

► **inductive high temperature sensors  
up to +180°C**

**flush, non-flush, all-metal**



## inductive sensors from -25 to max. +180°C

design	sensing range Sn [mm]							flush	non-flush	length [mm]	10 ... 30V DC / pnp	7 ... 30V DC / pnp	10 ... 35V DC / pnp	silicone-cable	teflon-cable	M12-connector	M12-cable connector	lemo-mini-connector	lemo-connector	page	
	2	3	4	5	8	10	15														
M8x1	X							X		60							X				7
M12x1		X						X		56...76				X	X	X	X		X		7-8
M12x1			X					X		60...80				X	X	X	X				8-9
M18x1				X				X		70...84.5				X	X	X	X			X	9-10
M18x1					X			X		77...91				X	X	X	X				10-11
M30x1.5						X		X		70...85				X	X	X	X			X	11-13
M30x1.5							X		X	79...94				X	X	X	X			X	13-14

## inductive all-metal sensors from -25 to max. +130°C

M12x1	X			X				X		59...71		X		X		X		X			15
M18x1			X					X		71...83		X		X					X		16
M30x1.5					X			X		71...83		X		X					X		16
12x12x66	X					X		X		66	X								X		17

## ACCESSORIES

cable sockets																					18
connection, fixing material																					19



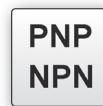
design  
**M8 x 1**  
**M12 x 1mm**  
**M18 x 1mm**  
**M30 x 1.5mm**  
**12 x 12 x 66mm**

flush  
 non-flush  
 measuring range  
 measuring range  
**2 to 10mm**  
**4 to 15mm**



- ✓ innovation by ipf-electronic
- ✓ all-metal sensors all around (sleeve, front- and backside) made of stainless steel
- ✓ with integrated amplifier
- ✓ connection with cable, M12- or lemo-connector

**active face made of stainless steel or vectra® devices usable up to +180°C**



### description

Inductive high temperature sensors are available with integrated amplifiers in the M8, M12, M18 and M30 designs. The maximum ambient temperature, depending on the version, can lie between +130°C and +180°C. The devices are available with silicone or teflon cables and also with M12 or lemo-connectors.

On the active faces, devices with full metal housings are absolutely impermeable to fluids and gasses, against which the entire housing material is resistant.

They are much more resistant to mechanical loads than conventional proximity switches. Easy cleaning with a stream jet is also satisfied.

To obtain the maximum sensing range, pay attention to the size of the object (standard target) and its surface finish (even surface).

### application examples

- integration in machine parts under rough industrial conditions
- robotics applications in welding plants
- detection of hot workpieces in the steel industry, in foundries and glass manufacture
- positioning hot parts in handling and conveying systems
- foodstuffs industry, chemical industry

**notes on inductive proximity switches****I inductive sensor**

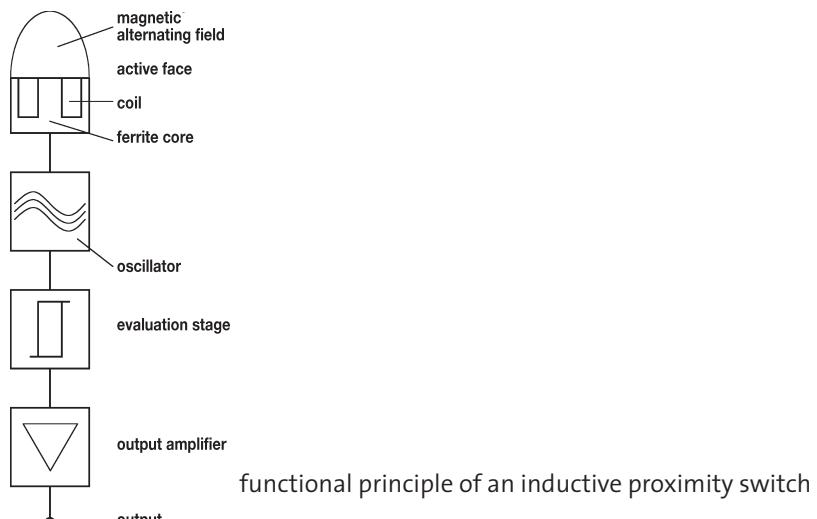
- IB** flush
- IC** flush, all-metal
- IN** non-flush

**function**

The oscillation coil behind the active surface of the proximity switch produces an alternating electromagnetic rotational current field. Any electrically conductive material entering the field will induce rotational currents extracting energy from the oscillating circuit. The damping of the oscillator is then converted into a switch signal in the output amplifier.

It follows from the functional principle that all metals are detected, moving or not.

**Important:** The high frequency field produces no measurable increase in temperature and no magnetic influence inside the object to be detected. That means the sensors operate without interacting with the system.

**sensing range / norm trimming plate**

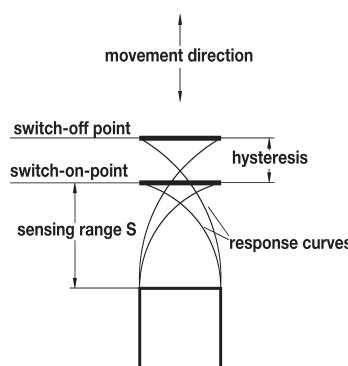
The distance to the sensor surface, where a metal causes a change in the state, is called sensing range. This range is not the same for all metals. That is why a so-called correction factor has been specified for the respective metal, e.g. copper or aluminium. The nominal sensing range is determined by a norm trimming plate. This is a quadratic metal plate made from steel (St37) with a thickness of 1mm and a smoothed face for determining the sensing range  $S_n$ . The edge length is  $3 \times S_n$  if  $3 \times S_n$  is larger than the diameter of the active face, otherwise the edge length is the same as the diameter of the active face.

