# Photoelectrics
# Laser, Diffuse-reflective, Background Suppression
# Type LD32CNB06

- **Miniature sensor range**
- **Range: 60 mm**
- **Sensitivity adjustment by Teach-In programming**
- **Modulated, red laser light, 650 nm (class 2)**
- **Supply voltage: 10 to 30 VDC**
- **Output: 100 mA, NPN or PNP preset**
- **Make and break switching function programmable**
- **LED for output indication, signal stability and power ON**
- **Protection: reverse polarity, short circuit and transients**
- **Cable and plug versions**
- **Compact housing**
- **Excellent EMC performance**

CE

## Product Description

The LD32 sensor family is available in a compact 12 x 32 x 20 mm reinforced PMMA/ABS-housing.
The sensors are useful in applications where high-accuracy detection as well as small size is required.
The Teach-In function for adjustment of the sensitivity makes the sensors highly flexible.
The small spot and background suppression makes the sensor able to detect small objects close to the background.
The output type is preset (NPN or PNP), and the output switching function is programmable (NO or NC).

## Ordering Key

**LD32CNB06PPM5T**

- **Type**
- **Housing style**
- **Housing size**
- **Housing material**
- **Housing length**
- **Detection principle**
- **Sensing distance**
- **Output type**
- **Output configuration**
- **Connection type**
- **Teach-In**

## Type Selection

| **Housing W x H x D** | **Range $S_n$** | **Ordering no. NPN & PNP cable Make & break switching** | **Ordering no. NPN & PNP plug Make & break switching** |
|---|---|---|---|
| 12 x 32 x 20 mm | 60 mm | **LD 32 CNB 06 NPT**<br>**LD 32 CNB 06 PPT** | **LD 32 CNB 06 NPM5T**<br>**LD 32 CNB 06 PPM5T** |

## Specifications

| | |
|---|---|
| **Rated operating distance** ($S_n$) | Up to 60 mm, reference target Kodak test card R 27, white, 90% reflectivity, 100 x 100 mm |
| **Blind zone** | ≤ 25 mm |
| **Sensitivity** | Adjustable by Teach-In (push button or wire) |
| **Temperature drift** | ≤ 1%/°C |
| **Hysteresis** (H) (differential travel) | ≤ 7% (grey scale displacement 90%/18%) |
| **Rated operational volt.** ($U_B$) | 10 to 30 VDC (ripple included) |
| **Ripple** ($U_{rpp}$) | ≤ 10% |
| **Output current**<br>Continuous ($I_e$)<br>Short-time (I) | <br>≤ 100 mA<br>≤ 100 mA (max. load capacity 100 nF) |
| **No load supply current** ($I_o$) | ≤ 25 mA @ 24 VDC |
| **Minimum operational current** ($I_m$) | 0.5 mA |
| **OFF-state current** ($I_r$) | ≤ 100 µA |
| **Voltage drop** ($U_d$) | ≤ 2.4 VDC @ 100 mA |
| **Protection** | Short-circuit, reverse polarity and transients |
| **Laser protection class** | Class 2 - according to EN60825-1-3/97 |
| **Average power** | < 1 mW |
| **Pulse width** | t = 3 s |
| **Pulse repetition time** | f = 5 kHz |
| **MTBF** | > 50'000 h @ $T_a$ = 40°C |
| **Light source** | Laser red light, 650 nm |
| **Light type** | Red, modulated |
| **Sensing angle** | < 0.8° |
| **Ambient light** | 5,000 lux |
| **Light spot** | < 0.5 mm |
| **Operating frequency** | 1000 Hz |
| **Response time**<br>OFF-ON ($t_{ON}$)<br>ON-OFF ($t_{OFF}$) | <br>≤ 0.5 ms<br>≤ 0.5 ms |
| **Power ON delay** ($t_v$) | ≤ 300 ms |

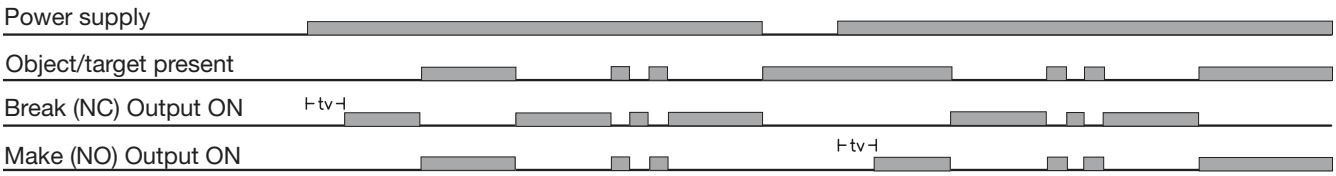
## Specifications (cont.)

