Gas Leak Detection GLD

Description

The GLD gas leak detection range is suitable for use in Boiler Rooms and other Commercial applications to provide safety and shut down functions in the event of gas leakage.

Control units are available in 1, 2 or 3 channels for connection to 1, 2 or 3 remote sensors. They are mounted in DIN rail housings with the option of panel or wall mount enclosures.

Output relays to operate auxiliary devices such as Solenoid Gas Valves or Sirens and fault remote signalling are fitted to all units.

Power supply is 230Vac or 12-24Vdc and sensors are available for both Natural Gas, LPG/Propane and Carbon Monoxide.

Features

- 1, 2 & 3 channel options
- Audio & visual alarms
- Adjustable alarm sensitivity
- Relay output for gas valves
- Relay outputs for remote alarms
- Auto or manual reset

Technical Specification

Power Supply:	GLD361: 230Vac ±10% @ 50Hz	
	GLD65*: 12V ±10%	
Power Consumption:	GLD361: 3VA	
	GLD65*: 7VA	
Relay Outputs:	GLD361: 5(1)A @ 250V SPDT	
	GLD65*: 2 x 5(1)a @ 250V SPDT	
Pre-alarm Thresholds:	**Natural Gas:**	0.3% to 0.8% (3000 to 8000ppm)
	LPG:	0.14% to 0.35% (1400 to 3500ppm)
	CO:	0.012% to 0.03% (120 to 300ppm)
Alarm Thresholds:	**Natural Gas:**	0.5% to 1.25% (5000 to 12500ppm)
	LPG:	0.22% to 0.56% (2200 to 5600ppm)
	CO:	0.02% to 0.05% (200 to 500ppm)
Sensors:	**Natural Gas:**	GLD150
	LPG:	GLD250
	CO:	GLD350
Materials:	Base – Nylon, Cover – ABS	
Ambient:	**Storage:**	-25°C to +60°C
	Operating:	0°C to +45°C

Order Codes

GLD361	DIN rail Single Channel Gas Leak Detection Controller
GLD651	DIN rail Single Channel Gas Leak Detection Controller
GLD652	DIN rail Two Channel Gas Leak Detection Controller
GLD653	DIN rail Three Channel Gas Leak Detection Controller
GLD655	Panel Mounting Kit
GLD150	Natural Gas Sensor
GLD250	Propane/LPG Sensor
GLD350	Carbon Monoxide Sensor

Installation

Detector

The detector must be sited in a dry space in which the relevant ambient limits shown in the Technical Specification are observed. If sited in a space classified as “Dangerous” it must be installed in a cabinet for electrical devices constructed according to the regulations in force for the danger class involved.

The controller can be installed on a DIN rail or in a DIN modular enclosure.

Sensors

The correct siting of the sensors is essential for efficient operation and depends on the type of gas to be monitored and its density in respect of air:

Methane-natural gas (light): 10...50 cm from the ceiling

LPG-propane (heavy): 10...50 cm. from the floor

CO-carbon monoxide: 150...200 cm. from the floor

It is advisable to position the sensors at a certain distance from the gas appliances so as to avoid triggering unnecessary alarms:

Boilers & calorifiers : 1...2 meters

Gas cookers : 2...3 meters

Shut-off solenoid valve

This must be installed on the gas feed pipe, possibly **outside the space controlled, in a place which is easily accessible and is protected from bad weather.**

In LPG installations the valve must be installed **downstream of the pressure reducing valve** (30 ... 40 mbar).

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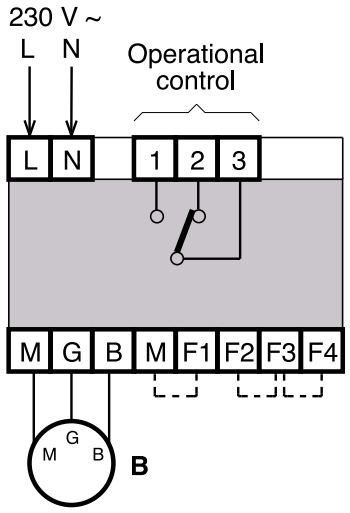
Wiring

1. Separate base and cover
2. Mount base on DIN rail and check that the securing elements hold it firmly in place.
3. Carry out the wiring according to the diagram and in observance of the regulations in force, using cables of:
   – 1.5 mm2 for power and relay control outputs
   – 1 mm2 for sensor with maximum distance of 50 meters or 1.5 mm2 with maximum distance of 75 meters.
4. Carry out “Link functions” to adapt detector to type of operational control.
5. Switch on power (230 V ~) and check the voltage across terminals L and N
6. Switch off power, replace cover on base and secure it with the two screws supplied.
7. You are advised not to insert more than two cables in a single terminal of the detector and if necessary to use external junction boxes.

