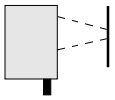
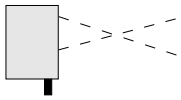
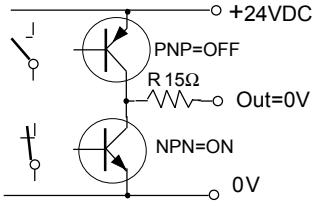
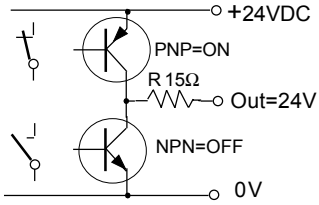
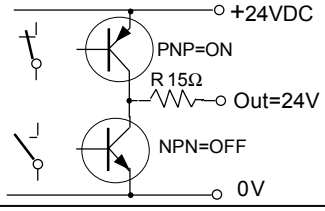
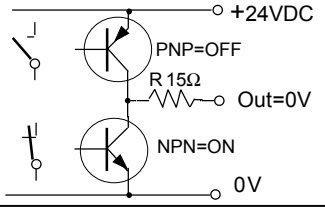
ISO 9001:2000

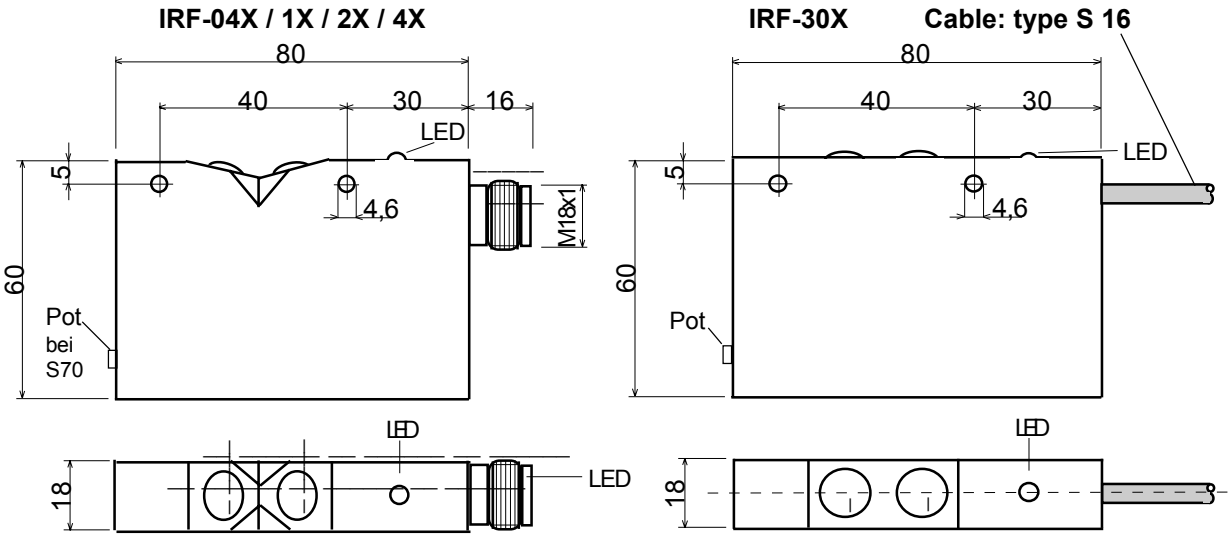
Photoelectric proximity switch IRF-...

- flat, strong housing
- especially suitable for detecting glass surfaces (Types -04X to -4X)
- extended range up to 3m (Type IRF-30X)
- Output function determinable by changing the supply voltage polarity

Type / Technical Data	IRF-04X	IRF-1X	IRF-2X	IRF-4X	IRF-30X
Range	40mm	100mm	200mm	400mm	3m
Determined at	Mirror	white paper, 80, A4			
Supply voltage	12 to 28 VDC				
Current consumption	25mA				35mA
Max. power dissipation	0.7W				1.0W
Output, type	Push-pull, short circuit protected				
Output, load	maximum 100mA				
Switching frequency	100Hz				
Hysteresis, axial	appr. 10% of range				
Hysteresis, radial	appr. 2% of range				
Operating temperature	-20°C < T_A < +50°C				
Housing	Zinc, die casting, with Aluminum cover				
Housing color	black-blue	yellow-blue	red-blue	grey-blue	blue-blue
System of protection	IP65 at EN 60529				
Connection	Connector: M18, Binder series 714, 4 terminals				
Connection, IRF-..X / S 16	Cable: 3+PE x 0.5mm² + shield / L=3m				
Connection, IRF-..X / S 99	Connector: M12, Binder series 713/763, 4 terminals				
Options	- switching frequency up to 2kHz, on request - with cable connection: IRF-..X **S16** - with potentiometer for fine adjustment: IRF-04X **S70** - special lense glueing (high solvent resistant): IRF-04X **S94** - with Connector M12, Binder series 713/763: IRF-..X **S99** - with emitter disable input, and connector M12, 5 terminals IRF-..X-**DI S99**				
Function and LED indication	 Object detected: Connector LED (red): ON Housing LED (green): OFF S 16: LED: RED		 No object detected: Connector LED (red): OFF Housing LED (green): ON S 16: LED: GREEN		
Connection diagram for standard function: Connection: M18 M12 Cable +24VDC 1 1 1 Output 2 4 3 0V 3 3 2 PE 4 2 yel-grn					
Connection diagram for inverted function: Connection: M18 M12 Cable +24VDC 3 3 2 Output 2 4 3 0V 1 1 1 PE 4 2 yel-grn					

