

M18 DC DECOUT® Photoelectric Switches MS



DECOUT® NPN-PNP-NO-NC multi-function isolated output barrel type photoelectric switches

- Diffuse, retro-reflective, polarised, through-beam optical fibre models and background suppression
- 16m and 32m through-beam types
- Diagnostic CHECK function available on through-beam models
- IP67 protected nickel-plated or plastic housing
- Plug-in models
- Rear mounted LED operation indicator
- Short-circuit protection
- UL and CUL approved



Options and ordering codes

DECOUT® Photoelectric switches ø18mm	MS
DECOUT® Photoelectric switches ø18mm with 90° lens	MP

10cm diffuse	2
20cm diffuse	4
40cm diffuse	6
50mm sensing background suppression	0
100mm sensing background suppression	1
4m retro-reflective	C
3m polarised retro-reflective	P
Standard transmitter	E
16m standard receiver	R
32m long distance receiver	D
Optical fibre	F

MS	2	0	0	0	A
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A	Standard cable exit
E	M12 plastic plug

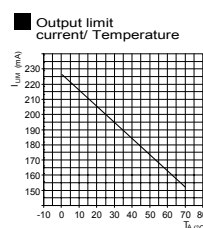
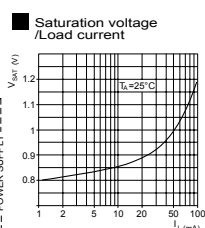
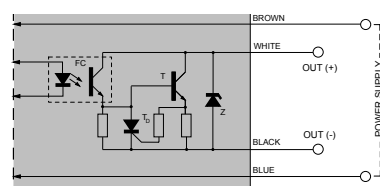
0	Plastic housing
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X	Transmitter with CHECK
0	All other models

Add suffix 'UR' for UL approved models

Output circuit

DECOUT output range
MS*/00-** model

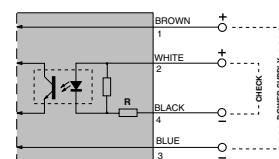


Note: in case of combined load i.e. resistive and capacitive, the maximum admissible capacity is 0.1µF for maximum output voltage and output current.

CHECK

MSE/X Transmitter

- operating voltage: 6-30VDC
- R value: 4.7KOhm
- max. isolation voltage
- CHECK/supply: 1000VAC



The CHECK function is incorporated in the MSE/X transmitter. If 6-30 V DC is applied between the white and black wires; the presence of a target is simulated; forcing the receiver output to switch. As the input is internally decoupled, the CHECK function can be performed by either NPN or PNP configurations.

M18 DC DECOU[®] Photoelectric Switches MS continued



Specification

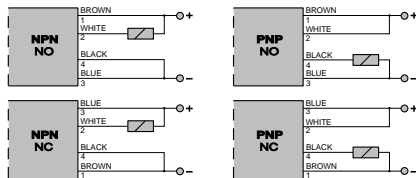
Type	diffuse		b/supp	retro-reflective	polarised	through-beam		optical fibre		
Models	MS2	MS4	MS6	MS0	MS1	MSC	MSP	MSE-MSR	MSE-MSD	MSF
Sensing range	10cm ⁽¹⁾	20cm ⁽¹⁾	40cm ⁽²⁾	50mm	100mm	4m ⁽³⁾	3m ⁽³⁾	16m ⁽⁴⁾	32m ⁽⁴⁾	20-400mm
Emission	infra-red					red	infrared		red	
Hysteresis	10%									
Repeatability	5%									
Tolerance	+ 15% - 10% of the sensing range									
Supply voltage	10 - 30 DC									
Ripple	10% max.									
Max consumption	30mA	30mA	30mA	trans 15mA (w. CHECK 35mA) receiver 25mA		25mA				
Response time	6ms	6ms	6ms	16ms		1ms				
Output type	DECOU [®] (NPN,PNP,NO,NC selectable on the single unit)									
Load current	100 mA									
Residual output voltage	1.2V max. IL = 100 mA									
Leakage current	< 10 μ A									
Output current limit	200 mA (see graph, overleaf)									
Electric protections	against short circuit (discount power to reset) - polarity reversal - inductive loads									
Time before switch operation	200 ms									
LED status indicator	yes (at the rear)									
Insulation resistance	> 1000M Ohm to 1000VDC									
Dielectric strength	2000VAC 50Hz for 1 Minute									
Noise immunity	1000V (IEC 801-4, II) plastic housing, 500V (IEC801-4, I) metal housing									
Protection degree	IEC IP67									
Materials	housing: plastic body - polyamide (nylon), metal body - nickel-plated brass, lenses: acrylic, cable exit: polycarbonate									
Operating temperature	-25° + 70°C (without freeze)									
Interference by external light	3000 lux (artificial light), 10000 lux (sunlight)									
Tightening torque	INm (10kgcm), (plastic housing); 40Nm (408 kgcm), (metal housing)									
Ambient humidity	35-85% r.h.									
Weight (approx.)	125g (plastic) 150g (metal)					210g (plastic) 250g (metal)			125g	