One differentiates between the normal sensing range  $S_n$ , which is determined without consideration for manufacturing tolerances or external influences, and the operational sensing range  $S_o$ .

The safe operational sensing range is between 0 and 81% of  $S_n$  ( $0 < S_o < 0.81 \times S_n$ ).

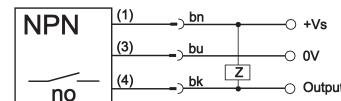
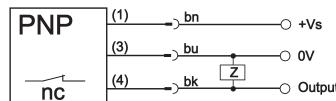
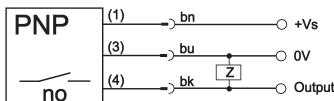
**hysteresis**

During the approach and subsequent removal of the measuring plate from the initiator there will be a difference between switch-on point and switch-off point. This integrated hysteresis prevents the switching output from oscillating during mechanical vibrations. Usually the hysteresis is between 5 to 15% of  $S_n$ .



**output circuit**

For the switching outputs of direct current devices a differentiation is made between **PNP** and **NPN**. For **PNP** outputs the load is connected in such a way that it is energized (positive switching) when the sensor is driven to full output (damping). **NPN** devices maintain their load permanently energized, switching the earth connection only (negative switching). A corresponding wiring diagram has been enclosed with every sensor.

**connection in series**

When a number of sensors are connected in series, the voltage drop of each device should be taken into account in order to ensure that the final device also receives the required operating voltage. The internal electronics permits a maximum of 3 devices to be connected in series.

To be operationally safe the connection in series of 3-wire PNP sensors requires a logical AND-gate, e.g. the **VL250100**.

**connection in parallel**

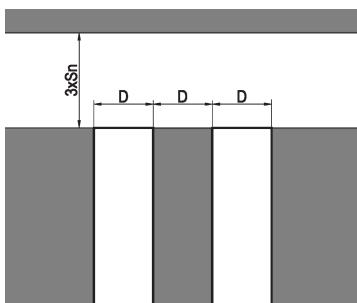
When connecting 3-wire PNP sensors in parallel, the internal resistance of the sensor that is driven to full output influences the other proximity switches. This requires decoupling diodes to be inserted into the outputs. A logical OR-gate, e.g. the **VL250120**, can be used to facilitate the connection in parallel.

**mounting**

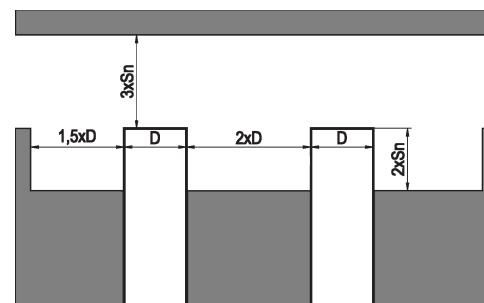
Please follow the mounting instructions for flush or non-flush sensors when installing inductive proximity switches into a metal carrier material to avoid undefined switching of the device. For a flush device the active face may be on one level with the carrier material.

Non-flush sensors must protrude. As a rule of thumb use 2x the nominal sensing range of the sensor.

mounting parameters for flush sensors



mounting parameters for non-flush sensors

**sampling frequency**

The sampling frequency states the maximum number of available switching operations per second. Every switching operation of the inductive proximity switch causes the oscillating circuit to move.

The time needed for this puts a limit on the sampling frequency.

For half the nominal sensing range the pulse to pause ratio should be at least 1:2.

When choosing the right proximity switch, a compromise needs to be made between the size of the sensor and the sampling frequency. General rule: The larger the sensor, the smaller the sampling frequency.



**torque range**

To avoid damage when mounting proximity switches, never exceed the tightening torque given.

**metal threads**

M8	=	6Nm
M12	=	10Nm
M18	=	25Nm
M30	=	40Nm

**active zone/ active face:**

The active zone is the area in front of the active face, within which the proximity switch reacts to the approach of metal parts, i.e. changes the state of the output.

**nominal sensing range ( $S_n$ ):**

The distance, at which a metal part that is approaching the active face of the proximity switch causes a change in the state of the switching output.

**repeatability:**

Repeat accuracy of two measurements under standardized conditions. The difference in the measured values should be less than 10%.

**output function:**

normally open contact: object within the area of the active zone – output switched

normally closed contact: object within the area of the active zone – output inhibited

**power-on delay time:**

The time required by the proximity switch after the supply voltage has been applied before it is ready for operation (lies in the millisecond range).

**correction factors**

Specify the reduction in the sensing range, if materials other than steel are used. The variance in the sensing range depends on the type, composition (internal structure), size and geometry of the material to be detected.

Typical correction factors: steel: 1, stainless steel: approx. 0.7, brass: approx. 0.4, aluminium: approx. 0.3, copper: approx. 0.2

In order to establish the approximate sensing range of materials that deviate from steel, it is necessary to multiply the sensing range for steel by the corresponding correction factor.

**repeat accuracy**

The repeat accuracy (according to IEC 60947-5-2 / EN 60947-5-2) is the repeat accuracy of the real sensing range  $S_r$  over a period of 8 hours at an ambient temperature of  $(23 \pm 5)^\circ\text{C}$  and a defined operating voltage  $V_s$ . The specified repeat accuracy corresponds to this definition. Generally the repeat accuracy is importantly better in case of sequent measurements.

**reverse polarity protection:**

An internal protection prevents the proximity switch being destroyed if the connecting leads are inverted.

**short-circuit protection:**

An internal protection prevents the proximity switch being destroyed in the event of overcurrent.

**switch-point drift:**

The switch-point shifts due to the change in ambient temperature.