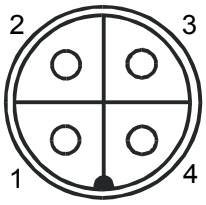
Standard Anschluss:

Dimensions:



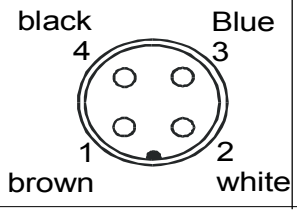
Connector M18,
Binder series 714:

1 +24VDC
2 Output
3 0V
4 PE

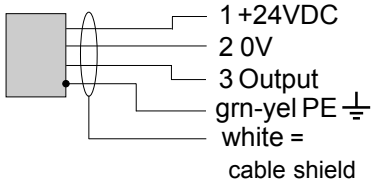


Connector M12, IRF-.. S99,
Binder series 713/763:

1 +24VDC
2 PE
3 0V
4 Output



Cable, IRF-... S16:



Operating Manual / EC - Declaration of Conformity:

General mounting prescriptions:
Do not exceed the maximum ratings. The electrical connections must be exactly as shown in the connection diagram. The cable shield must be connected short. The cable shield should be connected to PE or 0V(-) of the supply voltage. Connection cables must not be installed parallel to high voltage cables.

Function
The types IRF-04X to 4X are specialized for mirroring surfaces. The type IRF-30x is applicable for a wide range up to 3m. The sensor works basically as proximity switch on diffuse optical reflections. If the sensor detects reflected light, the LED shows red and the output switches on 0V. If no reflected light will be recognized, the output switches to +24VDC. The push-pull output allows to connect the load to +24VDC or 0V. By changing the polarity of the supply voltage, the output function will be inverted.

LED indication
The sensors types IRF have a red LED in the transparent connector housing and a green LED in front of the housing. The cable type IRF-..X S16 has only a 2-color LED in the housing. Disturbances will be indicated by red flushing of the LED in the housing.

Sensors with disable input, types IR.-..-..-DI:
If several sensors are installed close to another, it is necessary to use sensors with disable input. By using the disable input DI, each sensor can be controlled in a short reaction time. If only one sensor is activated in the same time, a mutual influence is precluded.

DI= 0V or not connected = emitter enabled
DI= High (24VDC) = emitter disabled

For a correct function the sensor must be enabled for at minimum >= 7.5ms (DI=0V). If the DI input will be disabled, the outputs holds the previous output status from the last enabled time.

The DI input is PNP compatible.

Maintenance
Protect the sensor and the optional fibre optics against pollution. If the fibre optics or the sensor lenses are contaminated, clean with alcohol. Do not use aggressive solvents. Optical fibres can be destroyed by strong solvents. Equipment must only be repaired or serviced by the manufacturer.

Safety Informations
The sensors types IRF-.. must not be used for Accident-Prevention! When installing and operating with the sensor, it is necessary to take into consideration the relevant international and other national regulations.
Standards met:
- EN 61000-6-1/-2, EN 61000-6-3/4, EN 60529
- Machine directive: 98/37/EG
- Low voltage directive: 73/23/EWG, 93/68/EWG
- EMC 89/336/EWG, 91/263/EWG, 92/31/EWG, 93/68/EWG

General Notes
We reserve the right to modify our equipment. Our equipment is designed such way, that it has the least possible adverse effect on the environment. It neither emit or contain any damaging or siliconized substances and use a minimum of energy and resources. No longer usable or irreparable units must be disposed of in accordance with local waste disposal regulations.

