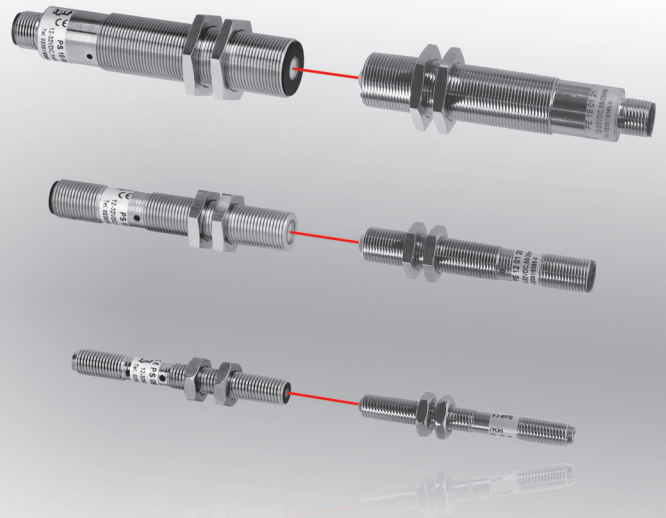


design **M8x1**
M12x1
M18x1

through-beam sensor operating distance **1.5m**
3.0m
5.0m
60.0m



- ✓ recognition of smallest objects
- ✓ high sampling frequency up to 25kHz
- ✓ external adjustable laser power with function test
- ✓ simple alignment with visible red light
- ✓ adjustable sensitivity
- ✓ robust and insensitive to soiling
- ✓ dynamic switching threshold tracking with compensation of the soiling degree
- ✓ exact adjustment with optional angle bracket or flange

switching output / analog output
high precision repeatability



description

All one way receivers on this data sheet have a digital output. This supplies a 24V DC signal, if the path of light between the transmitter and receiver is broken (PNP no / dark-on mode). Alternatively this supplies a 0V signal, if the path of light between the transmitter and receiver is not broken (PNP nc / light-on mode).

The **PE12...** and **PE18...** devices are additionally equipped with an analog output (0 ... 10V DC).The analog voltage changes with the covering of the laser beam. This way, it is possible to conduct challenging measuring tasks and adjustment is made easier. At the same time, with the analog signal, the degree of soiling can be monitored.

The transmitting power of the **PE12...** and **PE18...** through-beam transmitters can be set externally. Normally, when connecting the operating voltage and open test lead (current control input), the transmitting power of the laser is approx. 60%. When connecting the test lead with 0V, the transmitting power is 100%. If a current of between 0V and 5V DC is applied to the test lead, each voltage level can be assigned a designated transmitting power between 100%

and 0%. This way, the response sensitivity of the through-beam sensor can be influenced. With a current of 5V to 24V DC the laser in the transmitter switches itself off. With this input, it is also possible to carry out a function test for the complete through-beam sensor if the output signal of the corresponding through-beam receiver is evaluated.

A special feature of the through beam receiver 'special' version is the automatic tracking of the switching threshold. Consequently, the digital output always switches independently of the degree of soiling of the transmitter or of the receiver, if the light beam is covered up to 90%.

application examples

- ▶ sampling control of articles from tools
- ▶ reference point sensor for positioning tasks
- ▶ scanning of small parts (wires / pegs / drill holes)
- ▶ monitoring for completeness in the case of installation tasks
- ▶ detection of fast moving components
- ▶ measuring tasks via the integration of slit diaphragms