⁽¹⁾ referred to 100x100mm white matt paper; ⁽²⁾ referred to 200x200mm white matt paper; ⁽³⁾ with \varnothing 80mm reflector (RL110 supplied separately); ⁽⁴⁾ minimum detectable target \varnothing 7.5mm

Wiring connections

DECOU output

MS*/00-** model



PARALLEL connection

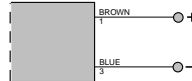
Since the value for leakage current is very low (10 μ A max.) there are no practical restrictions in the parallel connection of several sensors, provided the load current is of a few mA.

SERIES connection

In the series connection of several sensors it is necessary to account for the voltage drop value V_{sat} (between 0.8V and 1.2V typical) according to the available supply voltage.

TRANSMITTER

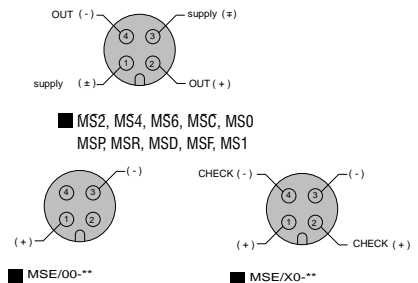
MSE/00-** model



Plug-pin connections

M12 plug

Cable exit option E or H



Optical fibre

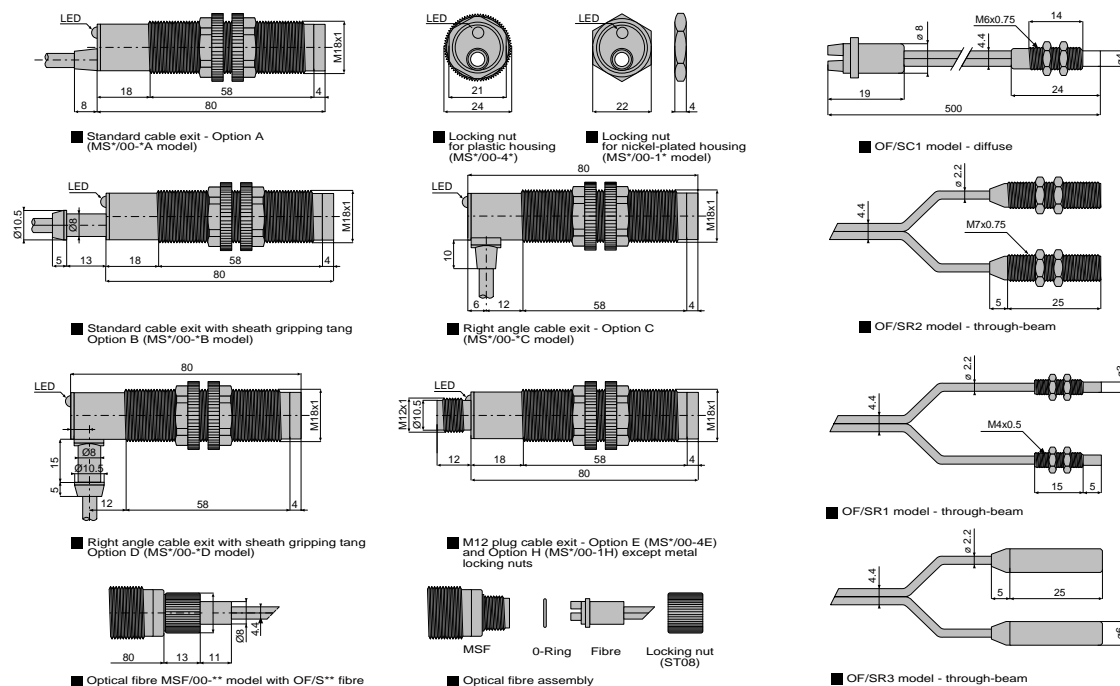
type	diffuse ⁽²⁾	through-beam	through-beam	through-beam
models	OF/SC1	OF/SR1	OF/SR2	OF/SR3
sensing range ⁽¹⁾	20mm	40mm	400mm	400mm
fibre head	M6x0.75	M4x0.5	M7x0.75	\varnothing 6mm unthreaded
fibre	500mm standard fibre length - \varnothing 1mm active fibre			
operating temperature	- 10°+70 °C			
materials	fibre: methacrylate - sheath: polyethylene - fibre head: aluminium			