GLD361



B– Gas sensor
Y1– N.O. solenoid valve with manual reset
Y2– N.C. solenoid valve
Y3– N.C. solenoid valve with manual reset
M– Aeration fan

Link functions:

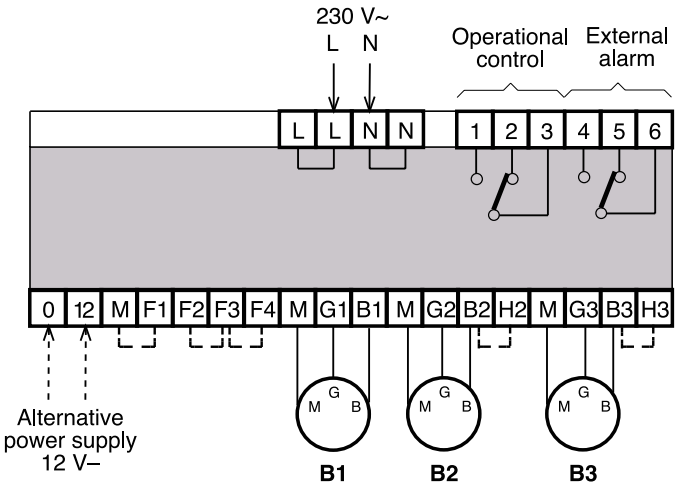
M - F1 **without link** = internal buzzer enabled
with link = internal buzzer disabled

F2 - F3 **without link** = relay normally energised; in presence of gas de-energised
with link = relay normally de-energised; in presence of gas energised

F3 - F4 **without link** = relay with latching alarm
with link = relay with non-latching alarm

Warning: Before changing link positions switch off power supply

GLD65x



B – Gas sensor
Y1 – N.O. solenoid valve with reset 230 V ~
Y2 – N.O. solenoid valve with reset 12 V –
M – Aeration fan
h1 – Blinking 230 V~
h2 – Siren 230 V~
h3 – Blinking 12 V~
h4 – Siren 12 V~

Link functions:

M- F1 **without link** = Internal buzzer and external alarm activated
with link = internal buzzer and external alarm disactivated

F2 - F3 **without link** = relay normally energised; in presence of gas de-energised
with link = relay normally de-energised; in presence of gas energised

F3 - F4 **without link** = relay with latching alarm
with link = relay with non-latching alarm

B2 - H2 with link = B2 sensor not connected

B3 - H3 with link = B3 sensor not connected

NB: For N.C. valves do not make link F2-F3

Warning: Before changing link positions switch off power supply

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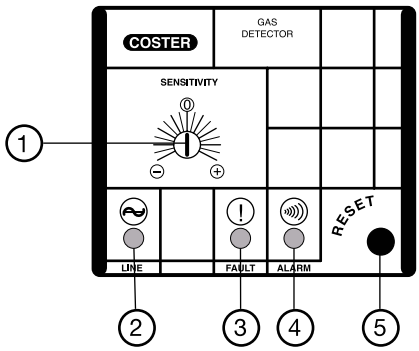
Facias

GLD361



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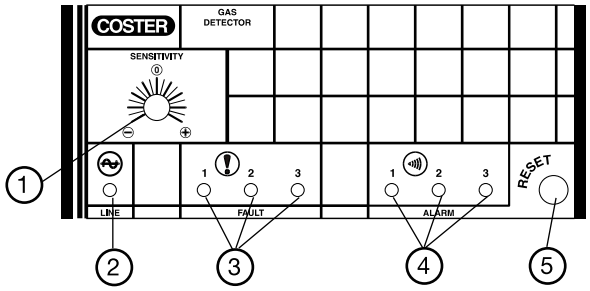

1– Sensitivity potentiometer
2– Power supply LED
3– Fault LED
4– Alarm LED
5– Reset button

OPERATION

The detector, when it is powered (2), remains inactive for 1.5 ... 2 minutes with the FAULT (3) and ALARM (4) LEDs blinking, to give time to the sensor to become stabilised.

The sensor sends to the detector a signal with a voltage proportional to the concentration of gas present in the air.

When the concentration exceeds the pre-alarm threshold the ALARM (4) LED blinks.

When the signal exceeds the alarm threshold the detector, after a delay of about 20 seconds :

– activates the internal buzzer
– switches on the ALARM (4) LED
– activates the operational control

Pre-alarm and alarm threshold

The alarm threshold for natural gas is about 16% of the LEL (lower limit of explosivity of the gas in air). This is below the limit set by the manufacturing standards (20% of LEL). The pre-alarm threshold is about two thirds of the alarm threshold.

This permits, in the event of an alarm, taking action under conditions of maximum safety.

