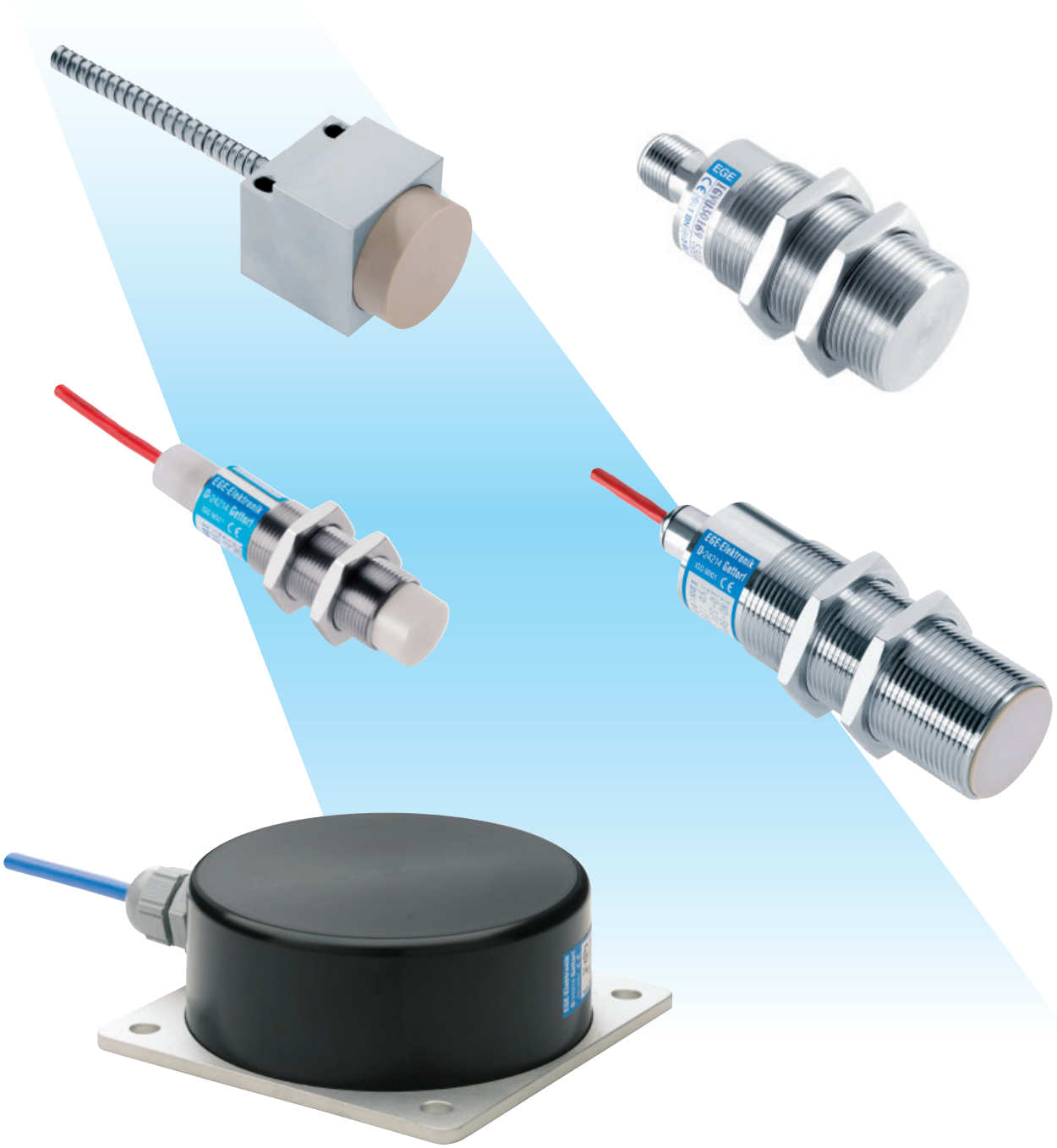
Special-Sensors
for
Automation



Inductive Sensors

Inductive Sensors

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Technical alterations are reserved to us without prior announcement. The information provided in this catalogue is for reference only. Product installation information can be found in the instructions supplied with each product.

Terminology for inductive measurement

Operating Principal

An inductive proximity switch works with a high frequency oscillating circuit that creates an alternating electromagnetic field on the active sensor surface by means of a coil. When a metallic object nears this field a damping occurs in the oscillating circuit. If this damping exceeds a threshold value, a switching signal is generated.

Operating distance

The operating distance is the distance between an object and the active sensor surface at which a switching signal is generated. The operating distance depends on the diameter of the coil. Therefore larger sensors are required for longer operating distances. On some of the EGE sensors the operating distance is adjustable.

If a metal object dampens only a part of the alternating field, the operating distance decreases; a larger object increases it. The following approximate values are derived from a standard rectangular measurement plate made of steel ST 37 with an edge length that corresponds to the diameter of the sensor coil or three times the rated operating distance, whichever is greater.

Damping area in %	150	100	75	50	25	12.5
Operating distance in %	110	100	93	86	73	55

The operating distance is influenced by the material of the object: Constant dimensions for different materials against steel ST 37 yield a changed operating distance.

The following table lists approximate values for the material dependent reduction factors. In practical applications variations could occur due to different alloying, for example.

Material	Operating distance in %
steel ST37	100
stainless steel	70
brass (Br)	50
copper (Cu)	45
aluminium (Al)	40

Rated operating distance s_n

The rated operating distance is a device parameter that does not take into account sample variances and external influences such as temperature and supply voltages.

