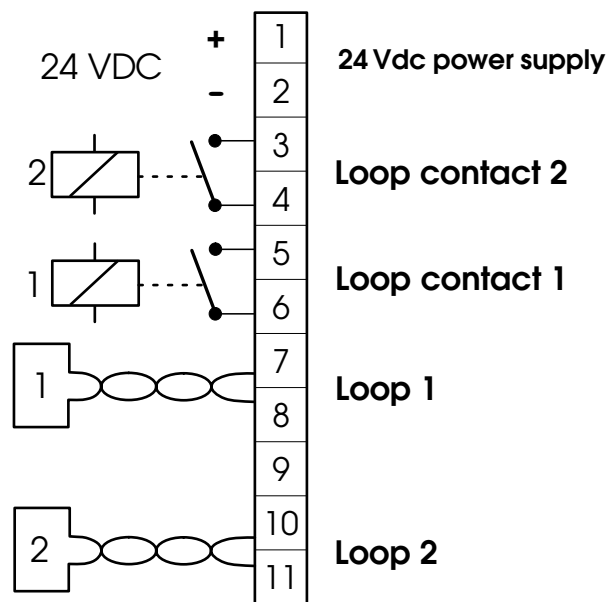
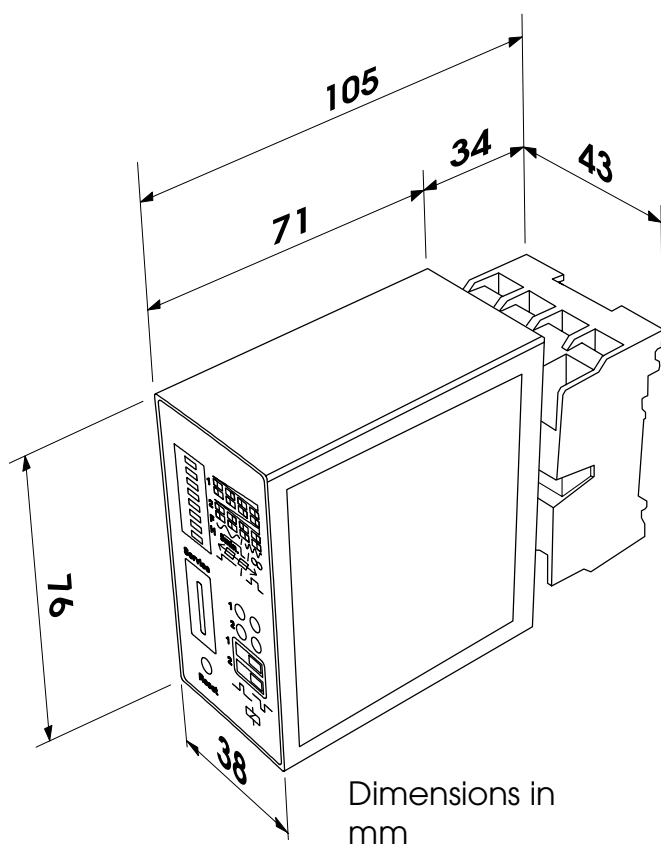


FG2 TWO-CHANNEL DETECTOR

ENGLISH

1. DIMENSIONS AND ELECTRIC CONNECTIONS



2. GENERAL INFORMATION

Applications:

- control of barriers, gates and parking systems

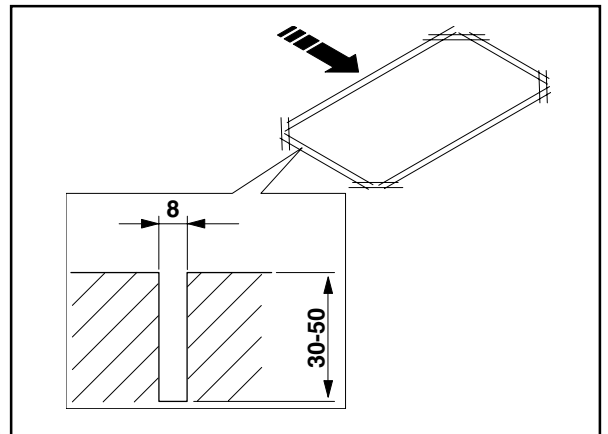
Characteristics :

