

TL50 SERIES

The **TL50** contrast sensor line offers the best solution for all the applications where cost reduction is requested, without compromising the excellent detection performances. The optimised optics of these sensors, the RGB LED emission with automatic colour selection and the very fine resolution, allow the detection of the weakest contrast of colours or grayscale between mark and background, or between different objects or surfaces. The high resolution is not a limit for the detection speed, reaching 33 ms response time and 15 kHz switching frequency. Thanks to the compact dimensions and multiple fixing holes with metallic inserts present in standard positions, the sturdy ABS plastic housing is fully compatible and can replace the most traditional contrast sensors, as well as offering an interesting cost reduction. The special PMMA plastic lens, that can be fixed either in an axial or lateral position, is suitable for sensor use in the food industry, where the presence of glass parts must be avoided.



HIGHLIGHTS

- High resolution and RGB LED emission with automatic colour selection
- Very fast switching frequency and low response time
- Easy sensor setting by means of two pushbuttons Mark/Bkgd
- Sturdy plastic housing with standard dimensions and fixing holes

APPLICATIONS

Packaging lines



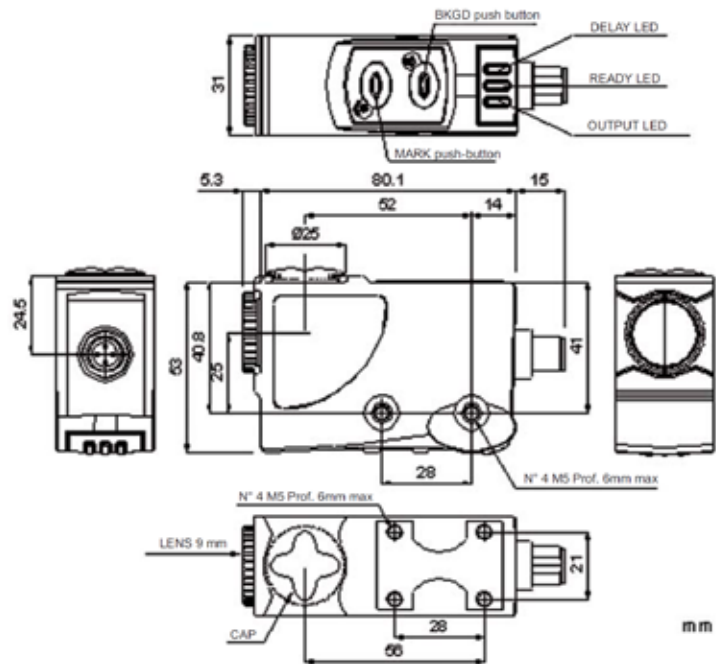
Contrast reading



The acquisition of the mark and background signals is made by pressing the MARK and BKGD push-buttons.

The switching threshold level is set automatically between the mark and background values. The Dark/Light operating mode is selected by the sensor on the ground of the lower or higher mark reflectivity with respect to the background. When the green LED turns on the setting has been successfully completed and the sensor is ready, whereas the LED blinking indicates a setting failure or an insufficient contrast between mark and background.

DIMENSIONS



INDICATORS AND PUSH-BUTTONS



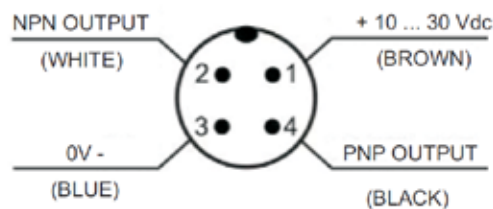
- A yellow OUTPUT LED
- B green READY LED
- C orange DELAY LED
- D MARK push-button
- E BKGD push-button

ACCESSORIES

For **dedicated accessories** refer to the **ACCESSORIES** section of this catalogue.

Refer also to **Connectors** of the **General Catalogue**.

