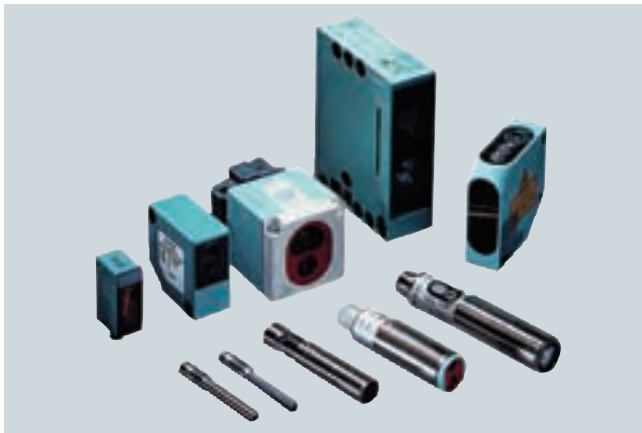


SIMATIC PXO photoelectric proximity switches

Introduction

Photoelectric proximity switches – fast and accurate sensing with light and laser



Pure photoelectric astuteness – this is what distinguishes these extremely precise, quick-acting and accurately pin-pointing photoelectric proximity switches. This is supplemented by first-class ease of adjustment using a teach-in function or potentiometer and easiest possible handling during operation. With the wide range of different designs, from cubic to cylindrical right down to miniature designs and different types, e.g. as diffuse sensors with or without background suppression, retroreflective or thru-beam sensors, they master any task with a range of up to 50 m superbly.

Highlights

- Extremely precise and quick-acting with pin-point locating ability
- Maximum performance even over large distances
- Small, compact enclosure
- Degree of protection up to IP68
- Adjustable ranges
- Easy commissioning (teach-in)
- Suitable for global use (UL/CSA)

Configurator

A configurator for photoelectric proximity switches is available in the Mall. Based on the technical features required, the desired product can be quickly and easily selected, placed in the shopping cart and ordered.

The configurator can be reached by the following link:
www.siemens.com/simatic-sensors/px

PXO series

The photoelectric proximity switches are organized in different product families in accordance with their technical version and design:

SIMATIC sensors	Version	Design
PXO100	Cylindrical version, mini	D4, M5, M12
PXO200	Cylindrical versions	M18, M18S, L18
PXO300	Cubic version, mini	K21, K21R, K20, L20, C20
PXO400	Cubic version, small	K31, K30
PXO500	Cubic version	C40, L50, L50HF, L50HF adv., C50
PXO600	Cubic version, large	K80, L80HF, L90L
PXO800	Special device amplifiers	GL, LV70

Application

The various versions of the photoelectric proximity switches are predominantly used in the following applications:

- In conveyor systems
- In packaging machines
- In mechanical engineering
- In paper, textile and plastics processing
- In printing machines
- For access control.

These photoelectric sensors detect all objects regardless of their composition, whether metal, wood or plastic.

Special versions of the K20 form in miniature enclosure and the C40 are available for detecting transparent objects. Special devices such as the color sensor or color mark reader can be used to detect differences in color or contrast. The analog laser supports extremely precise distance measurements and position monitoring.

Sensors for Ex Zone 2/22



The K80 ATEX photoelectric proximity switch is approved according to EU Guideline 94/9/EG (ATEX) Appendix VIII

The approval is for:

- Gas EX II 3G EEx nA II T6x and
- Dust EX II 3D IP65 T 80 °C x

The functionality of the photoelectric proximity switches with ATEX approval is identical to that of the standard proximity switches.

Safety-related applications



NSDD_00801

The use of the sensors is not permissible for applications in which the safety of persons is dependent on the function of the proximity switch.

Design

The devices can be mounted in any position. They should be installed in such a manner as to prevent dirt deposits as far as possible. The available accessories enable the devices to be mounted easily and correctly.

Alignment

Diffuse sensor

The sensor must be aligned with the object to be sensed to ensure reliable switching. In devices that have a surplus light function, the relevant LED must be active.

Reflex sensors

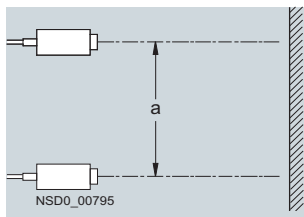
- Place the reflector at the required location and secure it firmly.
- Cover the reflector with adhesive tape so that only the center (approximately 25 % of the surface) remains free.
- Install the reflex sensor so that it switches reliably.
- Finally remove the adhesive tape from the reflector.

Thru-beam sensors

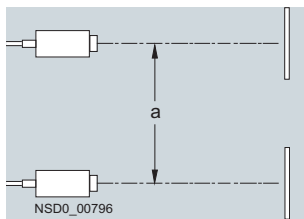
- Place the receiver in the required position and secure it firmly.
- Align the emitter with the receiver as accurately as possible.

Minimum clearance

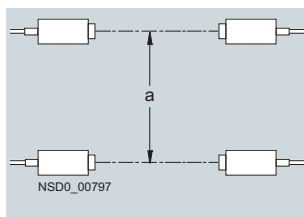
The proximity switches must not interfere with each other. Therefore a minimum distance a must be observed between two sensors. The following distances are recommended values only. The values given are for maximum sensitivity.



Diffuse sensor



Reflex sensor



Thru-beam sensor.

Photoelectric proximity switches Dimension a

D4/M5	50 mm
M12	250 mm
M18	250 mm
K31	250 mm
K30	750 mm
K80	500 mm
L18 (laser light barrier)	150 mm ¹⁾
L50 (laser light scanner)	30 mm
L50 (laser light barrier)	80 mm
C50 (color sensor)	500 mm

1) Focusing at 50 m.

Setting the operating distance

Sensitivity is either adjusted using a built-in potentiometer or taught by means of a teach-in function. When a potentiometer is used, turning clockwise increases sensitivity and thus the achievable operating distance.

Diffuse sensor and diffuse sensor with background suppression

The object is positioned in front of the sensor inside its sensing range. Set the sensitivity, or distance, in such a way that the object to be scanned is sure to be sensed. If necessary, the surplus light display (green LED) must be active. The object must then be removed. If the output remains on, sensitivity must be reduced.

In devices with teach-in function, sensitivity is adjusted automatically. During this process, the sensor is taught the two states "Object there" and "Object not there" by pressing the keys.

Reflex sensors and thru-beam sensors

In normal cases, the sensor is always operated with sensitivity at maximum. This produces the maximum surplus light. It is usually only necessary to reduce sensitivity for sensing very small or transparent objects. The procedure is the same as for diffuse sensors.

Cable length

Long cables between the devices result in:

- Additional capacitive loading (short-circuit protection)
- Increased injection of interference.

For this reason the specified maximum cable length must not be exceeded.

SIMATIC PXO photoelectric proximity switches

Introduction

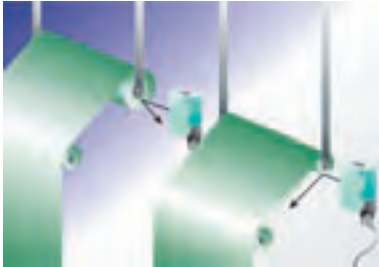
Function

Diffuse sensor (energetic sensor)



The light from the emitter falls on an object and is reflected in a diffuse pattern. Part of this reflected light reaches the receiver located in the same device. If the intensity of the received light is sufficient, the output is switched.

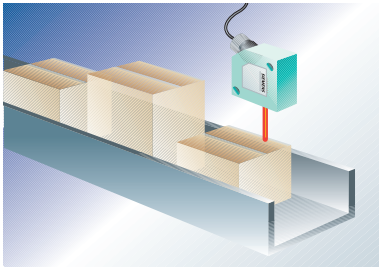
The sensing range depends on the size and color of the object involved as well as its surface texture. The sensing range can be varied within a wide range by means of the built-in potentiometer. The energetic sensor can therefore also be used to detect different colors.



Diffuse sensor with background suppression



Diffuse sensors with background suppression can detect objects up to a specific sensing range. All objects beyond this range are suppressed. The focus level can be adjusted. The background is suppressed due to the geometric constellation between the emitter and the receiver.

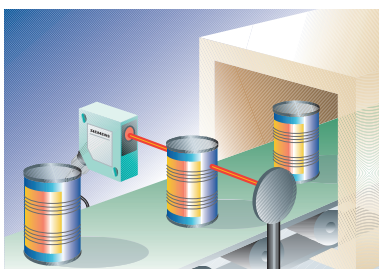


Reflex sensors



The light from the emitter diode is focused through a lens and directed via a polarization filter to a reflector (principle of a 3-way mirror). Part of the reflected light passes through another polarization filter and reaches the receiver. The filters are selected and aligned in such a way that only the light reflected from the reflector reaches the receiver and not the light reflected from other objects within the beam range.

An object that interrupts the light beam from the emitter through the reflector to the receiver causes the output to switch.

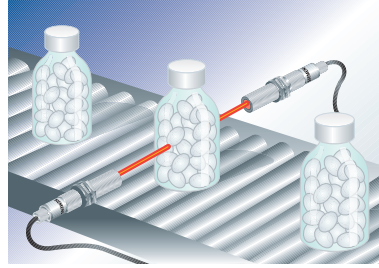


Thru-beam sensors



Thru-beam sensors comprise an emitter and a receiver. The emitter is aligned in such a way that the greatest possible amount of pulsed light from the emitter diode reaches the receiver. The receiver evaluates the incoming light to clearly separate it from the ambient light and other light sources.

Any interruption of the light beam between emitter and receiver causes the output to switch.

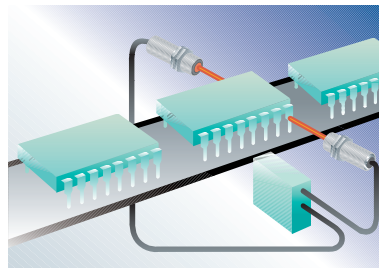


Devices for fiber-optic wires



Optical fibers are fitted in front of the emitter and receiver. They represent the "extended eye" of the photoelectric proximity switch.

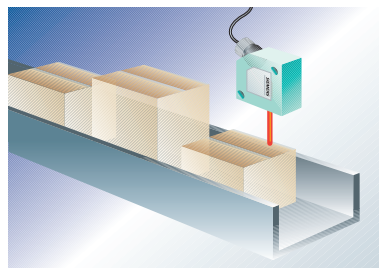
As optical fibers are very small and flexible, they provide a practical solution to the problem of sensing at points that are not easily accessible. Furthermore no electrical potential is transferred.



Laser diffuse sensor with analog output



The analog laser proximity switch can measure the exact distance of an object within its sensing range. Due to the use of visible laser light, the measurement is highly accurate and the output is extremely linear. All laser proximity switches belong to safety class 2, i.e. they are harmless and can be used without any risk to health (e.g. to the eyes).



Color sensors

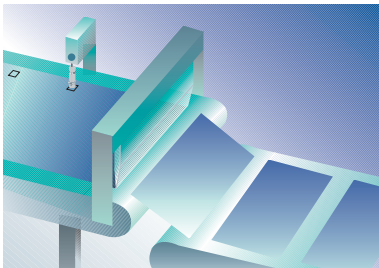
The color sensor functions with an incandescent LED, which illuminates the object.

During sensor adjustment, the light reflected from the object is measured and assigned to the appropriate output. The recognized color is stored in the device in a non-volatile memory, and is immediately available even when the sensor has been switched off and on again. Either three independent colors or one color scale can be saved and evaluated.

The measured color value (RGB) is not available.

Color mark sensor

The color mark sensor uses green or red emitted light. The color is selected automatically depending on the contrast. The mark color and the background color can be set separately by means of two keys.

**Technical specifications**

The table lists data which are independent of the design

Type		Solid-state output	Relay output (K80)	Devices with laser
Voltage drop at 200 mA	V	Max. 2.0	–	Max. 2.4
Operating capacity	mA	Max. 200	2000	Max. 200
Reverse current of outputs	mA	Max. 0.1	–	Max. 0.1
Power-up delay	ms	Max. 20	Max 300	Max. 300
Hysteresis (typical) for diffuse sensors		10%	10%	5%
Repeat accuracy for diffuse sensors		5% of operating distance		
Ambient light limit				
• Sunlight	Lux	10.000		
• Halogen light	Lux	3.000		
Precautions				
• Overload protection		•	–	•
• Overvoltage protection		•	–	•
• Short-circuit protection		•	Back-up fuse required	•
Permissible cable length	m	Max. 250	Max. 250	Max. 100

For further technical specifications, see respective type

SIMATIC PXO photoelectric proximity switches

Introduction

2

Design	D4		M5		M12			M18S			M18	L18
	Diffuse sensor	Thru-beam sensor	Diffuse sensor	Thru-beam sensor	Diffuse sensor	Reflex sensor with polarization filter	Thru-beam sensor	Diffuse sensor	Reflex sensor with polarization filter	Thru-beam sensor	Diffuse sensor with background suppression	Thru-beam sensor
PXO100												
• 5 cm	2/86		2/87									
• 25 cm		2/86		2/87								
• 30 cm					2/88							
• 150 cm						2/88						
• 400 cm							2/88					
PXO200												
• 1 ... 12 cm											2/93	
• 60 cm								2/91				
• 80 cm								2/91				
• 250 cm									2/91			
• 300 cm									2/91			
• 600 cm										2/91		
• 5000 cm												2/94

Design	K21/K21R		K20		L20		C20
	Diffuse sensor	Reflex sensor	Reflex sensor with background suppression	Reflex sensor	Reflex sensor with background suppression	Reflex sensor	Contrast sensor
PXO300							
• 2.5 ... 10 cm			2/99				
• 3 ... 11 cm					2/100		
• 4 ... 15 cm							2/101
• 50 cm	2/97						
• 5 ... 50 cm				2/99			
• 300 cm		2/97					
• 7.5 ... 300 cm						2/100	

Design	K31				K30				
	Diffuse sensor	Diffuse sensor with background suppression	Reflex sensor with polarization filter	Thru-beam sensor	For plastic fiber-optic wires	Diffuse sensor	Reflex sensor	Thru-beam sensor	For plastic fiber-optic wires
PXO400									
• 3 ... 15 cm		2/103							
• 60 cm	2/103								
• 120 cm						2/105			
• 200 cm			2/103						
• 400 cm							2/105		
• 600 cm				2/103					
• 1200 cm								2/105	
• Depending on fiber-optic wire					2/103				2/105

Design	C40				L50			L50HF	L50HF advanced	C50
	Diffuse sensor	Diffuse sensor with background suppression	Reflex sensor with polarization filter	Reflex sensor for transparent objects	Diffuse sensor with background suppression	Laser diffuse sensor with analog output	Laser reflex sensor	Laser diffuse sensor with analog output	Laser diffuse sensor with analog output	Color sensor
PXO500										
• 1.2 ... 3.2 cm										2/114
• 4.5 ... 8.5 cm						2/110				
• 3 ... 15 cm					2/110					
• 3 ... 10 cm								2/112		
• 5 ... 25 cm		2/108								
• 8 ... 30 cm									2/112	
• 70 cm	2/108									
• 100 cm				2/108						
• 600 cm			2/108							
• 2000 cm							2/110			

Design	K80				L80HF	L90L
	Diffuse sensor	Diffuse sensor with background suppression	Reflex sensor with polarization filter	Thru-beam sensor	Laser diffuse sensor with analog output	Diffuse sensor
PXO600						
• 25 ... 75 cm					2/119	
• 20 ... 100 cm		2/116				
• 20 ... 600 cm						2/120
• 20 ... 3000 cm						2/120
• 200 cm	2/116					
• 600 cm			2/116			
• 1200 cm			2/116			
• 5000 cm				2/116		

Design	GL	LV70
	Thru-beam sensor	For plastic fiber-optic wires
PXO800		
• 3 cm	2/123	
• 5 cm	2/123	
• 8 cm	2/123	
• 12 cm	2/123	
• Depending on fiber-optic wire		2/125

SIMATIC PXO photoelectric proximity switches

Introduction



Notes

2

SIMATIC PXO photoelectric proximity switches


SIMATIC PXO100

Overview

SIMATIC sensors PXO100

- D4,
- M5,
- M12.

