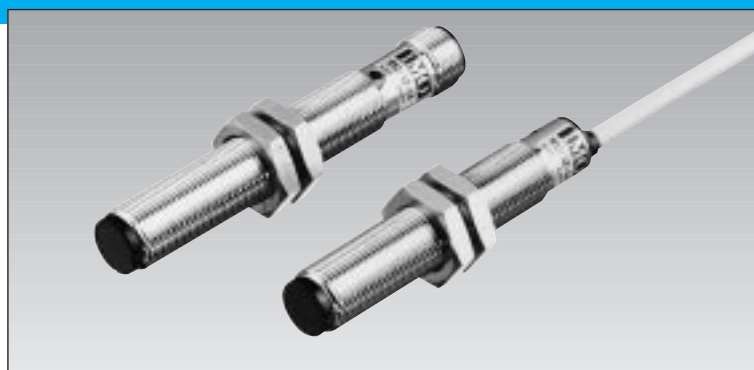
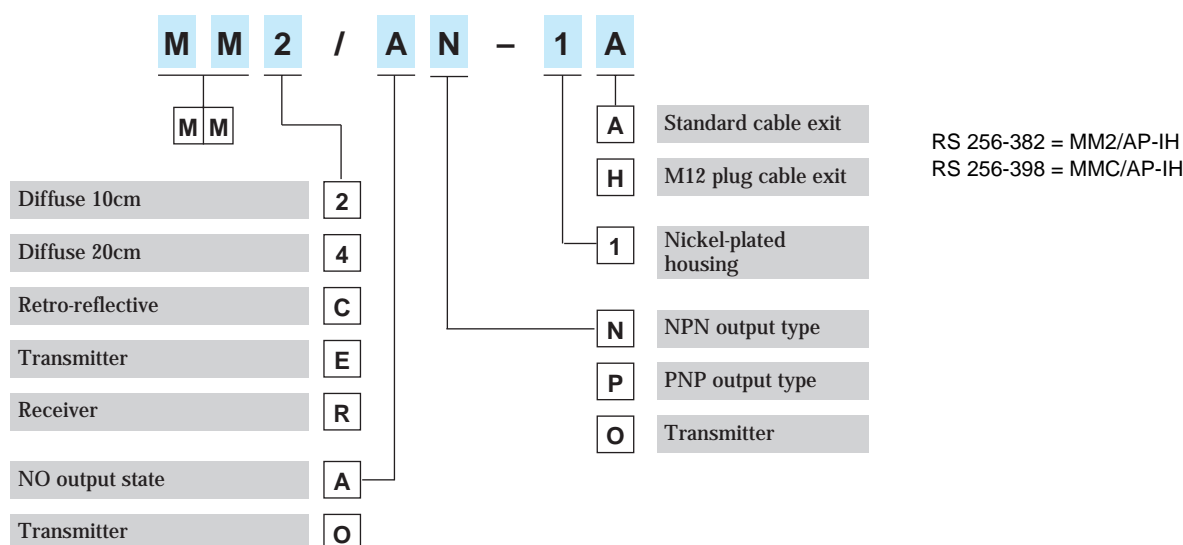


## Ultra-small ø12 x 65mm barrel type photoelectric switches for DC operation

- Diffuse, retro-reflective and through-beam models
- Nickel-plated housing with IP67 protection
- Rear mounted LED operation indicator
- Short-circuit protection
- 68 options including plug-in versions\*



## Options and ordering codes



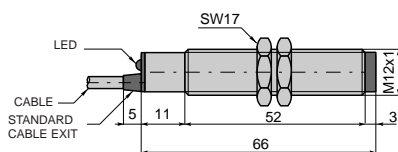
\*Please contact IMO for details of options not shown Connectors please see page 332

## Specifications

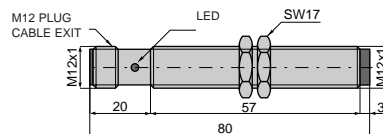
Type	diffuse		retro-reflective	through-beam
Models	MM2	MM4	MMC	MME - MMR
Sensing range	10cm <sup>(1)</sup>	20cm <sup>(1)</sup>	2m <sup>(2)</sup>	4m
Hysteresis	10%			
Repeatability	5%			
Tolerance	+15% - 5% of the sensing range			
Supply voltage	10 - 30VDC			
Ripple	10% maximum			
Consumption	20mA max.	20mA max.	20mA max.	20mA (E) 20mA (R) max.
Response time	5ms	5ms	5ms	10ms
Output type	NPN or PNP - NO or NC			
Load current	200mA			
Residual output voltage	1.2V max. IL = 100mA			
Leakage current	0.1µA max. to 30VDC			
Output current limit	<300mA to 25°C			
Electric protections	against short circuit (autoreset) - polarity reversal - damping diode for inductive loads			
Time before switch operation	200ms			
LED status indicator	yes (at the rear)			
Insulation resistance	>1000MOhm to 1000VDC			
Dielectric strength	2000VAC 50Hz for 1 Minute			
Noise immunity	1000V (IEC 801)			
Protection degree	IEC IP67			
Materials	housing: nickel-plated - lens: acrylic - cable exit: polyamide (nylon)			
Operating temperature	-25° + 70°C (without freeze)			
Interference by artificial light	3000 lux			
Interference by sunlight	10000 lux			
Ambient humidity	35 - 85% r.h.			
Weight (approx.)	75gm	75gm	75gm	140gm

