

CONTRAST SENSORS

TL μ

All registration mark detection applications

- Teach-in, Remote settings
- Red/green or white LED emission
- Various interchangeable lenses and fiber-optic models
- Metal housing with orientable optics and connector



APPLICATIONS

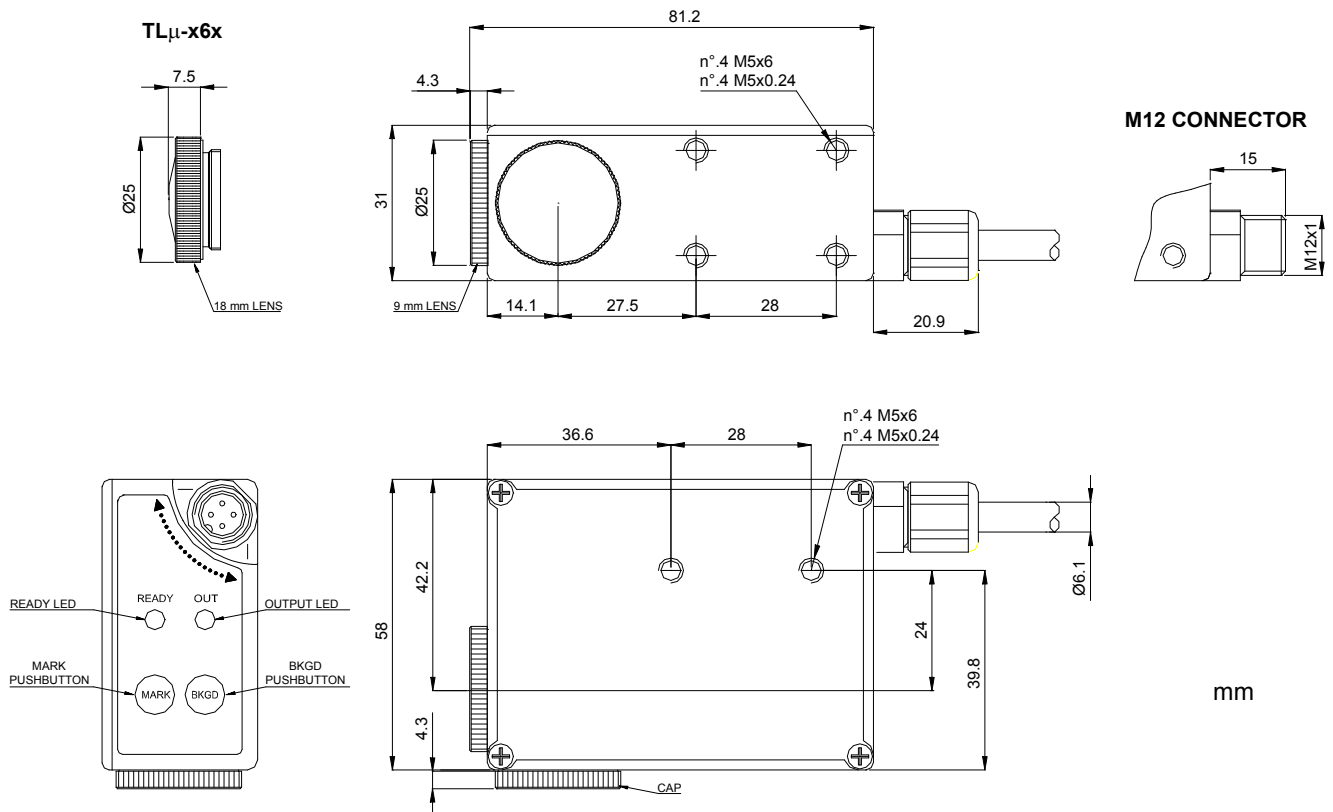
- Packaging and labeling machinery
- Beverage/Food/Cosmetic/
Pharmaceutical industries
- Printing machinery

TL μ		
Contrast sensor		6...12 mm (9 mm lens) 14...22 mm (18 mm lens) 22...34 mm (28 mm lens) 40...60 mm (50 mm lens)
Contrast sensor with fiber optic		0...3 mm (proximity) 0...10 mm (through beam)
Switching frequency		10 kHz 20 kHz
Light emission		red/green LED white LED
Setting		push buttons remote
Power supply	Vdc	10...30 V
	Vac	
	Vac/dc	
Output	PNP	▪
	NPN	▪
	NPN/PNP	
	relay	
	other	0...5 V Analog Output
Connection	cable	▪
	connector	▪
	pig-tail	
Approximate dimensions (mm)		31x81x58
Housing material		Zama
Mechanical protection		IP67