The FG2 magnetic loop detector is a system for inductively detecting vehicles, and has the following characteristics:

- analysis of 2 loops
- loops and detector galvanically separated
- system sets automatically at power-up
- frequency drifts are continuously updated to prevent environmental influence
- sensitivity control is independent of loops inductance
- relay outputs with free contacts
- output can be selected as N.O. or N.C. with microswitches
- presence or direction identification
- continuous or pulsed signal
- 2 frequency levels for both channels
- 4 sensitivity levels for each channel
- secured to DIN bar

3. HOW TO MAKE THE LOOPS

The loops must be constructed at least 15 cm from fixed metal objects, at least 50 cm from moving metal objects, and at no more than 5 cm from the surface of the definitive flooring. Use a normal single-pole 1.5mm² diameter cable (if the cable is buried directly, it must be double insulated). Make a loop, preferably square or rectangular, using a PVC raceway or making a chase in the floor as shown in the figure at the side (corners should be cut at 45° to prevent the cable from fracturing). Lay the cable, with the number of windings indicated in the table. The two cable ends must be intertwined (at least 20 times per meter) from the loop to the detector.



Do not make any joints on the cable (if this is necessary, solder the conductors and seal the joint with a heat-shrink sheath) and keep it away from mains power cables.

| Loop perimeter | number of windings |
|-----------------|--------------------|
| less than 3 m. | 6 |
| from 3 to 4 m. | 5 |
| from 4 to 6 m. | 4 |
| from 6 to 12 m. | 3 |
| over 12 m. | 2 |

4. PROGRAMMING

4.1. Sensitivity

Sensitivity is set to define, for each channel, the minimum frequency variation that a vehicle must cause to activate the detector output contact. Sensitivity can be set to 4

| SENSITIVITY | Channel 1 | | Channel 2 | |
|-------------------------------------|-----------|-----|-----------|-----|
| | DIP 1 | 2 | DIP 3 | 4 |
| 1 LOW (0,64% $\Delta f/f$) | | OFF | | OFF |
| 2 MEDIUM LOW (0,16% $\Delta f/f$) | | ON | | OFF |
| 3 MEDIUM HIGH (0,04% $\Delta f/f$) | | OFF | | ON |
| 4 HIGH (0,01% $\Delta f/f$) | | ON | | ON |

different levels by using two DIP microswitches. Microswitches 1 and 2 control channel 1, whereas microswitches 3 and 4 control channel 2.



4.2. Frequency

The operating frequency of the detector can be selected on two levels with microswitch 5, jointly for both channels. Moreover, frequency depends on loop shape, number of windings and total length of cable. Different frequencies must be used for detectors commanding adjacent loops.

| Frequency | DIP 5 |
|-----------|-------|
| LOW | OFF |
| HIGH | ON |



4.3. Presence time and Rest

Maximum presence time can be set with microswitch 6. When presence time elapses, the engaged channel resets automatically and signals "loop free". Presence time of a channel begins when the relevant loop is engaged. An automatic reset is effected when the detector is powered up or if the setting of dip 6 is changed.

| PRESENCE TIME | DIP 6 |
|---------------|---|
| 5 min. |  OFF |
| Continuous |  ON |



