Issue **2008**

Compact
Light Barrier

pantron
sensor technology

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SlimLine

Range overview

		Transmitter	
		STA-...	**STB-...**
Receiver	**SRSL-...**	1 m	5 m
	SRHL-...	6 m	20 m
	SRLL-...	15 m	40 m
	SRSD-...	1 m	5 m
	SRHD-...	6 m	20 m
	SRLD-...	15 m	40 m

All Pantron products fulfil the following approvals: CE

All technical specifications refer to the state of art 01/2008. Subject to modifications.

Safety instructions:
The devices are not to be used for applications where personal safety is dependent on their function.

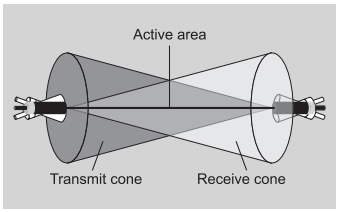
Do not look into the transmitter! It's possible, that highly concentrated non visible infrared light is emitting out of the transmitter STB..., which can be hazardous to the human eye. So you have to follow the safety precautions given in IEC 60825-1.

Compact Light Barrier

Pantron Instruments has been developing and manufacturing sensors for automation technology for over 25 years. Pantron products are outstanding in their features and offer the best solution for customers with special requirements and in most demanding applications. Pantron sensors are internationally successful state-of-the-art products made in Germany.

The compact light barriers were specially developed for areas of application in which traditional photo-electric sensors reach their limits. Extreme dirt resistance and a long range make them particularly suitable for most difficult applications. The system's high power guarantees excellent penetration, even in the case of extreme contamination. Chips, dust, flour, oil or muddy water are no longer an obstacle. They are perfectly suitable for use in the timber and paper industry, in car wash systems, for control bulk material, in elevators, for outdoor gate control, in the food processing industry and in many other applications.

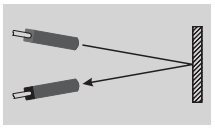
Each system consists of a transmitter and a receiver, available separately in very compact and robust designs. Thanks to their large field of view, they can be easily aligned even at distances of 40 meters. Simultaneously they are insensitivite to shock and vibrations and the resolution of the misalignment.

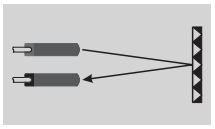


The simple installation of the transmiiter and receiver as well as the uncomplicated handling of the devices emphasize the high user friendliness.

The sensors can be mounted according to different operating principles as required:

Through beam

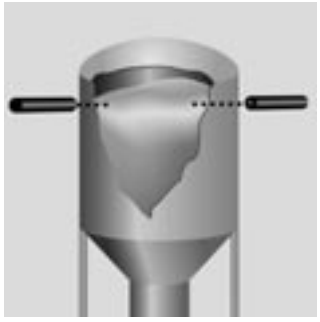

Retro reflective


Diffuse proximity

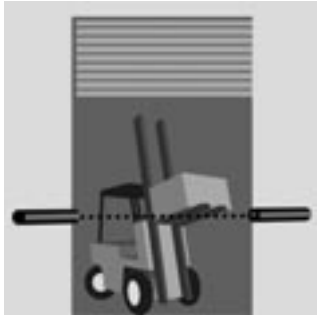
Applications

Through beam light barrier

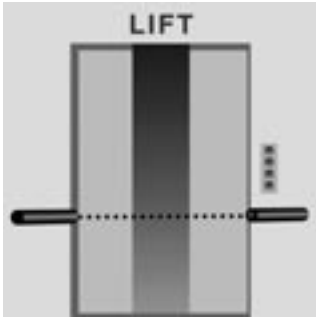
- Level control,
  e.g. harsh and dirty to control the levels of bulk material in silos.



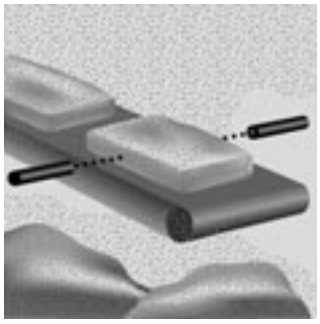
- Gate control,
  e.g. in industrial sectional gates, also outdoor in rain, snow and fog.



- Door control,
  e.g. in passenger and industrial elevators.

