

## ANALOG SENSORS WITH LED EMISSION



## CONTRAST SENSORS



- *Red or green selectable LED emission*
- *Threshold setting with multi-turn trimmer*
- *9, 18, 28 mm lenses and fibre-optics available*
- *Selectable NPN/PNP output and dark/light mode*

## TL80 SERIES

The **TL80** series is composed of analog-based contrast sensors with LED emission, distinguished by good depth of field and high switching frequency reaching 10 kHz.

Switching threshold setting is aided by two arrow indicators showing the multiturn trimmer's rotation direction; moreover switches for the selection of the red or green emission, dark or light operating mode, NPN or PNP output and timing function are also present.

Accessory lenses for different operating distances and various proximity and through beam fibre-optics extend the application possibilities. The sturdy metal housing guarantees IP67 protection.

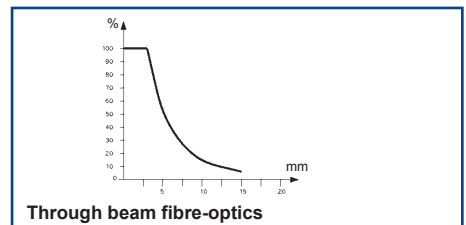
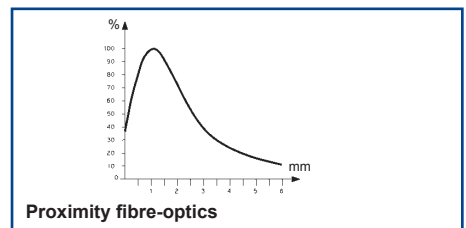
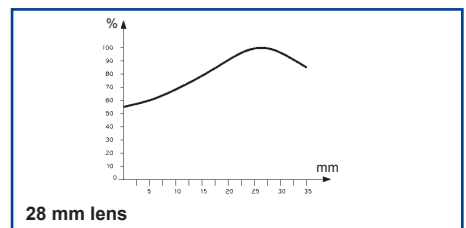
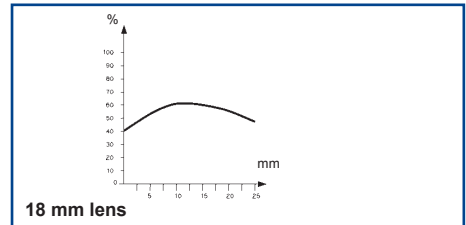
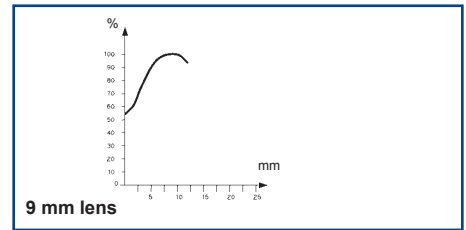
The sensors of the **TL80** series and relative accessories are available as spare parts. Contrast sensors of the **TL $\mu$**  series are recommended for replacements, new applications and improved performances (sec. 2.22).

## TECHNICAL DATA

<b>Power supply:</b> .....	10 ... 30 Vdc, reverse polarity protection
<b>Consumption:</b> .....	80 mA max.
<b>Light emission:</b> .....	red 635 nm / green 565 nm LED
<b>Spot dimension:</b> .....	1.5 x 5 mm (9 mm lens) 2 x 7 mm (18 mm lens) 3 x 10 mm (28 mm lens)
<b>Operating distance:</b> .....	7 ... 11 mm (9 mm lens) 16 ... 20 mm (18 mm lens) 25 ... 31 mm (28 mm lens)
<b>Operating distance with fibre-optics:</b> .....	0 ... 5 mm proximity 0 ... 15 mm through beam
<b>Depth of field:</b> .....	±2 mm (9 and 18 mm lenses) ±3 mm (28 mm lens)
<b>Setting:</b> .....	multi-turn trimmer
<b>Indicators:</b> .....	red OUTPUT LED red LEDs for trimmer rotation direction
<b>Output type:</b> .....	NPN or PNP, Rpull-down/up 10 kΩ
<b>Saturation voltage:</b> .....	1.2 V max. (NPN vers.) 2.2 V max. (PNP vers.)
<b>Output current:</b> .....	200 mA max.; short-circuit protection
<b>Response time:</b> .....	50 μs (8, 18 mm, fibre-optic vers.) 166 μs (28 mm vers.)
<b>Switching frequency:</b> .....	10 KHz max. (8, 18 mm, fibre-optic vers.) 3.3 KHz max. (28 mm vers.)
<b>Operating mode:</b> .....	dark/light selectable
<b>Analog output range:</b> .....	0 ... 5.5 Vdc (2 Vdc on white 90%) 2.2 kΩ output resistance
<b>Timing function:</b> .....	20 ms minimum output ON
<b>Connection:</b> .....	M12 4-pole conn., 3 m Ø 5 mm cable or cable with Amphenol connector
<b>Electrical protection:</b> .....	class 1
<b>Mechanical protection:</b> .....	IP67
<b>Housing material:</b> .....	ZAMA
<b>Lens material:</b> .....	glass
<b>Fibre-optic material:</b> .....	fibre in glass / sheath in metal fibre in PMMA / sheath in PE (OF-30)
<b>Weight:</b> .....	550 g max.
<b>Operating temperature:</b> .....	-10 ... +55°C
<b>Storage temperature:</b> .....	-20 ... +70°C
<b>Fibre operating temperature:</b> .....	-30 ... +150°C (glass OF vers.) -30 ... +60°C (OF-30)
<b>Reference standard:</b> .....	EN 60947-5-2
<b>Certifications:</b> .....	CE