Selection table

SIMATIC PXO100								
								
	D4		M5		M12			
Operating mode								
• Diffuse sensor	■		■		■			
• Reflex sensor						■		
• Thru-beam sensor		■		■				■
Sensing range								
• 5 cm ... 11 cm	■		■					
• 20 cm ... 30 cm		■		■	■			
• 1 m ... 1.5 m						■		
• 4 m ... 6 m								■
Output								
• pnp	■	■	■	■	■	■	■	■
• npn	■	■	■	■	■	■	■	■
Operating voltage								
• 24 V DC	■	■	■	■	■	■	■	■
Connection								
• M8 connector	■	■	■	■				
• M12 connector					■	■		■
• Cable	■	■	■	■	■	■	■	■
Special features								
• Metal enclosure	■	■	■	■	■	■	■	■
Illuminant								
• Red light					■	■		■
• Infrared light	■	■	■	■				
See page	2/86	2/86	2/87	2/87	2/88	2/88		2/88

A configurator for fast product selection and ordering in the Internet can be found at www.siemens.com/simatic-sensors/px

SIMATIC PXO photoelectric proximity switches

SIMATIC PXO100

D4 design

Overview



Diffuse sensor (energetic sensor)

- Sensing range 5 cm (not adjustable)


Thru-beam sensor

- Sensing range 25 cm (not adjustable)

Technical specifications

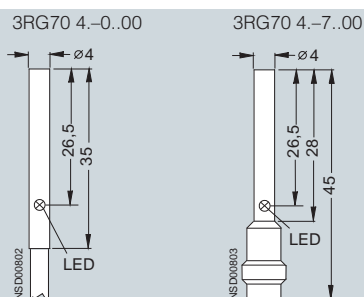
Operating mode		Diffuse sensor	Thru-beam sensor
			
Sensing range	cm	5 (not adjustable)	25 (not adjustable)
Standard target	mm	100 × 100 (white)	–
Operating voltage range (DC)	V	10 ... 30 (max. 20 % residual ripple)	
No-load current I_0 (typ.)	mA	10	5 / 5 (emitter / receiver)
Rated operational current I_e	mA	100	
Switching frequency	Hz	250	250
Switching time	ms	2.5	2.5
Wavelength (illuminant)	nm	880 (IR)	880 (IR)
Indicators		<ul style="list-style-type: none"> • Reliable detection: Yellow LED • Surplus light underrange: Yellow LED flashing 	
Enclosure material		Stainless steel	
Degree of protection		IP67	
Ambient temperature	°C	0 ... +55	
Temperature coefficient	%/K	0.3	
Type		3RG70 40-...00	3RG70 42-...00

Selection and Ordering data

	Operating mode	Sensing range cm	Illuminant nm	Connection	Switching output	Circuit diagram number ¹⁾	Order No.
	Diffuse sensor	5	880 (IR)	2 m cable, PUR, 3 × 0.14 mm ²	pnp, light-ON	1	3RG70 40-0AB00
					npn, light-ON	1	3RG70 40-0GB00
				M 8 connector, 3-pole, Type A	pnp, light-ON	1	3RG70 40-7AB00
				npn, light-ON	1	3RG70 40-7GB00	
	Thru-beam sensor	25	880 (IR)	cable 2 m, PUR, 3 × 0.14 mm ²	pnp, light-ON	1	3RG70 42-0AB00
					npn, light-ON	1	3RG70 42-0GB00
Emitter					2	3RG70 42-0BG00	
			M 8 connector, 3-pole, Type A	pnp, light-ON	1	3RG70 42-7AB00	
				npn, light-ON	1	3RG70 42-7GB00	
				Emitter	2	3RG70 42-7BG00	

1) see page 2/127.



Dimensions




Overview

- Diffuse sensor (energetic sensor)
- Sensing range 5 cm (not adjustable)
- Thru-beam sensor
- Sensing range 25 cm (not adjustable)

Technical specifications

Operating mode		 Diffuse sensor	 Thru-beam sensor
Sensing range	cm	5 (not adjustable)	25 (not adjustable)
Standard target	mm	100 × 100 (white)	–
Operating voltage range (DC)	V	10 ... 30 (max. 20 % residual ripple)	
No-load current I_0 (typ.)	mA	10	5 / 5 (emitter / receiver)
Rated operating current I_e	mA	100	
Switching frequency	Hz	250	250
Switching time	ms	2.5	2.5
Wavelength (illuminant)	nm	880 (IR)	880 (IR)
Indicators		<ul style="list-style-type: none"> Reliable detection: Yellow LED Surplus light underrange: Yellow LED flashing 	
Enclosure material		Brass, nickel-plated	
Degree of protection		IP67	
Ambient temperature	°C	0 ... +55	
Temperature coefficient	%/K	0.3	
Type		3RG70 30–...00	3RG70 32–...00

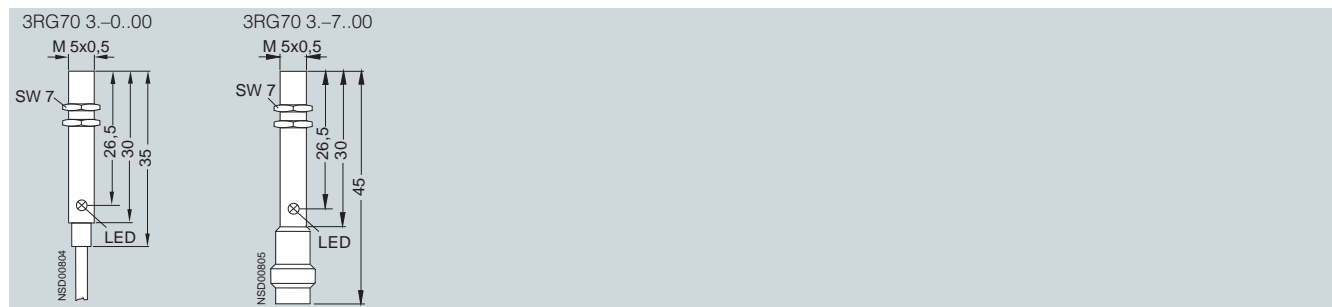
Selection and Ordering data

	Operating mode	Sensing range cm	Illuminant nm	Connection	Switching output	Circuit diagram number ¹⁾	Order No.
	Diffuse sensor	5	880 (IR)	2 m cable, PUR, 3 × 0.14 mm ²	pnp, light-ON npn, light-ON	1 1	3RG70 30–0AB00 3RG70 30–0GB00
				M8 connector, 3-pole, type A	pnp, light-ON npn, light-ON	1 1	3RG70 30–7AB00 3RG70 30–7GB00
	Thru-beam sensor	25	880 (IR)	2 m cable, PUR, 3 × 0.14 mm ²	pnp, light-ON npn, light-ON Emitter	1 1 2	3RG70 32–0AB00 3RG70 32–0GB00 3RG70 32–0BG00
				M 8 connector, 3-pole, type A	pnp, light-ON npn, light-ON Emitter	1 1 2	3RG70 32–7AB00 3RG70 32–7GB00 3RG70 32–7BG00

1) see page 2/127.

▶ Preferred type, available from stock.

Dimensions



SIMATIC PXO photoelectric proximity switches

SIMATIC PXO100

M12 design

Overview

Diffuse sensor (energetic sensor)

- Sensing range 30 cm (adjustable via potentiometer)




Reflex sensor

- Sensing range 1.5 m
- Supplied without reflector

Thru-beam sensor

- Sensing range 4 m
- Enabling input for test purposes

Technical specifications


Operating mode		Diffuse sensor	Reflex sensor with polarization filter	Thru-beam sensor
				
Sensing range	cm	30 (adjustable)	150	400
Standard target	mm	200 × 200 (white)	Reflector type D84	–
Operating voltage range (DC)	V	10 ... 36 (max. 20 % residual ripple)		
No-load current I_0 (typ.)	mA	15	15	15 / 15 (emitter / receiver)
Rated operating current I_e	mA	200		
Switching frequency	Hz	1000	1000	1000
Switching time	ms	0.5	0.5	0.5
Wavelength (illuminant)	nm	660 (red)	660 (red, polarized)	660 (red)
Indicators				
• Switching status		Yellow LED		
• Surplus light		Green LED		
Enclosure material		Brass, nickel-plated		
Degree of protection		IP67		
Ambient temperature	°C	–25 ... +55		
Temperature coefficient	%/K	0.3		
Type		3RG71 20–...00	3RG71 21–...00	3RG71 22–...00

SIMATIC PXO photoelectric proximity switches

SIMATIC PXO100

M12 design

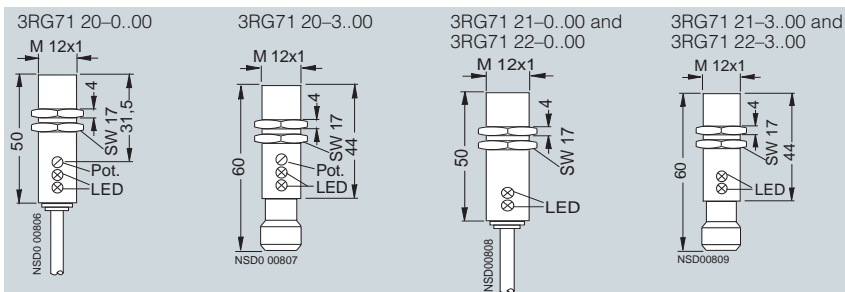
Selection and Ordering data

	Operating mode	Sensing range cm	Illuminant nm	Connection	Switching output	Circuit diagram number ¹⁾	Order No.		
	Diffuse sensor	30 (adjustable via potentiometer)	660 (red)	2 m cable, PUR, 3 × 0.34 mm ²	pnp, light-ON	12	▶ 3RG71 20-0AB00 ▶ 3RG71 20-0AA00 ▶ 3RG71 20-0GB00 ▶ 3RG71 20-0GA00		
					pnp, dark-ON	13			
					npn, light-ON	12			
					npn, dark-ON	13			
					M12 connector, 4-pole, type F	pnp, light-ON		12	▶ 3RG71 20-3AB00 ▶ 3RG71 20-3AA00 ▶ 3RG71 20-3GB00 ▶ 3RG71 20-3GA00
					pnp, dark-ON	13			
	npn, light-ON	12							
	npn, dark-ON	13							
	Reflex sensor	150	660 (red, polarized)	2 m cable, PUR, 3 × 0.34 mm ²	pnp, light-ON	13	▶ 3RG71 21-0AB00 ▶ 3RG71 21-0AA00 ▶ 3RG71 21-0GB00 ▶ 3RG71 21-0GA00		
					pnp, dark-ON	12			
					npn, light-ON	13			
					npn, dark-ON	12			
M12 connector, 4-pole, type F					pnp, light-ON	13		▶ 3RG71 21-3AB00 ▶ 3RG71 21-3AA00 ▶ 3RG71 21-3GB00 ▶ 3RG71 21-3GA00	
pnp, dark-ON					12				
npn, light-ON	13								
npn, dark-ON	12								
Thru-beam sensor	400	660 (red)	2 m cable, PUR, 3 × 0.34 mm ²	pnp, light-ON	13	▶ 3RG71 22-0AB00 ▶ 3RG71 22-0AA00 ▶ 3RG71 22-0GB00 ▶ 3RG71 22-0GA00 ▶ 3RG71 22-0BG00			
				pnp, dark-ON	12				
				npn, light-ON	13				
				npn, dark-ON	12				
				Emitter	7				
				M12 connector, 4-pole, type F	pnp, light-ON		13	▶ 3RG71 22-3AB00 ▶ 3RG71 22-3AA00 ▶ 3RG71 22-3GB00 ▶ 3RG71 22-3GA00 ▶ 3RG71 22-3BG00	
pnp, dark-ON	12								
npn, light-ON	13								
npn, dark-ON	12								
Emitter	7								

1) see page 2/127.

▶ Preferred type, available from stock.

Dimensions



SIMATIC PXO photoelectric proximity switches

SIMATIC PXO200

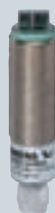
Overview

SIMATIC sensors PXO200

- M18S,
- M18,
- L18.

Selection table

SIMATIC PXO200



	M18S			M18	L18
Operating mode					
• Diffuse sensor	■				
• Diffuse sensor with background suppression				■	
• Reflex sensor		■			
• Thru-beam sensor			■		■
Sensing range					
• 12 cm ... 15 cm				■	
• 60 cm ... 80 cm	■				
• 1 m ... 1.5 m	■				
• 2 m ... 3 m		■			
• 4 m ... 6 m			■		
• 20 m ... 50 m					■
Output					
• pnp	■	■	■	■	■
• npn				■	
Operating voltage					
• 24 V DC	■	■	■	■	■
Connection					
• M12 connector	■	■	■	■	■
• Cable	■	■	■	■	■
Special features					
• Surplus light emission	■	■	■		
• Metal enclosure	■	■	■	■	■
Illuminant					
• Red light	■	■	■	■	
• Laser light, red					■
See page	2/91	2/91	2/91	2/93	2/94

A configurator for fast product selection and ordering in the Internet can be found at www.siemens.com/simatic-sensors/px

Overview

Diffuse sensor (energetic sensor)

- Sensing range 60 or 80 cm (adjustable using a potentiometer)

Reflex sensors

- Sensing range 2.5 m (with angle head) or 3.0 m
- Supplied without reflector

Thru-beam sensor

- Scanning angle 6 m

Technical specifications

Operating mode		Diffuse sensor	Reflex sensor with polarization filter	Thru-beam sensor	
Sensing range	cm	80 (adjustable)	60 (adjustable)	250 (for 3RG76 51) 300 (for 3RG76 41)	600
Standard target	mm	200 × 200 (white)	Reflector type D84	–	–
Operating voltage range (DC)	V	10 ... 30 (max. 20 % residual ripple)			
Rated operating current I_e	mA	150			
Switching frequency	Hz	700			
Switching time	ms	0.5			
Wavelength (illuminant)	nm	660 (red)	660 (red, polarized)	660 (red)	660 (red)
Displays		<ul style="list-style-type: none"> • Switching status: Yellow LED • Surplus light: Green LED 			
Enclosure material		Brass, nickel-plated			
Degree of protection		IP67			
Ambient temperature	°C	–25 ... +55			
Temperature coefficient	%/K	0.3			
Type		3RG76 40–...00	3RG76 50–...00	3RG76 41–...00, 3RG76 51–...00	3RG76 42–...00, 3RG76 52–...00

Selection and Ordering data

Operating mode	Sensing range cm	Illuminant nm	Connection	Switching output	Circuit diagram number ¹⁾	Order No.		
Straight sensor								
	Diffuse sensor	80 (adjustable via potentiometer)	660 (red)	2 m cable, PUR, 3 × 0.34 mm ² , 4 × 0.34 mm ²	pnp, light-ON	12	▶ B	3RG76 40-0AB00
					pnp, dark-ON	12	▶ B	3RG76 40-0AA00
					pnp, light-ON and dark-ON	5	▶ B	3RG76 40-0CC00
					pnp, light-ON and surplus light function	6	B	3RG76 40-0CD00
	Reflex sensor	300	660 (red, polarized)	2 m cable, PUR, 3 × 0.34 mm ² , 4 × 0.34 mm ²	pnp, light-ON	12	▶ B	3RG76 41-0AB00
					pnp, dark-ON	12	▶ B	3RG76 41-0AA00
					pnp, light-ON and dark-ON	5	▶ B	3RG76 41-0CC00
					pnp, light-ON and surplus light function	6	B	3RG76 41-0CD00
			M12 connector, 4-pole, type F	pnp, light-ON	12	▶ B	3RG76 40-3AB00	
				pnp, dark-ON	13	▶ B	3RG76 40-3AA00	
				pnp, light-ON and dark-ON	5	▶ B	3RG76 40-3CC00	
				pnp, light-ON and surplus light function	6	B	3RG76 40-3CD00	
			M12 connector, 4-pole, type F	pnp, light-ON	12	▶ B	3RG76 41-3AB00	
				pnp, dark-ON	13	▶ B	3RG76 41-3AA00	
				pnp, light-ON and dark-ON	5	▶ B	3RG76 41-3CC00	
				pnp, light-ON and surplus light function	6	B	3RG76 41-3CD00	

¹⁾ see page 2/127.

B: Subject to export regulations AL = N and ECCN = EAR99.

▶ Preferred type, available from stock.

SIMATIC PXO photoelectric proximity switches

SIMATIC PXO200

M18S design

2

	Operating mode	Sensing range cm	Illuminant nm	Connection	Switching output	Circuit diagram number ¹⁾	Order No.	
Straight sensor								
	Thru-beam sensor	600	660 (red)	2 m cable, PUR, 3 × 0.34 mm ² 4 × 0.34 mm ²	pnp, light-ON	12	▶ B	3RG76 42-0AB00
					pnp, dark-ON	12	▶ B	3RG76 42-0AA00
					pnp, light-ON and dark-ON	5	▶ B	3RG76 42-0CC00
					pnp, light-ON and surplus light function	6	B	3RG76 42-0CD00
					Emitter	9	▶ B	3RG76 42-0BG00
	M12 connector, 4-pole, type F	pnp, light-ON	12	▶ B	3RG76 42-3AB00			
		pnp, dark-ON	13	▶ B	3RG76 42-3AA00			
		pnp, light-ON and dark-ON	5	▶ B	3RG76 42-3CC00			
		pnp, light-ON and surplus light function	6	B	3RG76 42-3CD00			
		Emitter	9	▶ B	3RG76 42-3BG00			
Angled sensor								
	Diffuse sensor	60 (adjustable via potentiometer)	660 (red)	2 m cable, PUR, 3 × 0.34 mm ² 4 × 0.34 mm ²	pnp, light-ON	12	▶ B	3RG76 50-0AB00
					pnp, dark-ON	12	▶ B	3RG76 50-0AA00
					pnp, light-ON and dark-ON	5	▶ B	3RG76 50-0CC00
					pnp, light-ON and surplus light function	6	B	3RG76 50-0CD00
					M12 connector, 4-pole, type F	pnp, light-ON	12	▶ B
	pnp, dark-ON	13	▶ B	3RG76 50-3AA00				
	pnp, light-ON and dark-ON	5	▶ B	3RG76 50-3CC00				
	pnp, light-ON and surplus light function	6	B	3RG76 50-3CD00				
	Reflex sensor	250	660 (red, polarized)	2 m cable, PUR, 3 × 0.34 mm ² 4 × 0.34 mm ²	pnp, light-ON	12	▶ B	3RG76 51-0AB00
					pnp, dark-ON	12	▶ B	3RG76 51-0AA00
pnp, light-ON and dark-ON					5	▶ B	3RG76 51-0CC00	
pnp, light-ON and surplus light function					6	B	3RG76 51-0CD00	
M12 connector, 4-pole, type F					pnp, light-ON	12	▶ B	3RG76 51-3AB00
pnp, dark-ON	13	▶ B	3RG76 51-3AA00					
pnp, light-ON and dark-ON	5	▶ B	3RG76 51-3CC00					
pnp, light-ON and surplus light function	6	B	3RG76 51-3CD00					
Thru-beam sensor	600	660 (red)	2 m cable, PUR, 3 × 0.34 mm ² 4 × 0.34 mm ²	pnp, light-ON	12	▶ B	3RG76 52-0AB00	
				pnp, dark-ON	12	▶ B	3RG76 52-0AA00	
				pnp, light-ON and dark-ON	5	▶ B	3RG76 52-0CC00	
				pnp, light-ON and surplus light function	6	B	3RG76 52-0CD00	
				Emitter	9	▶ B	3RG76 52-0BG00	
	M12 connector, 4-pole, type F	pnp, light-ON	12	▶ B	3RG76 52-3AB00			
		pnp, dark-ON	13	▶ B	3RG76 52-3AA00			
		pnp, light-ON and dark-ON	5	▶ B	3RG76 52-3CC00			
		pnp, light-ON and surplus light function	6	▶ B	3RG76 52-3CD00			
		Emitter	9	▶ B	3RG76 52-3BG00			

1) see page 2/127.