⁽¹⁾referred to MSF photoelectric switch – ⁽²⁾can be used in retro-reflective version

M18 DC DECOUT® Photoelectric Switches MS continued



Dimensions (mm)



Red LED showing the output state; MSE models equipped with LED showing the presence of supply voltage.

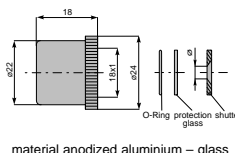
Cable: $\phi 4.7$ mm, 2m length, 0.34mm² conductor section, PVC material

Each model is also available with fibre length of 1m (OF/S*-1 model) and 2m (OF/S*-2 model)

Accessories

Type	Code
Swing mount bracket	ST02
Axial mount bracket	ST18-A
Right-angle mount bracket	ST18-C
Antidust front	ST30
Right angle beam adapter	ST03
Shutter	ST0S*
Protective front	ST50
Reflectors	see RL leaflet
Right angle beam adapter for OF/SR2 fibre	ST28

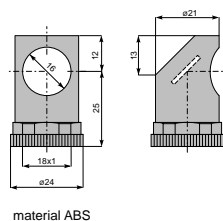
Shutter $\phi 18$ mm



This accessory, available for through-beam photoelectric switches $\phi 18$ mm, 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.

Shutter code	ST0S2	ST0S3	ST0S4	ST0S6	ST0S8
ϕ shutter aperture (mm)	2	3	4	6	8
MSE/MSR sensing range (m)	0.8	1.8	3.2	6.5	N/A
ϕ min. detectable object (mm)	1	1.5	2	3	N/A
MSE/MSD sensing range (m)	1.5	3.5	6.5	15	26
ϕ min. detectable object (mm)	1	1.5	2	3	4

Right angle beam adapter $\phi 18$ mm



For directing the photoelectric detection at 90° to the photoelectric switch optical axes for $\phi 18$ mm* sensors.

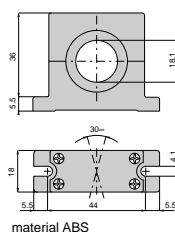
This accessory consists of an internal threaded body to be screwed on the optical head of the photoelectric switch.

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 diffuse types.

Swing mount bracket $\phi 18$ mm



For easy mounting and alignment of retro-reflective and through-beam photoelectric switches $\phi 18$ mm:

- fasten the mount bracket and tightly tighten the 4 self-tapping screws
- direct the photoelectric switch to find the optimum position. The accessory allows rotation in all directions at an angle of 15° max.
- clamp the 4 screws in the defined position

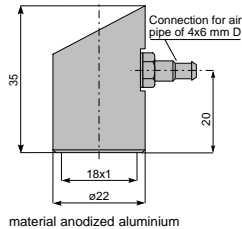


M18 DC DECOUT® Photoelectric Switches MS continued



Accessories continued

Antidust front ø18mm (ST3Ø model)

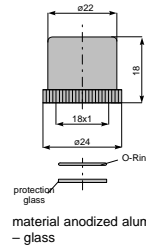


This is used to prevent dust or other deposits on the lenses of photoelectric switches ø18mm*, thus ensuring constant detection is maintained. It consists of a threaded body with a side air inlet pipe. The sensitivity loss is approx. 30%.



*not for diffuse types

Protective front ø18mm (ST5Ø model)

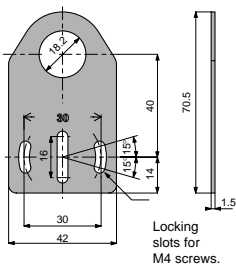


For the protection of the lenses of photoelectric switches ø18mm*. It allows use of the sensor even in particularly aggressive conditions (presence of chemical solvents etc.)

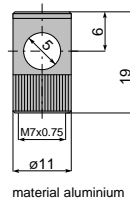
The system consists of a threaded metal body, an O-ring and a protection glass. The sensitivity loss is approx. 25%.