Effective operating distance s_r

The effective operating distance is the operating distance at nominal voltage and a nominal temperature of 23 °C. It is between 90% and 110% of the rated operating distance.

Usable operating distance s_u

The usable operating distance lies in the entire allowable temperature and voltage range between 90% and 110% of the effective operating distance.

Assured operating distance s_a

The assured operating distance takes into account all the external influences and sample variances and lies in the range from 0% to 80% of the usable operating distance. Within this range a guaranteed switching is ensured.

Switch point drift

The operating distances are given for an ambient temperature of 23 °C. In the permissible temperature range the operating distance varies by less than 15% from the value at 23 °C. The temperature of the measured object has no influence on the switch point.

Hysteresis H

The switching hysteresis describes the distance between the turn-on point while approaching an object and the turn-off point during the separation of it from the sensor. The hysteresis brings about a stable switching signal even when there are vibrations, temperature drift, or electrical variations. The hysteresis is defined in EN 60947-5-2 as a maximum 20% from the effective operating distance, and carries a value of typically 10% from the effective operating distance sr for EGE sensors.

Repeating accuracy R

The repeating accuracy describes the maintenance of the switching point after the repeated approach of an object under specified circumstances. EGE sensors have typical tolerances of less than 3% of the effective operating distance.

Switching frequency

The maximum switching frequency of the sensor is determined at half rated operating distance sn with standard measurement plates to EN 60947-5-2

Colour code: BK = black BN = brown BU = blue GN = green YE = yellow GY = grey PK = pink WH = white

Terminology for inductive measurement

Operating voltage
The operating voltage is the voltage range within EGE sensors function safely. For a constant voltage supply it is important to make sure that the limits are still observed when the residual ripple is included.

Switching current
This current gives the maximum long-term current for the switching output of the sensor at an ambient temperature of 25 °C and ohmic load. At an elevated ambient temperature, the current load capability decreases.
For analog outputs, the boundary values given in the appropriate technical data, and particularly the permissible values for resistance loads, must be observed.

Short circuit protection
The short circuit protection ensures the sensor against destruction through a short circuit on the output. After removal of the fault, the output is reactivated. Where a maximum overload current is listed, this should not be exceeded.

Excess-current release
This value indicates the median value of current at which the short circuit protection responds with a tolerance of ±20%.

Reverse polarity protection
The reverse polarity protection prevents destruction of the sensor by a reversal of the polarity of the voltage supply.

Voltage drop U_d
The voltage drop arises at the internal resistance of semiconductor elements, which are in the current-path of the output. It is dependent of the load-current and is declared according to EN 60947-5-2 for a mean current of 50 mA.

Residual current I_r
The residual current flows in the load current circuit when the output is blocked. The residual current must be considered when switching sensors in parallel.

Minimum load current I_m
The minimum load current is necessary for flawless operation with two-wire devices.

Current consumption
The current consumption is the maximum value of the no-load current Io that the sensor can absorb without a load.

Ambient temperature
The ambient temperature indicates the maximum allowable temperature range for the sensor.

Electromagnetic compatibility EMC
The EMC class is a measure of the noise immunity of the sensor against external electrical and magnetic influences. The information is based on the standard EN 61000-6-2.

Switch-on impulse suppression
EGE sensors have a switch-on supression that blocks the output during the switch-on phase, when the operational voltage is applied.

Protective system
The protective system indicates the protection of the sensors against penetration of foreign bodies and water to EN 60529.

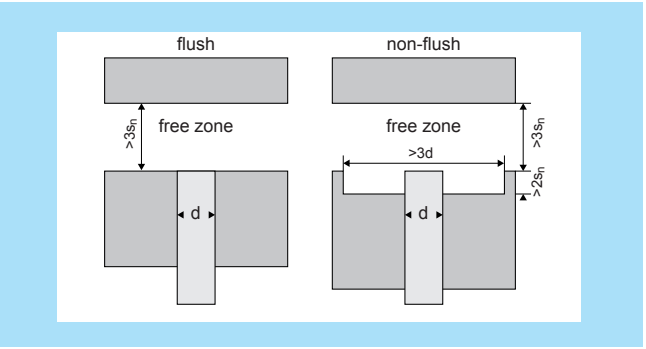
LED display
EGE sensors with yellow light-emitting diodes indicate the switching status optically.

Housing material
The housing material determines the chemical resistance of the sensor against external influences. For special applications, other housing materials are available.

Connection
The connection of the sensors is accomplished through plug-in connections or cables. Different cable types and lengths are available upon request.

Instructions for mounting

Mounting
For flush mounting the sensor can be built into metal up to its active surface without changing its characteristics. For non-flush mounting a metal-free zone around the sensor must be allowed for. A free zone to the material opposite the sensor must be maintained for all sensors.



The indicated free zones are in accordance with the standard EN 60947-5-2.

Fixing nuts are part of delivery for all metal thread sensors.
For mounting clamps see page 3.71.

Terminology for inductive measurement

Collocation

When collocating the sensors, a minimum separation must be kept between the devices. When in doubt, a test should be conducted under application conditions. For flush mounting the lateral separation between two sensors must correspond to at least the diameter of the sensor. For non flush mounting, the lateral separation from each other must correspond to at least twice the diameter of the sensor. For oppositely mounted sensors, a minimal separation of six times the rated operating distance should be allowed.

Torques

In order to prevent destruction of the threaded bushing during fitting, the following maximum torques must not be exceeded:

Design	Metal Housing	Plastic Housing
M12x1	10 Nm	1 Nm
M18x1	25 Nm	2 Nm
M30x1.5	40 Nm	5 Nm

PTFE sensors may only be tightened by hand.