▶ Preferred type, available from stock.


B: Subject to export regulations AL = N and ECCN = EAR99

Dimensions refer to M18.


Overview

- Diffuse sensor with background suppression
- Sensing range 1 to 12 cm (adjustable via potentiometer)

Technical specifications

Operating mode		Diffuse sensor with background suppression	
			
Sensing range	cm	1 ... 12 (adjustable)	
Standard target	mm	50 × 50 (white)	
Operating voltage range (DC)	V	10 ... 36 (max. 20 % residual ripple)	
No-load current I_0 (typ.)	mA	25	
Rated operational current I_e	mA	200	
Switching frequency	Hz	500	
Switching time	ms	1	
Wavelength (illuminant)	nm	660 (red)	
Indicators		<ul style="list-style-type: none"> Switching status: Yellow LED Surplus light: Green LED 	
Enclosure material		Brass, nickel-plated	
Degree of protection		IP67	
Ambient temperature	°C	-25 ... +55	
Temperature coefficient	%/K	0.3	
Type		3RG71 34-...00	

Selection and Ordering data

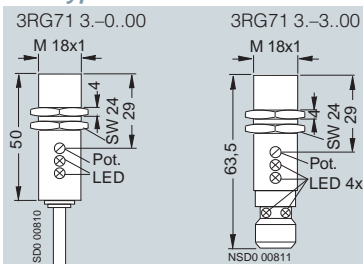
	Operating mode	Sensing range cm	Illuminant nm	Connection	Switching output	Circuit diagram number ¹⁾	Order No.		
	Diffuse sensor with background suppression	1 ... 12 (adjustable via potentiometer)	660 (red)	2 m cable, PUR, 3 × 0.34 mm ²	pnp, light-ON	12	▶ 3RG71 34-0AB00		
					pnp, dark-ON	13		▶ 3RG71 34-0AA00	
					npn, light-ON	12			▶ 3RG71 34-0GB00
					nnp, dark-ON	13			
				M12 connector, 4-pole, type F	pnp, light-ON	12	▶ 3RG71 34-3AB00		
					pnp, dark-ON	13		▶ 3RG71 34-3AA00	
					nnp, light-ON	12			▶ 3RG71 34-3GB00
					nnp, dark-ON	13			

1) see page 2/127.

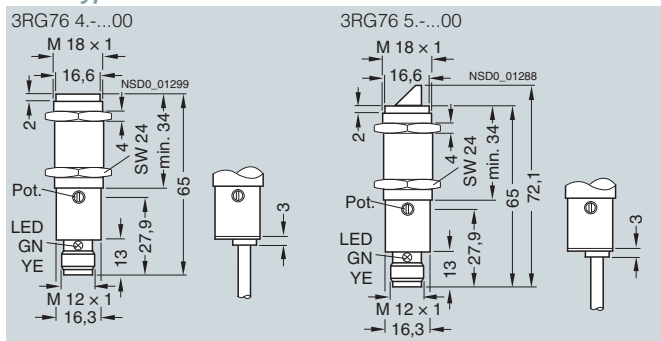
▶ Preferred type, available from stock.

Dimensions

M18 type



M18S type



SIMATIC PXO photoelectric proximity switches

SIMATIC PXO200

L18 design

Overview



Visible laser light (red), laser protection class 2 according to EN 60947-5-2

Thru-beam sensor




- Sensing range 50 m (adjustable using potentiometer)

Supplied without mounting material

Technical specifications

Operating mode		Laser thru-beam sensor	
			
Sensing range	m	50 (adjustable)	
Operating voltage range (DC)	V	10 ... 30	
No-load current I_0 , max.	mA	15 (receiver), 10 (emitter)	
Rated operational current I_e	mA	200	
Switching frequency	Hz	6000	
Switching time	ms	< 0,083	
Wavelength (illuminant)	nm	660 (red laser light)	
Indicators		<ul style="list-style-type: none"> • Switching status: Yellow LED • Surplus light: Red LED • Operating voltage: Green LED 	
Enclosure material		Brass, nickel-plated	
Degree of protection		IP65	
Ambient temperature	°C	-10 ... +60	
Temperature coefficient	%/K	0.1	
Type		3RG71 35-...00, 3RG71 75-...00	

Selection and Ordering data

	Operating mode	Sensing range m	Illuminant nm	Connection	Switching output	Circuit diagram number ¹⁾	Order No.
Straight sensor							
	Laser thru-beam sensor	50 (adjustable via potentiometer)	660 (red, polarized)	3 m cable, PUR, 4 x 0.25 mm ²	pnp, light-ON and dark-ON (antivalent) Emitter	5	▶ 3RG71 35-0CC00
					pnp, light-ON and dark-ON (antivalent) Emitter	9	
				M12 connector, 4-pole, type F	pnp, light-ON and dark-ON (antivalent) Emitter	5	▶ 3RG71 35-3CC00
					pnp, light-ON and dark-ON (antivalent) Emitter	9	
Straight sensor							
	Laser thru-beam sensor	50 (adjustable via potentiometer)	660 (red, polarized)	3 m cable, PUR, 4 x 0.25 mm ²	pnp, light-ON and surplus light function	6	▶ 3RG71 35-0CD00
				M12 connector, 4-pole, type F	pnp, light-ON and surplus light function	6	
Angled sensor							
	Laser thru-beam sensor	50 (adjustable via potentiometer)	660 (red, polarized)	3 m cable, PUR, 4 x 0.25 mm ²	pnp, light-ON and dark-ON (antivalent) Emitter	5	▶ 3RG71 75-0CC00
					pnp, light-ON and dark-ON (antivalent) Emitter	9	
				M12 connector, 4-pole, type F	pnp, light-ON and dark-ON (antivalent) Emitter	5	▶ 3RG71 75-3CC00
					pnp, light-ON and dark-ON (antivalent) Emitter	9	


1) see page 2/127.

▶ Preferred type, available from stock.

SIMATIC PXO photoelectric proximity switches

SIMATIC PXO200

L18 design

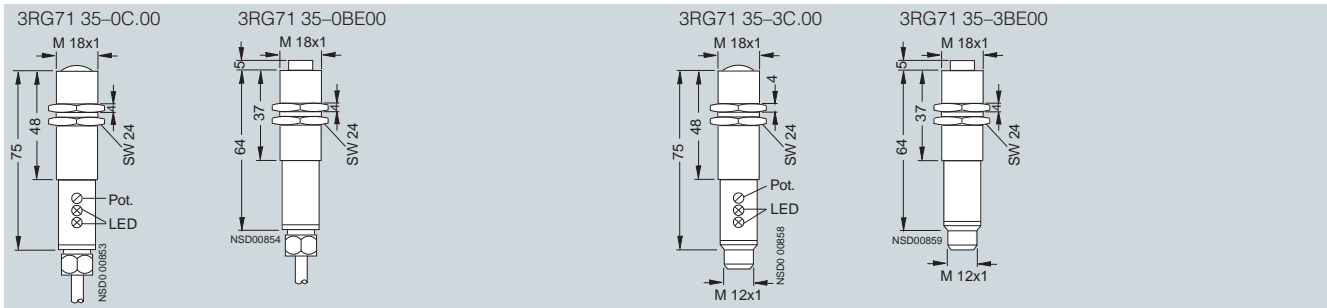
Operating mode	Sensing range m	Illuminant nm	Connection	Switching output	Circuit diagram number ¹⁾	Order No.
 Laser- Thru-beam sensor	50 (adjustable via potentiometer)	660 (red, polarized)	3 m cable, PUR, 4 x 0.25 mm ²	pnp, light-ON and surplus light function	6	3RG71 75-0CD00
			M12 connector, 4-pole, type F	pnp, light-ON and surplus light function	6	3RG71 75-3CD00

1) see page 2/127.

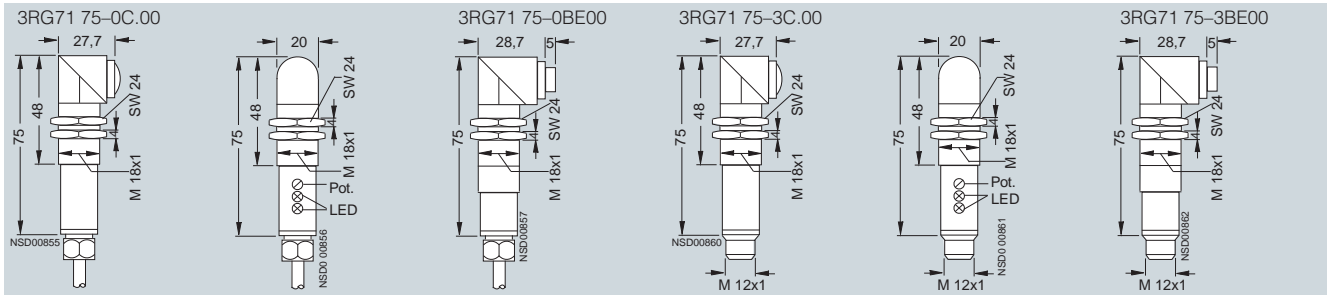
2

Dimensions

Straight sensor



Angled sensor



SIMATIC PXO photoelectric proximity switches

SIMATIC PXO300

Overview

SIMATIC sensors PXO300

- K21,
- K21R,
- K20,
- L20,
- C20.

Selection table

SIMATIC PXO300									
	K21		K21R		K20		L20		C20
Operating mode									
• Diffuse sensor	■		■						
• Diffuse sensor with background suppression					■		■		
• Reflex sensor		■		■		■		■	
• Contrast sensor									■
Sensing range									
• 5 cm ... 11 cm					■		■		
• 12 cm ... 15 cm									■
• 40 cm ... 50 cm	■		■			■			
• 2 m ... 3 m		■		■				■	
Output									
• pnp	■	■	■	■	■	■	■	■	■
• npn	■	■	■	■	■	■			
Operating voltage									
• 24 V DC	■	■	■	■	■	■	■	■	■
Connection									
• M8 connector	■	■	■	■	■	■	■	■	■
• Cable	■	■	■	■	■	■			
Special features									
• Transparent objects						■			
Illuminant									
• Red light	■	■	■	■	■	■			
• Laser light, red							■	■	■
See page	2/97	2/97	2/98	2/98	2/99	2/99	2/100	2/100	2/101

A configurator for fast product selection and ordering in the Internet can be found at www.siemens.com/simatic-sensors/px

Overview

Cubicle molded plastic enclosure, IP68

Diffuse sensor (energetic sensor)



- Sensing range 50 cm

Retroreflective sensor


- Sensing range 3 m

Supplied without mounting accessories and without reflector

Technical specifications

Operating mode	Diffuse sensor		Reflex sensor		
					
Sensing range	cm	50	300		
Standard target	mm	100 × 100 (white 90%)	Reflector type R 60		
Operating voltage range (DC)	V	10 ... 30			
No-load current I_0 (typ.)	mA	28	33	25	
Rated operating current I_e	mA	150			
Switching frequency	Hz	700			
Switching time	ms	0.5			
Wavelength (illuminant)	nm	660 (red)			
Indicators		<ul style="list-style-type: none"> • Switching status: Yellow LED • Operating voltage: Red LED 			
Enclosure material		ABS/PMMA			
Degree of protection		IP68			
Ambient temperature	°C	-5 ... +55			
Temperature coefficient	%/K	0.3			
Type		3RG74 00-...00	3RG74 20-...00	3RG74 01-...00	3RG74 21-...00

Selection and Ordering data

	Operating mode	Sensing range cm	Illumi- nant nm	Connection	Switching output	Circuit diagram number ¹⁾	Order No.	
	Diffuse sensor	50	660 (red)	2 m cable, PUR, 3 × 0.14 mm ²	pnp, light-ON	1	B	3RG74 00-0AB00
					pnp, dark-ON	1	B	3RG74 00-0AA00
					nnp, light-ON	1	B	3RG74 00-0GB00
					nnp, dark-ON	1	B	3RG74 00-0GA00
				M8 connector, 3-pole, type A	pnp, light-ON	1	▶ B	3RG74 00-7AB00
					pnp, dark-ON	1	B	3RG74 00-7AA00
	Retroreflective sensor	300	660 (red)	2 m cable, PUR, 3 × 0.14 mm ²	pnp, light-ON	1	B	3RG74 01-0AB00
					pnp, dark-ON	1	B	3RG74 01-0AA00
					nnp, light-ON	1	B	3RG74 01-0GB00
					nnp, dark-ON	1	B	3RG74 01-0GA00
				M8 connector, 3-pole, type A	pnp, light-ON	1	▶ B	3RG74 01-7AB00
					pnp, dark-ON	1	▶ B	3RG74 01-7AA00
				nnp, light-ON	1	B	3RG74 01-7GB00	
				nnp, dark-ON	1	B	3RG74 01-7GA00	

1) see page 2/127.

B: Subject to export regulations AL = N and ECCN = EAR99.


▶ Preferred type, available from stock.

SIMATIC PXO photoelectric proximity switches

SIMATIC PXO300

K21, K21R designs

2

	Operating mode	Sensing range cm	Illuminant nm	Connection	Switching output	Circuit diagram number ¹⁾	Order No.
K21R design							
	Diffuse sensor	50	660 (red)	2 m cable, PUR, 3 × 0.14 mm ²	pnp, light-ON	1	B 3RG74 20-0AB00
					pnp, dark-ON	1	B 3RG74 20-0AA00
					npn, light-ON	1	B 3RG74 20-0GB00
					npn, dark-ON	1	B 3RG74 20-0GA00
					M8 connector, 3-pole, type A	1	B 3RG74 20-7AB00
					pnp, dark-ON	1	▶ B 3RG74 20-7AA00
					npn, light-ON	1	B 3RG74 20-7GB00
					npn, dark-ON	1	B 3RG74 20-7GA00
	Reflex sensor	300	660 (red)	2 m cable, PUR, 3 × 0.14 mm ²	pnp, light-ON	1	B 3RG74 21-0AB00
					pnp, dark-ON	1	B 3RG74 21-0AA00
npn, light-ON					1	B 3RG74 21-0GB00	
npn, dark-ON					1	B 3RG74 21-0GA00	
M8 connector, 3-pole, type A					1	B 3RG74 21-7AB00	
				pnp, dark-ON	1	▶ B 3RG74 21-7AA00	
				npn, light-ON	1	B 3RG74 21-7GB00	
				npn, dark-ON	1	B 3RG74 21-7GA00	

Accessories

Mounting brackets for K21, K21R

▶ **3RX7 308-0AA00**

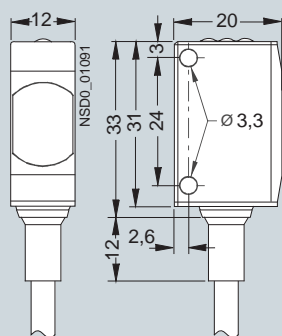
1) see page 2/127.

B: Subject to export regulations AL = N and ECCN = EAR99.

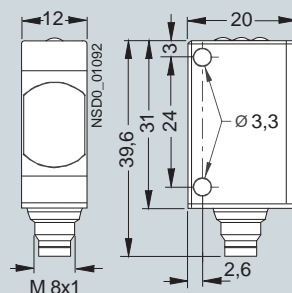
▶ Preferred type, available from stock.

Dimensions

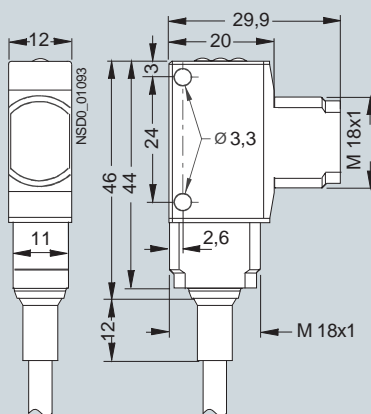
3RG74 0-0-0....



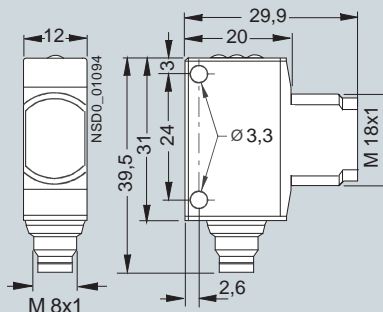
3RG74 0-7-7....



3RG74 2-0-0....



3RG74 2-7-7....



