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G 220

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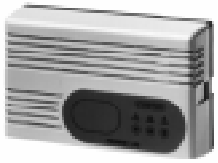
DOMESTIC GAS DETECTORS WITH MICROPROCESSOR AND RELAY OUTPUT

RGM 122 - 128 - 222 - 228 C1 Eng.

DISCONTINUED PRODUCT



- Power supply 220/240 V ac. or 12 V dc. Protection IP 42
- Includes internal monitoring sensor for methane (natural gas) or propane - LPG
- Possibility of connecting 1or 2 remote sensors for methane (natural gas), propane - LPG or carbon monoxide
- SPDT output relay
- Alarm threshold below 25% of 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

APPLICATION

RGM 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, of 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 output relay can control a gas shut-off valve, an aeration fan, etc.

MODELS

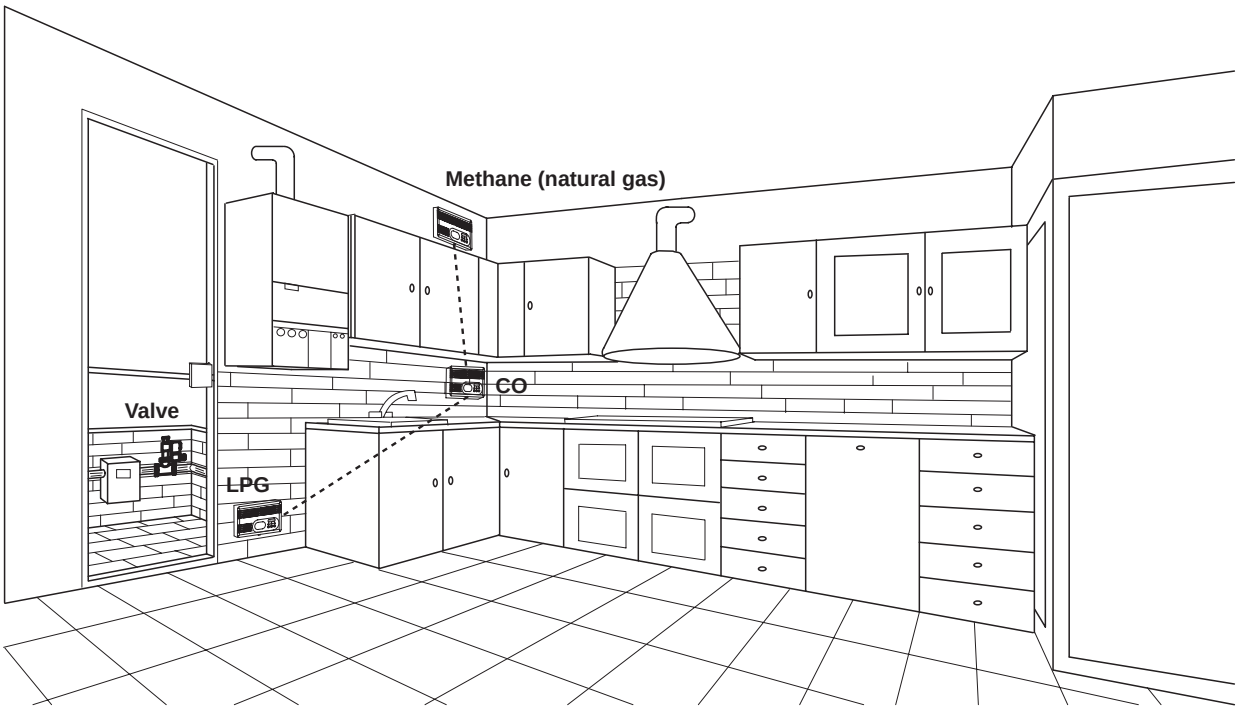
Code	Power supply	Type of gas	Internal sensor	Output	Remote sensors **SRC**
RGM 128	220/240 V ac	methane (natural gas)	TGS 842	SPDT relay	158 – 258 – 358
RGM 122	12 V dc	methane (natural gas)	TGS 842	SPDT relay	152 – 252 – 352
RGM 228	220/240 V ac	propane - LPG	TGS 813	SPDT relay	158 – 258 – 358
RGM 222	12 V dc	propane - LPG	TGS 813	SPDT relay	152 – 252 – 352