article-no.	PS080070	PS080075
version	through-beam transmitter	through-beam transmitter
operating distance	1.5m	5m
article-no.	PE080170	PE080175
version	through-beam receiver	through-beam receiver
output	pnp, dark-on mode / npn, light-on mode	pnp, dark-on mode / npn, light-on mode
article-no.	PE080270	PE080275
version	through-beam receiver	through-beam receiver
output	pnp, light-on mode / npn, dark-on mode	pnp, light-on mode / npn, dark-on mode
TECHNICAL DATA		
operating distance	1.5m	5m
aperture	0.5mm	1.0mm
resolution *	typical 1% of the aperture size	typical 1% of the aperture size
output *	see above	see above
operating voltage	12 ... 32V DC	12 ... 32V DC
current consumption (w/o load)	≤ 60mA (transmitter) / ≤ 30mA (receiver)	≤ 60mA (transmitter) / ≤ 30mA (receiver)
output current (max. load) *	100mA	100mA
voltage drop (max. load) *	2.0V DC	2.0V DC
transmitting element (pulsed)	laser LED	laser LED
wave length	670nm, red light	670nm, red light
laser class	2	2
sampling frequency *	1kHz	1kHz
display (signal) *	-	-
repeat accuracy *	5µm	10µm
sensitivity adjustment	-	-
transmitting power	-	-
short-circuit protection	+	+
reverse polarity protection	+	+
design	M8x1	M8x1
length (thread/complete)	36mm / 66mm	36mm / 66mm
housing material	nickel-plated brass	nickel-plated brass
lens material	glass	glass
temperature (operation/storage)	-20 ... +50°C / -20 ... +85°C	-20 ... +50°C / -20 ... +85°C
system of protection (EN 60529)	IP67	IP67
connection	M8-connector, 3-pin	M8-connector, 3-pin
connection accessories	e.g. VK200271 , 2m, PUR, angular, LED	e.g. VK200271 , 2m, PUR, angular, LED
mounting accessories (flange)	angle: AP000017 plain: AP000018	angle: AP000017 plain: AP000018
* only receiver		

article-no.	PS120022
version	through-beam transmitter
operating distance	1.5m
article-no.	PE120122
version	through-beam receiver
output	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC
TECHNICAL DATA	
operating distance	1.5m
aperture	0.5mm
resolution *	typical 1% of the aperture size (digital) typical 2% of the aperture size (analog)
output *	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC
operating voltage	12 ... 32V DC
current consumption (w/o load)	≤ 50mA (transmitter) / ≤ 30mA (receiver)
output current (max. load) *	100mA (digital) / 25mA (analog)
voltage drop (max. load) *	2.0V DC
transmitting element (pulsed)	laser LED
wave length	670nm, red light
laser class	2
sampling frequency *	25kHz
display (signal) *	-
repeat accuracy *	5µm (digital) / 10µm (analog)
sensitivity adjustment	-
transmitting power	0V ... 5V DC = 100% ... 0% / 5V ... 24V DC = 0%
short-circuit protection	+
reverse polarity protection	+
design	M12x1
length (thread/complete)	45mm / 75mm
housing material	nickel-plated brass
lens material	glass
temperature (operation/storage)	-20 ... +50°C / -20 ... +85°C
system of protection (EN 60529)	IP67
connection	M12-connector, 4-pin
connection accessories	e.g. VK200321 , 2m, PUR, angular
mounting accessories (flange)	angle: AP000013 plain: AP000014
* only receiver	

article-no.	PS120020	PS120028
version	through-beam transmitter	through-beam transmitter
operating distance	5m	5m
article-no.	PE120120	-
version	through-beam receiver	-
output	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC	-
article-no.	PE120121	PE120128
version	through-beam receiver (tracked)	through-beam receiver (tracked)
output	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC
TECHNICAL DATA		
operating distance	5m	5m
aperture	1.0mm	1.0x2.0mm
resolution *	typical 1% of the aperture size (digital) typical 2% of the aperture size (analog)	typical 1% of the aperture size (digital) typical 2% of the aperture size (analog)
output *	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC
operating voltage	12 ... 32V DC	12 ... 32V DC
current consumption (w/o load)	≤ 50mA (transmitter) / ≤ 30mA (receiver)	≤ 50mA (transmitter) / ≤ 30mA (receiver)
output current (max. load) *	100mA (digital) / 25mA (analog)	100mA (digital) / 25mA (analog)
voltage drop (max. load) *	2.0V DC	2.0V DC
transmitting element (unpulsed)	laser LED	laser LED
wave length	670nm, red light	670nm, red light
laser class	2	2
sampling frequency *	25kHz	25kHz
display (signal) *	-	-
repeat accuracy *	10µm (digital) / 20µm (analog) 1µm (tracked)	2µm (tracked)
sensitivity adjustment	-	-
transmitting power	0V ... 5V DC = 100% ... 0% / 5V ... 24V DC = 0%	0V ... 5V DC = 100% ... 0% / 5V ... 24V DC = 0%
short-circuit protection	+	+
reverse polarity protection	+	+
design	M12x1	M12x1
length (thread/complete)	45mm / 75mm	45mm / 75mm
housing material	nickel-plated brass	nickel-plated brass
lens material	plastik (PK)	glass
temperature (operation/storage)	-20 ... +50°C / -20 ... +85°C	-20 ... +50°C / -20 ... +85°C
system of protection (EN 60529)	IP67	IP67
connection	M12-connector, 4-pin	M12-connector, 4-pin
connection accessories	e.g. VK200321 , 2m, PUR, angular	e.g. VK200321 , 2m, PUR, angular
mounting accessories (flange)	angle: AP000013 plain: AP000014	angle: AP000013 plain: AP000014
* only receiver		