Overview

Diffuse sensor with background suppression

- Sensing range 2.5 to 10 cm (adjustable using teach-in)



Retro-reflective sensors for transparent objects (adjustable with teach-in)

- Sensing range 50 cm






Anti-interference function

Supplied without mounting material and without reflector


Technical specifications

Operating mode		 Diffuse sensor with background suppression	 Reflex sensor for transparent objects
Sensing range	cm	2.5 ... 10 (adjustable)	5 ... 50 (adjustable)
Standard target	mm	100 × 100 (gray 18%)	Reflector type R 60
Operating voltage range (DC)	V	10 ... 30	
No-load current I_0 (typ.)	mA	25	
Rated operating current I_e	mA	100	
Switching frequency	Hz	1000	
Switching time	ms	0.5	
Wavelength (illuminant)	nm	660 (red)	
Indicators			
• Switching status		Yellow LED	
• Surplus light		Green LED	
Enclosure material		Molded plastic (ABS)	
Degree of protection		IP67	
Ambient temperature	°C	-20 ... +60	
Temperature coefficient	%/K	0.3	
Type		3RG74 04-...00	3RG74 01-...52

Selection and Ordering data


	Operating mode	Sensing range cm	Illuminant nm	Connection	Switching output	Circuit diagram number ¹⁾	Order No.
	Diffuse sensor with background suppression	2.5 ... 10 (adjustable via "teach-in")	660 (red)	2 m cable, PUR, 4 × 0.14 mm ²	Light-ON or dark-ON	pnp 14 npn 14	 3RG74 04-0CH00 3RG74 04-0HH00
				M8 connector, 4-pole, type B	Light-ON or dark-ON	pnp 14 npn 14	 3RG74 04-7CH00 3RG74 04-7HH00
	Reflex sensor for transparent objects	5 ... 50 (adjustable via "teach-in")	660 (red)	2 m cable, PUR, 4 × 0.14 mm ²	Light-ON or dark-ON	pnp 14 npn 14	 3RG74 01-0CH52 3RG74 01-0HH52
				M8 connector, 4-pole, type B	Light-ON or dark-ON	pnp 14 npn 14	 3RG74 01-7CH52 3RG74 01-7HH52

Accessories

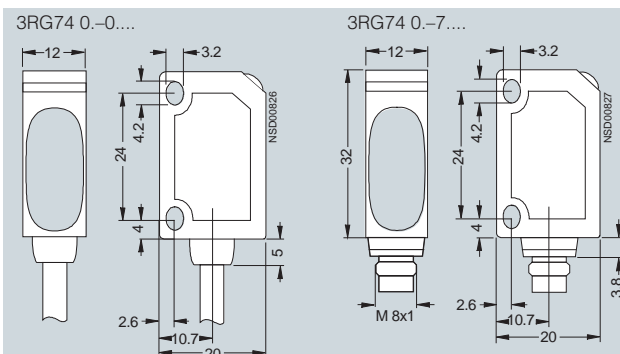
Mounting brackets for K20 

3RX7 308-0AA00

1) see page 2/127.

 Preferred type, available from stock.

Dimensions



SIMATIC PXO photoelectric proximity switches

SIMATIC PXO300

L20 design

Overview

Visible laser light (red),
laser protection class 1 or 2 according to EN 60947-5-2

Diffuse sensor with background suppression

- Sensing range 3 to 11 cm


Retroreflective sensor

- Sensing range 7.5 to 300 cm

Technical specifications

	Operating mode	Laser diffuse sensor with background suppression		Reflex sensor
Sensing range	cm	3 ... 11 (adjustable)		7.5 ... 300 (adjustable)
Standard target/reflector	mm	Gray 18%		Reflector type RL 50
Light spot diameter	mm	0.7 mm at 100 mm distance		1 mm at 300 mm distance
Operating voltage range (DC)	V	10 ... 30		
No-load current I_0 , max.	mA	≤ 30		≤ 25
Rated operating current I_e	mA	100		
Switching frequency	kHz	1		4
Wavelength (illuminant)	nm	650 (red laser light, class 2)		650 (red laser light, class 1)
Displays		Yellow LED		
• Switching status		Green LED		
• Surplus light				
Enclosure material		Molded plastic (ABS)		
Degree of protection		IP67		
Ambient temperature	°C	-20 ... +60		
Type		3RG74 06-7CH61		3RG74 07-7CH00

Selection and Ordering data

	Operating mode	Sensing range cm	Illuminant nm	Connection	Switching output	Circuit diagram number ¹⁾	Order No.
	Diffuse sensor with background suppression	3 ... 11 (adjustable via "teach-in")	650 (laser red)	M 8 connector, 4-pole, type B	Light-ON or dark-ON	pnp 14	3RG74 06-7CH61
	Retroreflective sensor	7,5 ... 300 (adjustable via "teach-in")	650 (laser red)	M 8 connector, 4-pole, type B	Light-ON or dark-ON	pnp 14	3RG74 07-7CH00

Accessories

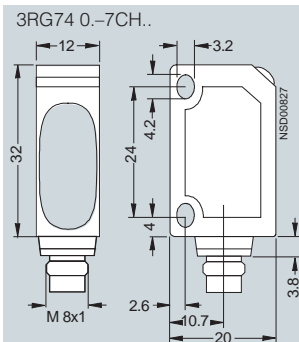
Mounting brackets for L20

3RX7 308-0AA00

1) see page 2/127.

▶ Preferred type, available from stock.



Dimensions




Overview

- Visible laser light (red)
 Laser protection class 2 according to EN 60947-5-2
 Contrast sensor for color mark sensing
- Sensing range 4 to 15 cm

Technical specifications

Operating mode	Contrast sensor	
		
Sensing range	cm	4 ... 15 (adjustable via teach-in)
Light spot diameter	mm	0.7 in focus
Operating voltage range (DC)	V	10 ... 30
No-load current I_0 , max.	mA	≤ 25
Output current I_A	mA	100
Switching frequency	Hz	4000
Wavelength (illuminant)	nm	650 (red)
Indicators		
• Switching state output		Yellow LED
• Surplus light		Green LED
Enclosure material		Molded plastic (ABS)
Degree of protection		IP67
Ambient temperature	°C	-20 ... +60
Type		3RG74 08-7CH00

Selection and Ordering data

	Operating mode	Sensing range cm	Illuminant nm	Connection	Switching output	Circuit diagram number ¹⁾	Order No.
	Contrast sensor	4 ... 15 (adjustable via "teach-in")	650 (red)	M8 connector, 4-pole, type B	pnp	14	3RG74 08-7CH00

Accessories

Mounting brackets for C20

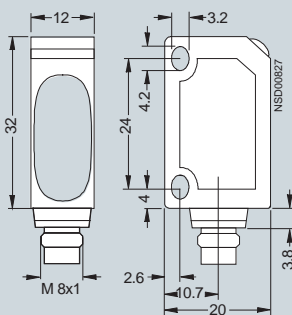
3RX7 308-0AA00

1) see page 2/127.

▶ Preferred type, available from stock.

Dimensions

3RG74 08-7CH00



SIMATIC PXO photoelectric proximity switches

SIMATIC PXO400

Overview

SIMATIC sensors PXO400

- K31,
- K30.

Selection table

SIMATIC PXO400



	K31					K30				
Operating mode										
• Diffuse sensor	■					■				
• Diffuse sensor with background suppression		■								
• Reflex sensor			■				■			
• Thru-beam sensor				■				■		
• For plastic fiber-optic wires					■					■
Sensing range										
• Depending on fiber-optic wire					■					■
• 12 cm ... 15 cm		■								
• 60 cm ... 70 cm	■									
• 1 m ... 1.5 m						■				
• 2 m ... 3 m			■							
• 4 m ... 6 m				■			■			
• 12 m ... 15 m								■		
Output										
• pnp	■	■	■	■	■	■	■	■	■	■
• npn	■	■	■	■	■	■	■	■	■	■
Operating voltage										
• 24 V DC	■	■	■	■	■	■	■	■	■	■
Connection										
• M8 connector	■	■	■	■	■	■	■	■	■	■
• Cable	■	■	■	■	■	■	■	■	■	■
Illuminant										
• Red light		■	■		■		■			■
• Infrared light	■				■	■		■		
See page	2/103					2/105				

A configurator for fast product selection and ordering in the Internet can be found at www.siemens.com/simatic-sensors/px

Overview

Diffuse sensor; energetic sensor

- Sensing range 60 cm (adjustable via potentiometer)

Diffuse sensor with background suppression

- Sensing range 3 to 15 cm (adjustable via potentiometer)

Reflex sensor

- Sensing range 2 m (adjustable via potentiometer)
- Supplied without reflector

Thru-beam sensor




- Sensing range 6 m (adjustable via potentiometer)



Sensor for plastic fiber-optic wires

- Sensing range depends on type of optical fiber

Supplied without mounting material

Technical specifications

Operating mode		Diffuse sensor	Diffuse sensor with background suppression	Reflex sensor with polarization filter
				
Sensing range	cm	60 (adjustable)	3 ... 15 (adjustable)	200 (adjustable)
Standard target	mm	200 × 200 (white)	100 × 100 (white)	Reflector type D 84
Operating voltage range (DC)	V	10 ... 30 (max. 20 % residual ripple)		
No-load current I_0 , max.	mA	15	25	15
Rated operating current I_e	mA	200		
Switching frequency	Hz	1000	500	1000
Switching time	ms	0.5	1	0.5
Wavelength (illuminant)	nm	880 (IR)	660 (red)	660 (red, polarized)
Displays				
• Switching status		Yellow LED		
• Surplus light		Green LED		
Enclosure material		Molded plastic (PBTP, Crastin)		
Degree of protection		IP65		
Ambient temperature	°C	-25 ... +55		
Temperature coefficient	%/K	0.3		
Type		3RG70 10-...	3RG70 14-...	3RG70 11-...



Operating mode		Thru-beam sensor	Sensor for plastic optical fibers
			
Sensing range	cm	600 (adjustable)	Depending on type of optical fiber
Standard target	mm	–	100 × 100 (white)
Operating voltage range (DC)	V	10 ... 30 (max. 20 % residual ripple)	
No-load current I_0 , max.	mA	15	
Rated operating current I_e	mA	200	
Switching frequency	Hz	1000	
Switching time	ms	0.5	
Wavelength (illuminant)	nm	880 (IR)	660 (red)
Displays			
• Switching status		Yellow LED	
• Surplus light		Green LED	
Enclosure material		Molded plastic (PBTP, Crastin)	
Degree of protection		IP65	
Ambient temperature	°C	-25 ... +55	
Temperature coefficient	%/K	0.3	
Type		3RG70 12-...	3RG70 13-...

SIMATIC PXO photoelectric proximity switches

SIMATIC PXO400

K31 design

Selection and Ordering data

	Operating mode	Sensing range cm	Illuminant nm	Connection	Switching output	Circuit diagram number ¹⁾	Order No.		
	Diffuse sensor	60 (adjustable via potentiometer)	880 (IR)	2 m cable, PUJR, 3 × 0.14 mm ²	pnp, light-ON	1	▶ B 3RG70 10-0AB01 3RG70 10-0AA01 3RG70 10-0GB00 3RG70 10-0GA00		
					pnp, dark-ON	1			
					npn, light-ON	1			
					nnp, dark-ON	1			
					M8 connector, 3-pole, type A	pnp, light-ON		1	▶ B 3RG70 10-7AB01 3RG70 10-7AA01 3RG70 10-7GB00 3RG70 10-7GA00
						pnp, dark-ON		1	
	Diffuse sensor with background suppression	3 ... 15 (adjustable via potentiometer)	660 (red)	2 m cable, PUJR, 3 × 0.14 mm ²	pnp, light-ON	1	▶ 3RG70 14-0AB00 3RG70 14-0AA00 3RG70 14-0GB00 3RG70 14-0GA00		
					pnp, dark-ON	1			
					nnp, light-ON	1			
					nnp, dark-ON	1			
					M8 connector, 3-pole, type A	pnp, light-ON		1	▶ 3RG70 14-7AB00 3RG70 14-7AA00 3RG70 14-7GB00 3RG70 14-7GA00
						pnp, dark-ON		1	
Reflex sensor	200 (adjustable via potentiometer)	660 (red, polarized)	2 m cable, PUJR, 3 × 0.14 mm ²	pnp, light-ON	1	▶ B 3RG70 11-0AB01 3RG70 11-0AA01 3RG70 11-0GB00 3RG70 11-0GA00			
				pnp, dark-ON	1				
				nnp, light-ON	1				
				nnp, dark-ON	1				
				M8 connector, 3-pole, type A	pnp, light-ON		1	B 3RG70 11-7AB01 3RG70 11-7AA01 3RG70 11-7GB00 3RG70 11-7GA00	
					pnp, dark-ON		1		
	Thru-beam sensor	600 (adjustable via potentiometer)	880 (IR)	2 m cable, PUJR, 3 × 0.14 mm ²	pnp, light-ON	1	▶ B 3RG70 12-0AB01 3RG70 12-0AA01 3RG70 12-0GB00 3RG70 12-0GA00 3RG70 12-0BG01		
					pnp, dark-ON	1			
					nnp, light-ON	1			
					nnp, dark-ON	1			
					Emitter	2			
					M8 connector, 3-pole, type A	pnp, light-ON		1	▶ B 3RG70 12-7AB01 3RG70 12-7AA01 3RG70 12-7GB00 3RG70 12-7GA00 3RG70 12-7BG01
	pnp, dark-ON	1							
	nnp, light-ON	1							
	nnp, dark-ON	1							
	Emitter	2							
	Sensor for plastic optical fibers	Depends on FO wire	660 (red)	2 m cable, PUJR, 3 × 0.14 mm ²		pnp, light-ON	1	▶ 3RG70 13-0AB00 3RG70 13-0AA00 3RG70 13-0GB00 3RG70 13-0GA00	
					pnp, dark-ON	1			
nnp, light-ON					1				
nnp, dark-ON					1				
M8 connector, 3-pole, type A					pnp, light-ON	1	▶ 3RG70 13-7AB00 3RG70 13-7AA00 3RG70 13-7GB00 3RG70 13-7GA00		
					pnp, dark-ON	1			

Accessories

Mounting brackets for K30, K31 ▶

3RX7 910

Fiber-optic conductors

see from page 2/263

1) See page 2/127.

B: Subject to export regulations AL = N and ECCN = EAR99.

▶ Preferred type, available from stock.

Dimensions

See page 2/106.

Overview

Diffuse sensor; energetic sensor

- Sensing range 1.2 m (adjustable via potentiometer)

Reflex sensor

- Sensing range 4 m (adjustable via potentiometer)
- Supplied without reflector

Thru-beam sensor



- Sensing range 12 m (adjustable via potentiometer)



Sensor for plastic fiber-optic wires

- Sensing range depends on type of optical fiber (see page 2/263)

Supplied without mounting material

Technical specifications

Operating mode		Diffuse sensor	Reflex sensor with polarization filter
			
Sensing range	cm	120 (adjustable)	400 (adjustable)
Standard target	mm	200 × 200 (white)	Reflector type D 84
Operating voltage range (DC)	V	10 ... 36 (max. 20 % residual ripple)	
No-load current I_0 , max.	mA	15	15
Rated operational current I_e	mA	200	
Switching frequency	Hz	1000	
Switching time	ms	0.5	
Wavelength (illuminant)	nm	880 (IR)	660 (red, polarized)
Indicators			
• Switching status		Yellow LED	
• Surplus light		Green LED	
Enclosure material		Molded plastic (PBTP, Crastin)	
Degree of protection		IP67	
Ambient temperature	°C	-25 ... +55	
Temperature coefficient	%/K	0.3	
Type		3RG70 10-...00	3RG70 11-...00


Operating mode		Thru-beam sensor	Sensor for plastic optical fibers
			
Sensing range	cm	1200 (adjustable)	Depending on type of optical fiber
Standard target	mm	–	100 × 100 (white)
Operating voltage range (DC)	V	10 ... 36 (max. 20 % residual ripple)	
No-load current I_0 , max.	mA	15	
Rated operational current I_e	mA	200	
Switching frequency	Hz	1000	
Switching time	ms	0.5	
Wavelength (illuminant)	nm	880 (IR)	660 (red)
Indicators			
• Switching status		Yellow LED	
• Surplus light		Green LED	
Enclosure material		Molded plastic (PBTP, Crastin)	
Degree of protection		IP67	
Ambient temperature	°C	-25 ... +55	
Temperature coefficient	%/K	0.3	
Type		3RG70 12-...00	3RG70 13-...00