Instructions for operation

Serial connection

For the serial connection of two wire or three wire sensors the individual voltage drops are added together. Therefore there is a lesser operational voltage at the disposal of the load. The addition of the switch-on delay times should be noted.

Parallel connection

The parallel connection of two wire sensors can only be conditionally recommended since the residual currents are added together and flow through the load. For the parallel connection of three wire sensors, the current consumption of the individual devices is added together. Since this current does not flow through the load, the maximum number of parallel connectable three wire sensors depends only on the power supply.

Approval for safety applications

Sensors for personal security must have a qualification approval according to EN 61508 and must be labeled accordingly. Sensors that are not labeled must not to be used for applications of this kind.

Valid standards

EN 60947-5-2
Control units; low voltage control units,
auxiliary switch, proximity switch

EN 61000-6-4
Electromagnetic compatibility (EMC)
Interference emissions in the industrial area

EN 61000-6-2
Electromagnetic compatibility (EMC)
Generic standards immunity for industrial enviroments

EN 61000-4-2 (ESD)
Electrostatic discharging immunity

EN 61000-4-3 (HF radiated)
Radiated radio-frequency electromagnetic field
immunity test

EN 61000-4-4 (Burst)
Electrical fast transient/burst immunity test

EN 61000-4-5 (Surge)
Surge immunity test

EN 61000-4-6 (HF conducted)
Immunity to conducted disturbances,
inducted vy radio-frequency fields

EN 60529 : 2013
Protective systems, IP-designation

EN 60079-0 : 2012 +A11:2013
Explosive atmospheres –
Part 0: Equipment – General requirements

EN 60079-7 : 2015
Explosive atmospheres –
Part 7: Equipment protection by increased safety „e“

EN 60079-11 : 2012
Explosive atmospheres –
Part 11: Equipment protection by intrinsic safety „i“

EN 60079-18 : 2015
Explosive atmospheres –
Part 18: Equipment protection by encapsulation „m“

EN 60079-26 : 2015
Explosive atmospheres –
Part 26: Equipment with Equipment Protection Level (EPL)Ga

EN 60079-31 : 2014
Explosive atmospheres –
Part 31: Equipment dust ignition protection by enclosure „t“

Authorisations

TÜV NORD CERT Zertifizierungsstelle - Deutschland
(technical monitoring certification agency - Germany)

Certification

TÜV-cert	ISO 9001 : 2008
TÜV-cert	Quality control production Attachment IV of the EC-Guidelines 94/9/EG DIN EN ISO/IEC 80079-34 : 2012
TÜV Nord	Re-cancelling certificate according to EN 10204

Application notes

Metal face sensors page 3.07 - 3.10

The inductive proximity switches series IGV are used in areas with heavy-duty mechanical loads at the sensor's face or where seals between face and housing cannot be used. Chips hitting the front or frequently changing coolants or lubricants do not diminish the function of these proximity switches. The variants with a PTFE coating are particularly well-suited for welding lines and similar environments where sensors are exposed to heavy soiling.
Metal face switches are manufactured from stainless steel and are one solid piece. They detect iron and steel through the metal front face.

POLAR-Switches page 3.12 - 3.14

The POLAR-switch is ideal for application in cold storage houses and in extreme climate conditions. It is waterproof, safe for cleaning and extremely chemical-resistant. Because of its stainless steel housing, it can withstand vibrations on vehicles. The POLAR-switch is very compact and robust, it can be used from – 60 °C to +60 °C. IGMP 030 S-80 sensors are suitable in cryogenic processes and for medical-technical applications; they can be used for temperatures up to –80 °C.

TROPICAL-Switches page 3.15 - 3.20

The TROPICAL switches series IGMF are anticipated for applications in corrosive environment. They are stable particularly at frequent temperature changes and simultaneously high humidity. The permanent work in carwashes is permissible. The high corrosion resisting at simultaneously high mechanical loading capacity is reached through the combination of PTFE and titan stabilized stainless steel. The PTFE-hoods are sealed through fluoroelastomers O-rings surely. The FEP-connecting cable is poured within the housing and freed over a double seal from the housing. Cable lengths up to 100 m are available. The installed LED's are shining through the cable side cap and don't break out the case. IGMW series sensors are suitable for hydro steam environments with pressures of up to 4 bars. For higher pressures in hydro steam environments, IGVW series sensors made of full stainless steel are recommended.

120 °C-High temperature switches page 3.21 - 3.26

The inductive PTFE switches series IGFW and INFW are made entirely of PTFE. The housing cover is securely sealed with a fluoroelastomer O-Ring. These sensors are disigned for particularly difficult and aggressive environmental conditions. They can be used in damp and aggressive environments as well as under water (oil).
IGMT- and IDT-series proximity switches are designed for use in temperatures up to 120 °C.

160 °C-High temperature switches page 3.27 - 3.28

Inductive compact devices for ambient temperatures up to 160 °C are available flush and non-flush in the standard designs M12, M18 and M30 with switching distances from 2 mm to 15 mm. The material used is the rugged stainless steel housing combined with high temperature resistant PEEK plastic.

250 °C-High temperatures sensors page 3.29 - 3.30

The inductive proximity switches series IGH/IDH/IRH are used for ambient temperatures up to 250 °C. The units feature optional a plug connection which withstands high temperatures, allowing users to quickly and easily install a replacement sensor head in case of damage without having to replace the sensor cable. The sensors are particularly suited for operation in extreme heat, e. g. in drying ovens or brick kilns. Manufactured from aluminum / stainless steel and PEEK, the robust sensors can be used in rugged industrial environments. Their electronics are housed separately in a pluggable cable amplifier. The units are connected via a metal armored cable.