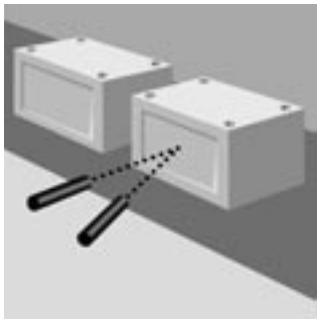


- Position recognition,
  e. g. in extremely dusty environments, such as cement or gravel plants.



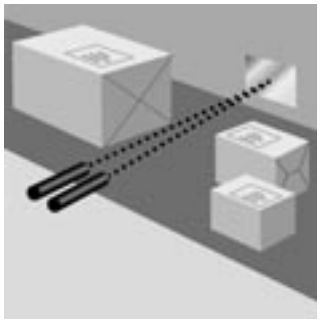
Diffuse proximity

- Objects detecting,
  e.g. from piece material.



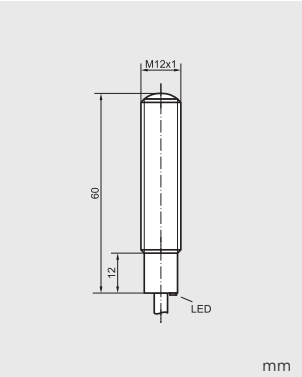
Retro reflective light barrier

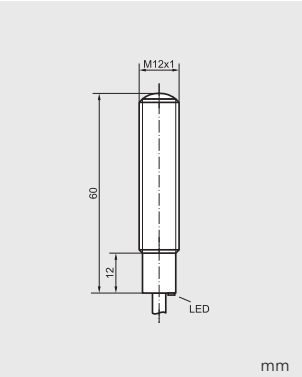
- High control,
  e. g. on a conveyor belt

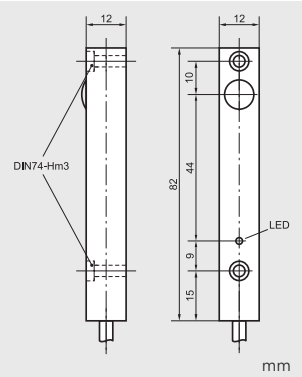


Transmitter **ST...** cable version

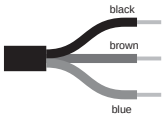
- Transmit power adjustment with external resistor
- Extremely dirt-resistant
- High penetration
- High range
- Small design
- Easy adjustment
- Cable or plug connection





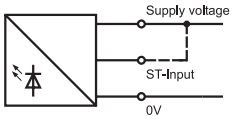


Connection diagram

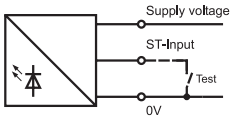


Supply voltage	brown
Ground (0V)	blue
ST-Input	black

Transmit power adjustment



Test function



Nickel plated brass thread

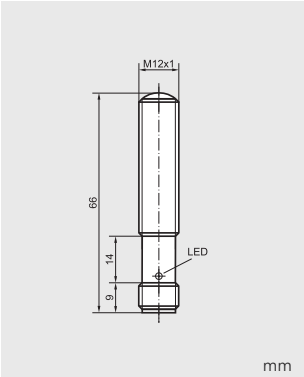
Stainless steel thread

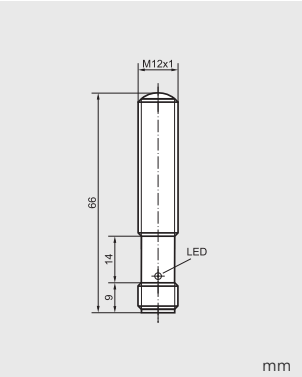
Aluminium anodized

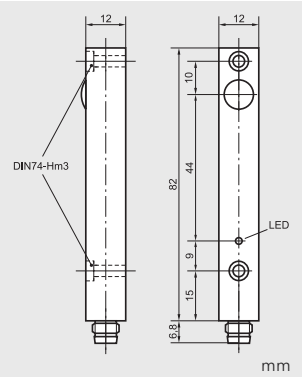
Technical data (at +20 °C, 24 V DC)			
Operating voltage		+15 V DC ... +30 V DC	
Current consumption		30 mA	
Transmit light		infrared 880nm, modulated	
Transmit angle STA-... / STB-...		20° / 6°	
Transmit frequency		11700 Hz	
Transmit power		externally adjustable with resistor	
Housing material	nickel plated brass	stainless steel	aluminium anodized
Cable material	PVC	PVC	PVC
Connection plug	-	-	-
Protection class		IP 67	
Operation temperature		-20 °C ... +60 °C	
Vibration		10...55 Hz, 1,5 mm	
Shock		30 g	