SIMATIC PXO photoelectric proximity switches

SIMATIC PXO400

K30 design

Selection and Ordering data

	Operating mode	Sensing range cm	Illuminant nm	Connection	Switching output	Circuit diagram number ¹⁾	Order No.				
	Diffuse sensor	120 (adjustable via potentiometer)	880 (IR)	3 m cable, PUR, 4 x 0.14 mm ²	Light-ON and dark-ON (antivalent)	pnp 3 npn 3	▶ 3RG70 10-0CC00 3RG70 10-0HC00				
					Light-ON and surplus light function	pnp 4 npn 4		▶ 3RG70 10-0CD00 3RG70 10-0HD00			
					Light-ON and dark-ON (antivalent)	pnp 3 npn 3		▶ 3RG70 10-7CC00 3RG70 10-7HC00			
				M8 connector, 4-pole, type B	Light-ON and surplus light function	pnp 4 npn 4	▶ 3RG70 10-7CD00 3RG70 10-7HD00				
					Reflex sensor	400 (adjustable via potentiometer)	660 (red, polarized)	3 m cable, PUR, 4 x 0.14 mm ²	Light-ON and dark-ON (antivalent)	pnp 3 npn 3	▶ 3RG70 11-0CC00 3RG70 11-0HC00
									Light-ON and surplus light function	pnp 4 npn 4	
	Light-ON and dark-ON (antivalent)	pnp 3 npn 3	▶ 3RG70 11-7CC00 3RG70 11-7HC00								
	M8 connector, 4-pole, type B	Light-ON and surplus light function	pnp 4 npn 4	▶ 3RG70 11-7CD00 3RG70 11-7HD00							
		Thru-beam sensor	1200 (adjustable via potentiometer)	880 (IR)	3 m cable, PUR, 4 x 0.14 mm ²	Light-ON and dark-ON (antivalent)	pnp 3 npn 3	▶ 3RG70 12-0CC00 3RG70 12-0HC00			
						Light-ON and surplus light function	pnp 4 npn 4		▶ 3RG70 12-0CD00 3RG70 12-0HD00		
	Emitter					2	▶ 3RG70 12-0BE00				
	M8 connector, 4-pole, type B				Light-ON and dark-ON (antivalent)	pnp 3 npn 3	▶ 3RG70 12-7CC00 3RG70 12-7HC00				
Light-ON and surplus light function					pnp 4 npn 4	▶ 3RG70 12-7CD00 3RG70 12-7HD00					
Emitter					2	▶ 3RG70 12-7BE00					
Sensor for plastic optical fibers	Depends on FO wire	660 (red)	3 m cable, PUR, 4 x 0.14 mm ²	Light-ON and dark-ON (antivalent)	pnp 3 npn 3	▶ 3RG70 13-0CC00 3RG70 13-0HC00					
				Light-ON and surplus light function	pnp 4 npn 4		▶ 3RG70 13-0CD00 3RG70 13-0HD00				
				Light-ON and dark-ON (antivalent)	pnp 3 npn 3		▶ 3RG70 13-7CC00 3RG70 13-7HC00				
				Light-ON and surplus light function	pnp 4 npn 4	▶ 3RG70 13-7CD00 3RG70 13-7HD00					

Accessories

Mounting brackets for K30, K31

▶ 3RX7 910

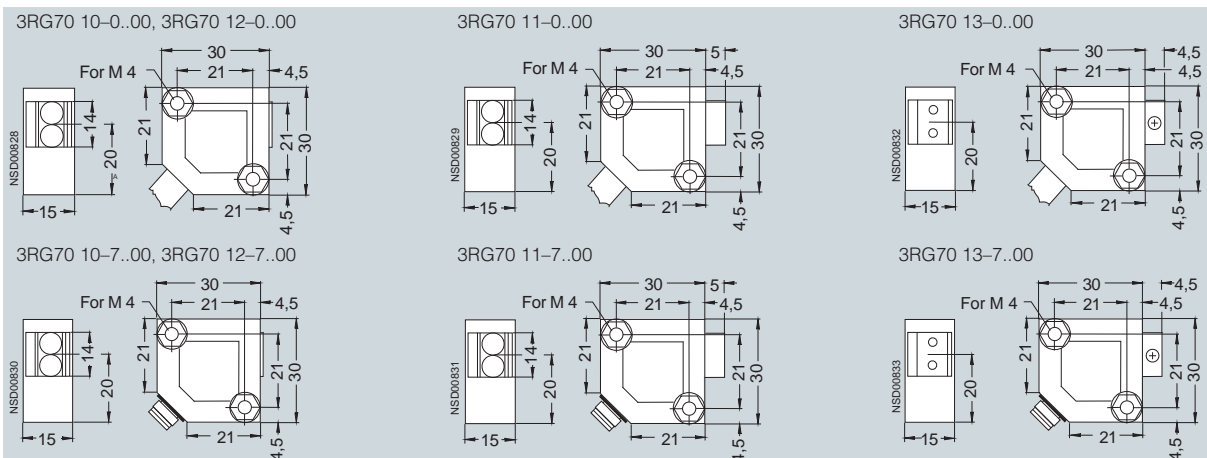
Fiber-optic conductors

▶ See from page 2/263

1) See page 2/127.

▶ Preferred type, available from stock

Dimensions



SIMATIC PXO photoelectric proximity switches

SIMATIC PXO500

Overview

SIMATIC sensors PXO500

- C40,
- L50,
- L50HF,
- C50.

Selection table

SIMATIC PXO500



	C40			L50			L50HF	L50HF advanced	C50
Operating mode									
• Diffuse sensor	■			■			■	■	
• Diffuse sensor with background suppression		■			■				
• Reflex sensor			■			■			
• Color sensor									■
Sensing range									
• 1.2 cm ... 3.2 cm									■
• 5 cm ... 11 cm				■			■		
• 12 cm ... 15 cm					■				
• 20 cm ... 30 cm		■						■	
• 60 cm ... 70 cm	■								
• 1 m ... 1.5 m			■						
• 4 m ... 6 m			■						
• 20 m ... 50 m						■			
Output									
• pnp	■	■	■		■	■	■	■	3 x ■
• npn	■	■	■		■	■			
• Analog				■			■	■	
Direct communication with the controller	ET 200S (via IQ-Sense)		ET 200S (via IQ-Sense)						
Operating voltage									
• 24 V DC	■	■	■	■	■	■	■	■	■
• 20 ... 265/320 V AC/DC									
Connection									
• M12 connector	■	■	■	■	■	■	■	■	■
• Cable				■	■	■			
Special features									
• Timing function				■			■	■	
• Surplus light emission					■	■			
• Transparent objects			■						
Illuminant									
• Red light	■	■	■						
• Laser light, red				■	■	■	■	■	
• Incandescent light									■
See page	2/108			2/110			2/112	2/112	2/114

A configurator for fast product selection and ordering in the Internet can be found at www.siemens.com/simatic-sensors/px

SIMATIC PXO photoelectric proximity switches

SIMATIC PXO500

C40 design

Overview

Diffuse sensor; energetic sensor

- Sensing range 70 cm (adjustable via "teach-in")

Diffuse sensor with background suppression

- Sensing range 5 to 25 cm (adjustable via "teach-in")

Reflex sensor

- Sensing range 6 m (adjustable via "teach-in")



Reflex sensor for transparent objects



- Sensing range 1 m (adjustable via "teach-in")

External "teach-in"

Supplied with mounting bracket, without reflector.

Technical specifications

Operating mode		Diffuse sensor	Diffuse sensor with background suppression
			
Sensing range	cm	70 (adjustable)	5 ... 25 (adjustable)
Standard target	mm	200 × 200 (white)	100 × 100 (gray)
Operating voltage range (DC)	V	10 ... 30	
No-load current I_0 , max.	mA	35	25
Rated operational current I_e	mA	200	250
Switching frequency	Hz	1000	200
Switching time	ms	0.5	2.5
Wavelength (illuminant)	nm	660 (red)	
Indicators			
• Switching status		Yellow LED	
• Surplus light		Green LED	
Enclosure material		Molded plastic (PBTP)	
Degree of protection		IP67	
Ambient temperature	°C	-25 ... +55	
Temperature coefficient	%/K	0.1	
Type		3RG72 40-...00	3RG72 44-...00


Operating mode		Reflex sensor with polarization filter	Reflex sensor for transparent objects
			
Sensing range	cm	600 (adjustable)	100 (adjustable)
Standard target	mm	Reflector type D 84	Reflector type D 84
Operating voltage range (DC)	V	10 ... 30	
No-load current I_0 , max.	mA	35	
Rated operational current I_e	mA	200	
Switching frequency	Hz	1000	
Switching time	ms	0.5	
Wavelength (illuminant)	nm	660 (red, polarized)	
Indicators			
• Switching status		Yellow LED	
• Surplus light		Green LED	
Enclosure material		Molded plastic (ABS)	
Degree of protection		IP67	
Ambient temperature	°C	-25 ... +55	
Temperature coefficient	%/K	0.1	
Type		3RG72 41-...00	3RG72 41-...52

SIMATIC PXO photoelectric proximity switches


SIMATIC PXO500

C40 design

Selection and Ordering data

	Operating mode	Sensing range cm	Illuminant nm	Connection	Switching output	Circuit diagram number ¹⁾	Order No.
	Diffuse sensor	70 (adjustable via "teach-in")	660 (red)	M12 connector, 4-pole, type F	pnp, light-ON or dark-ON	16	▶ 3RG72 40-3CH00
					npn, light-ON or dark-ON	16	3RG72 40-3HH00
	Diffuse sensor with background suppression	5 ... 25 (adjustable via "teach-in")	660 (red)	M12 connector, 4-pole, type F	pnp, light-ON or dark-ON	16	▶ 3RG72 44-3CH00
					npn, light-ON or dark-ON	16	3RG72 44-3HH00
	Reflex sensor with polarization filter	600 (adjustable via "teach-in")	660 (red, polarized)	M12 connector, 4-pole, type F	pnp, light-ON or dark-ON	16	▶ 3RG72 41-3CH00
					npn, light-ON or dark-ON	16	3RG72 41-3HH00
	Reflex sensor for transparent objects	100 (adjustable via "teach-in")	660 (red, polarized)	M12 connector, 4-pole, type F	pnp, light-ON or dark-ON	16	▶ 3RG72 41-3CH52
					npn, light-ON or dark-ON	16	3RG72 41-3HH52

Communication-capable proximity switches with C40 IQ-Sense design

	Diffuse sensor	70	660 (red)	for connection to the 4 IQ-Sense sensor module	IQ-Sense	9	▶ B	3SF72 40-3JQ00
	Reflex sensor	600	660 (red)	for connection to the 4 IQ-Sense sensor module	IQ-Sense	9	▶ B	3SF72 41-3JQ00

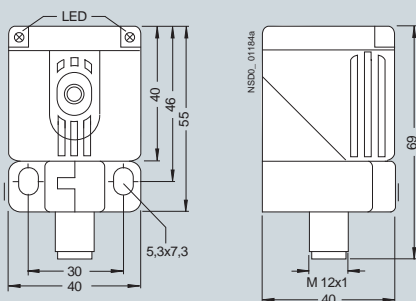
1) See page 2/127.

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99.

Dimensions

3RG72 4.-3....



SIMATIC PXO photoelectric proximity switches

SIMATIC PXO500

L50 design

Overview

Visible laser light (red)
 Laser protection class 2 according to EN 60947-5-2

Diffuse sensor with background suppression

- Sensing range 3 to 15 cm (adjustable via potentiometer)

Diffuse sensor with analog output




- Sensing range 4.5 to 8.5 cm (adjustable via potentiometer)



Reflex sensor

- Sensing range 20 m (adjustable via potentiometer)
- Supplied without reflector

Supplied without mounting material

Technical specifications

Operating mode		Laser diffuse sensor with background suppression	Laser reflex sensor
			
Sensing range	cm	3 ... 15 (adjustable)	2000 (adjustable)
Standard target/reflector	mm	100 × 100 (white)	Reflector type RL 50
Operating voltage range (DC)	V	10 ... 30 (max. 10 % residual ripple)	
No-load current I_0 , max.	mA	50	
Rated operational current I_e	mA	200	
Switching frequency	Hz	2500	
Switching time	ms	< 0.2	
Wavelength (illuminant)	nm	650 (red laser light)	
LEDs			
• Switching status		Yellow LED	
• Surplus light		Red LED	
• Operating voltage		Green LED	
Enclosure material		Molded plastic (ABS)	
Degree of protection		IP67	
Ambient temperature	°C	-20 ... +45	
Temperature coefficient	%/K	0.1	
Type		3RG70 56-...00	3RG70 57-...00


Operating mode		Laser diffuse sensor with analog output	
			
Sensing range	mm	45 ... 85 (adjustable)	
Resolution	µm	80	20
Linearity	ms	< 1% of measuring range (40 mm)	
Measuring spot diameter (at 65 mm distance)	mm	< 0.8	
Operating voltage range (DC)	V	18 ... 28 (max. 10 % residual ripple)	
No-load current I_0 , max.	mA	35	
Analog output	V	0 ... 10	
Output current, max.	mA	3	
Switching frequency	Hz	500	50
Switching time	ms	1	10
Wavelength (illuminant)	nm	650	
LEDs			
• Surplus light		Red LED	
• Operating voltage		Green LED	
Enclosure material		Molded plastic (ABS)	
Degree of protection		IP67	
Ambient temperature	°C	0 ... +45	
Temperature coefficient	µm/K	18	
Type		3RG70 56-.CM00	3RG70 56-.CM03

SIMATIC PXO photoelectric proximity switches

SIMATIC PXO500

L50 design

Selection and Ordering data

	Operating mode	Sensing range/resolution	Illuminant nm	Connection	Switching output/ analog output	Circuit diagram number ¹⁾	Order No.			
	Laser diffuse sensor with background suppression	3 ... 15 cm (adjustable via potentiometer)	650 (red laser light)	2 m cable, PUR, 4 x 0.25 mm ²	Light-ON and dark-ON (antivalent)	pnp 5 nnp 5	3RG70 56-0CC00 3RG70 56-0HC00			
					Light-ON and surplus light function	pnp 6 nnp 6	3RG70 56-0CD00 3RG70 56-0HD00			
						M12 connector, 4-pole, type F	Light-ON and dark-ON (antivalent)	pnp 5 nnp 5	3RG70 56-3CC00 3RG70 56-3HC00	
				Light-ON and surplus light function	pnp 6 nnp 6	3RG70 56-3CD00 3RG70 56-3HD00				
					Laser reflex sensor	2000 cm (adjustable via potentiometer)	650 (red laser light)	2 m cable, PUR, 4 x 0.25 mm ²	Light-ON and dark-ON (antivalent)	pnp 5 nnp 5
				Light-ON and surplus light function					pnp 6 nnp 6	3RG70 57-0CD00 3RG70 57-0HD00
	M12 connector, 4-pole, type F	Light-ON and dark-ON (antivalent)	pnp 5 nnp 5						3RG70 57-3CC00 3RG70 57-3HC00	
	Light-ON and surplus light function	pnp 6 nnp 6	3RG70 57-3CD00 3RG70 57-3HD00							
		Laser diffuse sensor with analog output	45 ... 85 mm/ 80 μm	650 (red laser light)	6 m cable, PVC, 4 x 0.34 mm ² , shielded	analog 0 ... 10 V, rising signal	- 15	3RG70 56-1CM00		
	- 15					3RG70 56-1CM03				
	45 ... 85 mm/ 20 μm		650 (red laser light)	M12 connector, 4-pole, type F	analog 0 ... 10 V, rising signal	- 15	3RG70 56-3CM00			
					- 15	3RG70 56-3CM03				

Accessories

Mounting brackets for L50

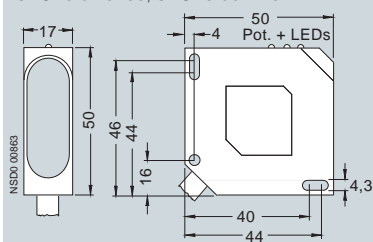
3RX7 302

1) See page 2/127.

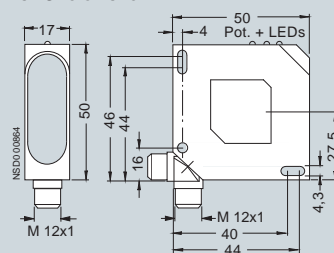
▶ Preferred type, available from stock.

Dimensions

3RG70 5.-0..00, 3RG70 56-1..0.

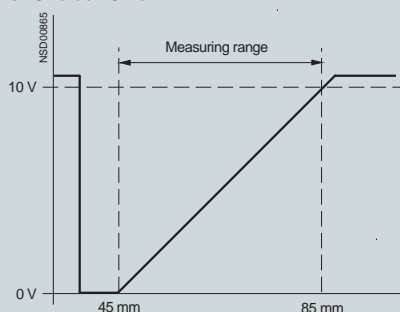


3RG70 5.-3..0.



Characteristic curves

3RG70 56-CM0.



SIMATIC PXO photoelectric proximity switches

SIMATIC PXO500

L50 HF, L50HF advanced designs

Overview

Visible laser light (red),
laser protection class 2 according to EN 60947-5-2

Diffuse sensor with analog output, parameterizable using
teach-in buttons



Resolution < 0.1% of full-scale value

Two digital channels, can be set as 2 switching outputs or
1 switching output and 1 trigger input

Analog output 4 to 20 mA (scaling can be set)

Supplied without mounting material

Technical specifications


Operating mode		Laser diffuse sensor with analog output	
			
Sensing range	mm	30 ... 100	80 ... 300
Resolution	%/MBE	< 0.1	
Linearity	%/MBE	< 0.25	
Light spot diameter (at end of sensing range)	mm	1.5 x 3.25	2 x 4.5
Operating voltage range (DC)	V	18 ... 30	
No-load current I_0 , max.	mA	40	
Analog output	mA	4 ... 20	
Output current per switching output	mA	100	
Recommended load	W	≤ 500	
Switching frequency	Hz	1000	
Switching time	ms	< 1	
Wavelength (illuminant)	nm	650	
LEDs			
• Ready for operation		Green LED	
• Status display		Red LED	
• Switching state, input/output		Yellow LED (2 x)	
• Status display, trigger input		Green LED	
• Object valid		Green LED	
• Timer function active		Green LED	
• Measured value centering active		Green LED	
Enclosure material		Molded plastic (ABS)	
Degree of protection		IP67	
Ambient temperature	°C	-10 ... +60	
Temperature coefficient	%/K	0.02	
Connection		M12 connector, 8-pole, Type O	
Type		3RG70 56-3NQ00	3RG70 56-3NQ61

SIMATIC PXO photoelectric proximity switches

SIMATIC PXO500

L50 HF, L50HF advanced designs

Selection and Ordering data

	Operating mode Design	Sensing range mm	Illuminant nm	Connection	Analog output mA	Circuit diagram number ¹⁾	Order No.
	Laser diffuse sensor with analog output L50 HF	30 ... 100	650 (red laser light)	M12 connector, 8-pole, Type O	4 ... 20	pnp 20	3RG70 56-3NQ00
	Laser diffuse sensor with analog output L50 HF advanced	80 ... 300	650 (red laser light)	M12 connector, 8-pole, Type O	4 ... 20	pnp 20	3RG70 56-3NQ61

HF L50 design

Accessories

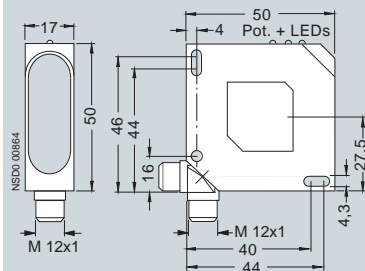
Mounting brackets for L50 HF	3RX7 302
Cable plug, shielded, 8 x 0.25 mm ²	3RX8 000-0CB81-1GF0

1) See page 2/127.