TECHNICAL DATA

Power supply	10 ... 30 Vdc (limit values; reverse polarity protection)
Ripple	2 Vpp max.
Consumption (output current excluded)	80 mA max.
Light emission	green LED 526 nm/red LED 630 nm (mod. TLμ-0/1xx) white LED 400-700 nm (mod. TLμ-4/5xx)
Setting	teach-in push-buttons/remote by 2 wires, 4 settings storage cable version
Operating mode	Light/Dark automatic setting with teach-in procedure
Indicators	red OUTPUT LED green READY LED
Output	PNP or NPN; analog output
Output current	200 mA max.
Saturation voltage	1 V max. NPN vers., 2 V max. PNP vers.
Response time	50 μs max. (mod. TLμ-4xx) 25 μs max. (mod. TLμ-5xx)
Switching frequency	10 kHz max. (mod. TLμ-4xx) 20 kHz max. (mod. TLμ-5xx)
Connection	3 m shielded cable Ø 6.1 mm, M12 4-pole connector
Dielectric strength	500 Vac, 1 min between electronics and housing
Insulating resistance	>20 MΩ, 500 Vdc between electronics and housing
Electrical protection	class 1
Mechanical protection	IP67
Ambient light rejection	according to EN 60947-5-2
Vibrations	0,5 mm amplitude, 10 ... 55 Hz frequency, for every axis (EN60068-2-6)
Shock resistance	11 ms (30 G) 6 shock for every axis (EN60068-2-27)
Minimum spot dimension	1,5 x 5 mm (TLμ-x1x), 2 x 7 mm (TLμ-x6x), Ø 3 mm (TLμ-4xx/5xx)
Depth of field	± 3 mm (TLμ-x1x/4xx/5xx) / ± 4 mm (TLμ-x6x)
Housing material	ZAMA
Lens material	glass
Operating temperature	-10 ... 55 °C
Storage temperature	-20 ... 70 °C
Weight	450 g max. cable vers., 310 g max. connector vers.

DIMENSIONS



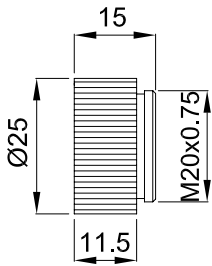
CONTRAST SENSORS

MODEL SELECTION AND ORDER INFORMATION

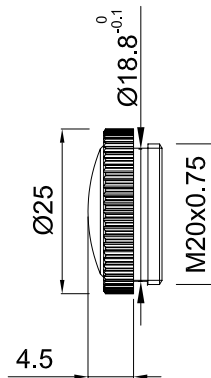
OPTIC FUNCTION	EMISSION	OPTICS	CONNECTION	OUTPUT	MODEL	ORDER No.		
Contrast sensor	Red/Green (Vertical spot)	9 mm	3m Cable	NPN	TLμ-011	964401000		
				PNP	TLμ-111	964401080		
			M12 Connector	NPN	TLμ-015	964401020		
				PNP	TLμ-115	964401100		
	Red/Green (Horizontal spot)		3m Cable	NPN	TLμ-011L	964401010		
				PNP	TLμ-111L	964401090		
			M12 Connector	NPN	TLμ-015L	964401030		
				PNP	TLμ-115L	964401110		
	Red/Green (Vertical spot)	18 mm	M12 Connector	NPN	TLμ-065	964401060		
				PNP	TLμ-165	964401140		
	White (Circular spot)	9 mm	M12 Connector	NPN	TLμ-415C	954151330		
				PNP	TLμ-515C	954151360		
3m Cable			NPN	TLμ-411C	954151410			
			PNP	TLμ-511C	954151420			
Fiber optic contrast sensor			White	Fiber optics	M12 Connector	PNP	TLμ-545	954151380
						NPN	TLμ-445	954151350

ACCESSORIES

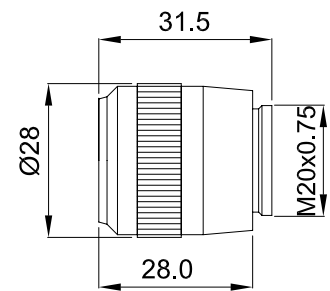
HI-RES LENS



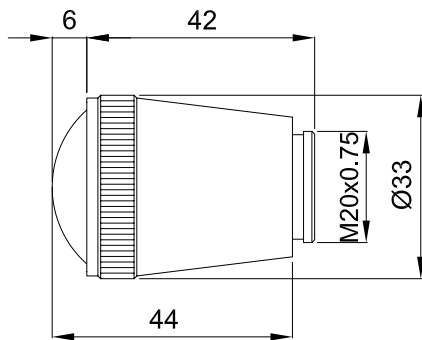
18 mm LENS



22 mm LENS



28 mm LENS



40 mm LENS