<sup>(1)</sup> referred to 100x100mm white matt paper; <sup>(2)</sup> with ø80mm reflector (RL110 supplied separately)

## Dimensions (mm)

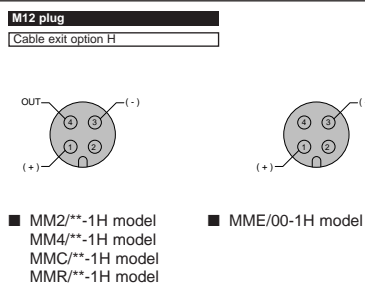
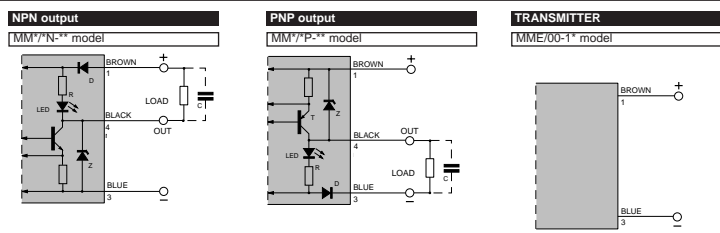


■ Standard cable exit - Option A  
(MM\*/\*\*-1A model)



■ M12 plug cable exit - Option H  
(MM\*/\*\*-1H model)

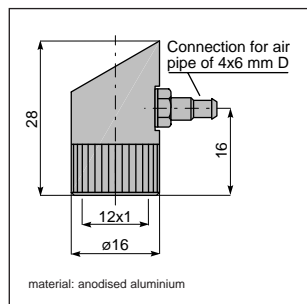
## Output circuit – wiring connections



Note: In case of combined load, i.e. resistive and capacitive, the maximum admissible capacity (C) is 0.1µF for maximum output voltage and output current.

## Antidust front ø12mm

## ST36



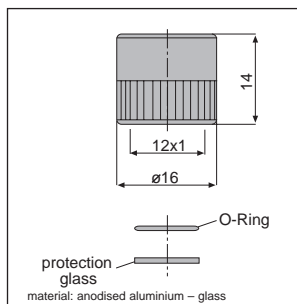
This is used to prevent dust or other deposits on the lenses of photoelectric switches ø12mm\*, thus ensuring constant detection is maintained. It consists of a threaded body with a side air inlet pipe. The sensitivity loss is approx. 20-30%.



\*not for MM2 or MM4 types.

## Protection front ø12mm

## ST60



For the protection of the lenses of photoelectric switches ø12mm\*. It allows use of the sensor even in particularly aggressive conditions (presence of chemical solvents etc.).

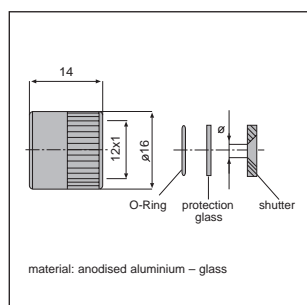
The system consists of a threaded metal body, an O-ring and a protection glass.

The sensitivity loss is approx. 20-25%.

\*not for MM2 or MM4 types.

## Shutter ø12mm

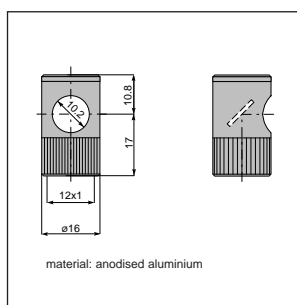
## STOM\_



This accessory, available for through-beam photoelectric switches ø12mm, reduces the emitted beam allowing the detection of small targets (down to 1mm). The shutter consists of a threaded ring nut, a protection glass, an O-ring and an aperture to be screwed on the optical head of both transmitter and receiver.

The attained sensing ranges refer to the minimum detectable target as indicated in the table below

## Right angle beam adapter ø12mm ST37



For directing the photoelectric detection through 90° to the photoelectric switch optical axes for ø12mm\* sensors.

This accessory consists of an internal threaded body to be screwed on the optical head of the photoelectric switch.

The mirror inside the body is set at 45° to the optical axes of the sensor allowing detection at 90°.

The sensitivity loss is approx. 20-30%.

\*Not for MM2 or MM4 types.

Shutter code		STOM1	STOM2	STOM3	STOM4	STOM5	STOM6
MM series	Ø minimum target (mm)	1	2	3	4	5	6
	sensing range (m)	0.05	0.20	0.40	0.60	1.40	2.00