▶ Preferred type, available from stock.

Dimensions

3RG70 56-3NQ..



2

SIMATIC PXO photoelectric proximity switches

SIMATIC PXO500

C50 design


Overview

- Color sensor with three individually adjustable switch outputs
- 3 color ranges can be learned
- Long-term stable and neutral color white-light transmitter LEDs
- 5 tolerance levels selectable

- Sensing range 12 to 32 mm
- Transparent objects with reflection film detectable
- Trigger function via activation input
- External Teach-in


Supplied without mounting material and without reflector

Technical specifications

Operating mode	Color sensor
	
Operating voltage	DC 12 ... 28 V
Max. residual ripple	10%
Reverse polarity protection, short-circuit protection	yes
Current consumption during no-load operation	≤ 40 mA at 24 V DC
Switching outputs	Q1 ... Q3, PNP NO contact
Max. output current	100 mA
Max. voltage drop at the switching output	< 2.4 V
Power-up delay	< 300 ms
Switching frequency	500 Hz
Switching status indicator CH1 ... CH3	3 x Yellow LED
Operating voltage indicator	Green LED
Tolerance level indicator Tol1 ... Tol5	3 x Red LED

Response time	10 ms
Pulse stretching/dropout delay	50 ms
Sensing range for light spot ø4 mm	12 ... 32 mm
Sensing range tolerance for light spot ø 4 mm	± 6 mm for mean tolerance
Color resolution tolerance	Adjustable in 5 stages
Illuminant	White light, pulsed
Light spot diameter at a distance of 22 mm	4 mm
Ambient light limit	EN 60947-5-2
Enclosure material	ABS
Degree of protection	IP67
Ambient temperature range	-10 ... +55 °C
Storage temperature range	-20 ... +80 °C
Type of connection	M12 connector, 8-pole
Max. permissible lead length	100 m
Weight	40 g

Selection and Ordering data

	Operating mode	Sensing range mm	Illuminant	Connection	Switching output	Circuit diagram number ¹⁾	Order No.
	Color sensor PXO560 with 3 switching outputs	12 ... 32	White light, pulsed	M12 connector, 8-pole, Type O	3 x pnp	17	3RG70 50-3NB00

Accessories

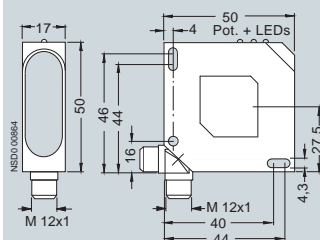
Mounting bracket for form C50	▶	3RX7302
Cable plug, shielded, 8 x 0.25 mm ² , 5 m	▶	3RX8000-0CB81-1GF0
Reflection film for detection of transparent objects	▶	3RX7307-0AB00

1) See page 2/127.

▶ Preferred type, available from stock.

Dimensions

3RG70 50-3NB00



SIMATIC PXO photoelectric proximity switches

SIMATIC PXO600

Overview

- K80,
- L80HF,
- L90L.

Selection table

SIMATIC PXO600



	K80				L80HF	L90L
Operating mode						
• Diffuse sensor	■				■	■
• Diffuse sensor with background suppression		■				
• Reflex sensor			■			
• Thru-beam sensor				■		
Sensing range						
• 60 cm ... 75 cm					■	
• 1 m ... 1.5 m		■				
• 2 m ... 3 m	■					
• 4 m ... 6 m			■			■
• 12 m ... 15 m			■			
• 20 m ... 50 m				■		■
Output						
• pnp	■	■	■	■	■	■
• npn	■	■	■	■		
• Relay	■		■	■		
• Analog					■	■
Direct communication with the controller	ET 200S (via IQ-Sense)	ET 200S (via IQ-Sense)	ET 200S (via IQ-Sense)			
Operating voltage						
• 24 V DC	■	■	■	■	■	■
• 20 ... 265/320 V AC/DC	■		■	■		
Connection						
• M12 connector	■	■	■	■	■	■
• Terminals	■	■	■	■		
Special features						
• Timing function	■	■	■	■		
• Surplus light emission	■	■	■	■		
Illuminant						
• Red light			■			
• Infrared light	■	■		■		
• Laser light, red					■	
• Laser light, infrared						■
Approval for hazardous area						
• Zone 2/22	■		■	■		
See page	2/116				2/119	2/120

A configurator for fast product selection and ordering in the Internet can be found at www.siemens.com/simatic-sensors/px

SIMATIC PXO photoelectric proximity switches

SIMATIC PXO600

K80 design

Overview

Versions for use in potentially explosive environments acc. to 94/9/EG (ATEX exists):

- Zone 2 (gases, vapors, mist) according to classification II 3G
- Zone 22 (dust atmosphere, non-conductive dust) according to classification II 3D

Diffuse sensor (energetic sensor)

- Sensing range 2 m (adjustable via potentiometer)

Diffuse sensor with background suppression

- Sensing range 0.2 to 1 m (adjustable via potentiometer)

Reflex sensor

- Sensing range 6 m (adjustable via potentiometer)

- Supplied without reflector

- "Advanced" version 1 to 12 m

Thru-beam sensor

- Sensing range 50 m (adjustable via potentiometer)



Rated operating voltage 24 V DC or 240 V AC/DC



Inputs and outputs

- Electronics output pnp or npn
 - Programmable as light-ON or dark-ON
 - Light-ON and dark-ON (antivalent)
- Relay output 20 to 320 V AC/DC
- Timing function (delayed pick-up or drop-out, pulse shaping)
- Enabling input for test purposes

Supplied without mounting material

Technical specifications

Operating mode	Diffuse sensor				Diffuse sensor with background suppression				
									
Sensing range	m	2 (adjustable)				0.2 ... 1 (adjustable)			
Standard target	mm	400 x 400 (white)				200 x 200 (white)			
Operating voltage range (DC)	V	10 ... 36	–	10 ... 36	10 ... 36	–	10 ... 36	–	
No-load current I_0 , max.	mA	30	–	30	30	–	45	–	
Operating voltage range (AC/DC)	V	–	20 ... 265	200	–	–	–	–	
No-load power, max.	VA	–	2	–	–	–	–	–	
Rated operating current I_e	mA	200	2000 (at 240 V AC)	200	200	–	200	–	
Switching frequency, max.	Hz	1000	20	1000	1000	20	250	–	
Switching time, max.	ms	0.5	20	0.5	2	–	2	–	
Wavelength (illuminant)	nm	880 (IR)				880 (IR)			
Switching state/surplus light function display		LED yellow/LED green							
Enclosure material		Molded plastic (PBTP)							
Degree of protection		IP67							
Approval for Ex Zones 2/22		no	no	yes	no	no	yes	no	
Ambient temperature	°C	–5 ... +55	–5 ... +55	–5 ... +40	–5 ... +55	–5 ... +55	–5 ... +55	–5 ... +55	
Temperature coefficient	%/K	0.3							
Type		3RG72 00-...00, 3RG72 10-...00	3RG72 10-6MC00	3RG72 00-3CC00- 0XB4	3RG72 04-...00, 3RG72 14-...00				




Operating mode	Reflex sensor with polarization filter				Thru-beam sensor				
									
Sensing range	m	6/12 (adjustable)				50 (adjustable)			
Reflector	mm	Reflector type D 84				–			
Operating voltage range (DC)	V	10 ... 36	–	10 ... 36	10 ... 36	–	10 ... 36	–	
No-load current I_0 , max.	mA	30	–	30	30	–	–	–	
Operating voltage range (AC/DC)	V	–	20 ... 265	–	–	20 ... 320	–	–	
No-load power, max.	VA	–	2	–	–	2	–	–	
Rated operating current I_e	mA	200	2000 (at 240 V AC)	200	200	2000 (at 240 V AC)	200	–	
Switching frequency, max.	Hz	1000	20	1000	1000	20	1000	–	
Switching time, max.	ms	0.5	20	0.5	0.5	20	0.5	–	
Wavelength (illuminant)	nm	660 (red, polarized)				880 (IR)			
Switching state/surplus light function display		LED yellow/LED green							
Enclosure material		Molded plastic (PBTP)							
Degree of protection		IP67							
Approval for Ex Zones 2/22		no	no	yes	no	no	yes	no	
Ambient temperature	°C	–5 ... +55	–5 ... +55	–5 ... +40	–5 ... +55	–5 ... +55	–5 ... +55	–5 ... +40	
Temperature coefficient	%/K	0.3							
Type		3RG72 01-...00, 3RG72 01-...61, 3RG72 11-...00, 3RG72 11-...61	3RG72 11-6MC00, 3RG72 11-6MC61	3RG72 01- 3CC-0XB4	3RG72 02- ...00, 3RG72 12- ...00	3RG72 12-6MC00, 3RG72 02-6FG00	3RG72 02- ...-0XB4, 3RG72 12- ...-0XB4	–	

SIMATIC PXO photoelectric proximity switches

SIMATIC PXO600

K80 design

Selection and Ordering data

	Operating mode	Sensing range m	Illuminant nm	Connection	Switching output		Circuit diagram number ¹⁾	Order No.
K80 design								
	Diffuse sensor	2 (adjustable via potentiometer)	880 (IR)	M12 connector, 4-pole, type F	Light-ON and dark-ON (antivalent)	pnp 5 npn 5	▶	3RG72 00-3CC00 3RG72 00-3HC00
				M12 connector, 5-pole, type G	Light-ON or dark-ON and surplus light, with timing function (0.01 ... 1 s)	pnp 8 npn 8	B B	3RG72 10-3DK00 3RG72 10-3EK00
				Pg 11, 4-pole	Light-ON and dark-ON (antivalent)	pnp npn		3RG72 00-6CC00 3RG72 00-6HC00
				Pg 11, with enabling input, 5-pole	Light-ON or dark-ON and surplus light, with timing function (0.01 ... 1 s)	pnp 11 npn 11	B B	3RG72 10-6DK00 3RG72 10-6EK00
				Pg 11, 5-pole	Relay, Light-ON and dark-ON, with timing function (0.1 ... 10 s)	Relay 10	▶ B	3RG72 10-6MC00
K80 design								
	Diffuse sensor with background suppression	0.2 ... 1 (adjustable via potentiometer)	880 (IR)	M12 connector, 4-pole, Type F	Light-ON and dark-ON (antivalent)	pnp 5 npn 5	▶	3RG72 04-3CC00 3RG72 04-3HC00
				M12 connector, 5-pole, Type G	Light-ON or dark-ON and surplus light, with timing function (0.01 ... 1 s)	pnp 8 npn 8		3RG72 14-3DK00 3RG72 14-3EK00
				Pg 11, 4-pole	Light-ON and dark-ON (antivalent)	pnp npn	▶	3RG72 04-6CC00 3RG72 04-6HC00
				Pg 11, with enabling input, 5-pole	Light-ON or dark-ON and surplus light, with timing function (0.01 ... 1 s)	pnp 11 npn 11		3RG72 14-6DK00 3RG72 14-6EK00
K80 design								
	Reflex sensor	6 (adjustable via potentiometer)	660 (red, polarized)	M12 connector, 4-pole, Type F	Light-ON and dark-ON (antivalent)	pnp 5 npn 5	▶	3RG72 01-3CC00 3RG72 01-3HC00
				M12 connector, 5-pole, Type G	Light-ON or dark-ON and surplus light, with timing function (0.01 ... 1 s)	pnp 8 npn 8	B B	3RG72 11-3DK00 3RG72 11-3EK00
				Pg 11, 4-pole	Light-ON and dark-ON (antivalent)	pnp 11 npn 11	▶	3RG72 01-6CC00 3RG72 01-6HC00
				Pg 11, with enabling input, 5-pole	Light-ON or dark-ON and surplus light, with timing function (0.01 ... 1 s)	pnp 11 npn 11	B B	3RG72 11-6DK00 3RG72 11-6EK00
				Pg 11, 5-pole	Relay, Light-ON and dark-ON, with timing function (0.1 ... 10 s)	– 10	▶ B	3RG72 11-6MC00
		12 (adjustable via potentiometer)	660 (red, polarized)	M12 connector, 4-pole, Type F	Light-ON and dark-ON (antivalent)	pnp 5	▶	3RG72 01-3CC61
				Pg 11, 4-pole	Light-ON and dark-ON (antivalent)	pnp	▶	3RG72 01-6CC61
				Pg 11, 5-pole	Relay, Light-ON and dark-ON, with timing function (0.1 ... 10 s)	Relay 10	▶ B	3RG72 11-6MC61

1) See page 2/127.

▶ Preferred type, available from stock.



B: Subject to export regulations AL = N and ECCN = EAR99.

2

SIMATIC PXO photoelectric proximity switches

SIMATIC PXO600

K80 design

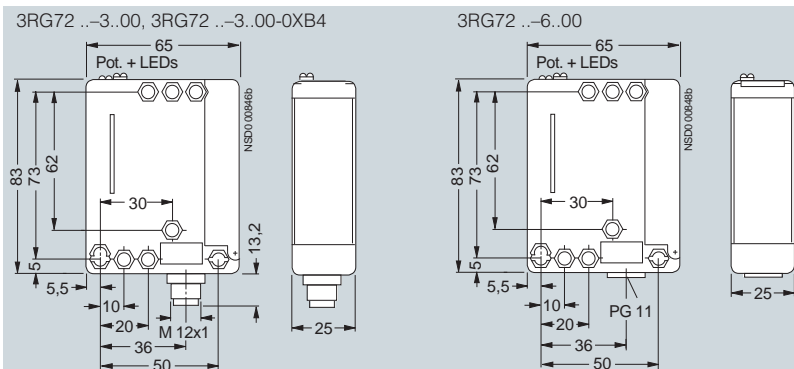
	Operating mode	Sensing range m	Illuminant nm	Connection	Switching output	Circuit diagram number ¹⁾	Order No.			
K80 design										
	Thru-beam sensor	50 (adjustable via potentiometer)	880 (IR)	M12 connector, 4-pole, Type F	Light-ON and dark-ON (antivalent)	pnp 5	▶	3RG72 02-3CC00 3RG72 02-3HC00		
					Light-ON or dark-ON and surplus light, with timing function (0.01 ... 1 s)	pnp 6			B	3RG72 12-3DK00
					Light-ON and dark-ON (antivalent)	pnp 11				
					Light-ON or dark-ON and surplus light, with timing function (0.01 ... 1 s)	pnp 11			B	3RG72 12-6DK00 3RG72 12-6EK00
					Relay, Light-ON and dark-ON, with timing function (0.1 ... 10 s)	– 10			▶ B	
					Emitter DC with enabling input	– 7			▶	3RG72 02-3BG00
Emitter DC with enabling input	– 11	▶	3RG72 02-6BG00							
Emitter AC/DC with enabling input	– 11	▶ B	3RG72 02-6FG00							
K80 ATEX design										
	Diffuse sensor	2 (can be set with potentiometer)	880 (IR)	M12 connector, 4-pole, type F	Light-ON and dark-ON (antivalent)	pnp 5	▶	3RG72 00-3CC00-0XB4		
	Reflex sensor	6 (can be set with potentiometer)	660 (red, polar.)	M12 connector, 4-pole, Type F	Light-ON and dark-ON (antivalent)	pnp 5	▶	3RG72 01-3CC00-0XB4		
		12 (can be set with potentiometer)	660 (red, polarized)	M12 connector, 4-pole, Type F	Light-ON and dark-ON (antivalent)	pnp 5	▶	3RG72 01-3CC61-0XB4		
	Thru-beam sensor	50 (can be set with potentiometer)	880 (IR)	M12 connector, 4-pole, Type F	Light-ON and dark-ON (antivalent)	pnp 5	▶	3RG72 02-3CC00-0XB4		
		–	–	–	Light-ON or dark-ON and surplus light, with timing function (0.01 ... 1 s)	pnp 6	▶ B	3RG72 12-3DK00-0XB4		
–	–	–	–	Sender with enable input	– 7	▶	3RG72 02-3BG00-0XB4			
Communication-capable proximity switches with K80 IQ-Sense form										
	Diffuse sensor	2	880 (IR)	M12 connector, 4-pole, Type F	for connection to the 4IQ-Sense sensor module	– 9	▶ B	3SF72 10-3JQ00		
	Diffuse sensor with background suppression	0.2 ... 1	880 (IR)	M12 connector, 4-pole, Type F	for connection to the 4IQ-Sense sensor module	– 9	▶ B	3SF72 14-3JQ00		
	Reflex sensor	8	660 (red, polar.)	M12 connector, 4-pol., Type F	for connection to the 4IQ-Sense sensor module	– 9	▶ B	3SF72 11-3JQ00		
Accessories										
	Mounting brackets for K80						▶	3RX7 303		

1) See page 2/127.