Purchase order table (other cable length or cable materials by request)			
Transmit angle 20°			
Connection cable 5 m	STA-CLN-5	STA-CLV-5	STA-LLA-5
Connection plug	-	-	-
Transmit angle 6°			
Connection cable 5 m	STB-CLN-5	STB-CLV-5	STB-LLA-5
Connection plug	-	-	-

Transmitter **ST...** plug version

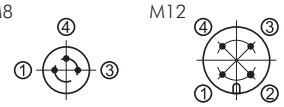






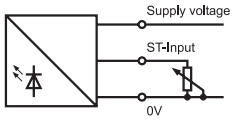
Connection diagram

M8 M12

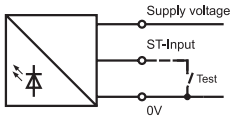


Supply voltage	PIN 1
Ground (0V)	PIN 3
ST-Input	PIN 4

Transmit power adjustment



Test function



Nickel plated brass thread

Stainless steel thread

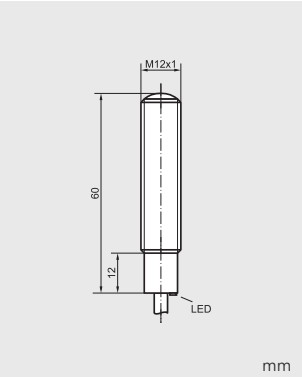
Aluminium anodized

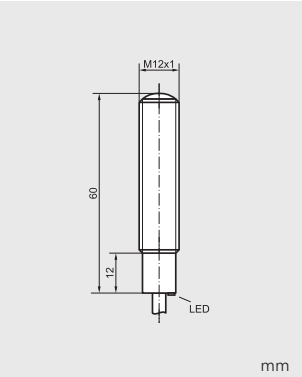
Technical Data (at +20 °C, 24 V DC)			
Operating voltage		+15 V DC ... +30 V DC	
Current consumption		30 mA	
Transmit light		infrared 880nm, modulated	
Transmit angle STA-... / STB-...		20° / 6°	
Transmit frequency		11700 Hz	
Transmit power		externally adjustable with resistor	
Housing material	nickel plated brass	stainless steel	aluminium anodized
Cable material	-	-	-
Connection plug	M12	M12	M8
Protection class		IP 67	
Operation temperature		-20 °C ... +60 °C	
Vibration		10...55 Hz, 1,5 mm	
Shock		30 g	

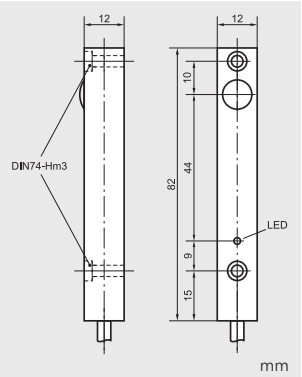
Purchase order table			
Transmit angle 20°			
Connection cable 5 m	-		-
Connection plug	STA-CLN-C4	STA-CLV-C4	STA-LLA-B3
Transmit angle 6°			
Connection cable 5 m	-	-	-
Connection plug	STB-CLN-C4	STB-CLV-C4	STB-LLA-B3

Receiver **SR...** cable version

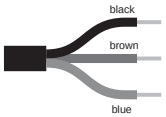
- Transistor output pnp/npn
- Extremely dirt-resistant
- High penetration
- Small design
- High switching accuracy
- Easy adjustment
- Switching behaviour light or dark
- Cable or plug connection