Amplifiers page 3.32 - 3.33

Switching amplifiers are designed for induction sensors for which it is necessary to separate the sensor coil from the amplifier, e. g. for operating temperatures above 160 ºC or for sensor coils which must be exchanged due to frequent damage.
The switching amplifiers work statically, that is, if the sensor coil is permanently damped, the switching output also remains activated. Switching interval and hysteresis (IKM 120 GPP, IU 130…) can be set on the amplifier. The sensor cable may have a length of up to 20 m.

Demanding environment Seite 3.34 - 3.41

The "Demanding environment" series is especially designed for harsh environments in which sensors are subjected to high electrical, electromagnetic or mechanical stress. For sensors used in critical applications, EGE has developed special inspection and test methods which place particular emphasis on the disturbances that occur in various production environments. The sensors are designed to be very resistant to the interference spectra produced by, e. g., frequency inverters, wireless communication systems and switching power supplies.

Surface sensors IFE... page 3.48 - 3.49

The switches are build as flat sensors. They are used particularly to detect moving sheet metal or steel rods on conveyor belts. The complete sensor is covered, which make the sensor moisture resistant.
Reduced overall height affects the operating distance (sn). The IFE switches are self-contained with integral amplifier.

Dust- and Gas-Ex sensors page 3.56 - 3.66

IGEX and IDEX are sensors for detecting metals in the Ex area zone 0/20 and zone 22 according to ATEX. Devices can be delivered in the standard configurations M12, M18 and M30. For large switching distances there are configurations with diameters of 80 mm to 160 mm.

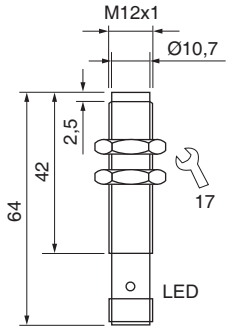
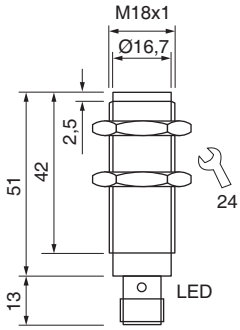
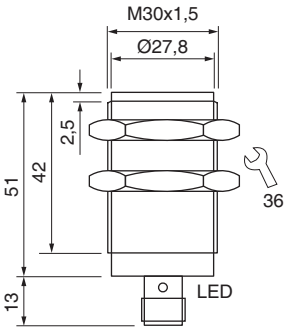
Metal face sensors • Plug connection

Series IGVU - Proximity switches

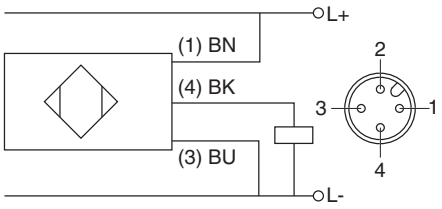
M12 / M18 / M30
One piece stainless steel housing

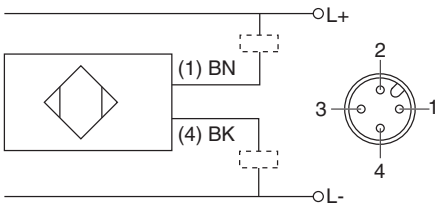
DC 10...30 V

Shock resistant
Impact proof

Design	DC PNP M12 • M18 • M30			DC 2-Wire M12 • M18 • M30		
Dimensions						
Operating distance sn [mm]	2	5	10	2	5	10
Switching output PNP	⎍	⎍	⎍	⎍	⎍	⎍
ID-No.	P31193	P31194	P31195	P31225	P31226	P31227
Type	IGVU 02 GSP	IGVU 05 GSP	IGVU 10 GSP	IGVU 02 GS	IGVU 05 GS	IGVU 10 GS
Supply voltage [V]	10...30 DC			8...30 DC		
Switching current [mA]	250			150		
Short circuit proof	•			•		
Reverse protection	•			•		
Voltage drop max. [V]	1.5			3.5		
Current consumption [mA]	5			1.5		
Switching frequency [Hz]	180	180	150	180	180	150
Ambient temperature [°C]	–25...+80			–25...+80		
EMC-class	A			A		
Protection [EN 60529]	IP 68 + IP 69K			IP 68 + IP 69K		
LED display	•			•		
Housing material	AISI 316 L			AISI 316 L		
Connection	M12 connector			M12 connector		

The specified operating distance (sn) applies to ferromagnetic objects (ST37).





Accessories	connecting cable type SLG 3-2 (Z01076), page 3.69

Inductive Sensors

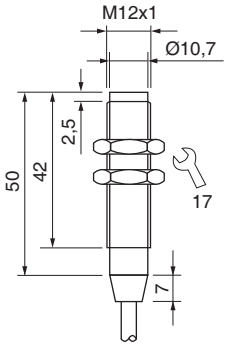
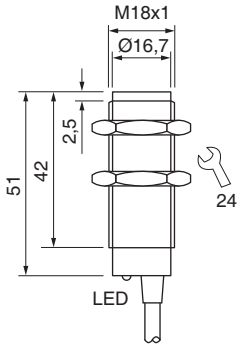
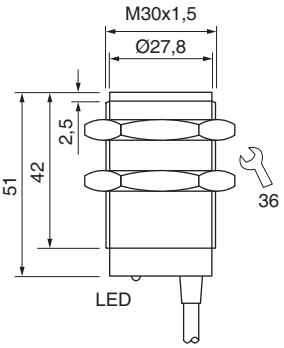
Metal face sensors • Cable connection