Declaration of Conformity
The conformity of the devices with the EC standards and directives and the observation of the Quality Safety System ISO 9001, declares:

Hans Bracher, Matrix Elektronik AG

IRF_e5/OCT.24,03/HB

Matrix Elektronik AG (Manufacturer)
Kirchweg 24 CH-5422 Oberehrendingen
Tel.:+41 (0) 56/2220-757 Fax -563

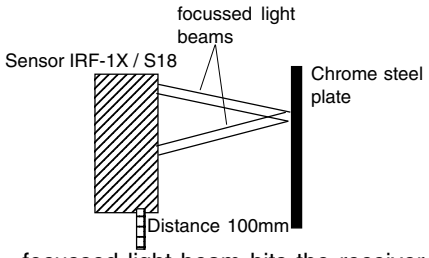
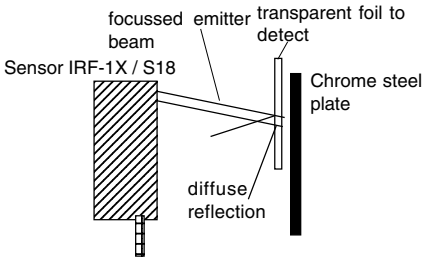
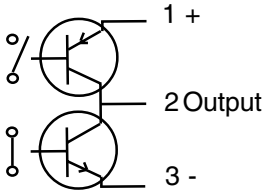
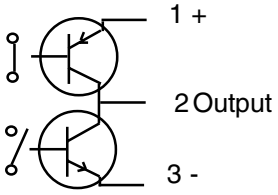
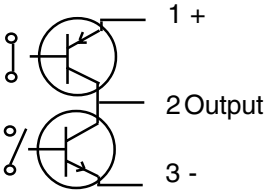
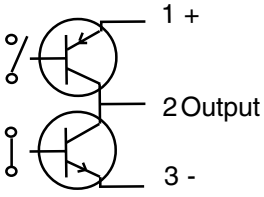
Tippkemper - Matrix GmbH
Meegener Str. 43 D-51491 Overath
Tel.:+49 (0) 2206/9566-0 Fax -19

Optoelectronic Proximity Switch IRF-1X S18

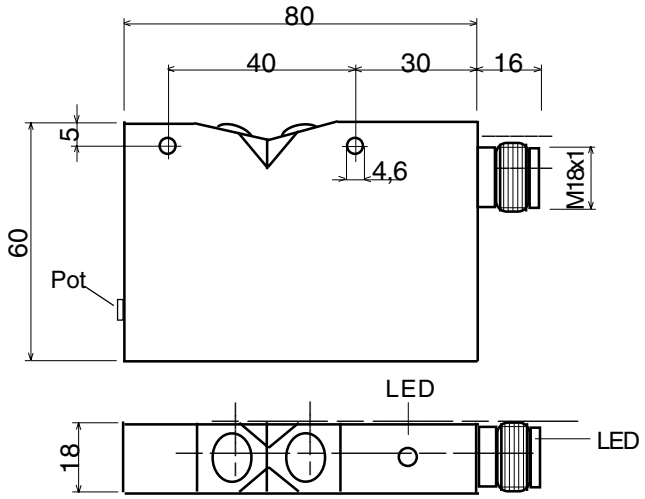
CE

ISO 9001

- Especially suitable for detecting of transparent foils

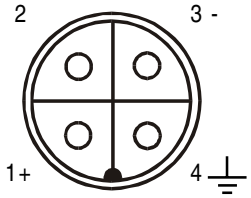
Type / Technical Data	IRF-1X S18	
Range on chrome steel plate	100 mm	
Supply voltage	12-28 VDC / Ripple max. 10% Vpp	
Current consumption	55mA	
max. Power dissipation	1.54W	
Circuit speed	2kHz	
Hysteresis: axial direction Hysteresis: radial direction	ca. 10% of operating distance ca. 2% of operating distance	
Output	1x Push-Pull / max. 100mA / short circuit protected	
Ambient temperature T_A	-20°C < T_A > +50°C	
Housing	Zinc die casting with Alu-cover	
Housing color	yellow-blue	
System of protection	IP65 according EN 60529	
Connection	Connector M18	
Function and LED-Display	 focussed light beam hits the receiver red LED = ON green LED = OFF	 emitter beam diffused by the foil, no light hits the receiver red LED = OFF green LED = ON
Output N-switching 1 + 2 Output 3 -		
Output P-switching 1 + 2 Output 3 -		
X-Function: Reverse polarity of the power supply is followed by an invert function of the output		

Dimensions:



Connection layout:

1 +
2 Output
3 -
4 Protection Earth



Operating Manual:

Mounting prescriptions
We recommend that the sensor is installed insulated from the protective earth. The sensor must only be used with the voltage shown on the identification label.
The shield is to connect with the protective earth (PE) in a wide area or to connect to "-". The connection cable must not be installed parallel to high voltage cables. The stated limit values must not be exceeded. The sensor has one Push-Pull-output. The load (Relay or other loads) can be connected at "+" or at "-". The sensor must be mounted absolutely parallel the mirror plate.