| | |
|---|---|
| **Output function** | |
| NPN and PNP | Preset |
| NO/NC switching function | Set up by button |
| **External Teach (ET)** | |
| Same function as button | 10 to 30 VDC |
| Locked (disable teach button) | 0 to 2.5 VDC |
| Operating mode | Not connected |
| **Indication** | |
| Output ON | LED, yellow |
| Power ON | LED, green |
| **Environment** | |
| Installation category | II (IEC 60664/60664A; 60947-1) |
| Pollution degree | 3 (IEC 60664/60664A; 60947-1) |
| Degree of protection | IP 67 (IEC 60529; 60947-1) |
| **Ambient temperature** | |
| Operating | -20° to +60°C (-4° to +140°F) |
| Storage | -20° to +80°C (-4° to +176°F) |

| | |
|---|---|
| **Vibration** | 10 to 55 Hz, 0.5 mm/7.5 g (IEC 60068-2-6) |
| **Shock** | 30 g / 11 ms, 3 pos, 3 neg per axis (IEC 60068-2-6, 60068-2-32) |
| **Rated insulation voltage** | 500 VAC (rms) |
| **Housing material** | |
| Body | ABS, black |
| Front material | PMMA, red |
| **Connection** | |
| Cable | PUR, black, 2 m<br>4 x 0.14 mm$^2$, Ø = 3.6 mm |
| Plug | M8, 4-pin |
| **Weight** | Cable type: 40 g<br>Plug type: 10 g |
| **CE-marking** | Yes |

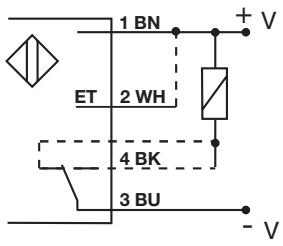
## Operation Diagram

tv = Power ON delay

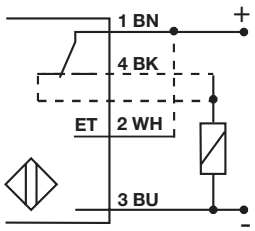



## Wiring Diagrams

**NPN**




**PNP**

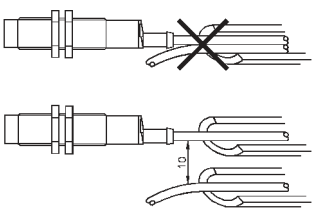



Teach input is active when 2 WH wire is connected to V+ (1 BN).

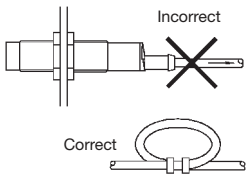
ET = External Teach

## Installation Hints

*To avoid interference from inductive voltage/ current peaks, separate the prox. switch power cables from any other power cables, e.g. motor, contactor or solenoid cables*