Series IGV - Proximity switches

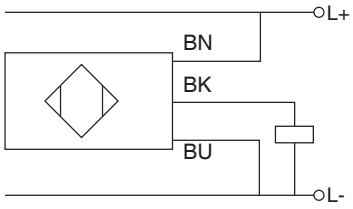
M12 / M18 / M30
One piece stainless steel housing

DC 10...30 V

Shock resistant
Impact proof

Design	DC PNP • M12x1	DC PNP • M18x1	DC PNP • M30x1.5
Dimensions			
Operating distance sn [mm]	2	5	10
Switching output PNP			
ID-No.	**P31228**	**P31229**	**P31230**
Type	IGV 02 GSP	IGV 05 GSP	IGV 10 GSP
Supply voltage [V]	10...30 DC		
Switching current [mA]	250		
Short circuit proof	•		
Reverse protection	•		
Voltage drop max. [V]	1.5		
Current consumption [mA]	max. 5		
Switching frequency [Hz]	180	180	150
Ambient temperature [°C]	–25...+80		
EMC-class	A		
Protection [EN 60529]	IP 67		
LED display	•		
Housing material	AISI 316 L		
Connection	2 m PVC-cable 3x0.34 mm²		

The specified operating distance (sn) applies to ferromagnetic objects (ST37).



Inductive Sensors

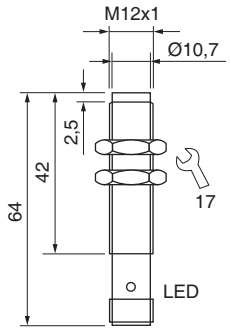
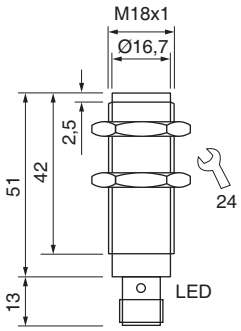
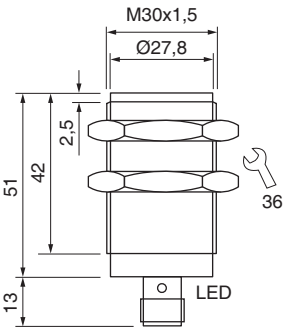
Metal face sensors • PTFE-coated

Series IGVU - Proximity switches

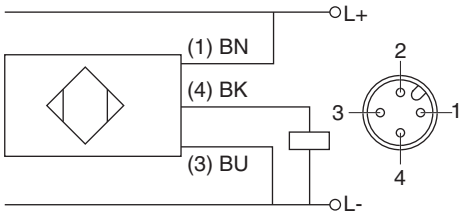
M12 / M18 / M30
One piece stainless steel housing

DC 10...30 V

Shock resistant
Impact proof

Design	DC PNP • M12x1	DC PNP • M18x1	DC PNP • M30x1.5
Dimensions			
Operating distance sn [mm]	2	5	10
Switching output PNP			
ID-No.	**P31234**	**P31235**	**P31236**
Type	IGVU 02 GSP-C	IGVU 05 GSP-C	IGVU 10 GSP-C
Supply voltage [V]	10...30 DC		
Switching current [mA]	250		
Short circuit proof	•		
Reverse protection	•		
Voltage drop max. [V]	1.5		
Current consumption [mA]	5		
Switching frequency [Hz]	180	180	150
Ambient temperature [°C]	–25...+80		
EMC-class	A		
Protection [EN 60529]	IP 68 + IP 69K		
LED display	•		
Housing material	AISI 316 L, PTFE-coated		
Connection	M12 connector Design with fixed cable on request		

The specified operating distance (sn) applies to ferromagnetic objects (ST37).



Accessories	connecting cable SLG 3-2 (Z01076), page 3.69

Inductive Sensors

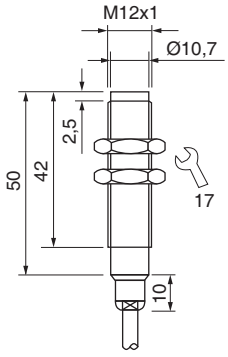
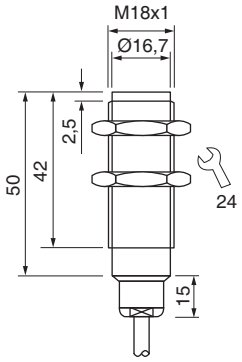
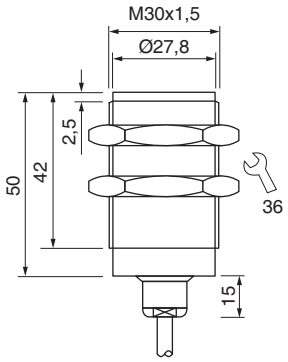
Metal face sensors • Climatic-proofed

Series IGVW - Proximity switches

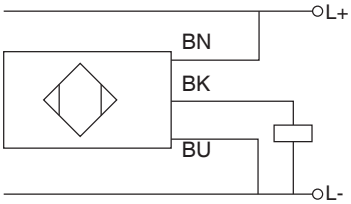
M12 / M18 / M30
One piece stainless steel housing

DC 10...30 V

Shock resistant
Impact proof

Design	DC PNP • M12x1	DC PNP • M18x1	DC PNP • M30x1.5
Dimensions			
Operating distance sn [mm]	2	5	10
Switching output PNP			
ID-No.	**P31237**	**P31238**	**P31239**
Type	IGVW 02 GSP	IGVW 05 GSP	IGVW 10 GSP
Supply voltage [V]	10...30 DC		
Switching current [mA]	250		
Short circuit proof	•		
Reverse protection	•		
Voltage drop max. [V]	1.5		
Current consumption [mA]	5		
Switching frequency [Hz]	180	180	150
Ambient temperature [°C]	–10...+110		
EMC-class	A		
Protection [EN 60529]	IP 68 + IP 69K		
Housing material	AISI 316 L		
Connection	2 m FEP-cable 3x0.34 mm²		

The specified operating distance (sn) applies to ferromagnetic objects (ST37).