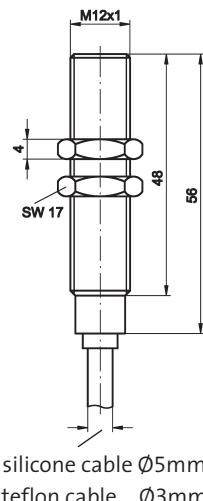
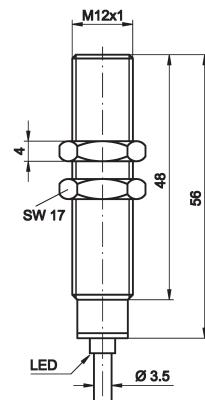
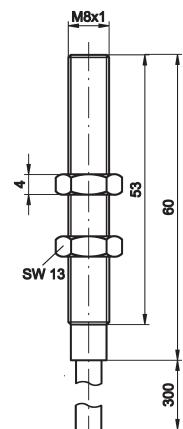
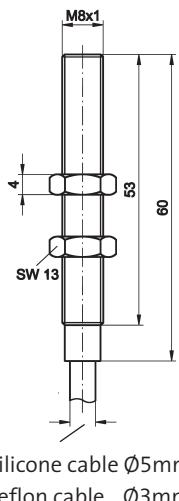
**warning:**

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



## high temperature sensors 2300

operating range	2mm	2mm	3mm	3mm
output signal	pnp, no	pnp, no	pnp, no	pnp, no
operating temperature	-25 ... +140°C	-25 ... +140°C	-25 ... +130°C	-25 ... +150°C
mounting	flush	flush	flush	flush
2m silicone cable	IB080150	-	IB120155	IB120150
5m silicone cable	IB080151	-	IB120156	IB120151
10m silicone cable	IB080152	-	IB120157	IB120152
2m teflon cable	IB0801T0	-	-	IB1201T0
5m teflon cable	IB0801T1	-	-	IB1201T1
10m teflon cable	IB0801T2	-	-	IB1201T2
M12-connector	-	IB08012W		



## TECHNICAL DATA

sensing range	2mm	2mm	3mm	3mm
output signal	pnp, no	pnp, no	pnp, no	pnp, no
operating voltage	10 ... 35V DC	10 ... 35V DC	10 ... 35V DC	10 ... 35V DC
current consumption (w/o load)	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
output current (max. load)	80mA	80mA	120mA	120mA
voltage drop (max. load)	2.0V DC	2.0V DC	2.0V DC	2.0V DC
hysteresis	3 ... 15%	3 ... 15%	3 ... 15%	3 ... 15%
sampling frequency	600Hz	600Hz	500Hz	500Hz
display (signal)	-	-	yellow LED	-
short-circuit protection	+	+	+	+
reverse polarity protection	+	+	+	+
design	M8x1	M8x1	M12x1	M12x1
housing material	stainless steel	stainless steel	stainless steel	stainless steel
front cap material	vectra®	vectra®	vectra®	vectra®
length (thread/complete)	53mm / 60mm	53mm / 60mm	48mm / 56mm	48mm / 56mm
operating temperature	-25 ... +140°C	-25 ... +140°C	-25 ... +130°C	-25 ... +150°C
system of protection (EN 60529)	IP65	IP65	IP65	IP65
connection	see above	see above	see above	see above
connection accessories	-	e.g. VK50H026, 5m polyolefin, straight	-	-
mounting accessories (clip)	AY000098	AY000098	AY000099	AY000099



# inductive sensors

## 2300 high temperature sensors



operating range	3mm	3mm	4mm	4mm
output signal	pnp, no	pnp, no	pnp, no	pnp, no
operating temperature	-25 ... +150°C	-25 ... +150°C	-25 ... +130°C	-25 ... +150°C
mounting	flush	flush	non-flush	non-flush
2m silicone cable	-	-	IN120155	IN120150
5m silicone cable	-	-	IN120156	IN120151
10m silicone cable	-	-	IN120157	IN120152
2m teflon cable	-	-	-	IN1201T0
5m teflon cable	-	-	-	IN1201T1
10m teflon cable	-	-	-	IN1201T2
M12-connector	-	IB12012W	-	-
lemo-mini-connector	IB1201L0	-	-	-
<b>TECHNICAL DATA</b>				
sensing range	3mm	3mm	4mm	4mm
output signal	pnp, no	pnp, no	pnp, no	pnp, no
operating voltage	10 ... 35V DC	10 ... 35V DC	10 ... 35V DC	10 ... 35V DC
current consumption (w/o load)	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
output current (max. load)	120mA	120mA	120mA	120mA
voltage drop (max. load)	2.0V DC	2.0V DC	2.0V DC	2.0V DC
hysteresis	3 ... 15%	3 ... 15%	3 ... 15%	3 ... 15%
sampling frequency	500Hz	500Hz	500Hz	500Hz
display (signal)	-	-	yellow LED	-
short-circuit protection	+	+	+	+
reverse polarity protection	+	+	+	+
design	M12x1	M12x1	M12x1	M12x1
housing material	stainless steel	stainless steel	stainless steel	stainless steel
front cap material	vectra®	vectra®	vectra®	vectra®
length (thread/complete)	65mm / 73mm	54mm / 76mm	48mm / 60mm	48mm / 60mm
operating temperature	-25 ... +150°C	-25 ... +150°C	-25 ... +130°C	-25 ... +150°C
system of protection (EN 60529)	IP50	IP65	IP65	IP65
connection	see above	see above	see above	see above
connection accessories	e.g. VK2000L4, 2m silicone, straight	e.g. VK50H026, 5m polyolefin, straight	-	-
mounting accessories (clip)	AY000099	AY000099	AY000099	AY000099