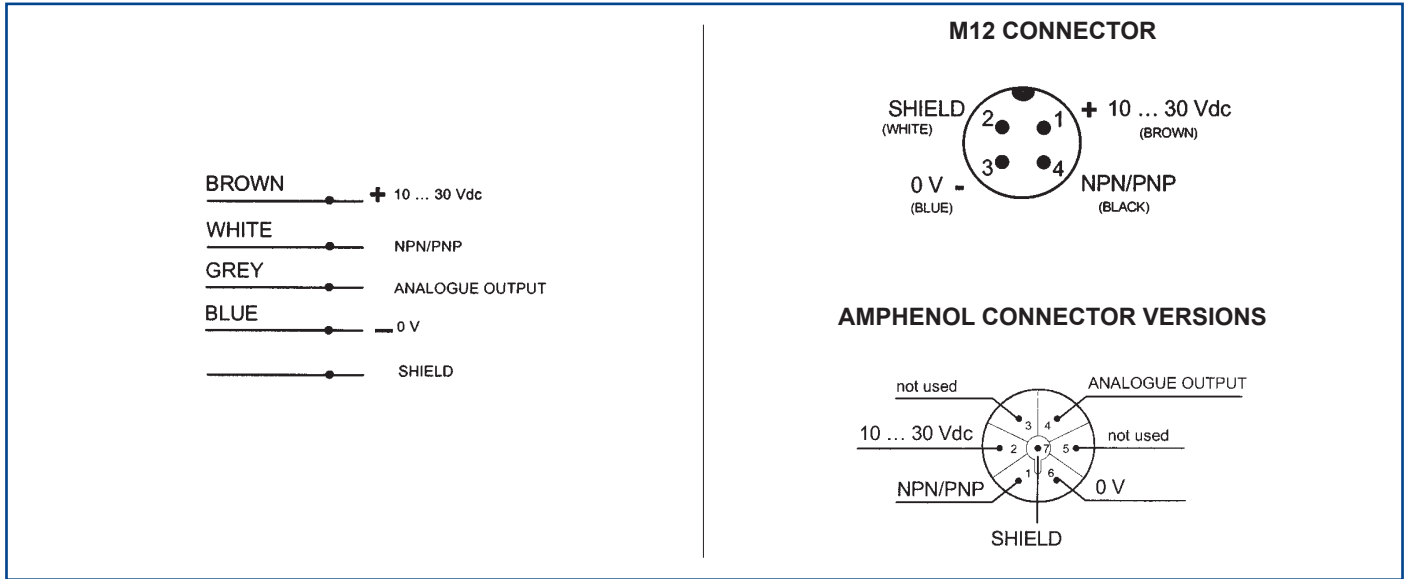
The operating distances indicate the detection distance with excess gain 2.