B: Subject to export regulations AL = N and ECCN = EAR99

▶ Preferred type, available from stock.

Dimensions





Overview


Visible laser light (red),
laser protection class 2 according to EN 60947-5-2
Diffuse sensor with analog output,
parameterizable using teach-in buttons
Resolution < 0.1% of full-scale value

Two digital channels, adjustable as 2 switching outputs or 1 switching output and 1 trigger input
Analog output 4 to 20 mA (scaling can be set)
Supplied without mounting material

Technical specifications

Operating mode		Laser diffuse sensor with analog output	
			
Sensing range	mm	250 ... 750	
Resolution	%/MBE	< 0.1	
Linearity	%/MBE	< 0.25	
Light spot diameter (at end of sensing range)	mm	2 x 4.5	
Operating voltage range (DC)	V	18 ... 30	
No-load supply current I_0 , max.	mA	40	
Analog output	mA	4 ... 20	
Output current per switching output	mA	100	
Recommended load	W	≤ 500	
Switching frequency	Hz	1000	
Switching time	ms	< 1	
Wavelength (illuminant)	nm	650	
Indicators			
• Ready for operation/Status display			Green LED/Red LED
• Switching state, input/output			Yellow LED (2 x)
• Status display, trigger input			Green LED
• Object valid			Green LED
• Timer function active			Green LED
• Measured value centering active			Green LED
Enclosure material		PBT	
Degree of protection		IP67	
Ambient temperature	°C	-10 ... +60	
Temperature coefficient	%/K	0,02	
Connection		M12 connector, 8-pole, type O	
Type		3RG72 56-3NQ00	

Selection and Ordering data

Operating mode Design	Sensing range mm	Illuminant nm	Connection	Analog output	Circuit diagram number ¹⁾	Order No.
 Laser diffuse sensor with analog output L80HF	250 ... 750	650 (red laser light)	M12 connector, 8-pole, type O	4 ... 20 mA pnp	20	3RG72 56-3NQ00

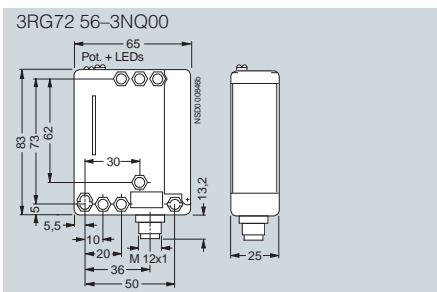
Accessories

Mounting brackets for L80 HF	▶	3RX7 303
Cable plug, shielded, 8 × 0.25 mm ²	▶	3RX8 000-0CB81-1GF0

1) See page 2/127.

▶ Preferred type, available from stock.

Dimensions



SIMATIC PXO photoelectric proximity switches

SIMATIC PXO600

SIMATIC PXO650 L90L

Overview

Measuring laser sensor based on the principle of optical running-time measurement


- Measuring laser with IR light; laser class 1
- Pilot laser for adjustment with visible red light; laser class 2
- Wired via M12 4-pole or 5-pole connector
- Range 6 m; range with reflector 30 m

- Rated operating voltage 24 V DC
- 1 or 2 solid-state outputs pnp
- NO or NC contact, adjustable via "teach-in"
- Analog output 4 to 20 mA
- Timer function

Technical specifications

Sensing range	0.2 ... 6 m	0.2 ... 6 m	0.2 ... 30 m
Standard target/reflector	white 90%, 100 x 100 mm		R250 reflector, 250 x 250 mm
Operating mode	Distance sensor/jogging		Distance sensor/reflex sensor
Light spot diameter (at end of sensing range)	4 x 12 mm		45 x 60 mm
Reproducibility			
• Slow	10 mm		5 mm
• Fast	15 mm		10 mm
Operating voltage range	18 ... 30 V DC		
No-load supply current I_0 , max.	125 mA at 24 V DC		
Rated operating current I_e	100 mA		
Analog output	-	4 ... 20 mA	
Response time			
• Slow	80 ms		65 ms
• Fast	13 ms		13 ms
Wavelength (illuminant)			
• Measuring laser	905 nm, IR, invisible, class 1		
• Pilot laser	650 nm, red, visible, class 2		
Displays			
• Switching status	Green LED		
• Operating voltage	Yellow LED	2 yellow LEDs	
• Operating mode	Orange LED		
Adjustment menu	-	4 x red LEDs	
Enclosure material	Plastic ABS		
Degree of protection	IP67		
Ambient temperature during operation	-20 ... +50 °C		
Ambient temperature during storage	-40 ... +80 °C		
Temperature coefficient	0.3%/K		
Type	6GR1654-3AD20	6GR1654-3CH20	6GR1654-3CH21

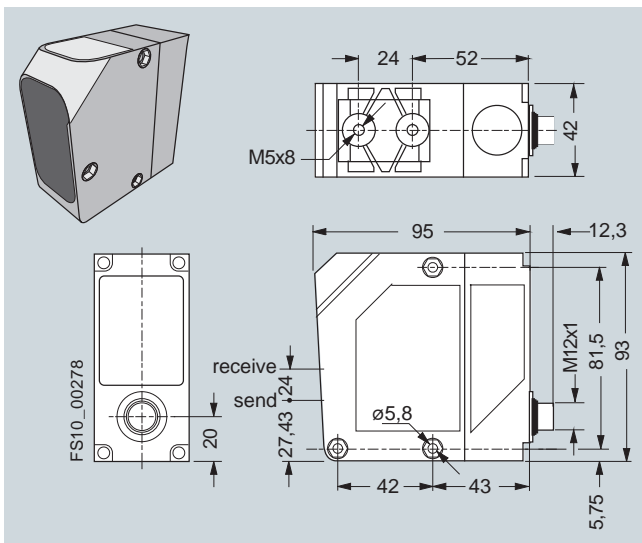
Selection and Ordering data

	Sensing range m	Connection	Switching output	Analog output mA	Circuit diagram number ¹⁾	Order No.
	0.2 ... 6	M12 connector, 4-pole, type F	1 x light-ON or dark-ON	-	pnp 12	6GR1654-3AD20
	0.2 ... 6	M12 connector, 5-pole, type F	2 x light-ON or dark-ON	4 ... 20	pnp 19	6GR1654-3CH20
	0.2 ... 30	M12 connector, 5-pole, type G	2 x light-ON or dark-ON	4 ... 20	pnp 19	6GR1654-3CH21

SIMATIC
PXO560 L90L

1) See page 2/127.

Dimensions



SIMATIC PXO photoelectric proximity switches

SIMATIC PXO800

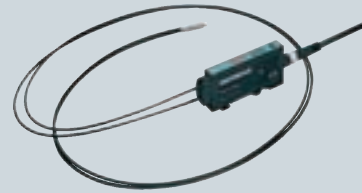
Overview

SIMATIC sensors PXO800

- GL fork sensor,
- LV70 fiber-optic conductor sensor.

Selection table

SIMATIC PXO800



	GL	LV70
Operating mode		
• Thru-beam sensor	■	
• For plastic fiber-optic wires		■
Sensing range		
• Depending on fiber-optic wire		■
• 1.2 cm ... 3.2 cm	■	
• 5 cm ... 11 cm	■	
• 12 cm ... 15 cm	■	
Output		
• pnp	■	■
Operating voltage		
• 24 V DC	■	■
Connection		
• M8 connector	■	■
• Cable		■
Special features		
• Surplus light emission		■
Illuminant		
• Red light	■	■
See page	2/123	2/125

A configurator for fast product selection and ordering in the Internet can be found at www.siemens.com/simatic-sensors/px

Overview

PXO830 GL fork sensor for detecting small objects.

- Molded plastic enclosure with screw-on or dovetail fastening.
- Wired with 3 or 4-pole M8 connector.
- 4 different fork widths:
 - GL30 = 30 mm
 - GL50 = 50 mm
 - GL80 = 80 mm
 - GL120 = 120 mm
- NO or NC contact, adjustable via "teach-in".
- Versions with external "teach-in".

Technical specifications

		PXO830 GL30	PXO830 GL50	PXO830 GL80	PXO830 GL120
Operating mode		Thru-beam sensor			
Fork width	mm	30	50	80	120
Operating voltage range	V DC	10 ... 30			
No-load supply current I_o , max.	mA	30			
Rated operating current I_e	mA	100			
Switching frequency	Hz	2000			
Wavelength (illuminant)	nm	640 (red, visible)			
Switching status indicators		4 x yellow LEDs			
Enclosure material		Plastic ABS			
Degree of protection		IP67			
Ambient temperature					
• During operation	°C	-20 ... +60			
• During storage	°C	-20 ... +80			
Temperature coefficient	%/K	0.3			
Type		6GR1802-....	6GR1804-....	6GR1806-....	6GR1808-....

SIMATIC PXO photoelectric proximity switches

SIMATIC PXO800

SIMATIC PXO830 GL

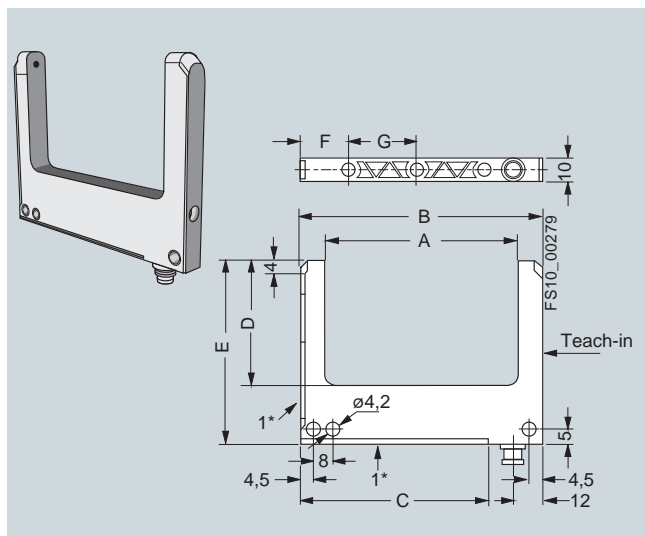
Selection and Ordering data

Fork width mm	Connection	Switching output	External "teach-in"	Circuit diagram number ¹⁾	Order No.
30	M 8 connector, 3-pole, Type A	Light-ON or dark-ON	npn -	1	6GR1802-7AD00
30	M 8 connector, 4-pole, Type B	Light-ON or dark-ON	npn yes	14	6GR1802-7BD05
50	M 8 connector, 3-pole, Type A	Light-ON or dark-ON	npn -	1	6GR1804-7AD00
50	M 8 connector, 4-pole, Type B	Light-ON or dark-ON	npn yes	14	6GR1804-7BD05
80	M 8 connector, 3-pole, Type A	Light-ON or dark-ON	npn -	1	6GR1806-7AD00
80	M 8 connector, 4-pole, Type B	Light-ON or dark-ON	npn yes	14	6GR1806-7BD05
120	M 8 connector, 3-pole, Type A	Light-ON or dark-ON	npn -	1	6GR1808-7AD00
120	M 8 connector, 4-pole, Type B	Light-ON or dark-ON	npn yes	14	6GR1808-7BD05

SIMATIC
PXO830 GL

1) See page 2/127.

Dimensions



All dimensions in mm

MLFB	A Fork width	B	C	D	E	F	G
6GR1802	30	50	30	34	59.5	20	
6GR1804	50	70	50	54	79.5	20	28
6GR1806	80	100	80	54	79.5	20	2 x 28
6GR1808	120	140	120	54	79.5	20	3 x 28

Overview

Fiber-optic wire sensor for snapping onto a DIN rail to DIN46277-3. Plastic fiber-optic wires 3RX7.... may be used.

Connection with cable or M8 connector. The function and range depend upon the type of fiber-optic wire used (see data of your selected fiber-optic wire)

- Rated operating voltage 24 V DC
- Electronic output pnp
- NO or NC contact, adjustable via "teach-in"
- LV70A with analog output 0 ... 10 V

Technical specifications


		PXO840 LV70	PXO840 LV70HF	PXO840 LV70A
Operating mode		Sensor/thru-beam sensor, depending on fiber-optic wire		
Sensing range		Depending on fiber-optic wire		
Standard target/reflector		Depending on fiber-optic wire		
Operating mode		Standard	Standard, Fast, Fine, High Distance	
Operating voltage range (DC)	V DC	10 ... 30		
No-load supply current I_0 , max.	mA	≤ 20 at 24 V	≤ 25 at 24 V	
Rated operating current I_e	mA	100		
Analog output	V	-	0 ... 10	
Switching frequency				
• Standard	Hz	1500	1000	
• Fast mode	Hz	-	8000	
• Fine mode	Hz	-	125	
• High Distance mode	Hz	-	125	
Wavelength (illuminant)	nm	660, red, visible		
Indicators				
• Switching status		Yellow LED	Yellow LED	
• Operating voltage		Green LED	Green LED	
• Configuration		-	Red LED	
• Key lock		-	Red LED	
• Make/break function		-	Red LED	
• Adjustment mode		-	Red LED	
• Timer function		-	Red LED	
• Function mode		-	Red LED	
Display		no	4-character, red	
Enclosure material		Plastic (ABS)		
Degree of protection		IP64		
Ambient temperature				
• During operation	°C	-20 ... +60		
• During storage		-20 ... +80		
Temperature coefficient	%/K	0.3		
Type		6GR1810-BD05	6GR1811-7BD05	6GR1811-0CJ05

SIMATIC PXO photoelectric proximity switches

SIMATIC PXO800

SIMATIC PXO840 LV70

Selection and Ordering data

	Connection	Illuminant nm	Switching output	Analog output	Circuit diagram number ¹⁾	Order No.
	Cable, 2 m PVC, 4 x 0.14 mm ²	660, red	Light-ON or dark-ON	-	pnp 14	6GR1810-0BD05
	M8 connector, 4-pole, type B	660, red	Light-ON or dark-ON	-	pnp 14	6GR1810-7BD05
	M8 connector, 4-pole, type B	660, red	Light-ON or dark-ON	-	pnp 14	6GR1811-7BD05
	Cable, 2 m PVC, 5 x 0.14 mm ²	660, red	Light-ON or dark-ON	0 ... 10 V	pnp 18	6GR1811-0CJ05

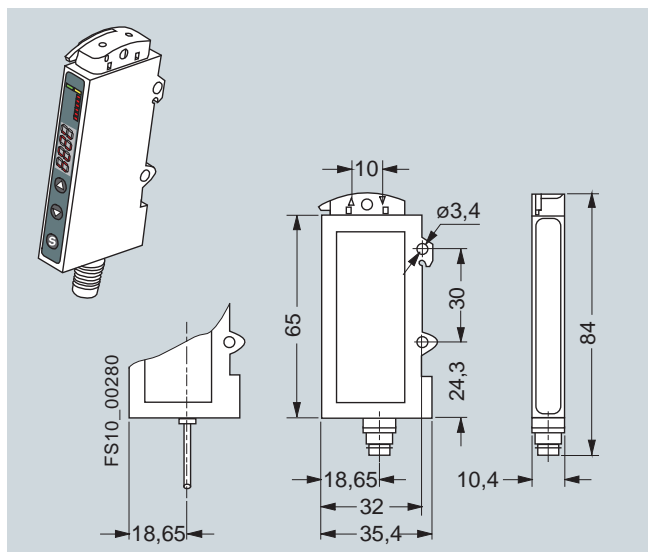
Accessories

3RX7 plastic fiber-optic conductor

see page 2/264

1) See page 2/127.

