Model Number

M12/MV12-F1/47/76b/92

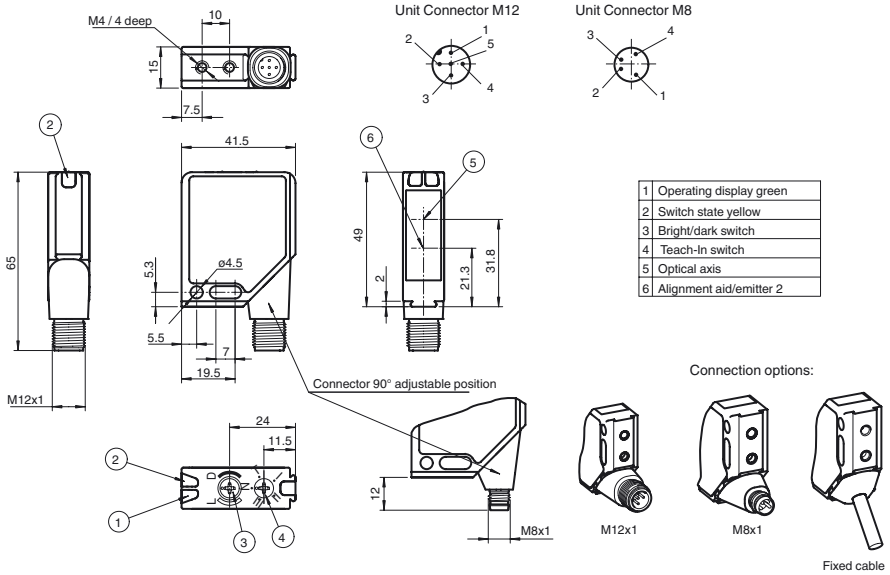
Thru-beam sensor

with 4-pin M12 connector, 90° adjustable position

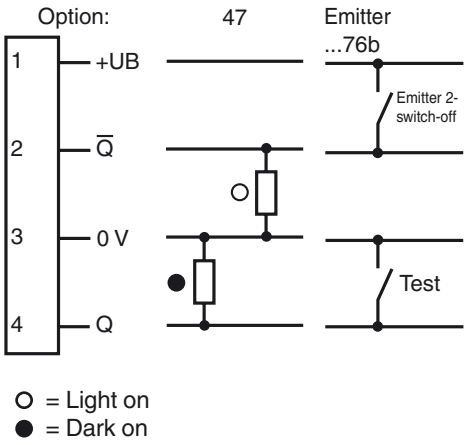
Features

- Series of sensors in a widely used standard housing
- TEACH-IN switch for setting the contrast detection levels
- Automatic adjustment in case of soiling in contrast detection mode
- Additional LED as alignment aid in receiver optics
- High level of stability thanks to the metal housing frame
- Resistant against noise: reliable operation under all conditions

Dimensions

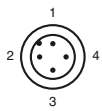


Electrical connection



○ = Light on
● = Dark on

Pinout



Wire colors in accordance with EN 60947-5-2

1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)

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Technical data

System components		
Emitter		M12-F1/76b/92
Receiver		MV12-F1/47/92
General specifications		
Effective detection range		0 ... 16 m
Threshold detection range		25 m
Light source		2 LED
Light type		modulated visible red light , 660 nm
Target size		min. 12 mm
Alignment aid		LED red in receiver
Diameter of the light spot		approx. 420 mm at a distance of 16 m
Angle of divergence		1.5 °
Ambient light limit		
Continuous light		40000 Lux
Modulated light		5000 Lux
Functional safety related parameters		
$MTTF_d$		570 a
Mission Time (T_M)		20 a
Diagnostic Coverage (DC)		90 %
Indicators/operating means		
Operation indicator		LED green, flashes in case of short-circuit
Function indicator		2 LEDs yellow for switching state, stability control, TEACH-IN and contrast detection mode
Control elements		rotary switch for light/dark, 5-step switch for contrast recognition adjustment
Contrast detection levels		15 % - clear glass bottles 25 % - plastic foils 40 % - colored glass or opaque materials adjustable due to Teach-In switch
Electrical specifications		
Operating voltage	U_B	10 ... 30 V DC
Ripple		max. 10 %
No-load supply current	I_0	Emitter: ≤ 35 mA Receiver: ≤ 45 mA
Input		
Test input		emitter deactivation at 0 V
Output		
Switching type		light/dark on, switchable
Signal output		2 PNP outputs, complementary, short-circuit protected, reverse polarity protected, open collector
Switching voltage		max. 30 V DC
Switching current		max. 0.2 A
Voltage drop	U_d	≤ 2.5 V DC
Switching frequency	f	1000 Hz
Response time		0.5 ms
Conformity		
Product standard		EN 60947-5-2
Ambient conditions		
Ambient temperature		-40 ... 60 °C (-40 ... 140 °F)
Storage temperature		-40 ... 75 °C (-40 ... 167 °F)
Mechanical specifications		
Housing width		41.5 mm
Housing height		49 mm
Housing depth		15 mm
Degree of protection		IP67
Connection		4-pin, M12 metal connector, 90° rotatable
Material		
Housing		Frame: nickel plated, die cast zinc, Laterals: glass-fiber reinforced plastic PC
Optical face		Plastic pane
Mass		120 g (emitter and receiver)
Compliance with standards and directives		
Standard conformity		
Shock and impact resistance		IEC / EN 60068. half-sine, 40 g in each X, Y and Z directions
Vibration resistance		IEC / EN 60068-2-6. Sinus. 10 -150 Hz, 5 g in each X, Y and Z directions
Approvals and certificates		
Protection class		II, rated voltage ≤ 300 V AC with pollution degree 1-2 according to IEC 60664-1
UL approval		cULus
CCC approval		CCC approval / marking not required for products rated ≤36 V

