

dimensions	20.4 x 65 x 50mm	
dif. reflection sensors (point)	measuring range	up to 1000mm
dif. reflection sensors (line)	measuring range	up to 1000mm

- ✓ color and soiling independent distance measurement via laser power tracking
- ✓ several measuring ranges
- ✓ excellent linearity thanks to integrated microprocessor
- ✓ high measurement resolution
- ✓ robust metal housing
- ✓ visible red light laser with glass lens
- ✓ laser protection class 2
- ✓ rotatable M12-connector, 5-pin



**analog signal 4 to 20mA / 0 to 10V
line and point-shaped laser beam**

analog

Alarm

DC

description

ipf laser distance sensors of the PT65 series use the triangulation principle for measurement. The compact sensors with integrated microprocessor provide a precise output signal, which is proportional to the distance measured. An intelligent signal analysis enables the sensor to operate precisely irrespective of color and surface structure. This results in very exact measured values.

Distances to rough surfaces can be measured reliably using a device that operates with a fine laser line instead of a laser spot. The evaluation electronics calculate a mean value for the illuminated area.

When it is turned on, the sensor checks if a current is flowing at the current output. If this is the case, the current output is activated, if not, the voltage output is activated after 100msec.

The implemented power tracking of the laser exposure ensures that the same signal quality is always maintained on light and dark surfaces, making the sensor "color blind". In addition, that also compensates for possible soiling of the lens.

A PNP switching signal triggers the alarm output if the measuring range is left. This is additionally signalled by a red LED lighting up.

With all triangulation sensors it must be ensured that the laser spot remains visible to the receiver lens at all times and that no obstacles are in front of the receiver lens.

The sensor can always be aligned easily and exactly using the small, visible laser spot.

application examples

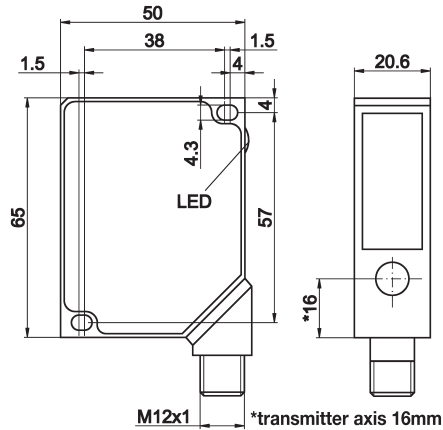
- ▶ monitoring and highly precise measurement of object heights
- ▶ contactless position and thickness measurement of small and large parts
- ▶ color independent recognition of position changes of miscellaneous objects
- ▶ precise measurement and positioning tasks in several application areas

article-no.	PT650020	PT650021
version	diffuse reflection sensor, laser spot	diffuse reflection sensor, laser spot
operating range	30 ... 50mm	30 ... 130mm
article-no.	PT653020	PT653021
version	diffuse reflection sensor, laser line	diffuse reflection sensor, laser line
operating range	30 ... 50mm	30 ... 130mm
TECHNICAL DATA		
measuring range	30 ... 50mm	30 ... 130mm
light beam form	spot: 1 ... 0.4mm line (wxh): (1 ... 0.4mm) x 2mm	spot: 2 ... 1mm line (wxh): (2 ... 1mm) x (3 ... 5mm)
alarm output	pnp, no	pnp, no
output signal	0 ... 10V DC / 4 ... 20mA	0 ... 10V DC / 4 ... 20mA
operating voltage	+Vs= 12 ... 28V DC	+Vs= 12 ... 28V DC
current consumption	≤ 100mA	≤ 100mA
load resistance	voltage: > 100kΩ current: <(+Vs-6V)/20mA	voltage: > 100kΩ current: <(+Vs-6V)/20mA
output current (max. load)	100mA (alarm)	100mA (alarm)
transmitting element (pulsed)	laser diode, red light, 650nm	laser diode, red light, 650nm
laser class	2	2
resolution	<0.01mm	0.05 ... 0.07mm
linearity deviation	±0.03mm	±0.15 ... ±0.22mm
response/decay time	< 10ms	< 10ms
display (operation)	green LED	green LED
display (soiling)	red LED, flashing	red LED, flashing
display (alarm)	red LED, constant	red LED, constant
adjustment	-	-
short-circuit protection	+	+
reverse polarity protection	+Vs / GND	+Vs / GND
dimensions	20.4x65x50mm	20.4x65x50mm
housing material	zinc diecast	zinc diecast
front screen material	glass	glass
operating temperature	0 ... +50°C	0 ... +50°C
degree of protection (EN 60529)	IP67	IP67
connection	M12-connector, 5-pin, rotatable	M12-connector, 5-pin, rotatable
connection accessories	e.g. VK205625	e.g. VK205625
mounting accessories (bracket)	AP000031	AP000031

