through-beam sensors 1600

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**
- ✓ **sensitivity adjustable**
- ✓ **simple alignment with visible red light**
- ✓ **robust and insensitive to soiling**
- ✓ **dynamic switching threshold tracing 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 closer / dark-on mode). Alternatively this supplies a 0V signal, if the path of light between the transmitter and receiver is not broken (PNP opener / 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.

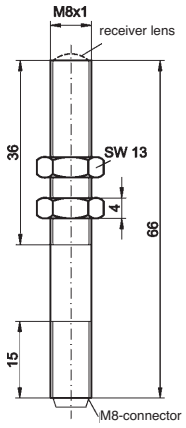
A special feature of the through beam receiver 'special' version is the automatic tracing of the switching threshold. Consequently, the digital output always switches independently of the degree of soiling of the transmitter or of the receiver, if the light beam is covered up to 90%.

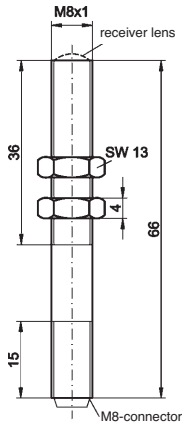
application examples

- 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 screens

1600 through-beam sensors

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	**digital: pnp, no (npn, nc)**	**digital: pnp, no (npn, nc)**



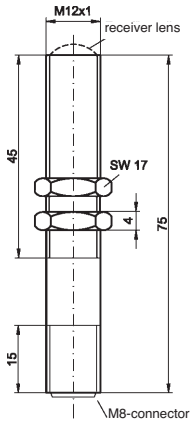


TECHNICAL DATA

operating distance	1.5m	5m
shade	0.5mm	1.0mm
resolution (depends on shade) *	1% of shade size	1% of shade size
output*	digital: pnp,no (npn, nc)	digital: pnp, no (npn, nc)
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	100mA
voltage drop (max. load) *	2.0V DC	2.0V DC
transmitting element	laser-LED, class 2, 45kHz-pulsed, ≤ 1mW	laser-LED, class 2, 45kHz-pulsed, ≤ 1mW
wave length (transmitter)	670nm, red light	670nm, red light
optical filter	interference filter	interference filter
external light limit *	max. 5,000Lux	max. 5,000Lux
sampling frequency *	1kHz	1kHz
display (status) *	-	-
repeatability *	5µm	10µm
repeatability (special) *	-	-
sensitivity setting *	-	-
test line (P_{laser} / test)	-	-
short-circuit protection	+	+
reverse polarity protection	+	+
design	M8x1	M8x1
length (thread/complete)	36mm / 66mm	36mm / 66mm
housing material	brass, nickel-plated	brass, nickel-plated
lens material	glass	glass
temperature (operating/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, angular, LED	e.g. **VK200271**, 2m, angular, LED
mounting accessories	angle: **AP000017** flat: **AP000018**	angle: **AP000017** flat: **AP000018**

* only receiver

article-no.	**PS120022**
version	**through-beam transmitter**
operating distance	**1.5m**
article-no.	**PE120122**
version	**through-beam receiver**
output	**digital: pnp, no (npn, nc) analog: 0 ... 10V DC**