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 mt.	75 mt.	N 811
SRC 152	12 V dc	methane (natural gas)	TGS 842	0.8 %	50 mt.	75 mt.	N 811
SRC 258	220/240 V ac	propane - LPG	TGS 813	0.35 %	50 mt.	75 mt.	N 811
SRC 252	12 V dc	propane - LPG	TGS 813	0.35 %	50 mt.	75 mt.	N 811
SRC 358	220/240 V ac	carbon monoxide	TGS 812	0.05 %	50 mt.	75 mt.	N 811
SRC 352	12 V dc	carbon monoxide	TGS 812	0.05 %	50 mt.	75 mt.	N 811

TYPICAL INSTALLATION

fig. 1



OPERATION

All the functions of the detector are processed by a CMOS microprocessor.
When it is powered the detector does not signal alarms for a period of two minutes so as to give time to the internal sensor, and to any remote sensors used, to become stabilised. This condition is indicated by the flashing of the green LED (fig. 2.5). Following this period the detector is ready to signal an alarm.
The internal sensor, and, if used, the remote sensors, monitor the gas concentration level in the surrounding air and, in the event that the pre-alarm concentration threshold is discerned by one of the sensors, the detector causes the red alarm LED (fig. 2.4) to flash; in the event that alarm threshold is exceeded, the detector causes red LED to light and stay lit and, after 30 seconds, the detector also switches on audible alarm and activates output relay.
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-LPG = 2.1 % (21,000 ppm).
Consequently, in the event of a gas leak, RGM detectors make it possible to intervene in conditions of maximum safety.

DETECTION OF CARBON MONOXIDE

By connecting remote sensor SRC 358 or SRC 352 to detector it is possible to detect the presence of carbon monoxide. The danger of this gas does not derive from its flammability but from its high toxicity for humans and this depends on the concentration level and time of exposure to the gas.

Concentration	Time	Effect
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, this LED flashes for two minutes and then remains lit.
- Red LED - Alarm (fig. 2.4) : When gas concentration reaches pre-alarm threshold this LED flashes and, when it reaches alarm threshold, LED remains lit.
- Yellow LED - Sensor fault (fig. 2.3) : Lights up when one of the sensors is faulty.

OUTPUT RELAY

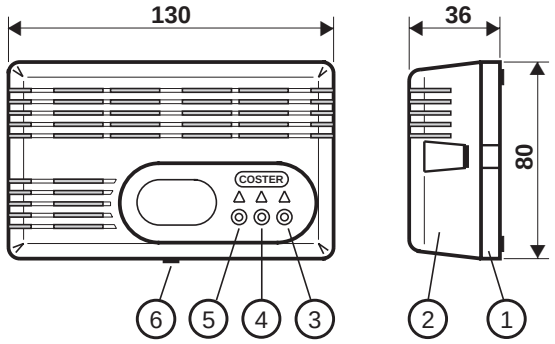
The output relay can be used in two different ways :
- Normally not energised :
  – Programmer (fig. 3.12) with switch 2 on On;
  – Under normal conditions (detector powered and not in alarm state) the relay is not energised with contact 5-6 closed and 4-5 open;
  – In alarm state, relay is energised with contact 5-6 open and 4-5 closed;
- Normally energised (BSI 7348 requirement);
  – Programmer (fig. 3.12) with switch 2 on Off;
  – Under normal conditions (detector powered and not in alarm state), relay is energised with contact 5-6 open and 4-5 closed;
  – In alarm state, relay is not energised with contact 5-6 closed and 4-5 open.

LATCHING ALARM

Once in alarm state, if programmer (fig. 3.12) has switch 1 on On (Latching Alarm), this state remains even when gas concentration returns below threshold level; to return to normal state it is necessary to press reset key (fig. 2.6) for at least three seconds. If switch 1 is on Off (without Latching Alarm), when gas concentration returns below threshold level normal functioning is automatically resumed.