*not for diffuse types

Axial mount bracket (ST18-A model)



Right angle beam adapter for OF/SR2 fibre

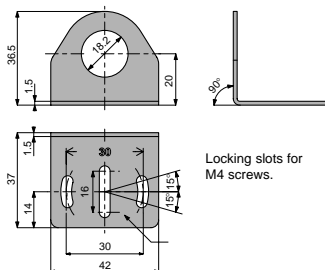


code ST28

The ST28 accessory is used for directing the photoelectric detection through 90° from the fibre optical axes. It consists of a threaded body to be screwed on the optical head of the sensor.

The mirror inside the body is set at 45° to the optical axes allowing detection at 90°. The sensitivity loss is approx. 20-30%.

Right angle mount bracket (ST18-C model)

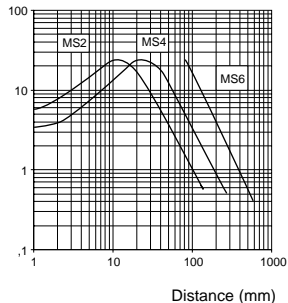


M18 DC DECOU[®] Photoelectric Switches MS continued

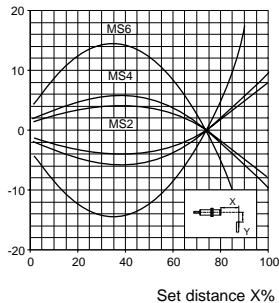


Characteristic curves

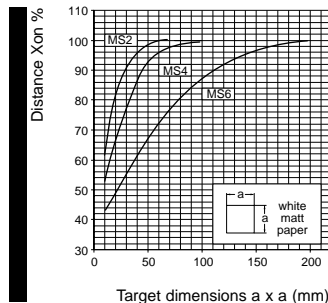
MS2-MS4-MS6 Excess gain



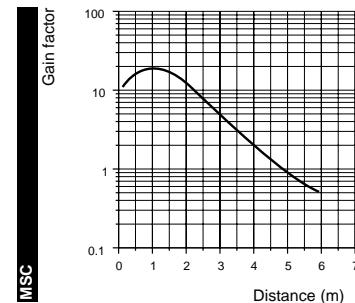
MS2-MS4-MS6 Parallel displacement



MS2-MS4-MS6 Distance/target size

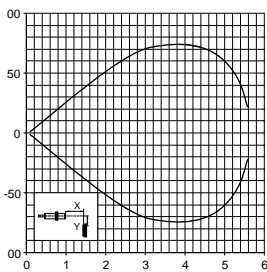


MSC Excess gain

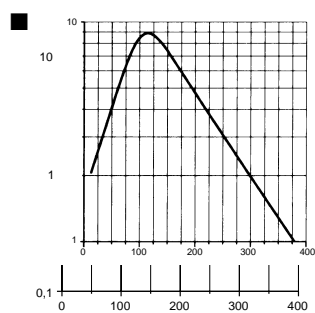


MSC Parallel displacement

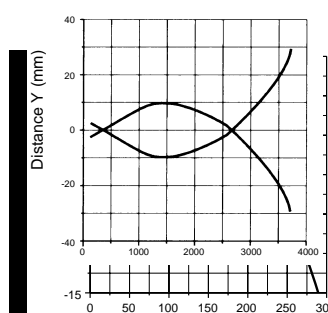
Parallel displacement



MSP Excess gain

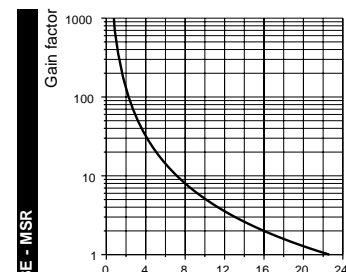


MSP Parallel displacement



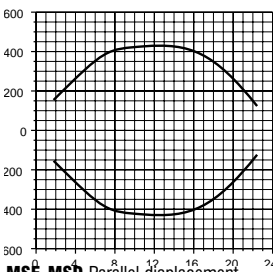
MSE-MSR Excess gain

Excess