## high temperature sensors 2300

operating range	4mm	5mm	5mm	5mm
output signal	pnp, no	pnp, no	pnp, no	pnp, nc
operating temperature	-25 ... +150°C	-25 ... +130°C	-25 ... +180°C	-25 ... +180°C
mounting	non-flush	flush	flush	flush
2m silicone cable	-	IB180155	IB180150	IB180250
5m silicone cable	-	IB180156	IB180151	IB180251
10m silicone cable	-	IB180157	IB180152	IB180252
2m teflon cable	-	-	IB1801T0	-
5m teflon cable	-	-	IB1801T1	IB1802T1
10m teflon cable	-	-	IB1801T2	-
M12-connector	IN12012W	-	-	-

## TECHNICAL DATA

sensing range	4mm	5mm	5mm	5mm
output signal	pnp, no	pnp, no	pnp, no	pnp, nc
operating voltage	10 ... 35V DC	10 ... 35V DC	10 ... 35V DC	10 ... 35V DC
current consumption (w/o load)	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
output current (max. load)	120mA	150mA	150mA	150mA
voltage drop (max. load)	2.0V DC	2.0V DC	2.0V DC	2.0V DC
hysteresis	3 ... 15%	3 ... 15%	3 ... 15%	3 ... 15%
sampling frequency	500Hz	400Hz	400Hz	400Hz
display (signal)	-	yellow LED	-	-
short-circuit protection	+	+	+	+
reverse polarity protection	+	+	+	+
design	M12x1	M18x1	M18x1	M18x1
housing material	stainless steel	stainless steel	stainless steel	stainless steel
front cap material	vectra®	vectra®	vectra®	vectra®
length (thread/complete)	54mm / 80mm	60mm / 70mm	60mm / 70mm	60mm / 70mm
operating temperature	-25 ... +150°C	-25 ... +130°C	-25 ... +180°C	-25 ... +180°C
system of protection (EN 60529)	IP65	IP65	IP65	IP65
connection	see above	see above	see above	see above
connection accessories	e.g. VK50H026, 5m polyolefin, straight	-	-	-
mounting accessories (clip)	AY000099	AY000100	AY000100	AY000100



# inductive sensors

## 2300 high temperature sensors



operating range	5mm	5mm	5mm	8mm
output signal	npn, no	pnp, no	pnp, no	pnp, no
operating temperature	-25 ... +180°C	-25 ... +180°C	-25 ... +150°C	-25 ... +130°C
mounting	flush	flush	flush	non-flush
2m silicone cable	IB181150	-	-	IN180155
5m silicone cable	IB181151	-	-	IN180156
10m silicone cable	IB181152	-	-	IN180157
2m teflon cable	-	-	-	-
5m teflon cable	-	-	-	-
10m teflon cable	-	-	-	-
M12-connector	-	-	IB18012W	-
lemo-connector	IB180140	-	-	-

### TECHNICAL DATA

sensing range	5mm	5mm	5mm	8mm
output signal	npn, no	pnp, no	pnp, no	pnp, no
operating voltage	10 ... 35V DC	10 ... 35V DC	10 ... 35V DC	10 ... 35V DC
current consumption (w/o load)	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
output current (max. load)	150mA	150mA	150mA	150mA
voltage drop (max. load)	2.0V DC	2.0V DC	2.0V DC	2.0V DC
hysteresis	3 ... 15%	3 ... 15%	3 ... 15%	3 ... 15%
sampling frequency	400Hz	400Hz	400Hz	400Hz
display (signal)	-	-	-	yellow LED
short-circuit protection	+	+	+	+
reverse polarity protection	+	+	+	+
design	M18x1	M18x1	M18x1	M18x1
housing material	stainless steel	stainless steel	stainless steel	stainless steel
front cap material	vectra®	vectra®	vectra®	vectra®
length (thread/complete)	60mm / 70mm	60mm / 83mm	60mm / 84.5mm	60mm / 77mm
operating temperature	-25 ... +180°C	-25 ... +180°C	-25 ... +150°C	-25 ... +130°C
system of protection (EN 60529)	IP65	IP50	IP65	IP65
connection	see above	see above	see above	see above
connection accessories	-	e.g. VK200940, 2m silicone, straight	e.g. VK50H026, 5m polyolefin, straight	-
mounting accessories (clip)	AY000100		AY000100	AY000100

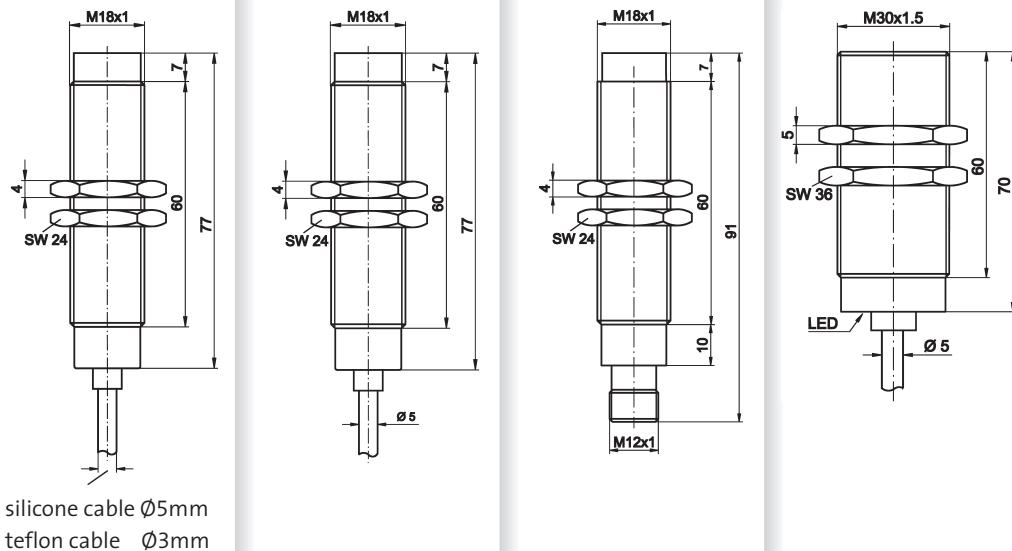


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## high temperature sensors 2300