Using the SENSITIVITY (1) potentiometer the thresholds can be adjusted within the limits established by the manufacturing standards :

Potentiometer towards + = increase in sensitivity

Potentiometer towards – = decrease in sensitivity

Alarm

The alarm status brings about the action of the operational relay :

- if normally de-energised (F2 - F3 with link) : relay becomes energised,contacts : 1-3 closes, 2-3 opens.
- if normally energised (F2 - F3 without link) : relay becomes de-energised,contacts : 1-3 opens, 2-3 closes.

It is signalled by :

- activation of internal buzzer (only if terminals M - F1 without link)
- lighting of ALARM (6.4) LED on facia.

Latching alarm and reset

The detector can be programmed in two ways :

1. Without latching alarm (F3 - F4 with link) :

- alarm ceases when concentration of gas returns below threshold level
- a slow blinking (0.2 seconds On and one second Off) of the ALARM (4) LED indicates the alarm status.
- To disactivate it use the RESET (5) button (press for 5 seconds).

2. With latching alarm (F3 - F4 without link - factory setting) :

- alarm continues even when concentration of gas returns below threshold level
- To disactivate it use the RESET (5) button (press for 5 seconds).

Self-diagnosis

In the event of a fault or of incorrect connection of the sensor the FAULT (3) or ALARM (4) LED lights.

Type of fault	Fault LED (3)	Alarm LED(4)
Breakage of sensor self-heating element	x	
No connection to terminal G	x	
No connection to terminal B	x	
No connection to terminal M		x
Connections G and B inverted	x	
Connections G and M inverted		x

When the ALARM LED lights up the detector puts the system in alarm mode.

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COMMISSIONING

- Power the detector : LINE (2) LED lights.
- After 1.5 ... 2 minutes the detector is enabled for operation.
- Set SENSITIVITY (1) potentiometer on 0.
- Simulate the presence of gas : release gas from an ordinary cigarette lighter near the monitoring sensor.
- When the gas concentration reaches the pre-alarm threshold the ALARM (4) LED blinks.
- When it reaches the alarm threshold, after a delay of about 20 seconds :
  – the ALARM (4) LED lights and remains lit
  – the internal buzzer sounds (only if terminals M - F1 are without link).
  – the operational relay closes the shut-off valve or switches on an aeration fan.
- Stop releasing gas : when the gas concentration near the sensor falls below the threshold level :
  – if the detector is Without latching alarm, the alarm ceases and the ALARM (4) LED continues to blink slowly until the RESET (5) button is pressed.
  – if With latching alarm, the alarm status continues until the RESET (5) button is pressed for at least five seconds.
- If the detector controls a valve with manual reset this must be re-opened.

Dimensions

1 – Protective cover for electronic components

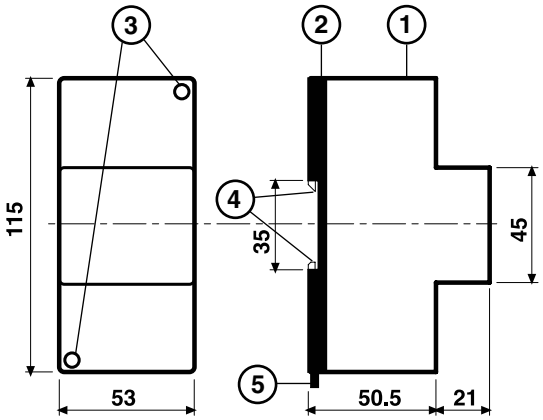
2 – Base with transformer, relay & terminal blocks

3 – Screws for fixing cover- base

4 – DIN rail securing elements

5 – DIN rail release lever

GLD361



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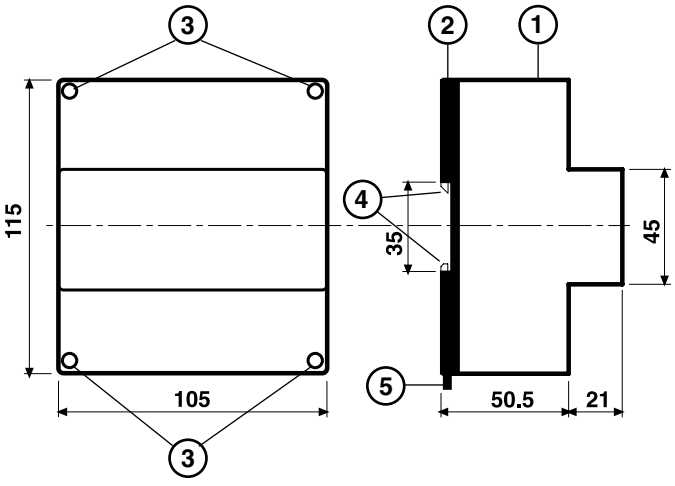

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