Function
The emitter light beam is focussed to a point of 2mm diameter at a distance of 100mm. At this distance of 100mm the emitter light beam will be reflected by mirroring plate (e.g. polished chromium steel, no triple mirrors allowed) and the beam hits on the receiver lens. The sensor is switching ON. If the emitter beam hits an transparent foil between the sensor and the mirror plate the light beam will be diffuse reflected and no light hits the receiver lens. The sensor is switching OFF. The operating state is shown by the red and green LED. The red is flushing on and the green LED is switching off, when the receiver has detected light.

X-Function
By changing the polarity of the supply voltage (3 = +, 1 = -), the output mode will be reversed (X-function). The LED function will remain unchanged.

Maintenance
The sensor does not require any special maintenance. Should the sensor become dirty, it should be cleaned with a non-aggressive medium. Equipment should only be repaired or serviced by the manufacturer.

General Notes
Our equipment is designed such way, that it has the least possible adverse effect on the environment. It neither emit or contain any damaging or siliconized substances and use a minimum of energy and resources. No longer usable or irreparable units must be disposed of in accordance with local waste disposal regulations. We reserve the right to modify our equipment.

Safety Informations
Should the sensor cable be broken or the sensor in any way become defect, the output may show any mode. When installing and operating with the Sensors, it is necessary to take into consideration the relevant EU and other national regulations.
Standards met:
- EN 50081-1/-2, EN 50082-1/-2,
- Machine Directive: 89/392/EWG, 91/368/EWG, 93/44/EWG, 93/68/EWG
- Low Voltage Directive: 73/23/EWG

NOV.11,99/HB

Group

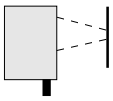
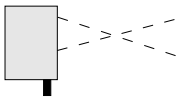
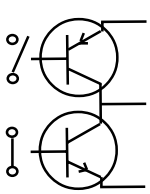
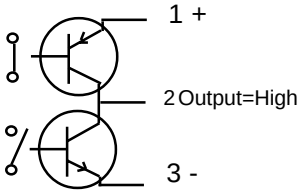
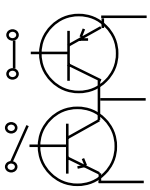
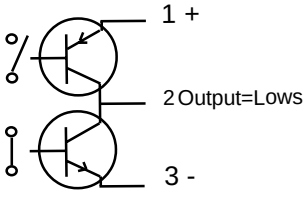
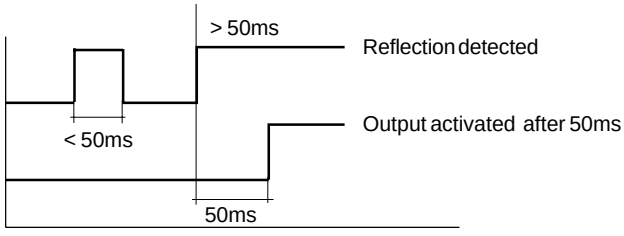
Tippkemper - Matrix GmbH
Meegener Str. 43 D-51491 Overath
Tel.:+49 (0) 2206/9566-0 Fax -19

Matrix Elektronik AG
Kirchweg 24 CH-5422 Oberehrendingen
Tel.:+41 (0) 56/2220-757 Fax -563