operating range	8mm	8mm	8mm	10mm
output signal	pnp, no	npn, no	pnp, no	pnp, no
operating temperature	-25 ... +180°C	-25 ... +180°C	-25 ... +150°C	-25 ... +130°C
mounting	non-flush	non-flush	non-flush	flush
2m silicone cable	IN180150	IN181150	-	IB300155
5m silicone cable	IN180151	IN181151	-	IB300156
10m silicone cable	IN180152	IN181152	-	IB300157
2m teflon cable	IN1801T0	-	-	-
5m teflon cable	IN1801T1	-	-	-
10m teflon cable	IN1801T2	-	-	-
M12-connector	-	-	IN18012W	-
lemo-connector	-	-	-	-



## TECHNICAL DATA

sensing range	8mm	8mm	8mm	10mm
output signal	pnp, no	npn, no	pnp, no	pnp, no
operating voltage	10 ... 35V DC	10 ... 35V DC	10 ... 35V DC	10 ... 35V DC
current consumption (w/o load)	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
output current (max. load)	150mA	150mA	150mA	150mA
voltage drop (max. load)	2.0V DC	2.0V DC	2.0V DC	2.0V DC
hysteresis	3 ... 15%	3 ... 15%	3 ... 15%	3 ... 15%
sampling frequency	400Hz	400Hz	400Hz	200Hz
display (signal)	-	-	-	yellow LED
short-circuit protection	+	+	+	+
reverse polarity protection	+	+	+	+
design	M18x1	M18x1	M18x1	M30x1.5
housing material	stainless steel	stainless steel	stainless steel	stainless steel
front cap material	vectra®	vectra®	vectra®	vectra®
length (thread/complete)	60mm / 77mm	60mm / 77mm	60mm / 91mm	60mm / 70mm
operating temperature	-25 ... +180°C	-25 ... +180°C	-25 ... +150°C	-25 ... +130°C
system of protection (EN 60529)	IP65	IP65	IP65	IP65
connection	see above	see above	see above	see above
connection accessories	-	-	e.g. VK50H026, 5m polyolefin, straight	-
mounting accessories (clip)	AY000100	AY000100	AY000100	AY000101/AY000104



## 2300 high temperature sensors

operating range	10mm	10mm	10mm
output signal	pnp, no	pnp, no	pnp, no
operating temperature	-25 ... +130°C	-25 ... +150°C	-25 ... +180°C
mounting	flush	flush	flush
2m silicone cable	-	-	IB300150
5m silicone cable	-	-	IB300151
10m silicone cable	-	-	IB300152
2m teflon cable	-	-	IB3001T0
5m teflon cable	-	-	IB3001T1
10m teflon cable	-	-	IB3001T2
M12-connector	-	IB30012W	-
lemo-connector	IB300145	-	-

silicone cable Ø5mm  
teflon cable Ø3mm

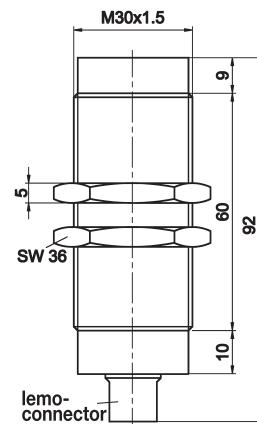
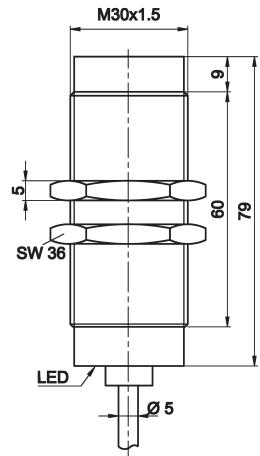
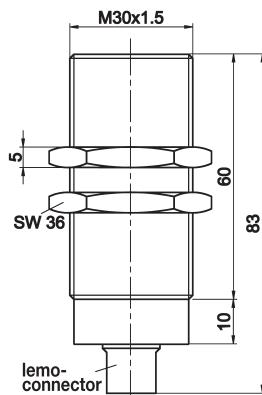
## TECHNICAL DATA

sensing range	10mm	10mm	10mm
output signal	pnp, no	pnp, no	pnp, no
operating voltage	10 ... 35V DC	10 ... 35V DC	10 ... 35V DC
current consumption (w/o load)	≤ 15mA	≤ 15mA	≤ 15mA
output current (max. load)	150mA	150mA	150mA
voltage drop (max. load)	2.0V DC	2.0V DC	2.0V DC
hysteresis	3 ... 15%	3 ... 15%	3 ... 15%
sampling frequency	200Hz	200Hz	200Hz
display (signal)	yellow LED	-	-
short-circuit protection	+	+	+
reverse polarity protection	+	+	+
design	M30x1.5	M30x1.5	M30x1.5
housing material	stainless steel	stainless steel	stainless steel
front cap material	vectra®	vectra®	vectra®
length (thread/complete)	60mm / 83mm	61mm / 85mm	60mm / 70mm
operating temperature	-25 ... +130°C	-25 ... +150°C	-25 ... +180°C
system of protection (EN 60529)	IP50	IP65	IP65
connection	see above	see above	see above
connection accessories	e.g. VK200940, 2m silicone, straight	e.g. VK50H026, 5m polyolefin, straight	-
mounting accessories (clip)	AY000101/AY000104	AY000101/AY000104	AY000101/AY000104



## high temperature sensors 2300

operating range	10mm	15mm	15mm
output signal	pnp, no	pnp, no	pnp, no
operating temperature	-25 ... +180°C	-25 ... +130°C	-25 ... +130°C
mounting	flush	non-flush	non-flush
2m silicone cable	-	IN300155	-
5m silicone cable	-	IN300156	-
10m silicone cable	-	IN300157	-
M12-connector	-	-	-
lemo-connector	IB300140	-	IN300145