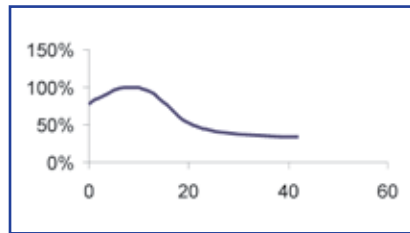
CONNECTIONS



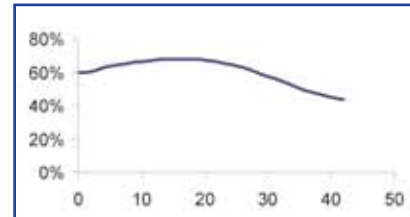
TECHNICAL DATA

| | |
|-------------------------------|---|
| Power supply: | 10 ... 30 Vdc ¹ , reverse polarity protection |
| Ripple: | 2 Vpp max. |
| Consumption: | 50 mA max. at 24Vdc |
| Light emission: | RGB LED (630nm red, 520nm green, 465nm blue) ² |
| Spot dimension: | 1.5 x 5 mm at 9 mm |
| Operating distance: | 9 mm |
| Depth of field: | ± 3 mm (with standard 9 mm lens) |
| Setting: | MARK push-button BKGD push-button |
| Indicators: | yellow OUTPUT LED green READY LED orange DELAY LED |
| Output type: | 1 PNP output / 1 NPN output |
| Output current: | 100 mA max. |
| Saturation voltage: | ≤2 V |
| Response time: | 33 μs |
| Switching frequency: | 15 kHz |
| Operating mode: | dark/light automatic |
| Timing function: | 0 ... 20 ms selectable |
| Connections: | 4-pole M12 connector |
| Electrical protection: | class 2 |
| Mechanical protection: | IP67 |
| Protection devices: | A, B ³ |
| Housing material: | ABS |
| Lens material: | PMMA |
| Weight: | 90 g max. |
| Operating temperature: | -10...55°C |
| Storage temperature: | -20...70°C |
| Reference standard: | EN 60947-5-2 |

DETECTION DIAGRAMS



Standard 9 mm lens
(1,5 x 5 mm spot on the focus distance)



Accessory 18 mm lens
(2 x 7 mm spot on the focus distance)



TECHNICAL NOTES

¹ Limit values

² Average life of 100.000 h with TA = +25 °C

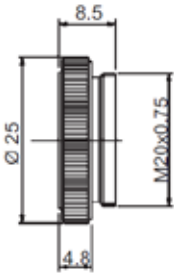
³ A - reverse polarity protection

B - overload and short-circuit protection

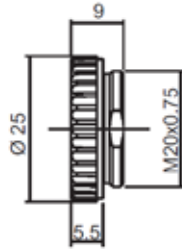
MODEL SELECTION AND ORDER INFORMATION

| MODEL | OPERATING DISTANCE | ORDER N° |
|------------|--------------------|-----------|
| TL50-W-815 | 9 mm | 954651000 |

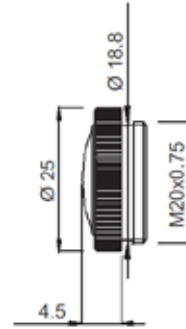
ACCESSORY LENSES



Lens No.9 glass



Lens No.9 PMMA



Lens 18 mm glass

mm

ACCESSORY SELECTION AND ORDER INFORMATION

| MODEL | DESCRIPTION | ORDER N° |
|------------------|------------------------------|-----------|
| Lens No.9 glass | glass lens with 9 mm focus | 95ACC2670 |
| Lens No.9 PMMA | plastic lens with 9 mm focus | 95ACC2540 |
| Lens No.18 glass | glass lens with 18 mm focus | 95ACC2680 |

Please refer also to **Sensor Accessories**

The company endeavours to continuously improve and renew its products; for this reason the technical data and contents of this catalogue may undergo variations without prior notice. For correct installation and use, the company can guarantee only the data indicated in the instruction manual supplied with the products.



TL50
Contrast sensor

INSTRUCTION MANUAL

CONTROLS

- OUT LED (yellow)**
The yellow LED indicates the output status.
 - READY LED (green)**
During functioning, the green LED permanently ON indicates a normal operating condition; fast blinking indicates an output overload condition.
 - DELAY LED (orange)**
The orange LED ON indicates the timing function activation on the digital output.
 - MARK PUSH-BUTTON**
The mark detection procedure is activated by pressing MARK push-button.
 - BKGD PUSH-BUTTON**
The background detection procedure is activated by pressing BKGD push-button.
- See the "SETTING" paragraph for setup procedure indications.