article-no.	PT650022	PT650023
version	diffuse reflection sensor, laser spot	diffuse reflection sensor, laser spot
operating range	50 ... 250mm	100 ... 500mm
article-no.	PT653022	PT653023
version	diffuse reflection sensor, laser line	diffuse reflection sensor, laser line
operating range	50 ... 250mm	100 ... 500mm
TECHNICAL DATA		
measuring range	50 ... 250mm	100 ... 500mm
light beam form	spot: 2mm line (wxh): 2.5mm x (4 ... 10mm)	spot: 2mm line (wxh): 2.5mm x (5.5 ... 18mm)
alarm output	npn, no	npn, no
output signal	0 ... 10V DC / 4 ... 20mA	0 ... 10V DC / 4 ... 20mA
operating voltage	+Vs= 12 ... 28V DC	+Vs= 12 ... 28V DC
current consumption	≤ 100mA	≤ 100mA
load resistance	voltage: > 100kΩ current: <(+Vs-6V)/20mA	voltage: > 100kΩ current: <(+Vs-6V)/20mA
output current (max. load)	100mA (alarm)	100mA (alarm)
transmitting element (pulsed)	laser diode, red light, 650nm	laser diode, red light, 650nm
laser class	2	2
resolution	0.1 ... 0.3mm	0.2 ... 0.5mm
linearity deviation	±0.3 ... ±0.8mm	±0.8 ... ±2mm
response/decay time	< 10ms	< 10ms
display (operation)	green LED	green LED
display (soiling)	red LED, flashing	red LED, flashing
display (alarm)	red LED, constant	red LED, constant
adjustment	-	-
short-circuit protection	+	+
reverse polarity protection	+Vs / GND	+Vs / GND
dimensions	20.4x65x50mm	20.4x65x50mm
housing material	zinc diecast	zinc diecast
front screen material	glass	glass
operating temperature	0 ... +50°C	0 ... +50°C
degree of protection (EN 60529)	IP67	IP67
connection	M12-connector, 5-pin, rotatable	M12-connector, 5-pin, rotatable
connection accessories	e.g. VK205625	e.g. VK205625
mounting accessories (bracket)	AP000031	AP000031

article-no.	PT650024
version	diffuse reflection sensor, laser spot
measuring range	200 ... 1000mm

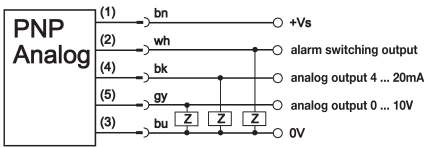
article-no.	PT653024
version	diffuse reflection sensor, laser line
measuring range	200 ... 1000mm



TECHNICAL DATA

measuring range	200 ... 1000mm
light beam form	spot: 2mm line (wxh): 2.5mm x (8.5 ... 35mm)
alarm output	pnp, no
output signal	0 ... 10V DC / 4 ... 20mA
operating voltage	+Vs= 12 ... 28V DC
current consumption	≤ 100mA
output current (max. load)	100mA (alarm)
load resistance	voltage: > 100kΩ current: < (+Vs-6V)/20mA
transmitting element (pulsed)	laser diode red light, 650nm
laser class	2
resolution	0.6 ... 2.5mm
linearity deviation	±2.4 ... ±10mm
response/decay time	< 10ms
display (operation)	green LED
display (soiling)	red LED, flashing
display (alarm)	red LED, constant
adjustment	-
short-circuit protection	+
reverse polarity protection	+Vs / GND
dimensions	20.4x65x50mm
housing material	zinc diecast
front screen material	glass
operating temperature	0 ... +50°C
degree of protection (EN 60529)	IP67
connection	M12-connector, 5-pin, rotatable
connection accessories	e.g. VK205625
mounting accessories (bracket)	AP000031

connection



wire colors: bn = brown (1), wh = white (1), bu = blue (3), bk = black (4), gy = gray (5)