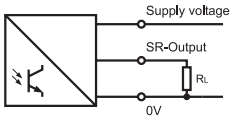


Connection diagram

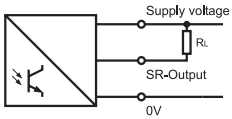


Supply voltage	brown
Ground (0V)	blue
SR-Output	black

pnp-Output



npn-Input



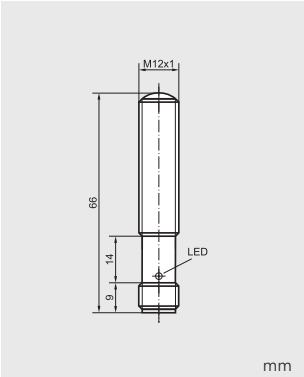
Nickel plated brass thread

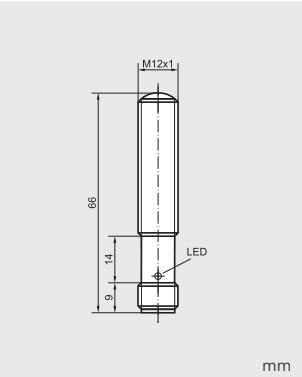
Stainless steel thread

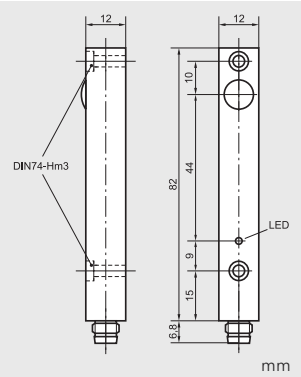
Aluminium anodized

Technical Data (at +20 °C, 24 V DC)			
Range (through beam)		see purchase order table	
Operating voltage		+15 V DC ... +30 V DC	
Current consumption		30 mA	
Opening angle		12°	
Transistor output		pnp / npn, push-pull circuit	
Load		100 mA	
Switching frequency		SRS...: 500 Hz / SRH...: 150 Hz / SRL...: 25 Hz	
Light immunity		60000 LUX	
Housing material	nickel plated brass	stainless steel	Aluminium anodized
Cable material		PVC	
Protection class		IP 67	
Operation temperature		-20 °C ... +60 °C	
Vibration		10...55 Hz, 1,5 mm	
Shock		30 g	
Purchase order table (other cable length or cable materials by request)			
Range: STA-... 1m / STB-... 5m			
Light switching	SRSL-CLN-5	SRSL-CLV-5	SRSL-LLA-5
Dark switching	SRSD-CLN-5	SRSD-CLV-5	SRSD-LLA-5
Range: STA-... 6m / STB-... 20m			
Light switching	SRHL-CLN-5	SRHL-CLV-5	SRHL-LLA-5
Dark switching	SRHD-CLN-5	SRHD-CLV-5	SRHD-LLA-5
Range: STA-... 15m / STB-... 40m			
Light switching	SRLL-CLN-5	SRLL-CLV-5	SRLL-LLA-5
Dark switching	SRLD-CLN-5	SRLD-CLV-5	SRLD-LLA-5

Receiver **SR...** plug version





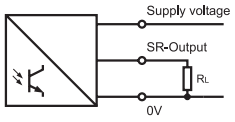


Connection diagram

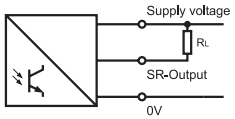
M8 M12

Supply voltage	PIN 1
Ground (0V)	PIN 3
SR-Output	PIN 4

pnp-Output



npn-Output

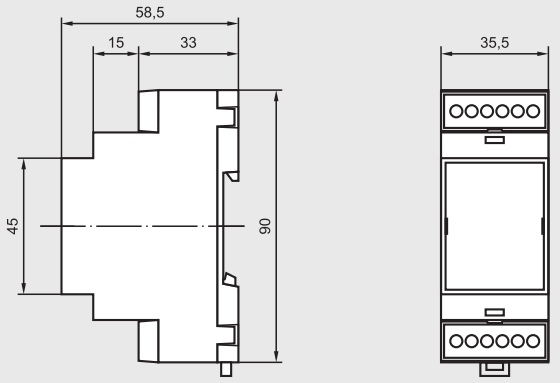


Nickel plated brass thread

Stainless steel thread

Aluminium anodized

Technical Data (at +20 °C, 24 V DC)			
Range (through beam)		see purchase order table	
Operating voltage		+15 V DC ... +30 V DC	
Current consumption		30 mA	
Opening angle		12°	
Transistor output		pnp / npn, push-pull circuit	
Load		100 mA	
Switching frequency		SRS...: 500 Hz / SRH...: 150 Hz / SRL...: 25 Hz	
Light immunity		60000 LUX	
Housing material	nickel plated brass	stainless steel	Aluminium anodized
Connection plug	M12	M12	M8
Protection class		IP 67	
Operation temperature		-20 °C ... +60 °C	
Vibration		10...55 Hz, 1,5 mm	
Shock		30 g	
Purchase order table			
Range: STA-... 1m / STB-... 5m			
Light switching	SRSL-CLN-C4	SRSL-CLV-C4	SRSL-LLA-B3
Dark switching	SRSD-CLN-C4	SRSD-CLV-C4	SRSD-LLA-B3
Range: STA-... 6m / STB-... 20m			
Light switching	SRHL-CLNC4	SRHL-CLV-C4	SRHL-LLA-B3
Dark switching	SRHD-CLN-C4	SRHD-CLV-C4	SRHD-LLA-B3
Range: STA-... 15m / STB-... 40m			
Light switching	SRLL-CLN-C4	SRLL-CLV-C4	SRLL-LLA-B3
Dark switching	SRLD-CLN-C4	SRLD-CLV-C4	SRLD-LLA-B3