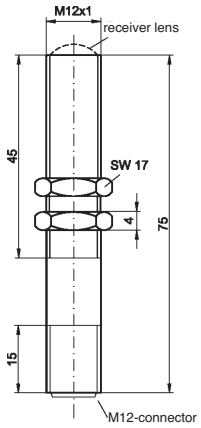
TECHNICAL DATA

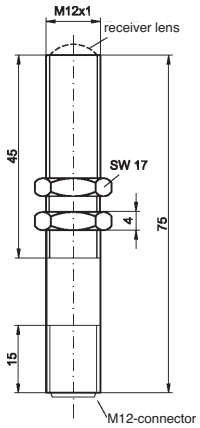
operating distance	1.5m
shade	0.5mm
resolution (depends on shade) *	1% (digital) / 2% (analog)
output*	digital: pnp,no (npn, nc) analog: 0 ... 10V DC
operating voltage	12 ... 32V DC
current consumption (w/o load)	≤ 50mA (transmitter)/ ≤ 30mA (receiver)
output current (max. load) *	100mA (digital) / 25mA (analog)
voltage drop (max. load) *	2.0V DC
transmitting element	laser-LED, class 2, constant light, ≤ 1mW
wave length (transmitter)	670nm, red light
optical filter	interference filter
external light limit *	max. 5,000Lux
sampling frequency *	25kHz
display (status) *	-
repeatability *	5µm (digital) / 10µm (analog)
repeatability (special) *	-
sensitivity setting *	-
test line (P_{laser} / test)	0V ... 5V DC = 100% ... 0% / 5V ... 24V DC = 0%
short-circuit protection	+
reverse polarity protection	+
design	M12x1
length (thread/complete)	45mm / 75mm
housing material	brass, nickel-plated
lens material	glass
temperature (operating/storage)	-20 ... +50°C / -20 ... +85°C
system of protection (EN 60529)	IP67
connection	M8-connector, 4-pin
connection accessories	e.g. **VK200321**, 2m, angular
mounting accessories	angle: **AP000013** flat: **AP000014**

* only receiver

1600 through-beam sensors

article-no.	**PS120020**	**PS120028**
version	**through-beam transmitter**	**through-beam transmitter**
operating distance	**5m**	**5m**
article-no.	**PE120120**	**-**
version	**through-beam receiver**	**-**
output	**digital: pnp, no (npn, nc) analog 0 ... 10V DC**	**-**
article-no.	**PE120121**	**PE120128**
version (special)	**through-beam receiver (tracked)**	**through-beam receiver (tracked)**
output	**digital: pnp, no (npn, nc) analog 0 ... 10V DC**	**digital: pnp, no (npn, nc) analog 0 ... 10V DC**

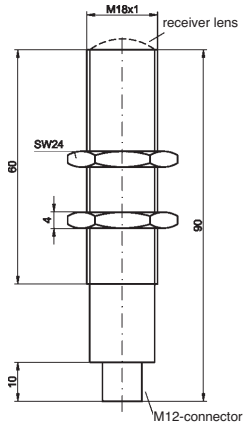


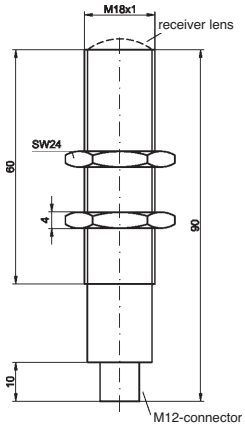


TECHNICAL DATA		
operating distance	5m	5m
shade	1.0mm	2.0x1.0mm
resolution (depends on shade) *	1% (digital) / 2% (analog)	1% (digital) / 2% (analog)
output*	digital: pnp,no (npn, nc) analog: 0 ... 10V DC	digital: pnp,no (npn, nc) analog: 0 ... 10V DC
operating voltage	12 ... 32V DC	12 ... 32V DC
current 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	laser-LED, class 2, constant light, ≤ 1mW	laser-LED, class 2, constant light, ≤ 1mW
wave length (transmitter)	670nm, red light	670nm, red light
optical filter	interference filter	interference filter
external light limit *	max. 5,000Lux	max. 5,000Lux
sampling frequency *	25kHz	25kHz
display (status) *	-	-
repeatability *	10µm (digital) / 20µm (analog)	-
repeatability (special) *	1µm (tracked)	2µm (tracked)
sensitivity setting *	-	-
test line (P_{laser} / test)	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	brass, nickel-plated	brass, nickel-plated
lens material	plastic (PK)	glass
temperature (operating/storage)	-20 ... +50°C / -20 ... +85°C	-20 ... +50°C / -20 ... +85°C
system of protection (EN 60529)	IP67	IP67
connection	M8-connector, 4-pin	M8-connector, 4-pin
connection accessories	e.g. **VK200321**, 2m, angular, LED	e.g. **VK200321**, 2m, angular, LED
mounting accessories	angle: **AP000013** flat: **AP000014**	angle: **AP000013** flat: **AP000014**