Accessories

OMH-MLV12-HWG
Mounting bracket for series MLV12 sensors

OMH-MLV12-HWK
Mounting bracket for series MLV12 sensors

OMH-K01
dove tail mounting clamp

OMH-K02
dove tail mounting clamp

OMH-K03
dove tail mounting clamp

OMH-06
Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm

Other suitable accessories can be found at www.pepperl-fuchs.com

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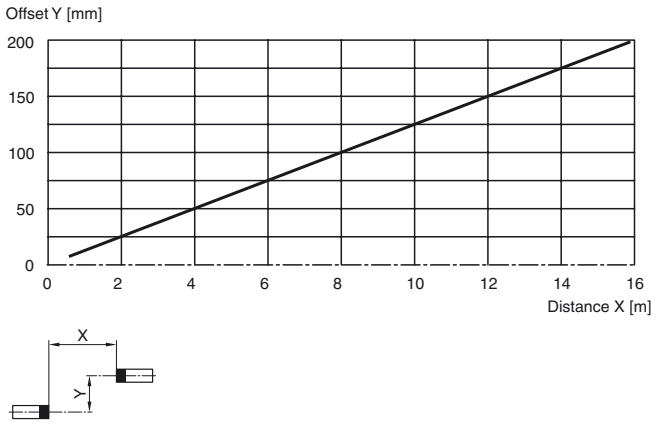
Curves/Diagrams

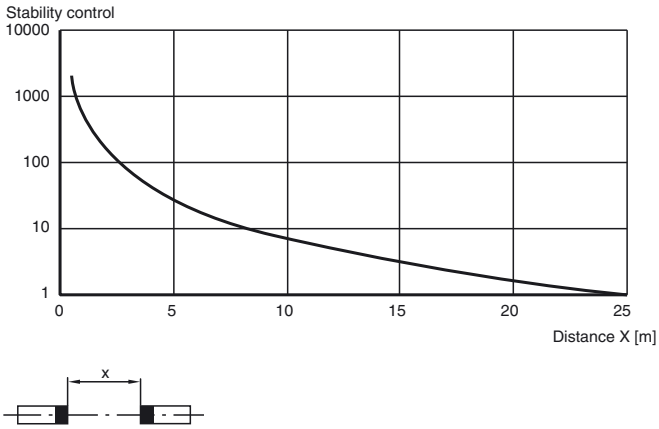
Characteristic response curve

M12/MV12



Relative received light strength

M12/MV12



Notes

Alignment

In switching position "N" senders and recipients align to:
Yellow LED lights up constantly, red LED is off.

TEACH-IN

- **Switch position "N" (standard operation):**
  LEDs are lit when the light beam is unobstructed, they flash when the value falls short of the function reserve and switch off when the beam is interrupted.
- **Switch position "T" (Teach-in mode):**
  After 1 s, the LED flashes slowly (approx. 1.5 Hz). The sensor is now ready to be set for a specific contrast detection value via the mechanical switch (pos. I, II or III).
- **Switch positions "I", "II" and "III" (contrast detection mode)**
  Contrast recognition values: I for 15 %, II for 25 %, III for 40 %
  1. LED permanently lit: light path unobstructed
  2. LED off: element to be sensed detected
  3. LED flashes rapidly: detection failure, excessive soiling, function reserve too low.

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