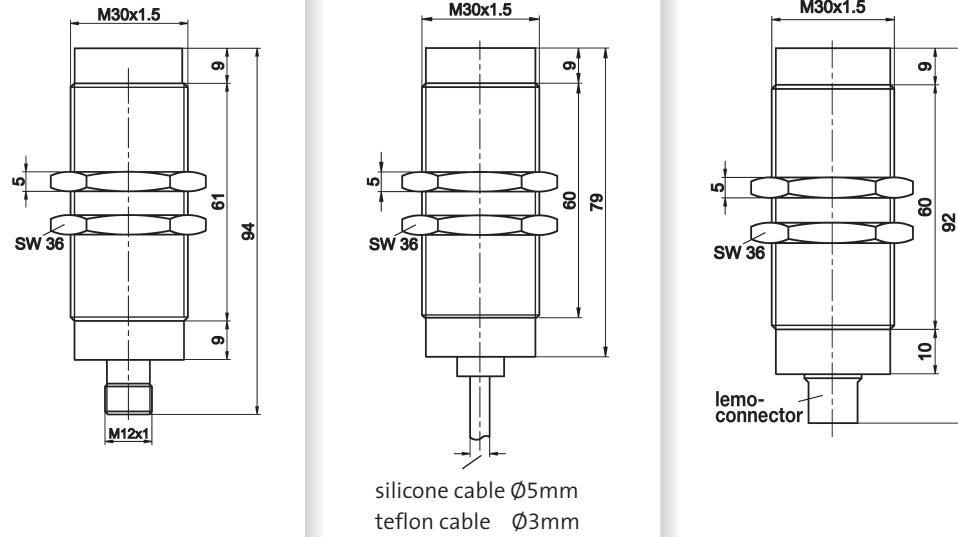
## TECHNICAL DATA

sensing range	10mm	15mm	15mm
output signal	pnp, no	pnp, no	pnp, no
operating voltage	10 ... 35V DC	10 ... 35V DC	10 ... 35V DC
current consumption (w/o load)	≤ 15mA	≤ 15mA	≤ 15mA
output current (max. load)	150mA	150mA	150mA
voltage drop (max. load)	2.0V DC	2.0V DC	2.0V DC
hysteresis	3 ... 15%	3 ... 15%	3 ... 15%
sampling frequency	200Hz	200Hz	200Hz
display (signal)	-	yellow LED	-
short-circuit protection	+	+	+
reverse polarity protection	+	+	+
design	M30x1.5	M30x1.5	M30x1.5
housing material	stainless steel	stainless steel	stainless steel
front cap material	vectra®	vectra®	vectra®
length (thread/complete)	60mm / 83mm	60mm / 79mm	60mm / 92mm
operating temperature	-25 ... +180°C	-25 ... +130°C	-25 ... +130°C
system of protection (EN 60529)	IP50	IP65	IP50
connection	see above	see above	see above
connection accessories	e.g. VK200940, 2m silicone, straight	-	e.g. VK200940, 2m silicone, straight
mounting accessories (clip)	AY000101/AY000104	AY000101/AY000104	AY000101/AY000104



## 2300 high temperature sensors

operating range	15mm	15mm	15mm
output signal	pnp, no	pnp, no	pnp, no
operating temperature	-25 ... +150°C	-25 ... +180°C	-25 ... +180°C
mounting	non-flush	non-flush	non-flush
2m silicone cable	-	IN300150	-
5m silicone cable	-	IN300151	-
10m silicone cable	-	IN300152	-
2m teflon cable	-	IN3001T0	-
5m teflon cable	-	IN3001T1	-
10m teflon cable	-	IN3001T2	-
M12-connector	IN30012W	-	-
lemo-connector	-	-	IN300140



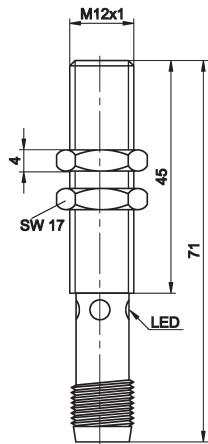
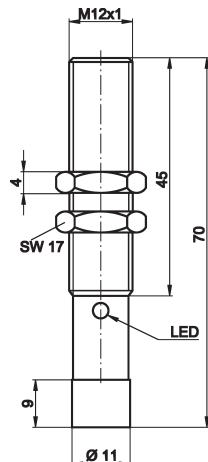
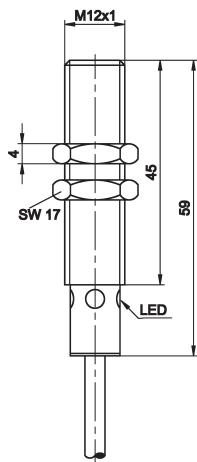
## TECHNICAL DATA

sensing range (Sn)	15mm	15mm	15mm
output signal	pnp, no	pnp, no	pnp, no
operating voltage	10 ... 35V DC	10 ... 35V DC	10 ... 35V DC
current consumption (w/o load)	≤ 15mA	≤ 15mA	≤ 15mA
output current (max. load)	150mA	150mA	150mA
voltage drop (max. load)	2.0V DC	2.0V DC	2.0V DC
hysteresis	3 ... 15%	3 ... 15%	3 ... 15%
sampling frequency	200Hz	200Hz	200Hz
display (signal)	-	-	-
short-circuit protection	+	+	+
reverse polarity protection	+	+	+
design	M30x1.5	M30x1.5	M30x1.5
housing material	stainless steel	stainless steel	stainless steel
front cap material	vectra®	vectra®	vectra®
length (thread/complete)	61mm / 94mm	60mm / 79mm	60mm / 92mm
operating temperature	-25 ... +150°C	-25 ... +180°C	-25 ... +180°C
system of protection (EN 60529)	IP65	IP65	IP50
connection	see above	see above	see above
connection accessories	e.g. VK50H026, 5m polyolefin, straight	-	e.g. VK200940, 2m silicone, straight
mounting accessories (clip)	AY000101/AY000104 A	Y000101/Y000104	AY000101/AY000104