* only receiver

article-no.	**PS180023**	**PS180022**
version	**through-beam transmitter**	**through-beam transmitter**
operating distance	**3m**	**5m**
article-no.	**PE180123**	**-**
version	**through-beam receiver**	**-**
output	**digital: pnp, no (npn, nc) analog 0 ... 10V DC**	**-**
article-no.	**-**	**PE180122**
version (special)	**-**	**through-beam receiver (tracked)**
output	**-**	**digital: pnp, no (npn, nc) analog 0 ... 10V DC**



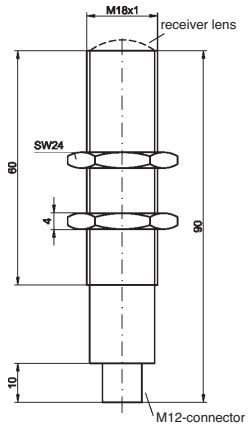


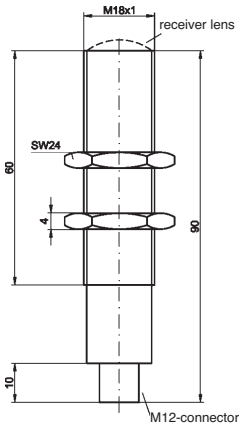
TECHNICAL DATA		
operating distance	3m	5m
shade	0.5x4.0mm	1.0x6.5mm
resolution (depends on shade) *	1% (digital) / 2% (analog)	1% (digital) / 2% (analog)
output*	digital: pnp,no (npn, nc) analog: 0 ... 10V DC	digital: pnp,no (npn, nc) analog: 0 ... 10V DC
operating voltage	12 ... 32V DC	12 ... 32V DC
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	laser-LED, class 2, 45kHz-pulsed, ≤ 1mW	laser-LED, class 2, 45kHz-pulsed, ≤ 1mW
wave length (transmitter)	670nm, red light	670nm, red light
optical filter	interference filter	interference filter
external light limit *	max. 5,000Lux	max. 5,000Lux
sampling frequency *	5kHz	5kHz
display (status) *	LED red	LED red
repeatability *	5µm (digital) / 10µm (analog)	-
repeatability (special) *	-	2µm (tracked)
sensitivity setting *	potentiometer	potentiometer
test line (P_{laser} / test)	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	brass, nickel-plated	brass, nickel-plated
lens material	glass	glass
temperature (operating/storage)	-20 ... +50°C / -20 ... +85°C	-20 ... +50°C / -20 ... +85°C
system of protection (EN 60529)	IP67	IP67
connection	M8-connector, 4-pin	M8-connector, 4-pin
connection accessories	e.g. **VK200321**, 2m, angular, LED	e.g. **VK200321**, 2m, angular, LED
mounting accessories	angle: **AP000015** flat: **AP000016**	angle: **AP000015** flat: **AP000016**

* only receiver

1600 through-beam sensors

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	**digital: pnp, no (npn, nc) analog 0 ... 10V DC**	**digital: pnp, no (npn, nc) analog 0 ... 10V DC**
article-no.	**PE180121**	**PE180126**
version (special)	**through-beam receiver (tracked)**	**through-beam receiver (tracked)**
output	**digital: pnp, no (npn, nc) analog 0 ... 10V DC**	**digital: pnp, no (npn, nc) analog 0 ... 10V DC**



