

5 - OUTPUTS AND LED INDICATORS

5.1 - Operating principle of the relays

The factory setting establishes that both relays function according to the principle of standby current. The operation principle of the relay can be set according to the following table by using jumpers, if fitted on the card. In this regard, the housing of the detector must be opened carefully (see table 7).

⚠ - Warning! On the card there are components which are sensitive to static energy. When working with the device open, appropriate precautions are required. Do not touch the components or conductors! The warranty will be nullified for damages caused by improper handling!

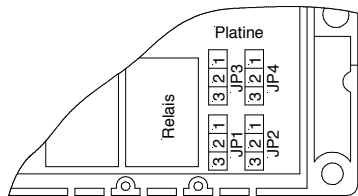


Table 7

Detector status	Relay operating principle			
	1*)	2	3	4
Tension is off				
Free loop				
Output				
Loop fault				

*) Factory setting

Relay	Jumper	Position	Relay function				
1	JP1	1-2		•		•	Normally open contact
		2-3	•		•		Normally closed contact
	JP3	1-2			•	•	Working current principle
		2-3	•	•			Quiescent current principle
2	JP2	1-2		•		•	Normally open contact
		2-3	•		•		Normally closed contact
	JP4	1-2			•	•	Working current principle
		2-3	•	•			Quiescent current principle

5.2 - LED indicators

The green LED indicates that the detector is ready for operation. The red LED, depending on the occupation status of the loop, indicates the activation of the relay output (see table 8).

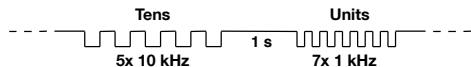
Table 8

Green LED loop control	Red LED loop status	Detector status
Off	Off	No power voltage
Flashing light	Off	Frequency indication or adjustment
On	Off	The detector is ready, free loop
On	On	The detector is ready, occupied loop
Off	On	Loop fault

5.3 - Loop frequency indication

About 1 s after the adjustment of the detector, the loop frequency is indicated by flashing signals on the green LED. First of all, the 10 kHz location of the frequency value will be displayed. For each frequency value of 10 kHz, the green LED of the detector channel will flash once. After 1 sec. the 1 kHz position will be displayed in the same manner. If the value at the position of 1 kHz is '0' the LED will flash 10 times. The 1 kHz position flashes are slightly shorter than the 10 kHz position flashes.

Example of 57 kHz loop frequency:



6 - ELECTRICAL CONNECTIONS

⚠ - Warning!

- Incorrect connections can cause faults or hazards; therefore ensure that the specified connections are strictly observed and performed by experienced and qualified personnel.
- Hook up the unit with the electrical power shut off.

Table 9

Description	Connection	
Power input	0 V	24 V
Relay 1	1a	1b
Relay 2	2a	2b
Loop 1 and Loop 2	Connector block with 4 - poles	

Installation examples

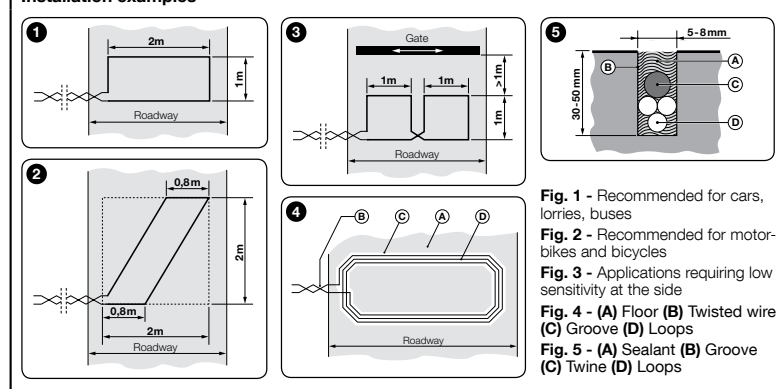


Fig. 1 - Recommended for cars, lorries, buses

Fig. 2 - Recommended for motorbikes and bicycles

Fig. 3 - Applications requiring low sensitivity at the side

Fig. 4 - (A) Floor (B) Twisted wire (C) Groove (D) Loops

Fig. 5 - (A) Sealant (B) Groove (C) Twine (D) Loops

7 - DISPOSAL OF THE PRODUCT

This product constitutes an integral part of the automation system, therefore it must be disposed of together with it. As in installation, also at the end of product lifetime, the disassembly and scrapping operations must be performed by qualified personnel. This product is made up of different types of material, some of which can be recycled while others must be disposed of. Seek information on the recycling and disposal systems envisaged by the local regulations in your area for this product category. **⚠**

- Some parts of the product may contain polluting or hazardous substances which, if disposed of into the environment, constitute serious environmental and health risks.