## high temperature all-metal sensors 2300

operating range	2mm	2mm	2mm
output signal	pnp, no	pnp, no	pnp, no
operating temperature	-25 ... +130°C	-25 ... +130°C	-25 ... +130°C
mounting	flush	flush	flush
2m silicone cable	IC120155	-	-
M12-connector	-	-	IC12012W
lemo-mini-connector	-	IC1201L0	-



## TECHNICAL DATA

sensing range	2mm	2mm	2mm
output signal	pnp, no	pnp, no	pnp, no
operating voltage	7 ... 35V DC	7 ... 35V DC	7 ... 35V DC
current consumption (w/o load)	≤ 15mA	≤ 15mA	≤ 15mA
output current (max. load)	150mA	150mA	150mA
voltage drop (max. load)	2.0V DC	2.0V DC	2.0V DC
hysteresis	3 ... 20%	3 ... 20%	3 ... 20%
sampling frequency	40Hz	40Hz	40Hz
display (signal)	LED rot	LED rot	LED rot
short-circuit protection	+	+	+
reverse polarity protection	+	+	+
design	M12x1	M12x1	M12x1
housing material	stainless steel	stainless steel	stainless steel
front cap material	stainless steel	stainless steel	stainless steel
length (thread/complete)	45mm / 59mm	45mm / 70mm	45mm / 71mm
operating temperature	-25 ... +130°C	-25 ... +130°C	-25 ... +130°C
system of protection (EN 60529)	IP65	IP50	IP65
connection	see above	see above	see above
connection accessories	-	e.g. VK2000L4, 2m silicone, straight	e.g. VK50H026, 5m polyolefin, straight
mounting accessories (clip)	AY000099	AY000099	AY000099



# inductive sensors

## 2300 high temperature all-metal sensors



operating range	5mm	5mm	10mm	10mm
output signal	pnp, no	pnp, no	pnp, no	pnp, no
operating temperature	-25 ... +130°C	-25 ... +130°C	-25 ... +130°C	-25 ... +130°C
mounting	flush	flush	flush	flush
2m silicone cable	IC180155	-	IC300155	-
lemo-connector	-	IC180145	-	IC300145
TECHNICAL DATA				
sensing range	5mm	5mm	10mm	10mm
output signal	pnp, no	pnp, no	pnp, no	pnp, no
operating voltage	7 ... 35V DC	7 ... 35V DC	7 ... 35V DC	7 ... 35V DC
current consumption (w/o load)	≤ 15mA	≤ 15mA	≤ 15mA	≤ 15mA
output current (max. load)	150mA	150mA	150mA	150mA
voltage drop (max. load)	2.0V DC	2.0V DC	2.0V DC	2.0V DC
hysteresis	3 ... 15%	3 ... 15%	3 ... 15%	3 ... 15%
sampling frequency	30Hz	30Hz	30Hz	30Hz
display (signal)	yellow LED	-	yellow LED	-
short-circuit protection	+	+	+	+
reverse polarity protection	+	+	+	+
design	M18x1	M18x1	M30x1.5	M30x1.5
housing material	stainless steel	stainless steel	stainless steel	stainless steel
front cap material	stainless steel	stainless steel	stainless steel	stainless steel
length (thread/complete)	60mm / 71mm	60mm / 83mm	60mm / 71mm	60mm / 83mm
operating temperature	-25 ... +130°C	-25 ... +130°C	-25 ... +130°C	-25 ... +130°C
system of protection (EN 60529)	IP65	IP50	IP65	IP50
connection	see above	see above	see above	see above
connection accessories	-	e.g. VK200940, 2m silicone, straight	-	e.g. VK200940, 2m silicone, straight
mounting accessories (clip)	AY000100	AY000100	AY000101/AY000104	AY000101/AY000104



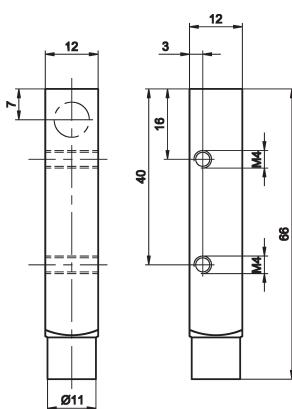
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## high temperature all-metal sensors 2300

operating range	2mm
output signal	pnp, no
operating temperature	-25 ... +130°C
mounting	flush

lemo-mini-connector	IC1301L0
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## TECHNICAL DATA

sensing range	2mm
output signal	pnp, no
operating voltage	10 ... 30V DC
current consumption (w/o load)	≤ 15mA
output current (max. load)	200mA
voltage drop (max. load)	2.0V DC
hysteresis	3 ... 15%
sampling frequency	40Hz
display (signal)	-
short-circuit protection	+
reverse polarity protection	+
design	12x12x66mm
housing material	stainless steel
front cap material	stainless steel
length (thread/complete)	- / 60mm
operating temperature	-25 ... +130°C
system of protection (EN 60529)	IP50
connection	see above
connection accessories	e.g. VK2000L4, 2m, silicone, straight
mounting accessories (clip)	-