Dimensions



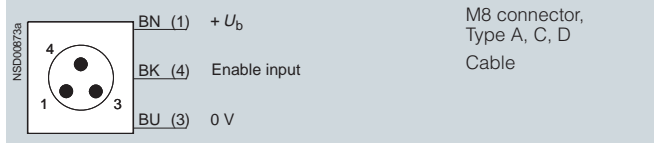


Schematics

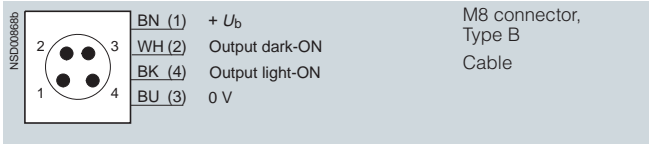
Circuit diagram 1



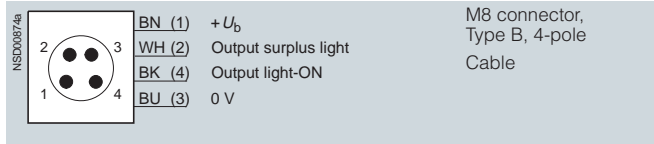
Circuit diagram 2



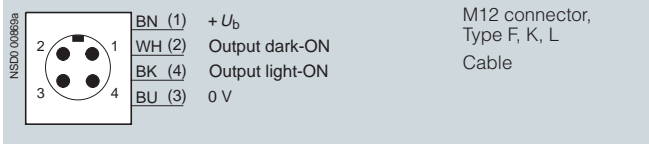
Circuit diagram 3



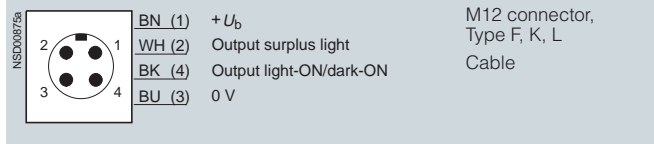
Circuit diagram 4



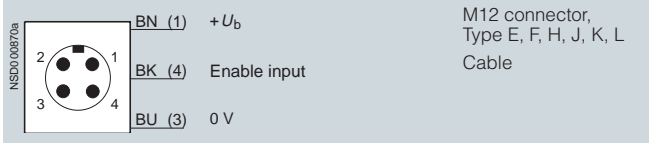
Circuit diagram 5



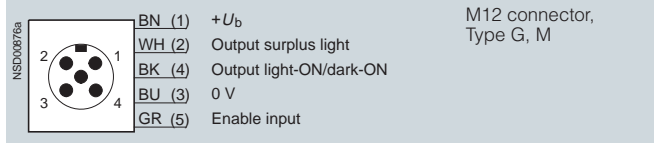
Circuit diagram 6



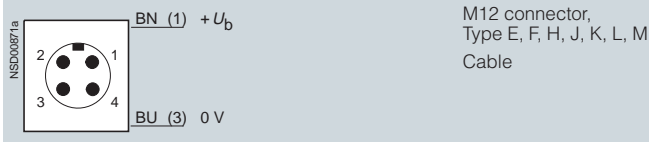
Circuit diagram 7



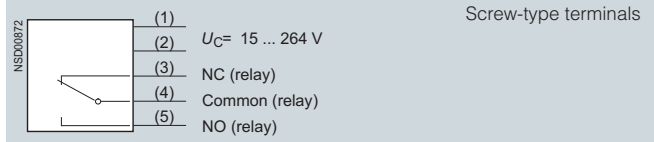
Circuit diagram 8



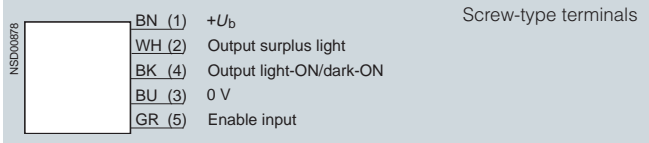
Circuit diagram 9



Circuit diagram 10



Circuit diagram 11



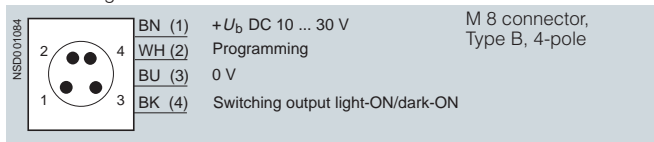
Circuit diagram 12



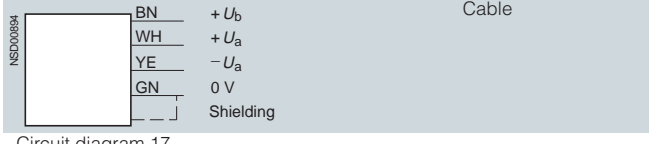
Circuit diagram 13



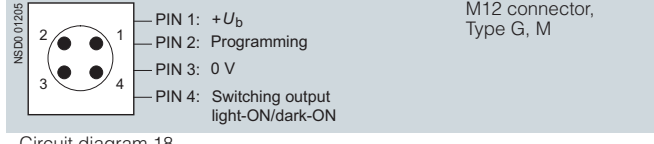
Circuit diagram 14



Circuit diagram 15



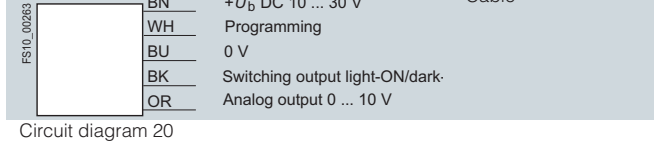
Circuit diagram 16



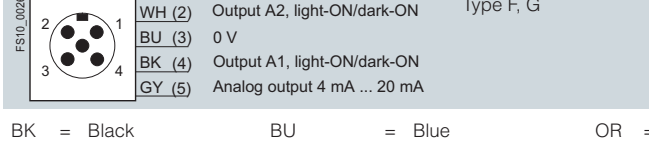
Circuit diagram 17



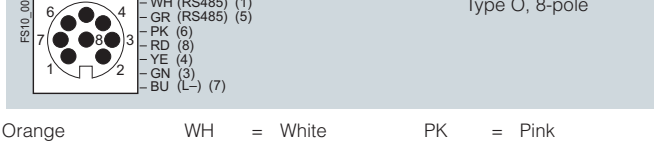
Circuit diagram 18



Circuit diagram 19



Circuit diagram 20



BK = Black BU = Blue OR = Orange WH = White PK = Pink
 BN = Brown GR or GY = Gray RD = Red YE = Yellow GN = Green

SIMATIC PXO photoelectric proximity switches

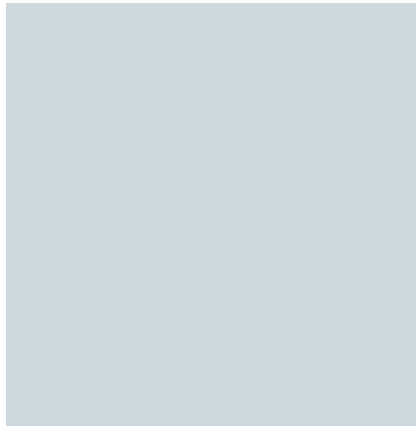
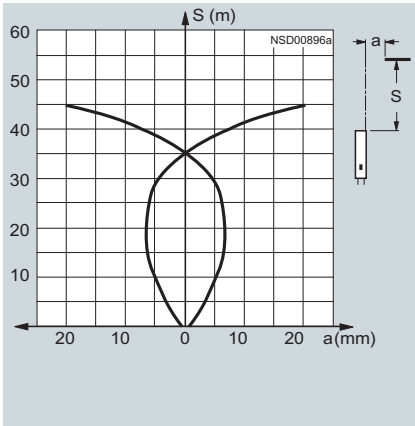
Characteristic curves

2

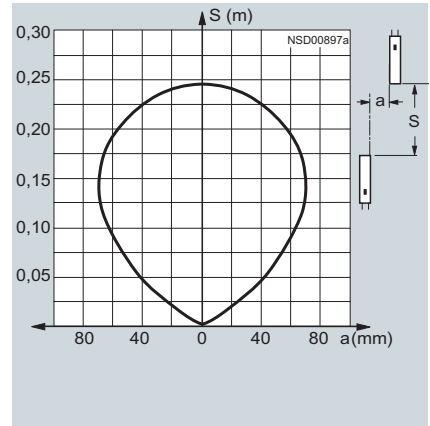
Characteristic curves

D4 and M5 design

Diffuse sensor

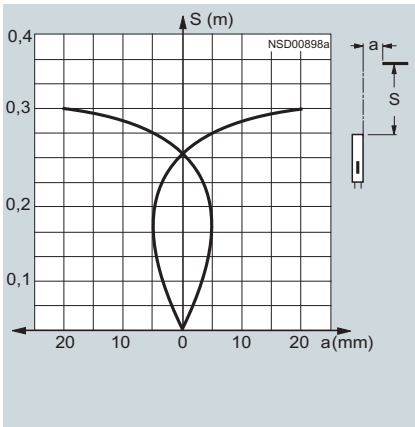


Thru-beam sensor

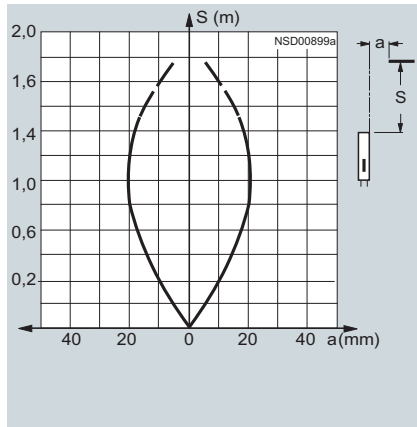


M12 design

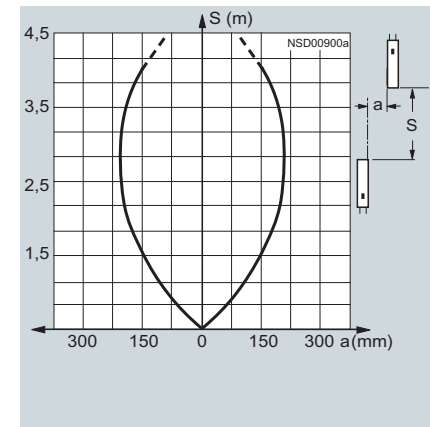
Diffuse sensor



Reflex sensor

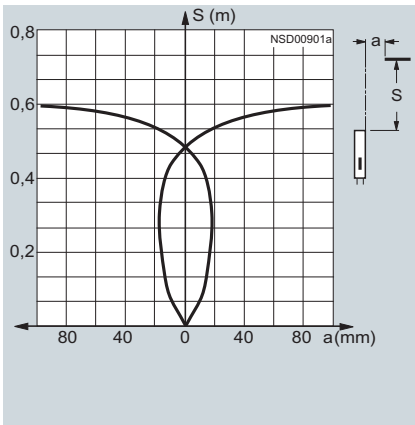


Thru-beam sensor

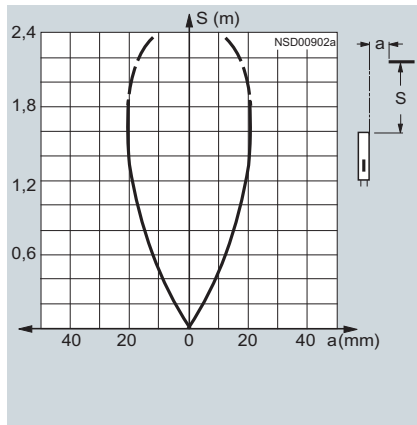


M18 design

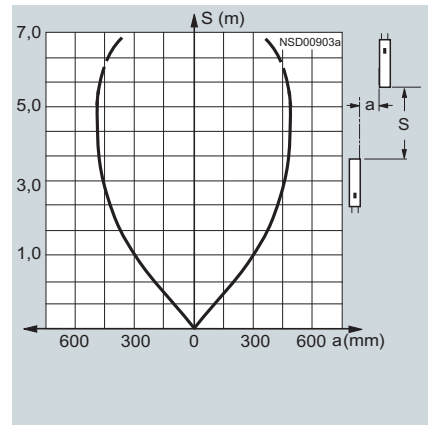
Diffuse sensor



Reflex sensor



Thru-beam sensor

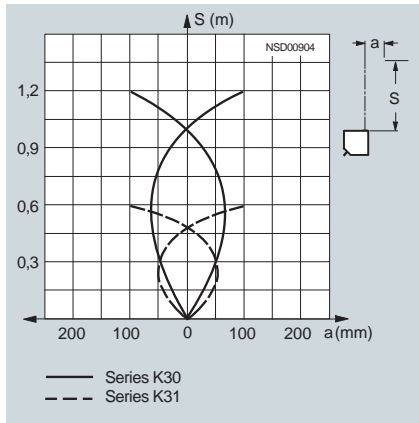


SIMATIC PXO photoelectric proximity switches

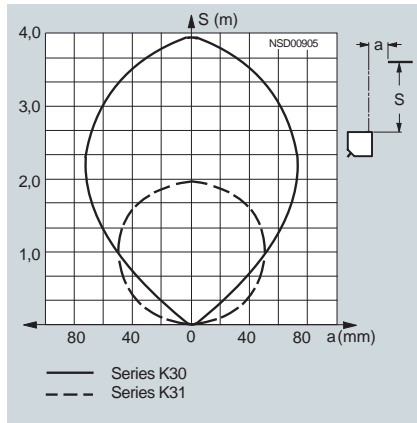
Characteristic curves

K30 and K31 design

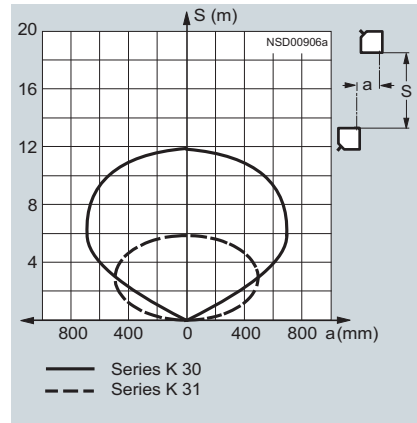
Diffuse sensor



Reflex sensor

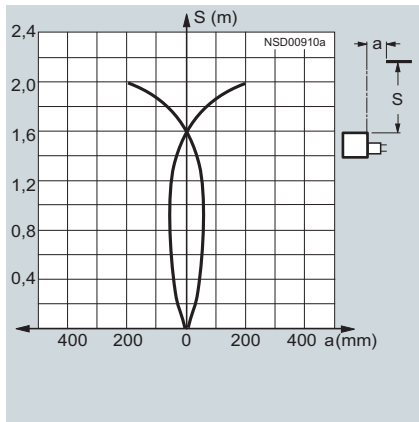


Thru-beam sensor

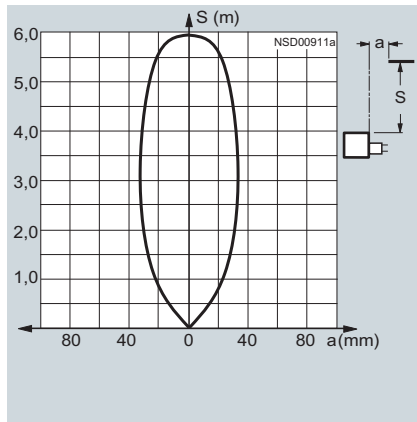


K80 design

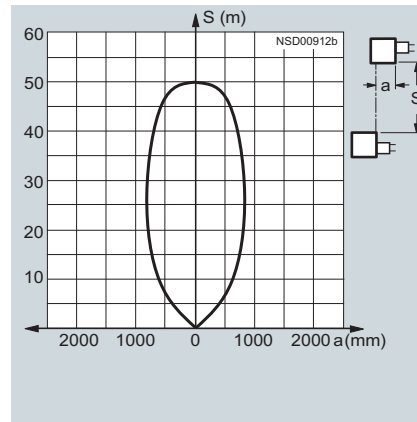
Diffuse sensor



Reflex sensor



Thru-beam sensor



Glossary for photoelectric proximity switches

More information

Terms associated with the technology of photoelectric proximity switches are explained below. Some of the terms are defined in IEC 60947-5-2.

Anti-interference function

This function prevents mutual interference between photoelectric proximity switches. The specified clearances between the devices does not have to be observed for devices with an anti-interference function. It is therefore possible to align two reflex sensors, for example, with a common reflector.

Function of the outputs**Dark-ON**

The "dark-ON" function means that this output is conducting (current-carrying) when **no** light reaches the receiver.

Light-ON

The "light-ON" function means that this output is conducting (current-carrying) when light reaches the receiver.

Antivalent

The devices with antivalent output have 2 outputs. One output is **dark-ON**, and the other is **light-ON**.

Surplus light

As an alternative, some devices can be supplied with a different configuration of outputs, one output light-ON and the other for signaling the surplus light.

Output current

The devices are designed for a maximum output current (rated operating current, see Technical specifications). If this current is exceeded, even briefly, the built-in overload and short-circuit protection will be activated. Destruction of the device is effectively prevented.

Incandescent lamps, capacitors and other strongly capacitive loads (e.g. long leads) have a similar effect to an overload.

A minimum load current (smallest operating current) is not required. A built-in pull-up resistor ensures that an output signal is always available.

Auto-collimation

With these devices, the optical axes of the emitter and receiver are identical. The device only has one optical axis. This means that there is no blind zone range in front of the proximity switch and the accuracy of the switching point is higher.

Spurious signal suppression

The devices feature spurious signal suppression. It prevents the occurrence of spurious signals from the moment of application of the operating voltage until the moment when the device is ready for operation (approximately 5 ms).

Sensing range

The sensing range is the range within which the operating distance can be set. This term replaces any other previously used terms (sensing range/transmission range).

Correction factors

The specified sensing ranges of diffuse sensors are achieved with the specified surfaces by using matte white standard paper. The following correction factors (approximate values) apply to other surfaces:

Test card	100%	Black neoprene	20%
White paper	80%	Automobile tires	15%
Light-colored wood	73%	Sheet aluminum	
White plastic	70%	• raw	200%
Cork	65%	• black, anodized	150%
Printed newspaper	60%	• matte (brushed)	120%
PVC, gray	57%	Stainless steel, polished	230%
Black plastic	22%		

Enabling input

With photoelectric proximity switches with a test input, the emitter can be switched on or off. Function monitoring can be implemented with appropriate evaluation of the output signal (light barrier: no obstruction of light beam / diffuse sensors: reflecting object exists).

To disable the proximity switch, the enabling input must be connected to 0 V. The enabling input does not have to be used for operation.

Ambient light limit

Ambient light is the light produced by external light sources. The luminescence level is measured on the light incidence surface. Thanks to the use of modulated light, the devices are insensitive to ambient light.

There is, however, an upper limit for the intensity of any external light which is referred to as the ambient light limit. It is specified for sunlight (unmodulated light) and halogen light (light modulated at twice the frequency of the electricity supply). Reliable operation is not possible above the relevant ambient light limit.

SIMATIC PXO photoelectric proximity switches



Notes

2