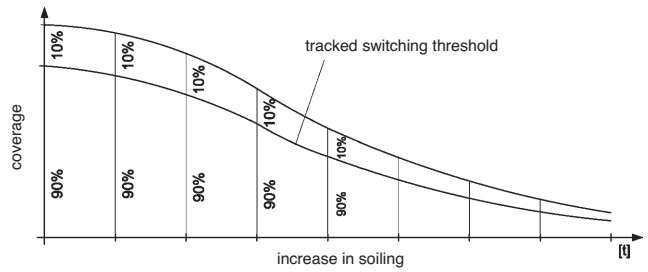


TECHNICAL DATA		
operating distance	5m	60m
shade	1.0mm	2.0x3.0mm
resolution (depends on shade) *	1% (digital) / 2% (analog)	1% (digital) / 2% (analog)
output*	digital: pnp,no (npn, nc) analog: 0 ... 10V DC	digital: pnp,no (npn, nc) analog: 0 ... 10V DC
operating voltage	12 ... 32V DC	12 ... 32V DC
current 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	laser-LED, class 2, 45kHz-pulsed, ≤ 1mW	laser-LED, class 2, 45kHz-pulsed, ≤ 1mW
wave length (transmitter)	670nm, red light	670nm, red light
optical filter	interference filter	interference filter
external light limit *	max. 5,000Lux	max. 5,000Lux
sampling frequency *	5kHz	5kHz
display (status) *	-	-
repeatability *	10µm (digital) / 20µm (analog)	20µm (digital) / 40µm (analog)
repeatability (special) *	1µm (tracked)	2µm (tracked)
sensitivity setting *	-	-
test line (P_{laser} / test)	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	brass, nickel-plated	brass, nickel-plated
lens material	plastic (PK)	glass
temperature (operating/storage)	-20 ... +50°C / -20 ... +85°C	-20 ... +50°C / -20 ... +85°C
system of protection (EN 60529)	IP67	IP67
connection	M8-connector, 4-pin	M8-connector, 4-pin
connection accessories	e.g. **VK200321**, 2m, angular, LED	e.g. **VK200321**, 2m, angular, LED
mounting accessories	angle: **AP000015** flat: **AP000016**	angle: **AP000015** flat: **AP000016**

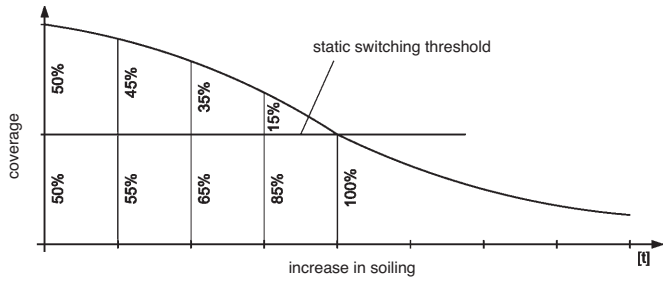
* only receiver

switching threshold diagram

with tracking (special)

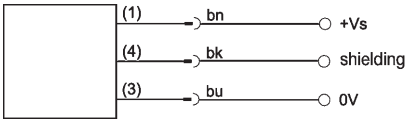


without tracking

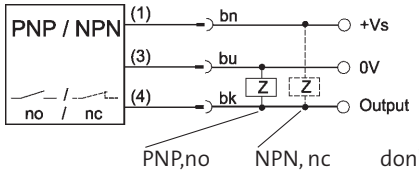


connection

through-beam transmitter, **PS08**

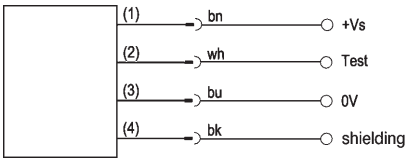


through-beam receiver, **PE08**

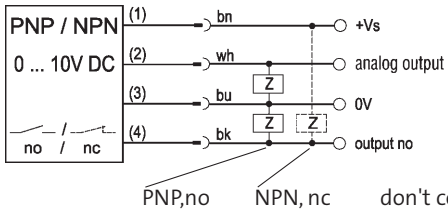


don't connect simultaneously!