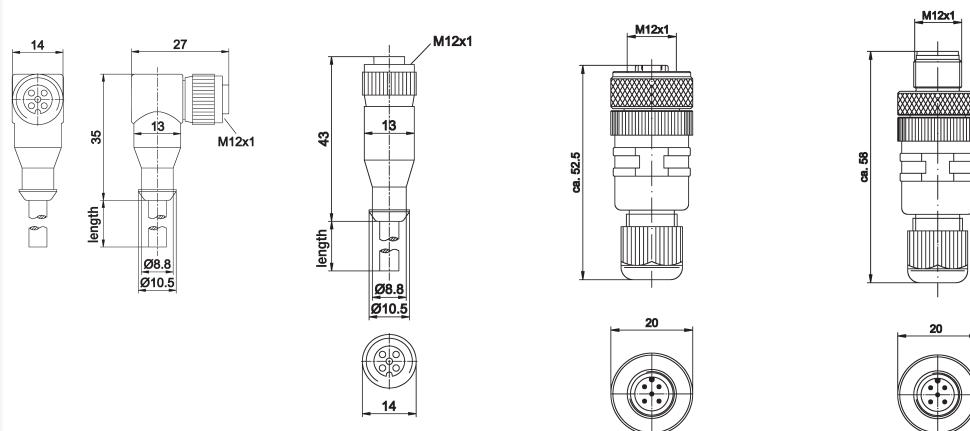


# inductive sensors

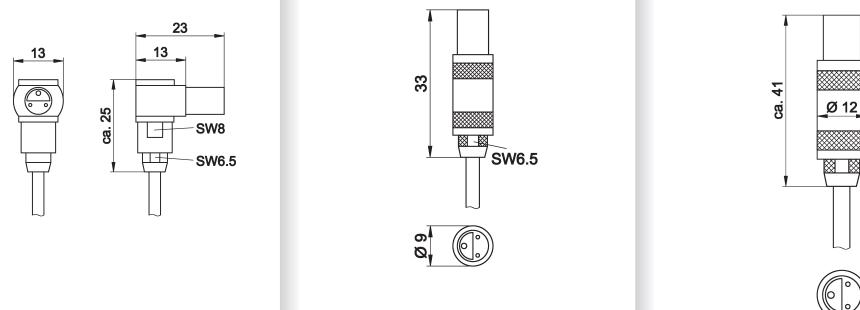
## 2300 high temperature sensors



cable socket	M12-cable socket +150°C, angular	M12-cable socket +150°C, straight	M12-cable socket +150°C, straight	M12-connector +150°C, straight
number of pins (assigned):	3-wire	3-wire	4-pin	4-pin
article-no. length	VK50H022, polyolefin 5m	VK50H026, polyolefin 5m	VK003524 can be ready-made	VK003528 can be ready-made
article-no. length	VKA0H022, polyolefin 10m	VKA0H026, polyolefin 10m	-	-

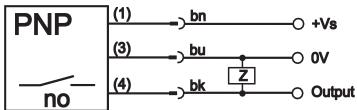


cable socket	lemosa-mini, angular	lemosa-mini, straight	lemosa, straight
number of pins (assigned):	3-wire	3-wire	3-wire
article-no. length	VK2000L0, silicone 2m	VK2000L4, silicone 2m	VK200940, silicone 2m
article-no. length	VK5000L0, silicone 5m	VK5000L4, silicone 5m	VK500940, silicone 5m
article-no. length	VKA000L0, silicone 10m	VKA000L4, silicone 10m	VKA00940, silicone 10m
article-no. length	VK2000L1, teflon 2m	VK2000L5, teflon 2m	VK200941, teflon 2m
article-no. length	VK5000L1, teflon 5m	VK5000L5, teflon 5m	VK500941, teflon 5m
article-no. length	VKA000L1, teflon 10m	VKA000L5, teflon 10m	VKA00941, teflon 10m
article-no. length	-	-	VKB00941, teflon 20m

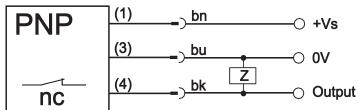


**connection**

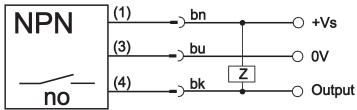
PNP, no



PNP, nc

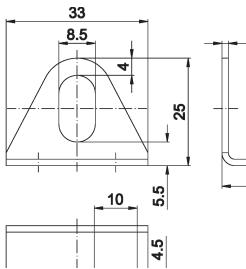


NPN, no

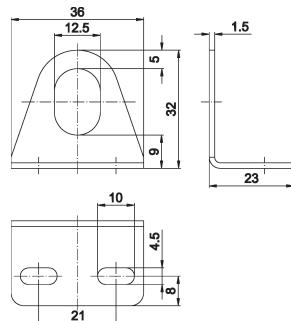

**wire colors:** bn = brown (1), bu = blue (3), bk = black (4)

**fixing material**

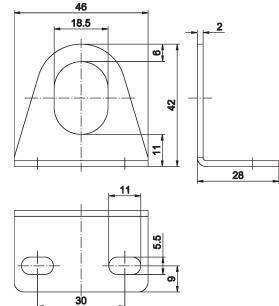
AY000098 for design M8x1, stainless steel



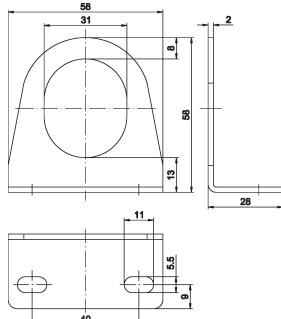
AY000099 for design M12x1, stainless steel



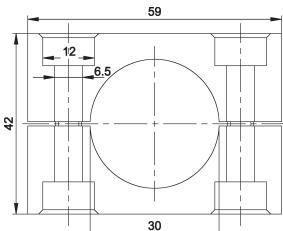
AY000100 for design M18x1, stainless steel



AY000101 for design M30x1.5, stainless steel



AY000104 for design M8x1, aluminium



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.


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**notes****export division**

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