4.4. Presence identification

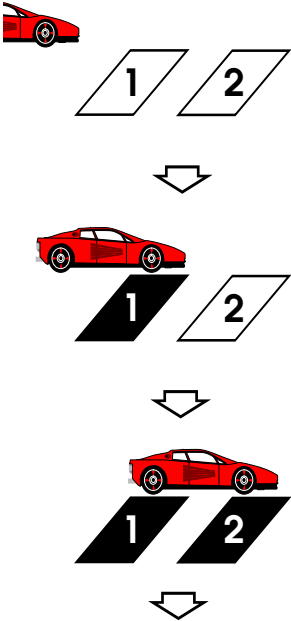
To identify presence, turn OFF microswitch 7. Under these conditions Relay 1 operates in "presence" logic (contact active for as long as the loop is engaged), whereas the logic of Relay 2 can be selected for either "presence" or "release pulse", by programming microswitch 8. The latter function can be useful for controlling barrier re-closing.

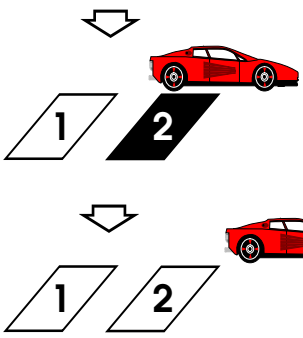
| DIP 7 = OFF | |
|----------------------|---|
| RELAY LOGIC 2 | DIP 8 |
| Presence |  OFF |
| Loop 2 release pulse |  ON |

4.5. Identifying direction

While microswitch 7 is ON, you can select from among two directional logics, using dip 8 to select. The directional pulse (dip 8 = ON) is useful for counting vehicles, whereas the continuous directional signal (dip 8 = OFF) can be useful for controlling a barrier or gate. The directional signal is generated by the relay of the loop which is engaged first. The following example shows operation with direction 1→2, and, therefore, the signal will be generated by relay 1.

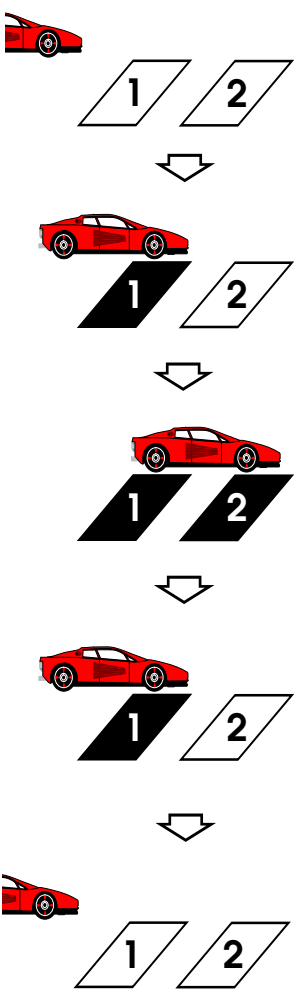
| DIP 7 = ON | |
|-------------------|---|
| DIRECTIONAL LOGIC | DIP 8 |
| Continuous signal |  OFF |
| Directional pulse |  ON |

| TRANSIT SEQUENCE | DIRECTIONAL PULSE (DIP 8 = ON) | CONTINUOUS SIGNAL (DIP 8 = OFF) |
|--|---|--|
|  | <p>RELAY 1 → Directional pulse</p> | <p>RELE' 1 → Continuous directional signal "ON"</p> |

| TRANSIT SEQUENCE | DIRECTIONAL PULSE (DIP 8 = ON) | CONTINUOUS SIGNAL (DIP 8 = OFF) |
|---|--------------------------------|--|
|  | | <p>RELE' 1 →Continuous directional signal "MAINTAINED"</p> <p>RELE' 1 →Continuous directional signal "OFF"</p> |

If transit is in the opposite direction, signals will be generated according to the same logic but by Relay 2.