Mounting clamp • For metal face sensors

Series KBM 012 / KBM 018 / KBM 030

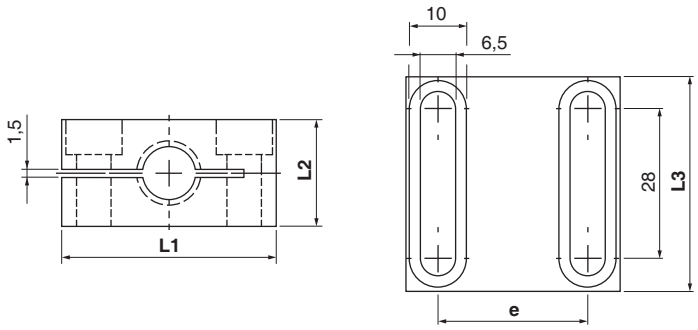
Impact- ans shock resistant, protected installation

Simple adjustment via slotted holes

Mount and replace sensor quickly and precisely

Design	KBM 012 • KBM 018 • KBM 030

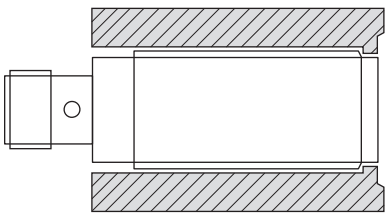
Dimensions



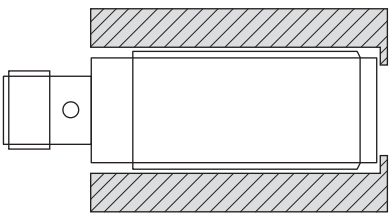
ID-No.		Z01209	Z01210	Z01211	Z01212	Z01213	Z01214
Type		KBM 012 A-ST52	KBM 018 A-ST52	KBM 030 A-ST52	KBM 012 B-A2	KBM 018 B-A2	KBM 030 B-A2
For sensor design		M12	M18	M30	M12	M18	M30
Dimensions L1 x L2 x L3	[mm]	34 x 24 x 40	40 x 30 x 40	55 x 40 x 40	34 x 24 x 40	40 x 30 x 40	55 x 40 x 40
Hole spacing e	[mm]	20	26	40	20	26	40
Sensor installation		flushed relative to the set back surface			set back		
Housing material		ST52, hardened			AISI 303		

Note:
Mounting clamps are fastened to their metal surface using M6 hexagon socket screws. Make sure that the provided stainless steel washers have been placed in-between.

The typical torque is 6 Nm.



flushed relative to the set back surface



set back

Inductive Sensors

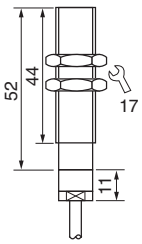
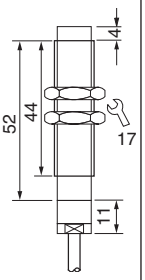
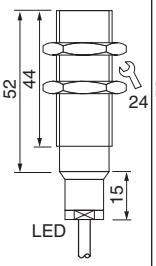
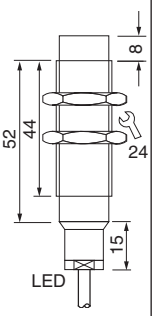
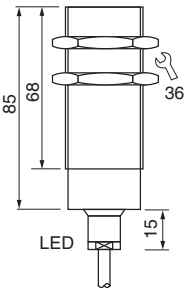
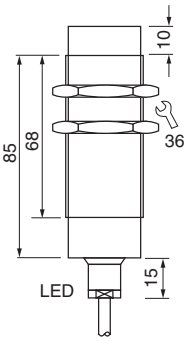
POLAR-Series DC • Climatic-proofed –60 °C

Series IGMP - Proximity switches

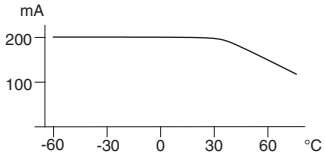
M12 / M18 / M30
Stainless steel sleeve

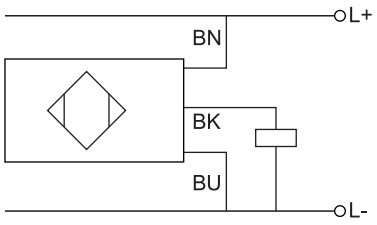
DC 10...30 V

IP 68 Water-proofed
IP 69K Resistant to
high pressure cleaning

Design	DC PNP • M12x1		DC PNP • M18x1		DC PNP • M30x1.5	
Dimensions						
Installation flush (f) non flush (nf)						
Operating distance sn [mm]	2 f	4 nf	5 f	7 nf	10 f	15 nf
Switching output PNP						
ID-No.	**P31145**	**P31146**	**P31147**	**P31148**	**P31219**	**P31220**
Type	IGMP 02 GSP	IGMP 04 GSP	IGMP 05 GSP	IGMP 08 GSP	IGMP 010 GSP	IGMP 015 GSP
Supply voltage [V]	10...30 DC					
Switching current [mA]	200					
Short circuit proof	•					
Overcurrent release [mA]	230					
Reverse protection	•					
Voltage drop max. [V]	2					
Load current [mA]	–					
Current consumption [mA]	4					
Switching frequency [Hz]	1000					
Ambient temperature [°C]	–55...+60					
Temperature min. [°C]	–60					
Temperature gradient [K/min]	5					
EMC-class	A					
Protection [EN 60529]	IP 68 + IP 69K					
LED display	•					
Housing material	PTFE / AISI 316 Ti					
Connection	2 m FEP-cable 3x0.34 mm²					