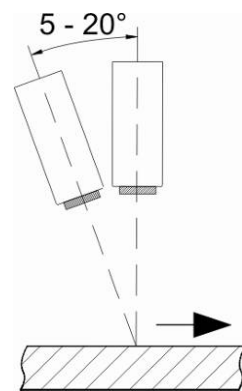


INSTALLATION

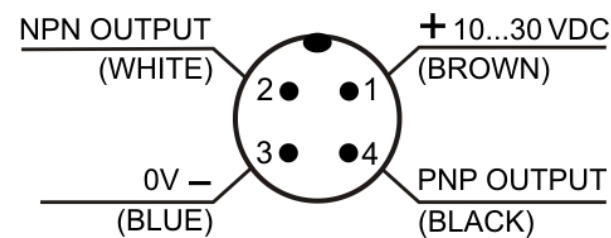
The sensor can be positioned using threaded M5 holes with max. 6 mm depth.
Do not apply excessive torque when adjusting (max 2.2 Nm).

The operating distance is measured starting from the front surface of the sensor optics.

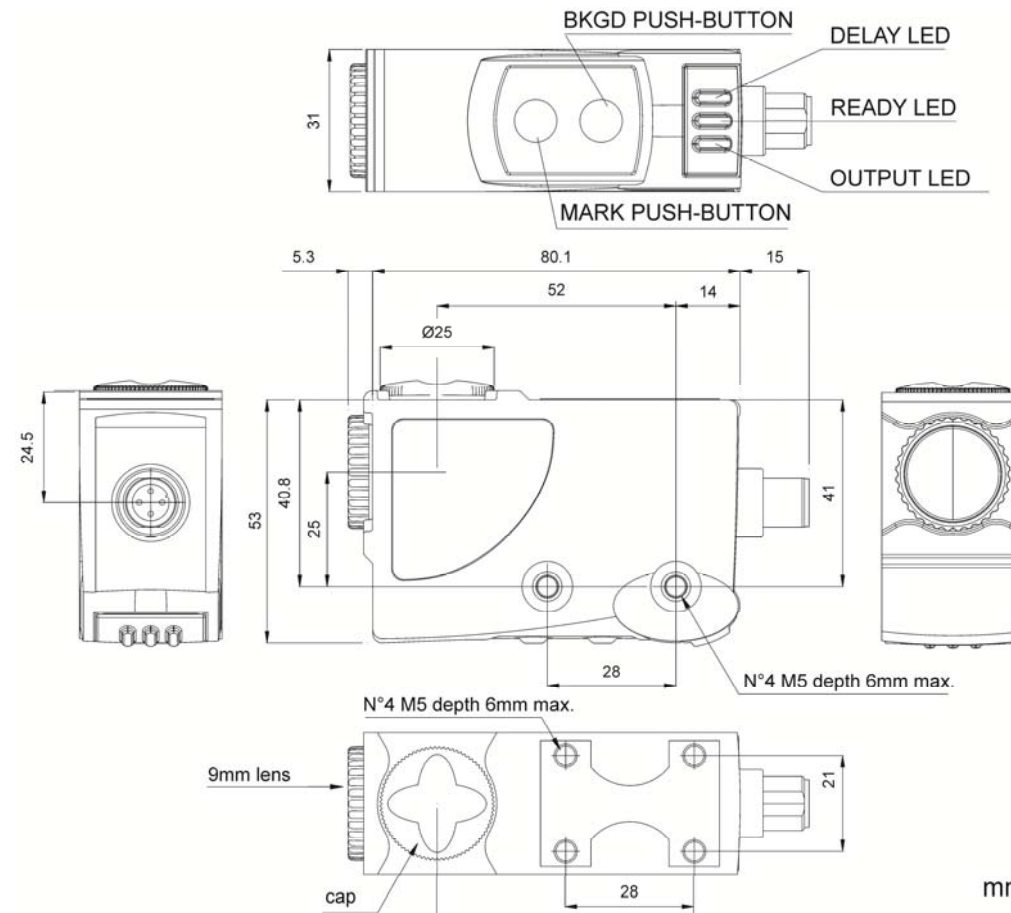
The reading direction can be changed inverting the cap and lens.
Mark detection on a reflective surface is improved adjusting the beam direction to 5° ... 20° from surface axis.