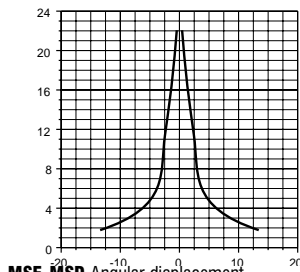
MSE-MSR Parallel displacement

Parallel displacement



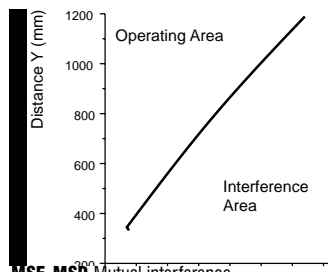
MSE-MSR Angular displacement

Angular displacement



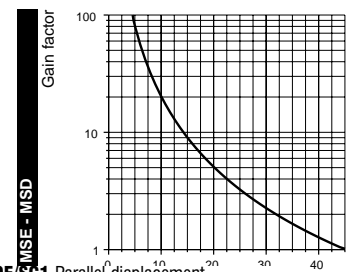
MSE-MSR Mutual interference

Mutual interference



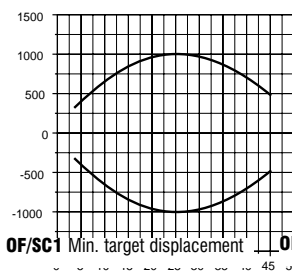
MSE-MSD Excess gain

Excess gain



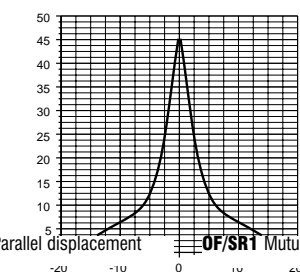
MSE-MSD Parallel displacement

Parallel displacement



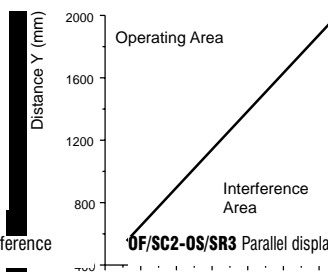
MSE-MSD Angular displacement

Angular displacement



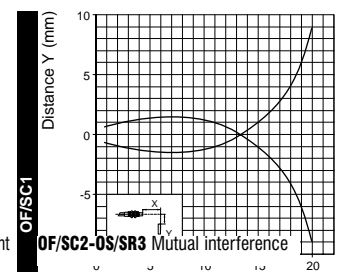
MSE-MSD Mutual interference

Mutual interference

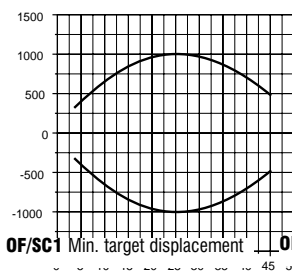


OF/SC1 Parallel displacement

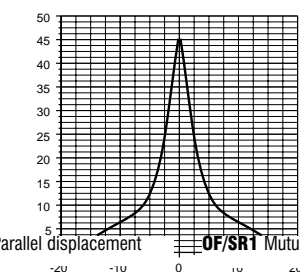
Parallel displacement



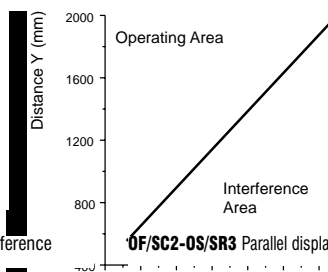
OF/SC1 Min. target displacement



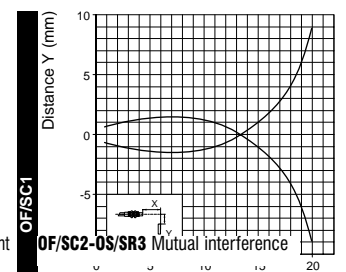
OF/SR1 Parallel displacement



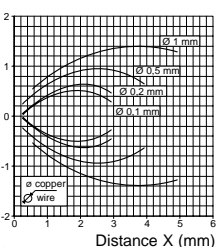
OF/SR1 Mutual interference



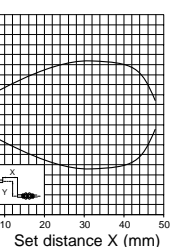
OF/SC2-OS/SR3 Parallel displacement



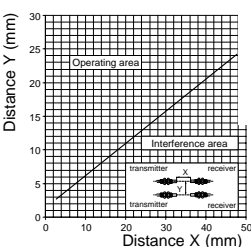
Min. target



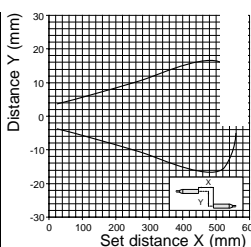
Parallel



Mutual Interference



Parallel



Mutual interference