In this case of faulty transit which involves reversing, signals will be managed as follows:

| TRANSIT SEQUENCE | DIRECTIONAL PULSE (DIP 8 = ON) | CONTINUOUS SIGNAL (DIP 8 = OFF) |
|---|--|--|
|  | <p>RELAY 1 →Directional pulse</p> <p>RELE' 2 →Directional pulse signalling that the vehicle is reversing</p> | <p>RELE' 1 →Continuous directional signal "ON"</p> <p>RELE' 1 RContinuous directional signal "OFF"</p> |

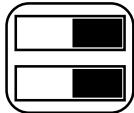

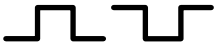

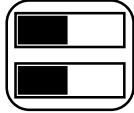
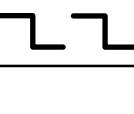
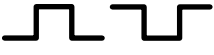

4.6. Reset

At power-up, the detector automatically self-sets the frequency on the loops; if power is cut for less than 0.3 s, self-setting is not effected. Self-setting can be commanded manually at any time by pressing the Reset push-button on the detector front panel. About 1 second is necessary for self-setting, if loop frequency is stable. If the loop is engaged during self-setting, more time may be required. Very long times mean the frequency is unstable – we advise you to check the state of the loop/detector system.

5. OUTPUTS AND LEDs

5.1. Functional criterion of relays













The detector is supplied with a free contacts relay for each output. You can select – separately for each channel – if you want the relay to operate on “rest current” (coil normally powered and N.O. contact) or on “operating current” (coil normally not powered and N.C. contact).

| MICROSWITCH | POSITION | FUNCTIONAL CRITERION |
|--|---|--|
| 1  2   |  | Rest current criterion (the relay coil de-energises when the loop is engaged). |
| 1  2   |  | Operating current criterion (the relay coil energises when the loop is engaged). |

5.2. Relay contacts

The table at the side shows the state of the relay contacts in relation to the position of the microswitches which select the functional criterion (see chapter 5.1).

If the detector is used to control re-closing of a 620-640 barrier, it is preferable to use the “rest current criterion”, because, in the event of a fault or power failure, this function prevents the barrier from re-closing, thus avoiding dangerous situations.

| Detector status |  |  |
|-----------------|---|---|
| Loop free |  |  |
| Loop engaged |  |  |
| Loop fault |  |  |
| Reset |  |  |
| Power off |  |  |

5.3. Loop fault

If a loop is faulty, the relay of the affected channel switches to “loop engaged” status. If the fault is solved or removed, the detector operates normally again but the LEDs signal on which loop the temporary fault occurred. To eliminate fault signalling, press the Reset push-button.

5.5. LEDs status

The green LED signals that the detector channel is operating, whereas the red LED supplies information on the status of the relay according to loop status. Signalling is shown separately for each of the 2 channels.

| GREEN LED | RED LED | DETECTOR STATUS |
|-----------|---------|---|
| OFF | OFF | no power supplied |
| flashes | OFF | Self-setting |
| ON | OFF | Detector ready Loop free |
| ON | ON | Detector ready Loop engaged |
| OFF | ON | Loop fault |
| pulsates | OFF | Loop free after a temporary fault |
| pulsates | ON | Loop engaged after a temporary fault |

6. TECHNICAL SPECIFICATIONS

| MODEL | DETECTOR FG2 |
|-------------------------------|--|
| Power supply | 24VDC |
| Absorbed power (W) | 2,5 W |
| Operating ambient temperature | -20 ÷ +55 °C |
| Air humidity | < 95% |
| Loop inductiveness | 20 - 700 µH |
| Frequency range | 30 - 130 kHz on 2 levels |
| Tripping sensitivity | from 0,01% to 0,65% ($\Delta f/f$) on 4 levels |
| Maintained state time | 5 min. or continuous |
| Loop power cable | < 250 m. |
| Loop resistance | < 20 Ohm |
| Relay contacts capacity | 1 A - 230 Vac |
| Pulse duration | > 200 ms |

7. NOTES

- Mixed voltage values must not be used on the relays (e.g. 24Vdc on Relé1 and 230Vac on Relé2)
- Duration of relay contacts can be prolonged by using RC elements connected externally in parallel to the contact.