CONNECTIONS



DIMENSIONS



TECHNICAL DATA

| | |
|--|--|
| Power supply: | 10...30 VDC limit values - Class 2 (UL508) |
| Ripple: | 2 Vpp max. |
| Current consumption (output current excluded): | 50 mA max. @ 24Vcc |
| Output: | 1 PNP output 1 NPN output |
| Output current: | 100 mA max. |
| Output saturation voltage: | ≤ 2 V |
| Response time: | 33 μs |
| Switching frequency: | 15 kHz |
| Delay: | 0 / 20 ms selectable (default configuration without delay) |
| Dark/light selection | automatic |
| Indicators: | OUT LED (yellow) / READY LED (green)/DELAY LED (orange) |
| Push-buttons: | MARK and BKGD push-buttons |
| DARK/LIGHT selection: | Automatic (default configuration LIGHT mode) |
| Operating temperature: | -10 ... 55 °C |
| Storage temperature: | -20 ... 70 °C |
| Dielectric strength: | 500 VAC 1 min., between electronics and housing |
| Insulating resistance: | >20 MΩ 500 Vdc, between electronics and housing |
| Operating distance: | 9 mm |
| Depth of field: | ± 3 mm |
| Minimum spot dimension: | 1.5x5mm @ 9mm |
| Emission type: | BLUE (465 nm) / GREEN (520 nm) / RED (630 nm) with automatic selection |
| Ambient light rejection: | According to EN 60947-5-2 |
| Vibrations: | 0.5 mm amplitude, 10 ... 55 Hz frequency, for each axis (EN60068-2-6) |
| Shock resistance: | 11 ms (30 G) 6 shock for each axis (EN60068-2-27) |
| Housing material: | ABS |
| Lens material: | PMMA |
| Mechanical protection: | IP67 |
| Connections: | M12 4-pole connector |
| Weight: | 90 g. max. |
| AIEx 2014/34/EU: | II 3G EX nA II T6 ; II 3D EX ID A22 IP67 T85°C |

SETTING

DETECTION (MARK-BACKGROUND)

- Position mark in front of the sensor light spot and press MARK push-button until the READY LED (green) turns OFF.
The sensor detects the mark alternating the red, green and blue emissions. Avoid mark movements during this phase.
- Position the background in front of the sensor light spot and press BKGD push-button; the sensor detects the mark alternating the red, green and blue emissions. Avoid background movements during this phase.

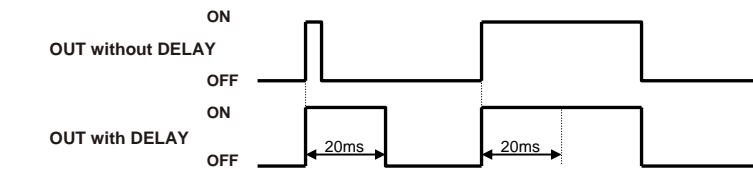


The DARK/LIGHT operating mode is automatically selected by the sensor.
Dark mark - light background = Dark mode.
Light mark - dark background = Light mode.

If the READY LED (green) is permanently ON, the detection is successful.
If the LED blinks slowly, the detection has failed due to insufficient contrast.
The sensor returns to the previous setting by pressing one of the two push-buttons.

DELAY SETTING

The DELAY extends to 20ms the minimum duration of the active output allowing the slower interfacing systems to detect shorter pulses.
The active delay is signalled by the corresponding orange LED ON.



Delay activation

Press MARK and BKGD push-buttons contemporaneously for 2 sec. until the DELAY LED turns ON.

Delay deactivation

Press MARK and BKGD push-buttons contemporaneously for 2 sec. until the DELAY LED turns OFF.



OUTPUT OVERLOAD

The digital output overload is signalled by the rapid blinking of the READY LED.

The sensors are NOT safety devices, and so MUST NOT be used in the safety control of the machines where installed.

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Helpful links at www.datalogic.com: [Contact Us](#), [Terms and Conditions](#), [Support](#).

The warranty period for this product is 36 months. See General Terms and Conditions of Sales for further details.

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