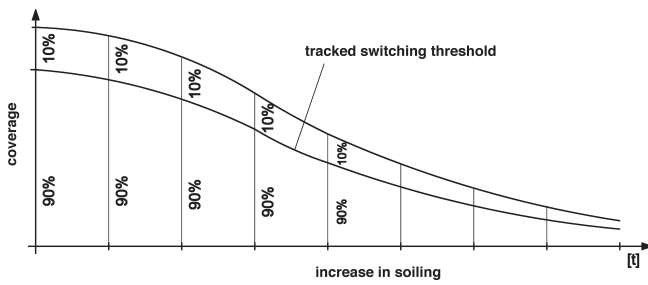
through-beam sensors 1600

article-no.	PS180023	PS180022
version	through-beam transmitter	through-beam transmitter
operating distance	3m	5m
article-no.	PE180123	-
version	through-beam receiver	-
output	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC	-
article-no.	-	PE180122
version	-	through-beam receiver (tracked)
output	-	pnp, light-on mode / npn, dark-on mode 0 ... 10V DC
TECHNICAL DATA		
operating distance	3m	5m
aperture	0.5x4.0mm	1.0x6.5mm
resolution *	typical 1% of the aperture size (digital) typical 2% of the aperture size (analog)	typical 0.5% of the aperture size (digital) typical 1% of the aperture size (analog)
output *	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC
operating voltage	12 ... 32V DC	12 ... 32V DC
current consumption (w/o load)	≤ 50mA (transmitter) / ≤ 40mA (receiver)	≤ 50mA (transmitter) / ≤ 40mA (receiver)
output current (max. load) *	100mA (digital) / 25mA (analog)	100mA (digital) / 25mA (analog)
voltage drop (max. load) *	2.0V DC	2.0V DC
transmitting element (pulsed)	laser LED	laser LED
wave length	670nm, red light	670nm, red light
laser class	2	2
sampling frequency *	5kHz	5kHz
display (signal) *	red LED	red LED
repeat accuracy *	5µm (digital) / 10µm (analog)	- 2µm (tracked)
sensitivity adjustment	potentiometer	potentiometer
transmitting power	0V ... 5V DC = 100% ... 0% / 5V ... 24V DC = 0%	0V ... 5V DC = 100% ... 0% / 5V ... 24V DC = 0%
short-circuit protection	+	+
reverse polarity protection	+	+
design	M18x1	M18x1
length (thread/complete)	60mm / 90mm	60mm / 90mm
housing material	nickel-plated brass	nickel-plated brass
lens material	glass	glass
temperature (operation/storage)	-20 ... +50°C / -20 ... +85°C	-20 ... +50°C / -20 ... +85°C
system of protection (EN 60529)	IP67	IP67
connection	M12-connector, 4-pin	M12-connector, 4-pin
connection accessories	e.g. VK200321 , 2m, PUR, angular	e.g. VK200321 , 2m, PUR, angular
mounting accessories (flange)	angle: AP000015 plain: AP000016	angle: AP000015 plain: AP000016
* only receiver		