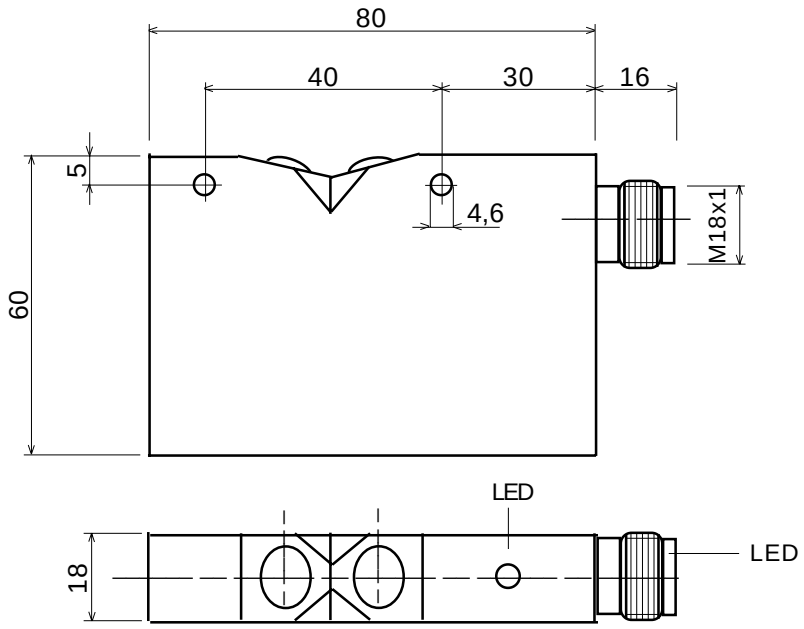
ISO 9001

Photoelectric Proximity Switch IRF-1X / S59

- 50ms rise time delay
- applicable for glass surface detection

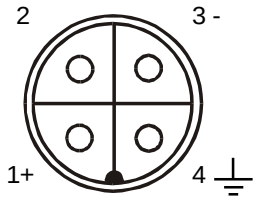
Type / Technical Data	IRF-1X / S59	
Range	100mm	
Supply voltage	12-28 VDC	
Current consumption	55mA	
Power dissipation	1.54W	
Output	Push-Pull, maximum 100mA, short circuit protected	
Response time Hysteresis: axial	500us appr. 10% of maximum range	
Hysteresis: radial	appr. 2% of maximum range	
Operating temperature TA	-20°C < TA < +50°C	
Housing	Zinc die casting with Aluminum-cover	
Housing color	yellow and blue	
Protection rating	IP65 at EN 60529	
Connection	Connector, M18	
Accessories	---	
Option	---	
Function and LED indication	 Diffuse reflected light detected LED, inside connector, shows red, green LED in the housing extinguished	 No reflection detected red LED, inside connector, extinguished, LED in the housing shows green
Function at standard connection of the supply voltage: 1 + 2 Output 3 -		
Function at reversing connection of the supply voltage: 1 - 2 Output 3 +		
X-Function: Inversely connection of the supply voltage = inversely output function		
Switching diagram:		

Dimensions:



Connection layout:

1 +
2 Output
3 -
4 Protection earth



Operating Manual / EC - Declaration of Conformity:

General mounting prescriptions:
Do not exceed the maximum ratings. The electrical connections must be exactly as shown in the connection diagram. The cable shield must be connected short. The cable shield should be connected to PE or 0V(-) of the supply voltage. Connection cables must not be installed parallel to high voltage cables.

Function
The sensor works basically as proximity switch on diffuse optical reflections. If the sensor detects reflected light, the LED, inside the connector, shows red, the green LED in the housing is extinguished and after a delay time of 50ms, the output switches on +24VDC or 0V (dependent of the polarity of the supply voltage). If no reflected light will be recognized, the red LED, inside the connector extinguished, the LED in the housing shows green and the output switches immediately to 0V or +24VDC (dependent of the polarity of the supply voltage). The push-pull output allows to connect the load to +24VDC or 0V. The function of the LED's is not influenced by the polarity of the supply voltage.

Maintenance
Protect the sensor and the optional fibre optics against pollution. If the fibre optics or the sensor lenses are contaminated, clean with alcohol. Do not use aggressive solvents. Optical fibres can be destroyed by strong solvents. Equipment must only be repaired or serviced by the manufacturer.

Safety Informations
The sensors type IRF-.. must not be used for Accident-Prevention! When installing and operating with the sensor, it is necessary to take into consideration the relevant international and other national regulations.
Standards met:
- EN 50081-1/-2, EN 50082-1/-2,
- Machine directive: 98/37/EG
- Low voltage directive: 73/23/EWG, 93/68/EWG
- EMC: 89/336/EWG, 91/263/EWG, 92/31/EWG, 93/68/EWG

General Notes
We reserve the right to modify our equipment. Our equipment is designed such way, that it has the least possible adverse effect on the environment. It neither emit or contain any damaging or siliconized substances and use a minimum of energy and resources. No longer usable or irreparable units must be disposed of in accordance with local waste disposal regulations.
The conformity of the devices with the EC standards and directives and the observation of the Quality Safety System ISO 9001 declares:

Hans Bracher, Matrix Elektronik AG

IrfS59_e1/MAY.06,03/HB

Matrix Elektronik AG (Manufacturer)
Kirchweg 24 CH-5422 Oberehrendingen
Tel.:+41 (0) 56/2220-757 Fax -563

Tippkemper - Matrix GmbH
Meegener Str. 43 D-51491 Overath
Tel.:+49 (0) 2206/9566-0 Fax -19