## DETECTION DIAGRAMS

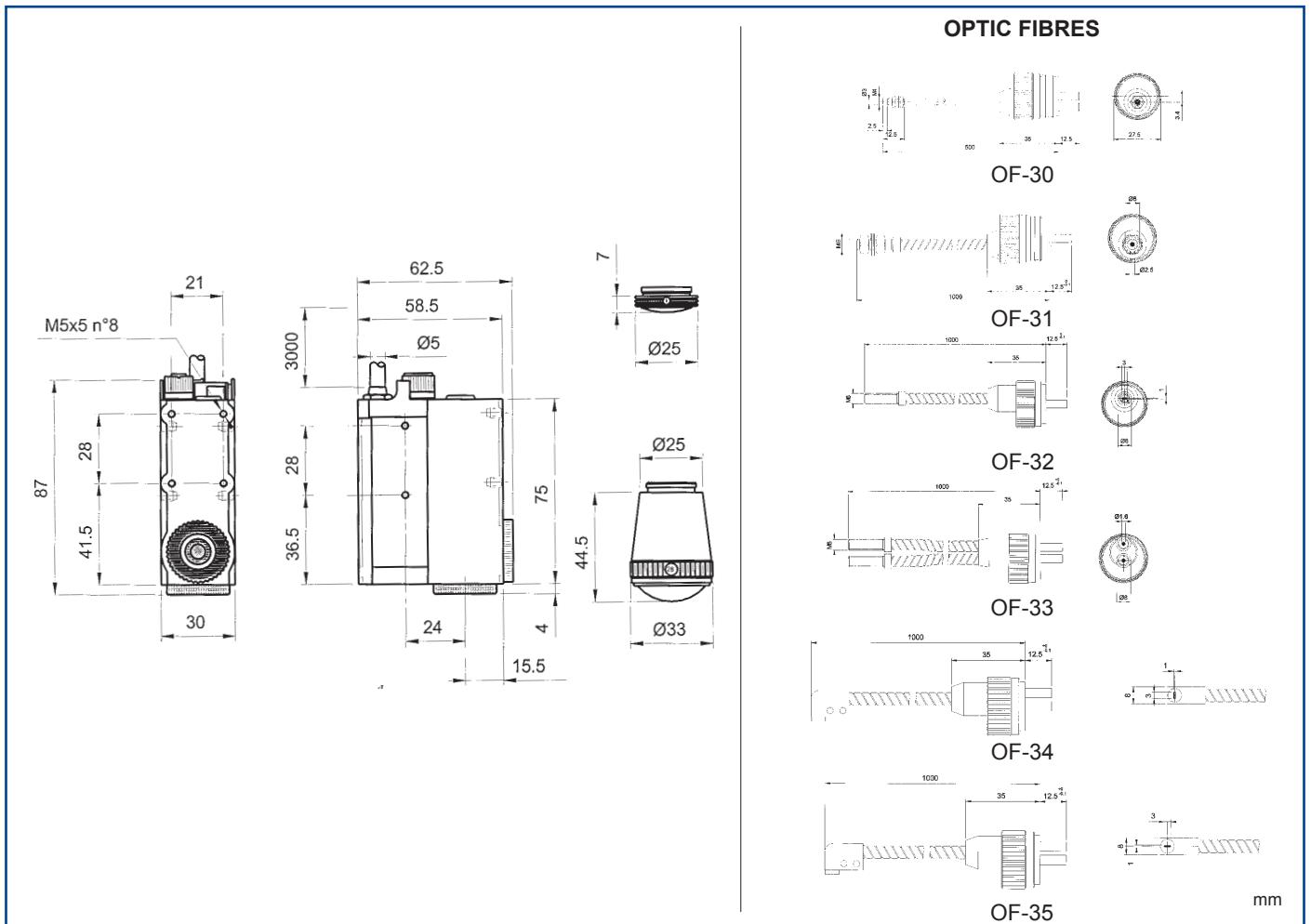


The detection diagrams indicate the typical operating distance with excess gain 1.

## CONNECTIONS



## DIMENSIONS



## MODELS

MODEL	SPOT	OPTICS	CONNECTION	CODE N°
TL80-011	vertical	9 mm	cable	964051000
TL80-011L	horizontal	9 mm	cable	964051010
TL80-012	vertical	9 mm	Amphenol connector	964051020
TL80-012L	horizontal	9 mm	Amphenol connector	964051030
TL80-015	vertical	9 mm	M12 connector	964051040
TL80-015L	horizontal	9 mm	M12 connector	964051050
TL80-061	vertical	18 mm	cable	964051180
TL80-061L	horizontal	18 mm	cable	964051190
TL80-065	vertical	18 mm	M12 connector	964051220
TL80-065L	horizontal	18 mm	M12 connector	964051230
TL80-021	vertical	28 mm	cable	964051060
TL80-021L	horizontal	28 mm	cable	964051070
TL80-025	vertical	28 mm	M12 connector	964051100
TL80-025L	horizontal	28 mm	M12 connector	964051110
TL80F-041	<i>refer to fibers</i>	optic fibre	cable	964051120
TL80F-042	<i>refer to fibers</i>	optic fibre	Amphenol connector	964051130
TL80F-045	<i>refer to fibers</i>	optic fibre	M12 connector	964051140

## ACCESSORIES

MODEL	DESCRIPTION	CODE N°
OF-30-5	plastic fibre-optic L 50 cm - point-shaped spot proximity	96B001070
OF-31-10	glass fibre-optic L 100 cm - point-shaped spot proximity	96B201000
OF-32-5	glass fibre-optic L 50 cm - rectangular spot proximity	96B001060
OF-32-10	glass fibre-optic L 100 cm - rectangular spot proximity	96B211000
OF-33-10	glass fibre-optic L 100 cm - through beam	96B221000
OF-34-10	glass fibre-optic L 100 cm - horizontal spot 90° proximity	96B231000
OF-35-10	glass fibre-optic L 100 cm - vertical spot 90° proximity	96B241000

Please refer also to **Sensor Accessories**

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### HEADQUARTERS

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