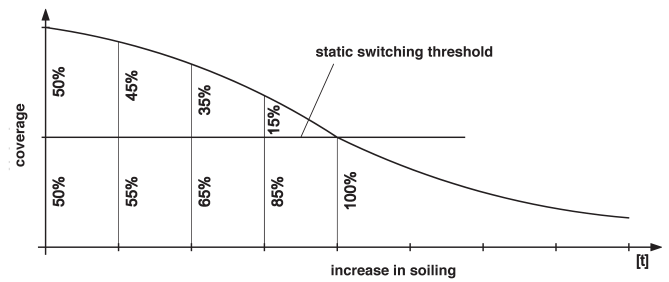
article-no.	PS180020	PS180025
version	through-beam transmitter	through-beam transmitter
operating distance	5m	60m
article-no.	PE180120	PE180125
version	through-beam receiver	through-beam receiver
output	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC
article-no.	PE180121	PE180126
version	through-beam receiver (tracked)	through-beam receiver (tracked)
output	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC
TECHNICAL DATA		
operating distance	5m	60m
aperture	1.0mm	2.0x3.0mm
resolution *	typical 1% of the aperture size (digital) typical 2% of the aperture size (analog)	typical 1% of the aperture size (digital) typical 2% of the aperture size (analog)
output *	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC
operating voltage	12 ... 32V DC	12 ... 32V DC
current consumption (w/o load)	≤ 50mA (transmitter) / ≤ 30mA (receiver)	≤ 50mA (transmitter) / ≤ 30mA (receiver)
output current (max. load) *	100mA (digital) / 25mA (analog)	100mA (digital) / 25mA (analog)
voltage drop (max. load) *	2.0V DC	2.0V DC
transmitting element (pulsed)	laser LED	laser LED
wave length	670nm, red light	670nm, red light
laser class	2	2
sampling frequency *	5kHz	5kHz
display (signal) *	-	-
repeat accuracy *	10µm (digital) / 20µm (analog) 1µm (tracked)	20µm (digital) / 40µm (analog) 2µm (tracked)
sensitivity adjustment	-	-
transmitting power	0V ... 5V DC = 100% ... 0% / 5V ... 24V DC = 0%	0V ... 5V DC = 100% ... 0% / 5V ... 24V DC = 0%
short-circuit protection	+	+
reverse polarity protection	+	+
design	M18x1	M18x1
length (thread/complete)	60mm / 90mm	60mm / 90mm
housing material	nickel-plated brass	nickel-plated brass
lens material	plastik (PK)	glass
temperature (operation/storage)	-20 ... +50°C / -20 ... +85°C	-20 ... +50°C / -20 ... +85°C
system of protection (EN 60529)	IP67	IP67
connection	M12-connector, 4-pin	M12-connector, 4-pin
connection accessories	e.g. VK200321 , 2m, PUR, angular	e.g. VK200321 , 2m, PUR, angular
mounting accessories (flange)	angle: AP000015 plain: AP000016	angle: AP000015 plain: AP000016
* only receiver		

switching threshold diagram

with tracking (special)

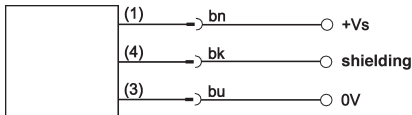


without tracking

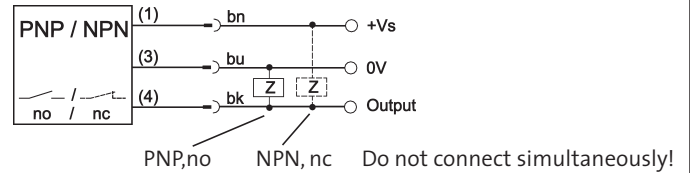


connection

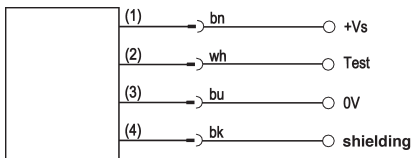
through-beam transmitter, **PS08...**



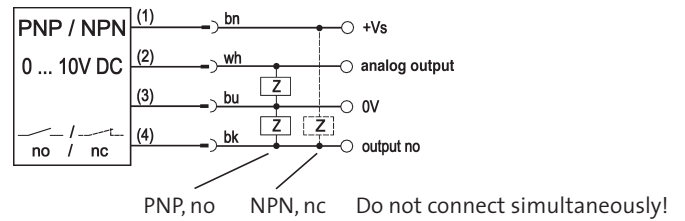
through-beam receiver, **PE08...**



through-beam transmitter, **PS12... and PS18...**



through-beam receiver, **PE12... and PE18...**



wire colors: bn = brown (1), wh = white (2), bu = blue (3), bk = black (4)