♻ As indicated by the symbol, the product may not be disposed of as domestic waste. Sort the materials for disposal, according to the methods envisaged by current legislation in your area, or return the product to the retailer when purchasing an equivalent product. **⚠ - Local legislation may include the application of serious fines in the event of improper disposal of this product.**

8 - TECHNICAL SPECIFICATIONS

Note: • All technical specifications stated herein refer to an ambient temperature of 20°C (± 5°C). • Nice S.p.A. reserves the right to apply modifications to products at any time when deemed necessary, maintaining the same intended use and functionality.

• **Dimensions:** 79 x 22.5 x 90 mm (H x W x L without plug) • **Protection type:** IP40 • **Power supply:** 24 V ~ / = ± 10 % max. 2.0 W • **Operation temperature:** -20°C to +70°C • **Air humidity:** max 95% with no condensation • **Loop inductivity:** 25-800 µH, recommended 100-300 µH • **Frequency range:** 30-130 kHz in 2 steps • **Sensitivity:** from 0.01% to 0.64 % (ΔI/I) in 4 levels - from 0.02% to 1.3% (ΔL/L) • **Delay:** 5 min or uninterrupted • **Electric power line of the loop:** max. 250 m • **Loop resistance:** max. 20 Ohm (including power line) • **Relay:** 250 mA / 24 V ~ / = (min. 1 mA/5 V) • **Energise delay:** normally 100 ms • **Signal duration:** > 200 ms • **De-energise delay:** normally 50 ms • **Connection:** Screw terminals (power supply, relay) - Snap-on terminal clamps (loops connection)

Nice
LP22

User, installation and
safety instructions

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Nice

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1 - GENERAL WARNINGS: SAFETY - INSTALLATION - USE (Instructions translated from Italian)

CAUTION Important safety instructions. Follow all instructions as improper installation may cause serious damage

CAUTION Important safety instructions. It is important for you to comply with these instructions for your own and other people's safety. Keep these instructions

- Before commencing the installation, check the "Product technical specifications", in particular whether this product is suitable for automating your guided part. If it is not suitable, DO NOT continue with the installation
- Before proceeding with the installation of the product, check that all materials are in good working order and suited to the intended applications
- The product is not intended for use by persons (including children) with reduced physical, sensory or mental capacities, nor by anyone with insufficient experience or familiarity
- Children must not play with the appliance
- Do not allow children to play with the control devices of the product

CAUTION In order to avoid any danger from inadvertent resetting of the thermal cut-off device, this appliance must not be powered through an external switching device, such as a timer, or connected to a supply that is regularly powered or switched off by the circuit

- Provide a disconnection device (not supplied) in the plant's mains power supply, with a contact opening distance that permits complete disconnection under the conditions dictated by overvoltage category III
- Handle the product with care during installation, taking care to avoid crushing, denting or dropping it, or allowing contact with liquids of any kind. Keep the product away from sources of heat and naked flames. Failure to observe the above can damage the product, and increase the risk of danger or malfunction. If this should happen, stop installation immediately and contact Customer Service
- The manufacturer assumes no liability for damage to property, items or persons resulting from non-compliance with the assembly instructions. In such cases the warranty for material defects is excluded
- Before working on the system (maintenance, cleaning), always disconnect the product from the mains power supply
- The packing materials of the product must be disposed of in compliance with local regulations
- If the product is damaged do not try to fix it and please contact the Service Centre

2 - PRODUCT DESCRIPTION AND INTENDED USE

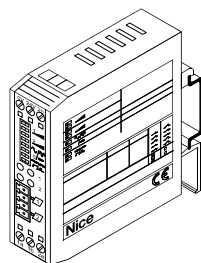
- Barrier controls
- Gate and door controls
- Parking and traffic managing

⚠ - Warning! All uses other than the described use and use in environmental conditions other than those indicated in this manual should be considered improper and forbidden!