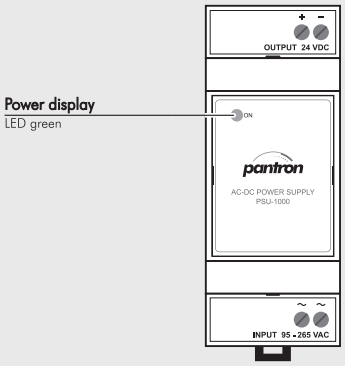


in mm

Power Supply Unit **PSU-1000**

- Wide input voltage range 95 ... 265 V AC / 47 ... 63 Hz
- Output voltage 24 V DC
- Output power 8,4 W
- Overload protection, short circuit proof
- Overtemperature protection
- External fuse is not necessary
- High efficiency >74 %
- Switching on current limiter
- Mounting for DIN rail

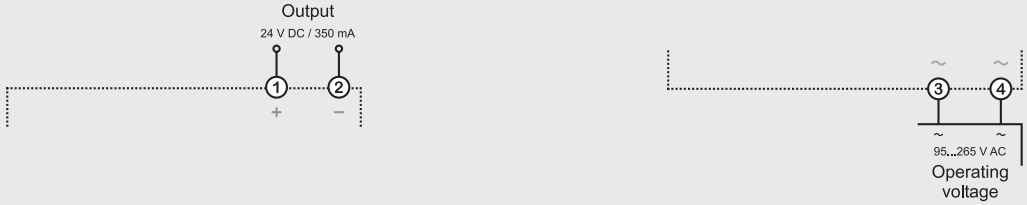
Technical Data (at +20°C)	
Operation voltage	95 V AC ... 265 V AC
Power consumption	max. 8,5 VA
Output voltage	24 V DC, short circuit proof
Voltage tolerance	± 5 %
Load (max.)	400 mA
Housing material	NORYL, grey
Protection class	IP 20
Connection	Screw terminals
Operating temperature	-25 °C ... +50 °C



Purchase order table	
Operating voltage	**Order code**
95 V AC to 265 V AC	PSU-1000S/95...265VAC

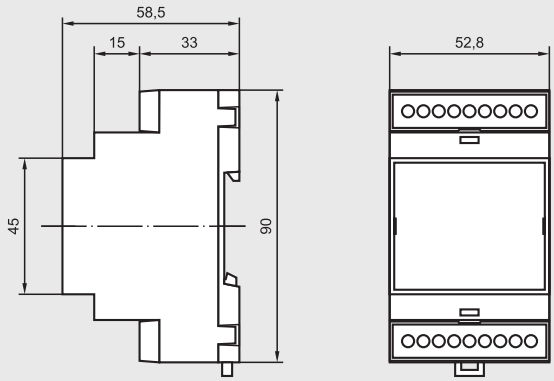
Accessories	
Protective enclosure	PanBox 1x1

Connection diagram

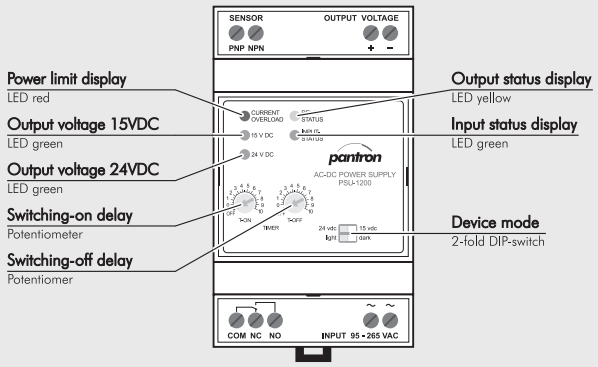


Power supply **PSU-1200**

- Wide input voltage range 95 ... 265 V AC / 47 ... 63 Hz
- Output voltage 15 / 24 V DC
- Output power 10,0 W
- Overload protection, short circuit proof
- Overtemperature protection
- External fuse is not necessary
- High efficiency >74 %
- Switching on current limiter
- Relay output, change over, control with sensor input
- Switching delay for relay output
- Mounting for DIN rail