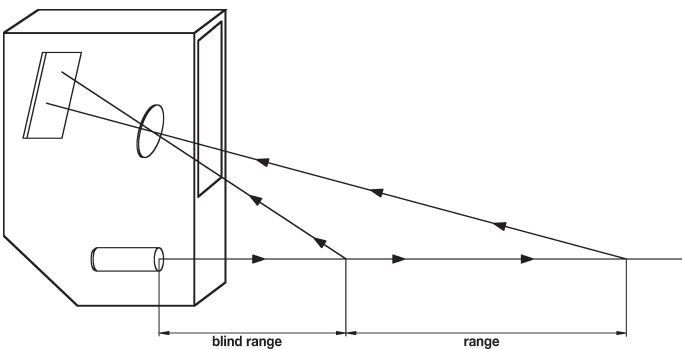
Warning

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

laser class 2

according to DIN EN 60825
 wavelength 630 ... 680nm
 max. output power 1mW

triangulation principle

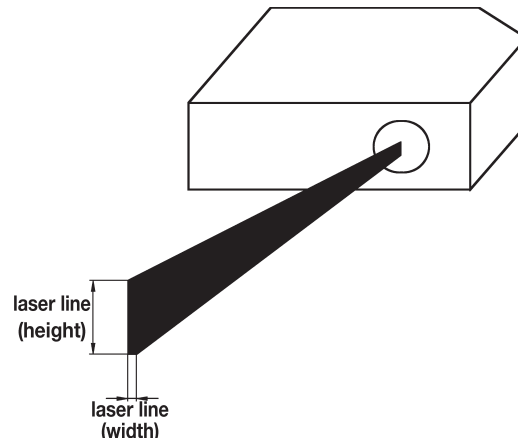
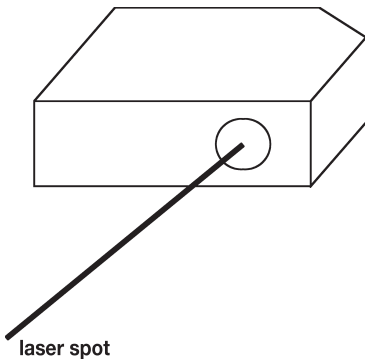


The distance measurement is based on the triangulation principle. The laser beam is emitted by the transmitter diode and hits the object as a small spot. The sensor's receiver element detects the position of this spot within the "detection range". The sensor basically measures the angle of this position and then calculates the adequate distance. There is a "blind range" directly in front of the sensor where the objects are not reliably recognized.

light beam form

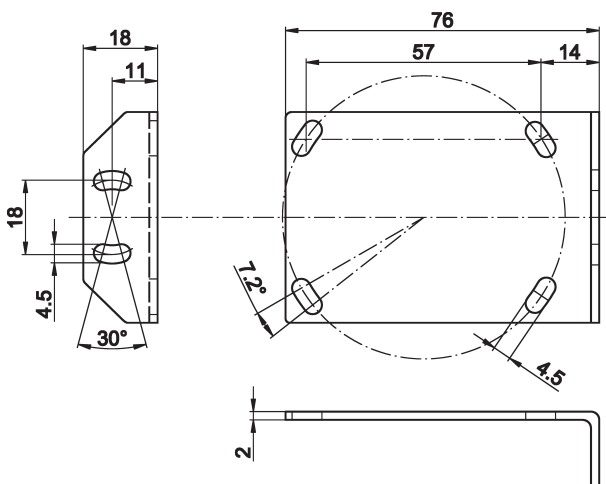
laser spot

laser line



	PT650020	PT650021	PT650022	PT650023	PT650024
laser spot \varnothing	1 ... 0.4mm	2 ... 1mm	2mm	2mm	2mm
	PT653020	PT653021	PT653022	PT653023	PT653024
laser line (width)	1 ... 0.4mm	2 ... 1mm	2.5mm	2.5mm	2.5mm
laser line (height)	2mm	3 ... 5mm	4 ... 10mm	5.5 ... 18mm	8.5 ... 35mm

mounting bracket AP000031



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 for "VK".

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

This data sheet as well as your personal contact can be found at www.ipf-electronic.com