COVER MODULE/OVERALL DIMENSIONS

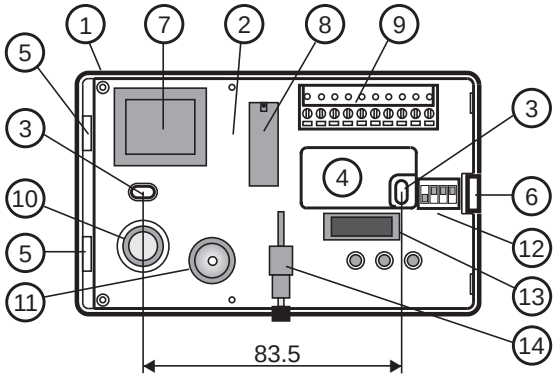
fig. 2



1 – Base module
2 – Cover module
3 – Sensor fault LED
4 – Alarm LED
5 – Line LED
6 – Reset button

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 – Output relay
9 – Terminal block
10 – Sensing element
11 – Alarm buzzer
12 – Programmatore
13 – Microprocessore
14 – Reset button

CONSTRUCTION

The detector 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. 3.9), programmer (fig. 3.12), microprocessor (fig. 3.13), reset button (fig. 3.14), alarm buzzer (fig. 3.11), sensing element (fig. 3.10), transformer (fig. 3.7) and airtight output relay containing inert gas (fig. 3.8).
  – 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).
- Cover module (fig. 2.2), in shockproof plastic material, on the facia of which are the sensor fault, alarm and line LEDs (fig. 2. 3.4.5). 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.

INSTALLATION

DETECTOR

The exact siting of the detector, and of any remote sensors used, is essential for correct functioning and depends on the 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 floor

It is advisable to site detector and any remote sensors used 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.

SHUT- OFF 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, the shut-off valve must be installed downstream of the low pressure reducing valve (30 to 40 mbar).

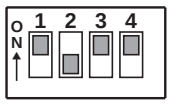
In LPG installations with cylinders, it must be installed downstream of the pressure reducing valve and, if possible, connected directly to the latter by means of a screwed connector.

TECHNICAL DATA

Power supply :	
– RGM 128 - 228	220/240 V ac ; 50 to 60 Hz
– RGM 122 - 222	12 V dc
Consumption	2.5 VA
Electromagnetic compatibility	CEE 93/68
Output relay :	
– type	airtight with inert gas
– contacts	SPDT voltage-free
– rated voltage	250 V
– rated capacity	5 (1) A
Audible warning	85 db
Sensing element:	
– methane (natural gas) (RGM 128 -122)	Figaro TGS 842
– propane - LPG (RGM 228 - 222)	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)	0.8 % (8,000 ppM)
– propane - LPG	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
Protection	IP 42
Weight	250 g
Dimensions	130x80x37 mm

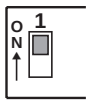
PROGRAMMER

fig. 4

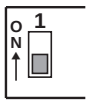


Factory setting (fig. 3.12)

Latching Alarm

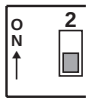


With Latching Alarm

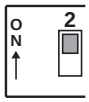


Without Latching Alarm

Output relay

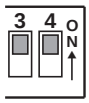


Norm. energised

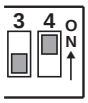


Norm. not energised

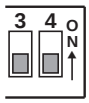
Sensor connections



Internal sensor only



With B2



With B2 e B3

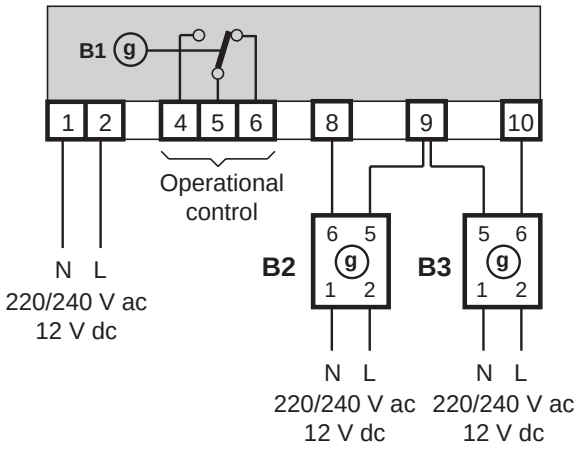
If programmer is not adapted to actual situation of sensors, detector signals sensor fault with yellow LED (fig. 2.3).