Switching current





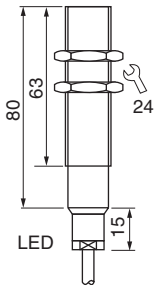
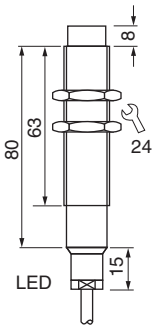
POLAR-Series AC • Climatic-proofed –60 °C

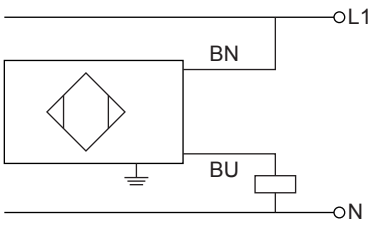
Series IGMP - Proximity switches

M18
Stainless steel sleeve

AC 20...250 V

IP 68 Water-proofed
IP 69K Resistant to
high pressure cleaning

Design	AC • M18x1	
Dimensions		
Installation flush (f) non flush (nf)		
Operating distance sn [mm]	5 f	7 nf
Switching output		
ID-No.	**P31149**	**P31150**
Type	IGMP 005 WS	IGMP 008 WS
Supply voltage [V]	20...250 AC	
Switching current [mA]	300	
Short circuit proof	–	
Overcurrent release [mA]	–	
Reverse protection	–	
Voltage drop max. [V]	4.5	
Load current [mA]	5	
Current consumption [mA]	2.5	
Switching frequency [Hz]	25	
Ambient temperature [°C]	–55...+60	
Temperature min. [°C]	–60	
Temperature gradient [K/min]	5	
EMC-class	A	
Protection [EN 60529]	IP 68 + IP 69K	
LED display	•	
Housing material	PTFE / AISI 316 Ti	
Connection	2 m FEP-cable 3x0.75 mm²	



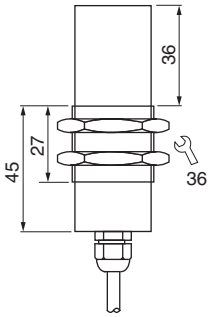
POLAR-Series • Climatic-proofed –80 °C

Series IGMP - Proximity switches

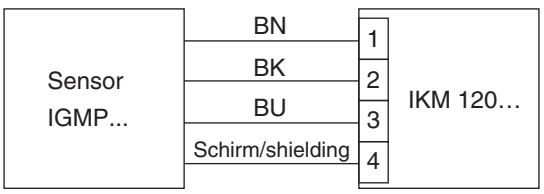
M30
Stainless steel sleeve

IP 68 Water-proofed

–80 °C permanent temperature

Design	M30x1.5
Dimensions	
Installation flush (f) non flush (nf)	
Operating distance sn [mm]	3 nf
ID-No.	**P31337**
Type	IGMP 030 S-80
Supply voltage [V]	–
Switching current [mA]	–
Hysteresis max. [%]	10
Short circuit proof	–
Reverse protection	–
Current consumption [mA]	–
Switching frequency [Hz]	–
Ambient temperature [°C]	–80...+50
EMC-class	A
Protection [EN 60529]	IP 68
LED display	–
Housing material	PTFE / AISI 316 Ti
Connection	2 m FEP-cable 3x0.75 mm², shielded

Sensor for the connection to amplifier IKM 120..., see page 3.32



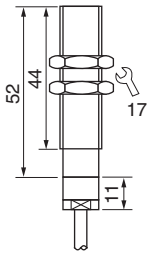
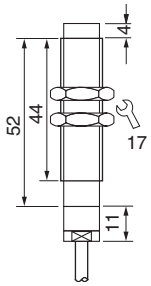
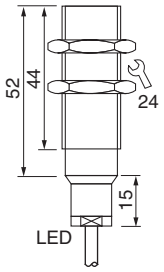
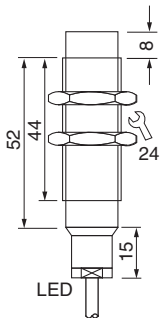
TROPICAL-Series DC • Climatic-proofed 120 °C

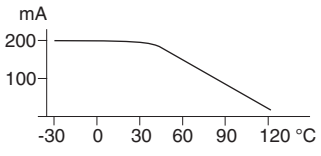
Series IGMF - Proximity switches

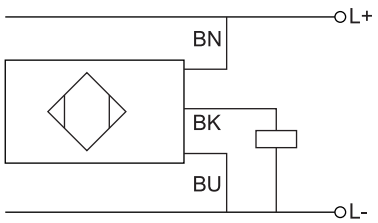
M12 / M18-short form
Stainless steel sleeve

DC 10...30 V

IP 68 Water-proofed
IP 69K Resistant to
high pressure cleaning

Design	DC PNP • M12x1		DC PNP • M18x1	
Dimensions Installation flush (f) non flush (nf)				
Operating distance sn [mm]	2 f	4 nf	5 f	7 nf
GSP ID-No.	P31132	P31133	P30701	P30703
GSP Type	IGMF 02 GSP	IGMF 04 GSP	IGMF 05 GSP	IGMF 08 GSP
GOP ID-No.			P30702	P30704
GOP Type			IGMF 05 GOP	IGMF 08 GOP
Supply voltage [V]	10...30 DC			
Switching current [mA]	200			
Overcurrent release [mA]	230			
Current consumption [mA]	4			
Residual current [µA]	1			
Voltage drop max. [V]	2			
Switching frequency [Hz]	1000			
Ambient temperature [°C]	–25...+120			
Compressive strength [bar]	10			
Residual ripple max. [%]	10			
EMC-class	A			
Protection [EN 60529]	IP 68 + IP 69K			
Housing material	PTFE / AISI 316 Ti (A4)			
Connection	2 m FEP-cable 3x0.34 mm²			
Switching current				