test line and transmitting power setting

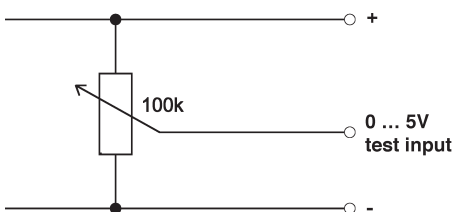
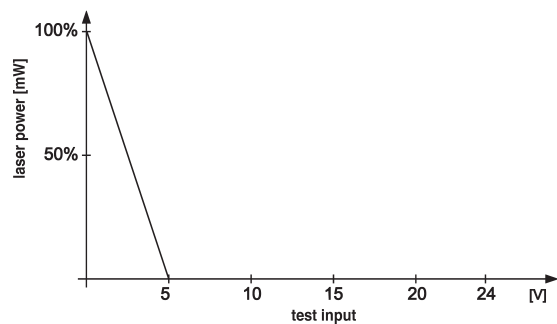


diagram laser power



* test input

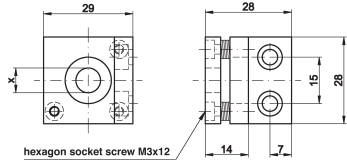
The transmitting power can be controlled via the test input of the sensor!
 test input **0V**: transmitting power **100%**
 test input **0V to 5V**: transmitting power **100% to 0% continuously adjustable**

Voltages at the test input exceeding **5V** will cause the sensor to be **switched off!**

mounting accessories

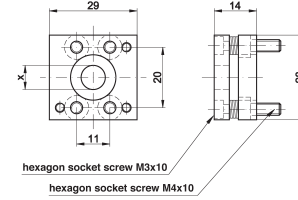
angle flange

AP000017 fitting 8mm

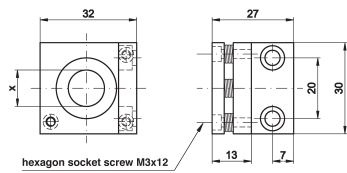


plain flange

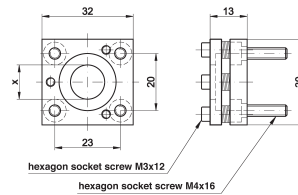
AP000018 fitting 8mm



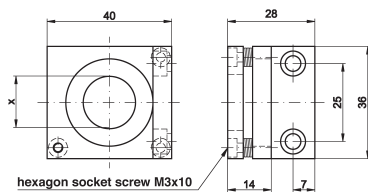
AP000013 fitting 12mm



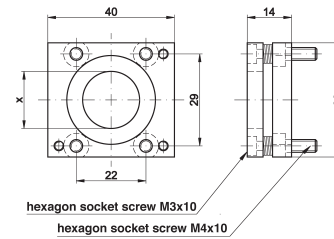
AP000014 fitting 12mm



AP000015 fitting 18mm



AP000016 fitting 18mm



ARTICLE-NO.	DESCRIPTION	SENSOR DIAMETER	MATERIAL	COMMENT
AP000017	angle flange	8mm (measurement x)	aluminium	precise alignment and mounting
AP000018	plain flange	8mm (measurement x)	aluminium	precise alignment and mounting
AP000013	angle flange	12mm (measurement x)	aluminium	precise alignment and mounting
AP000014	plain flange	12mm (measurement x)	aluminium	precise alignment and mounting
AP000015	angle flange	18mm (measurement x)	aluminium	precise alignment and mounting
AP000016	plain flange	18mm (measurement x)	aluminium	precise alignment and mounting

Caution! Laser radiation!
Do not stare into the beam!

Class 2 Laser

according to DIN EN 60825
Wave length 670nm
max. Output < 1mW



This data sheet contains the standard versions only. Kindly request the availability of other output- and connection functions.

We will be pleased to supply the matching cable socket for your devices with connector. Please refer to the list in catalog chapter "accessories" under "cable sockets **ipf-SENSORFLEX**" or search our website www.ipf-electronic.com for "VK".

Warning: Never use these devices in applications where the safety of a person depends on their functionality.