in mm



Technical Data (at +20°C)	
Operating voltage	95 V AC ... 265 V AC
Power consumption	max. 15 VA
Output voltage	24 V DC / 15 V DC, short circuit proof
Voltage tolerance	± 5 %
Load (max.) 24 V DC	400 mA
15 V DC	650 mA
Switching behavior	light / dark
Switching delay	0 ... 10 s
Parallel connection	yes
Series connection	yes
Input	npn / pnp
switching level npn	20 % of the output voltage
switching level pnp	80 % of the output voltage
Relay output	1 change over
max. operation values	5 A / 230 V AC (24 C DC)
reaction time	8 ms
Housing material	NORYL, grey
Protection class	IP 20
Connection	Screw terminals
Operating temperature	-25 °C ... +50 °C

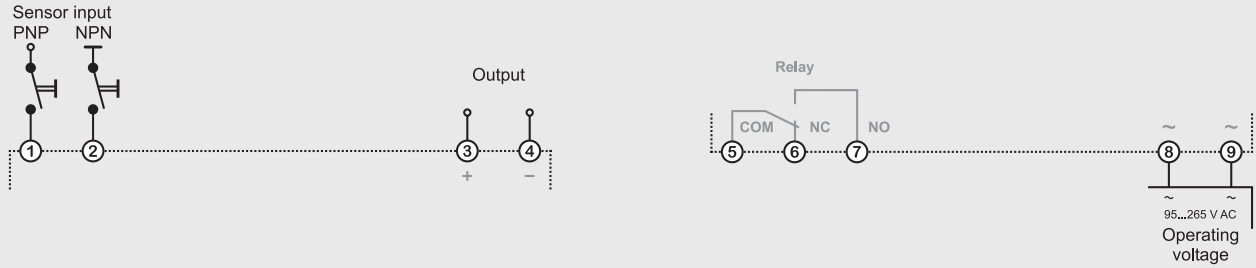
Device mode (Factory setting is marked in white)

1	Output voltage	15 V DC	24 V DC
2	Switching behaviour	light	dark

Purchase order table	
Operating voltage	**Order code**
95 V AC to 265 V AC	PSU-1200S/95...265VAC

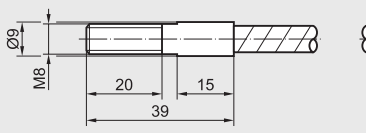
Accessories	
Protective enclosure	PanBox 1x1

Connection diagram

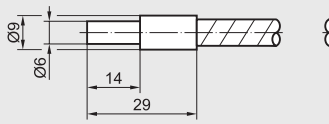


Connection cable

Plug connector M8 with open ended wires, 3-pole	
Description	**Order code**
female straight, PVC, length 3 m	CAB-M8-S3-3
female straight, PVC, length 5 m	CAB-M8-S3-5
female straight, PUR, length 3 m	CAB-M8-S3-P3
female straight, PUR, length 5 m	CAB-M8-S3-P5
female right angle, PVC, length 3 m	CAB-M8-R3-3
female right angle, PVC, length 5 m	CAB-M8-R3-5
female right angle, PUR, length 3 m	CAB-M8-R3-P3
female right angle, PUR, length 5 m	CAB-M8-R3-P5
Plug connector M12 with open ended wires, 3-pole	
Description	**Order code**
Female straight, PVC, length 3 m	CAB-M12-S3-3
Female straight, PVC, length 5 m	CAB-M12-S3-5
Female straight, PUR, length 3 m	CAB-M12-S3-P3
Female straight, PUR, length 5 m	CAB-M12-S3-P5
Female right angle, PVC, length 3 m	CAB-M12-R3-3
Female right angle, PVC, length 5 m	CAB-M12-R3-5
Female right angle, PUR, length 3 m	CAB-M12-R3-P3
Female right angle, PUR, length 5 m	CAB-M12-R3-P5



in mm



in mm

Glass fiber optic cable

Purchase order table	
Description	**Order code**
Cable end M8, stainless coating 1m	FOI-40V70-CB-1
Cable end M8, stainless coating 3m	FOI-40V70-CB-3
Cable end M8, stainless coating 5m	FOI-40V70-CB-5
Cable end Ø6, stainless coating 1m	FOI-40V70-C9/6-1
Cable end Ø6, stainless coating 3m	FOI-40V70-C9/6-3
Cable end Ø6, stainless coating 5m	FOI-40V70-C9/6-5