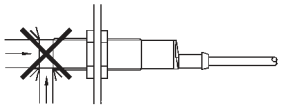



*Relief of cable strain*



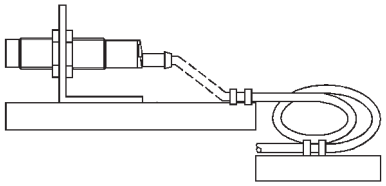

The cable should not be pulled

*Protection of the sensing face*



A proximity switch should not serve as mechanical stop

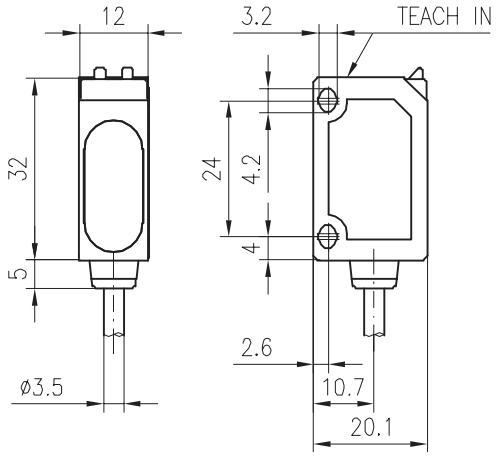
*Switch mounted on mobile carrier*



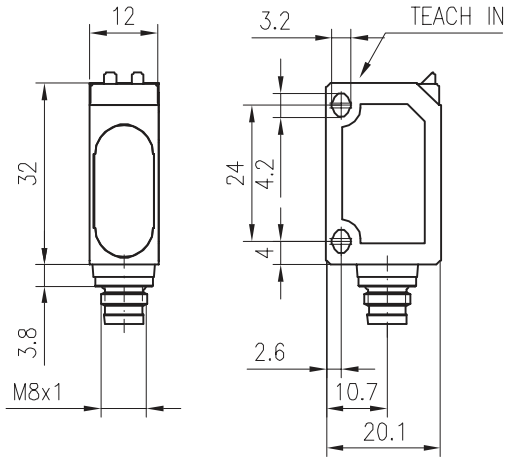
Any repetitive flexing of the cable should be avoided

## Dimensions

**Cable version**

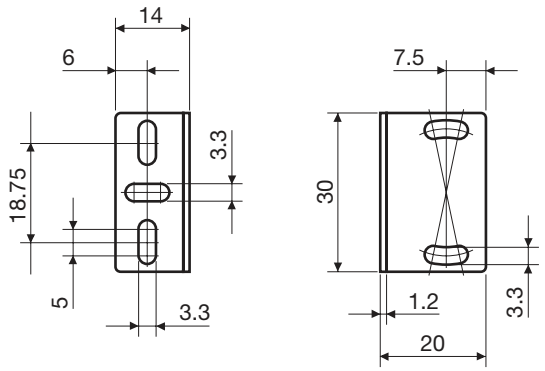



**Plug version**




## Accessories

**Mounting bracket APD32-MB3**




For further information refer to “Accessories”

## Delivery Contents

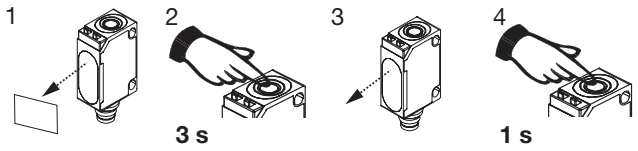
- Photoelectric switch: LD 32 CNB 06 ...
- Installation instruction
- **Packaging:** Cardboard box

CARLO GAVAZZI

# Adjustment

**Sensitivity adjustment, with static object**

1. Line up the sensor with the object. Yellow LED and green LED are ON.
2. Press the button for 3 s until both LED's flash simultaneously (the first switching point is stored).
3. Place the object outside the detection area.
4. Press the button for 1 s.
   a) The green LED flashes and stays ON: the second switching point is stored, and the sensor is ready to operate.
   b) Both LED's flash simultaneously: the sensor cannot detect the object, no switching points are stored.




**Sensitivity adjustment, with only one object**

1. Line up the sensor with the object. Yellow LED and green LED are ON.
2. Press the button for 3 s until both LED's flash simultaneously (the first switching point is stored).
3. Leave the object in the detection area, press the button for 1 s. The green LED flashes and stays on: the second switching point is stored, and the sensor is ready to operate.

**Sensitivity adjustment, with a running process**

1. Line up the sensor with the object. Green LED is ON. At this stage the status of the yellow LED can be ignored.
2. The running process must be the only "object" within the detection area. Press the button for 3 s until both LED's flash simultaneously.
   **3 s**
3. Press the button for at least the duration of one process cycle.
   **1 cycle**
   a) The green LED flashes and stays ON: both switching points have been stored, and the sensor is ready to operate.
   b) Both LED's flash simultaneously: the sensor cannot detect the object, no switching points are stored.

**Programming of make and break switching function**

1. Press the button for 13 s. **13 s**
   Both LED's flash alternately.
2. Release the button: the green LED flashes.
3. While the green LED flashes, the output is inverted each time the button is pressed. This is indicated by the yellow LED.
   When the button is not pressed for 10 s, the current output function is stored.
   The sensor is now ready for operation.

**Default setting**

1. No object in the detection area: Press the button for 3 s, until both LED's flash simultaneously. **3 s**
2. No object in the detection area:
   Press the button for 1 s. **1 s**
   The sensor is set to maximum sensitivity.

**NB!** The Teach Input (2 WH) will work similarly to the push button, active High.