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



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



don't connect simultaneously!

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

test line and transmitting power setting

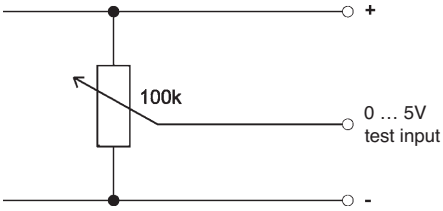
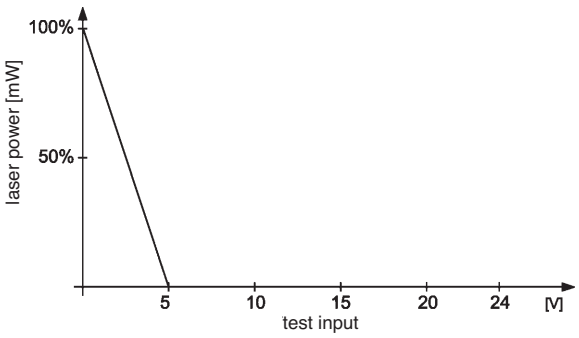


diagram laser power

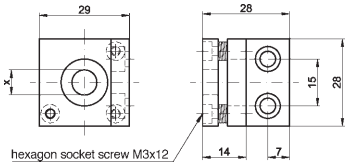


1600 through-beam sensors

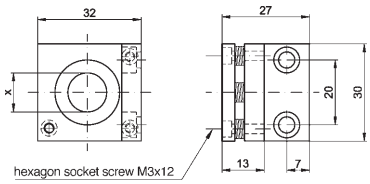
mounting accessories

angle bracket

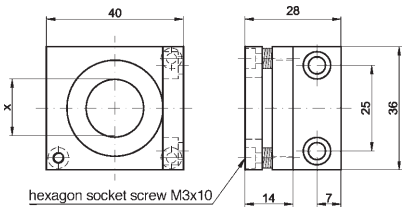
AP000017 fitting 8mm



AP000013 fitting 12mm

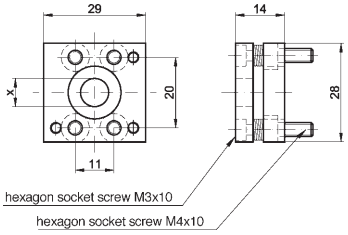


AP000015 fitting 18mm

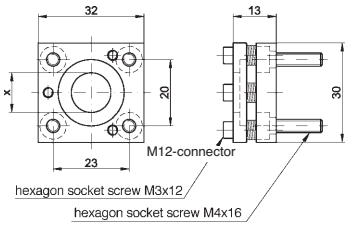


flange

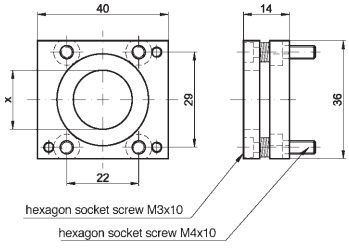
AP000018 fitting 8mm



AP000014 fitting 12mm



AP000016 fitting 18mm



ARTICLE-NO.	DESCRIPTION	SENSOR DIAMETER	MATERIAL	NOTES
AP000017	angle bracket	8mm (measurement X)	aluminium	precision angle and alignment
AP000018	flange	8mm (measurement X)	aluminium	precision angle and alignment
AP000013	angle bracket	12mm (measurement X)	aluminium	precision angle and alignment
AP000014	flange	12mm (measurement X)	aluminium	precision angle and alignment
AP000015	angle bracket	18mm (measurement X)	aluminium	precision angle and alignment
AP000016	flange	18mm (measurement X)	aluminium	precision angle and alignment

CAUTION, Laser Radiation
Do not stare into Beam

Laser-Diode

Wave length 675nm
maximum output power< 1mW
Class 2 Laser Product

The list of articles contains the available versions only. Kindly request the availability of other output 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 for "VK".

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