IR2 IR3 IR3G

Protective glass shield/light shutter

Purchase order table	
Description	**Order code**
Protective glass shield for sensors with M12 thread	IR2
Light shutter Ø1mm for sensors with M12 thread	IR3
Light shutter Ø1mm with protective glass shield for sensors with M12 thread	IR3G

Cleaning air nozzle

Purchase order table	
Description	**Order code**
Attachment with air connection for optic cleaning of sensors with M12 thread	ISO12

Compendium

Ambient light immunity
Ambient light is the light from other light sources . The light immunity is the maximum allowed illumination level from other light sources beyond that which is normally received from the receiver, which will allow the system to work safely.

Dark mode
On dark mode the PNP-Output will switch to operation voltage, when no light comes on the receiver. This is the equivalent of normally open with through beam or retro reflective light barriers and to normally closed with diffuse proximity light barriers.

Infrared light
Infrared light is described as a radiation with a wavelength from 780 nm up to 1500 nm. Above this level is visible light.

Light barrier
A light barrier is an arrangement from one or more light transmitters which one or more light receivers is illuminated by a light beam. The changing of the illumination will be converted to a electrical signal.

Light mode
In light mode the PNP-Output will switch to operation voltage, when light illuminates the receiver. This is the equivalent of normally closed with through beam or retro reflective light barriers and to normally open with diffuse proximity light barriers.

Light proximity
A light proximity is a arrangement from one or more light transmitters which illuminate an object. The light which reflects from the object will be received from one or more light receivers. The changing of the reflective light will be converted to a electrical signal.

Maximum range
The maximum range is the maximum usable distance between transmitter and receiver of a through beam light barrier. The amplifier must be set on the maximum sensitivity and on the highest basic transmit level.

Modulated light
Modulated light changes intensity with a specific frequency (see transmit frequency)

NPN-Output
The npn-output includes a transistor, which the load switches to the ground. The load will be connected between the operation voltage and the SR-output.

Operation voltage
The operation voltage consists of a nominal voltage and a tolerance. The specified nominal voltage is the voltage for which the device is designed. The tolerance is the maximum deviation from the nominal voltage. This information follows the voltage range, within which, the device will reliably work. To exceed or remain under the voltage range is not advised.

PNP-Output
The pnp-output includes a transistor, which the load switches to the operation voltage. The load will be connected between the SR-output and the ground.

Protection class
The protection class describes the protection of the device against the touching, ingress from objects, or moisture according to EN6529. The protection name starts with the character IP (Internation Protection) and the first number as an indicator for direct contact and ingress from objects. The second number is the protection against water. The bigger the number is, the higher is the respective protection.

Push-Pull circuit
The push-pull circuit is a connection from a pnp-output and an npn-output in series. They form a common transistor output where the connection of the load causes one of the two outputs to be activated. Do not connect sensors with a push-pull circuit in parallel.

Reaction time
The time between interruption or clearance of the light beam and the change of the output status is called reaction time

Retro reflective light barrier
A light barrier, where the light from the transmitter is reflected by a reflector back to the receiver. Light transmitter and light receiver are arranged side by side.

Diffuse light proximity
A light proximity, where light transmitter and light receiver are arranged side by side.

ST-Input
The transmitter ST... has an input which can decrease or switch off the transmit power. The transmit power can be decreased with an external resistor (<10 kOhm). If the ST-Input is open or wired with the operating voltage, the transmitter works with the maximum transmit power and if the input is wired with ground (0V), the transmitter is switched off.

Switching frequency
The maximum switching frequency is the maximum number of signal changes at the output per second, when the duty-circle is constant.

Switching behaviour
The switching behaviour describes the behaviour of the switching output when the beam of the light barrier is interrupted or cleared.

Through beam light barrier
A light barrier, which will deliver light from the transmitter to the receiver. Transmitter and receiver are separately arranged.

Transmit frequency
The transmit frequency is the number of light impulses per second.