3 - FUNCTIONAL SPECIFICATIONS

The inductive loops detector LP22 is a system used for detecting vehicles by means of inductive loops with the following characteristics:

- Evaluation of two loops
- Presence detection or directional detection
- Galvanic isolation between loop and electronic parts of the detector
- Automatic adjustment of the system after power up
- Continuous balancing of frequency drift
- Suitable for monitoring individual parking spaces
- No interference between loop 1 and 2 due to multiplexing.
- Sensitivity can be set regardless of the loop inductivity
- Occupied loop message reported by the LED indicator
- OV Relay contacts which serve as outputs
- Operating principle of the 2-channel relay with switchable jumper
- Indication of the loop frequency via LED
- Loop connection available for Diagnostics



In the design and installation of inductive loops, you should take into consideration the table opposite. A normal insulated copper wire, preferably with a cross-section of 1.5 mm², can be used to create the loop.

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.

Table	
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

The sensitivity setting determines for each channel the change in inductivity that a vehicle must cause in order to use the output of the detector.

The sensitivity setting is performed separately for each channel using the 2 DIP Switches (see table 1).

Table 1		
Sensitivity level		Channel 1: DIP Switch 1 and 2 Channel 2: DIP Switch 3 and 4
1 low	(0.64 % $\Delta f/f$)	
2	(0.16 % $\Delta f/f$)	
3	(0.04 % $\Delta f/f$)	
4 high	(0.01 % $\Delta f/f$)	

4.2 - Frequency setting

The operating frequency of the detector can be adjusted in 2 levels by using the DIP Switch 5 (see table 2).

Table 2	
Frequency	DIP Switch 5
Low	
High	

The permitted frequency range is between 30 kHz and 130 kHz. The frequency depends on the chosen frequency level, and the inductivity resulting from the geometry of the loop, the number of loops and the power supply line of the loop.

4.3 - Wait time and new adjustment

The hold time can be adjusted with DIP-switch 6. At the completion of hold time it will be displayed "free loop" and the detector calibrates automatically. The hold time starts with the occupation of the loop.

Table 3	
Delay	DIP Switch 6
5 minutes	
Uninterrupted	

A new adjustment can be activated manually by changing the delay time.

When switching on the power supply voltage, the detector will adjust the loop frequency. If there are brief outages in voltage (< 0.1 s), no new adjustment will take place.

4.4 - Output function

• Presence detection

For presence detection, the DIP Switch 7 must be positioned to the left. In this position, by means of the relay 1 the presence on loop 1 is reported. With the DIP Switch 8, the output signal for the relay 2 is determined (see table 4).

Table 4	
Output function	DIP Switch 7 - DIP Switch 8
Both channels perform presence detection	
Channel 1 presence det. Channel 2 output pulse	

• Directional detection

If DIP Switch 7 is in the right position, two directional logics will be supported depending on the DIP Switch 8 (see table 5).

Table 5	
Output function	DIP Switch 7 - DIP Switch 8
Direction presence signal	
Direction pulse output	

The directional pulse is mainly used for counting systems, while the presence direction signal is used for door and barrier control systems.

The examples in table 6 explain the operation modes of the direction logics. The direction signal is sent via the relay of the first loop to be crossed, i.e. in the driving direction 1 → 2 the signalling is done via the relay 1.

Table 6		
DIP Switch 8		
Single vehicle		
	Relay 1 Signal "on"	Relay 1 Pulse
	Relay 1 Signal "remains"	
	Relay 1 Signal "off"	
Traffic column		
	Relay 1 Signal "on"	Relay 1 Pulse
	Relay 1 Signal "remains"	
	Relay 1 Signal "remains"	
	Relay 1 Signal "off"	
	Relay 1 Signal "on"	Relay 1 Pulse
	Relay 1 Signal "remains"	
	Relay 1 Signal "off"	
Vehicle manoeuvring		
	Relay 1 Signal "on"	Relay 1 Pulse
	Relay 1 Signal "off"	
		Relay 2 Pulse

The direction signal in the opposite direction is generated in the same way.

In case of breakage or closure of a loop the operation switches to the "Presence detection" mode, until the fault has been fixed.

Through the relay of the loop channel without faults, the signal of presence is now emitted if the loop is occupied.