220/240 V ac), SRC 352 (12 V dc)
Pre-alarm threshold :	
– methane (natural gas)	0.5 % (5,000 ppM)
– propane - LPG	0.2 % (2,000 ppM)
– carbon monoxide	0.03 % (300 ppM)
Alarm threshold :	
– methane (natural gas) (RGM 148)	0.8 % (8,000 ppM)
– propane - LPG (RGM 248)	0.35 % (3,500 ppM)
– carbon monoxide	0.05 % (500 ppM)
Room temperature:	
– operation	0 to 40 °C
– storage	– 20 to + 60 °C
Relative humidity operating	20 to 80 % at 35 °C
Protezione	IP 42
Weight	250 g
Dimensions	130x80x37 mm

EVG 841 SOLENOID VALVE

Test pressure	240 mbar
Maximum working pressure	200 mbar
Body	OT58 nickel plated
Plug	OT58 nickel plated
Seal	Rubber
Plug seal	O-ring rubber
Protection	IP 54
Weight	400 g

COSTER
CIE CONTROLLI TEMPERATURA ENERGIA

20132 Milan	Head Office & Sales
Via San G.B. De La Salle, 4/a	Tel. +39.02.2722121 (TI) Tel. +39.02.45476193 (FW) Fax +39.02.2593645
00146 Rome	Reg. Off. Central & Southern
Viale G. Marconi, 437	Tel. +39.06.5573330 Fax +39.06.5566517
25048 Edolo (BS)	Orders and Shipping
Via Gen. Treboldi 190/192	Tel. +39.0364.7732.00/02 Fax +39.0364.770016
Web: www.coster.info	E-mail: info@coster.info

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