WIRING DIAGRAMS

fig. 5

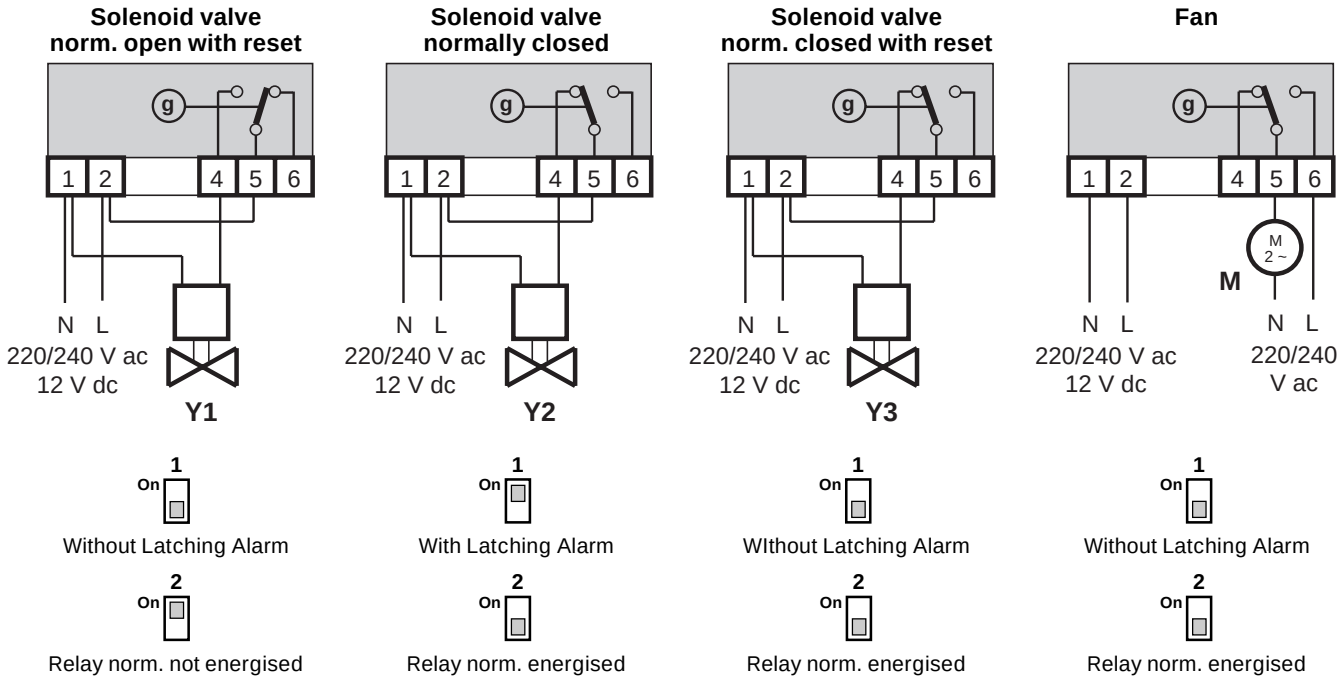
GENERAL LAYOUT

Relay contact is shown in condition of detector not powered and not in alarm



EXAMPLES OF OPERATIONAL CONTROLS

The relay contacts are shown in condtion of detector not powered and not in alarm



B1 – Internal sensor
B2-B3 – SRC ... remote sensors
M – Aeration fan

Y1 – Solenoid valve N.O. with reset
Y2 – Solenoid valve N.C.
Y3 – Solenoid valve N.C. with reset

ELECTRICAL CONNECTION

The power lead for SRC... sensors must be parallel to that of detector or taken singly 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.

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