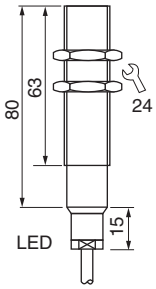
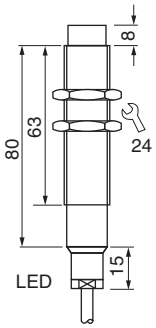
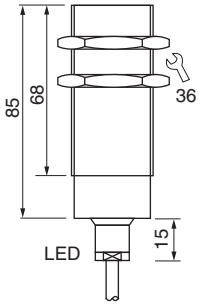
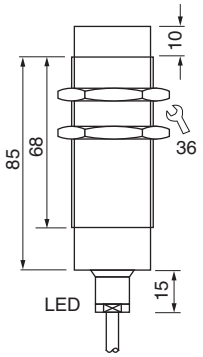
TROPICAL-Series DC • Climatic-proofed 120 °C

Series IGMF - Proximity switches

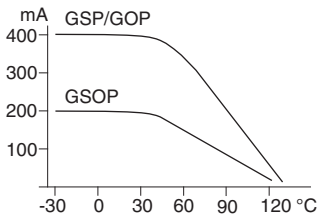
M18 / M30
Stainless steel sleeve

DC 10...55 V

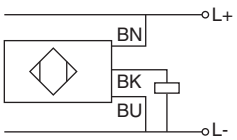
IP 68 Water-proofed
IP 69K Resistant to
high pressure cleaning

Design	DC PNP • M18x1		DC PNP • M30x1,5	
Dimensions				
Installation flush (f) non flush (nf)				
Operating distance sn [mm]	5 f	7 nf	10 f	15 nf
GSP ID-No.	P30705	P30708	P30711	P30714
Type	IGMF 005 GSP	IGMF 008 GSP	IGMF 010 GSP	IGMF 015 GSP
GOP ID-No.	P30706	P30709	P30712	P30715
Type	IGMF 005 GOP	IGMF 008 GOP	IGMF 010 GOP	IGMF 015 GOP
GSOP ID-No.	P30707	P30710	P30713	P30716
Type	IGMF 005 GSOP	IGMF 008 GSOP	IGMF 010 GSOP	IGMF 015 GSOP
Supply voltage [V]	...GSP, ...GOP 10...55 DC / ...GSOP 10...30 DC			
Switching current [mA]	...GSP, ...GOP 400 / ...GSOP 200			
Overcurrent release [mA]	...GSP, ...GOP 430 / ...GSOP 230			
Current consumption [mA]	4			
Residual current [µA]	1			
Voltage drop max. [V]	2			
Switching frequency [Hz]	...GSP, ...GOP 150 / ...GSOP 1000			
Ambient temperature [°C]	–25...+120			
Compressive strenght [bar]	10			
EMC-class	A			
Protection [EN 60529]	IP 68 + IP 69K			
Housing material	PTFE / AISI 316 Ti (A4)			
Connection	2 m FEP-cable 3x0.34 mm² / 2 m FEP-cable 4x0.25 mm²			

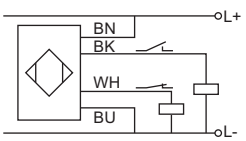
Switching current



GSP/GOP



GSOP



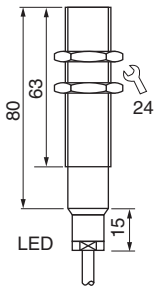
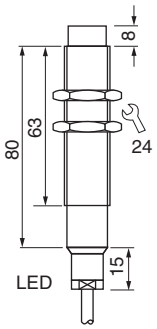
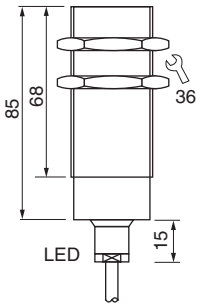
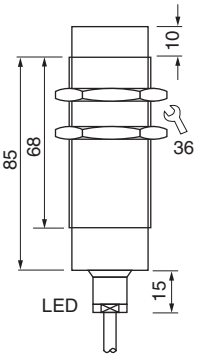
TROPICAL-Series AC • Climatic-proofed 120 °C

Series IGMF - Proximity switches

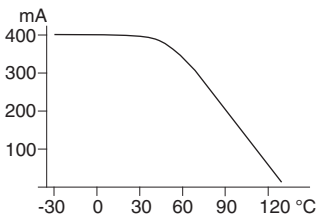
M18 / M30
Stainless steel sleeve

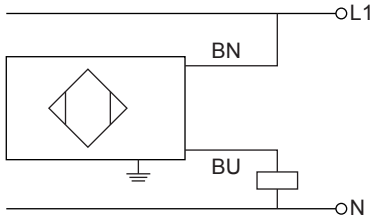
AC 20...250 V

IP 68 Water-proofed
IP 69K Resistant to
high pressure cleaning

Design	AC • M18x1		AC • M30x1.5	
Dimensions Installation flush (f) non flush (nf)				
Operating distance sn [mm]	5 f	7 nf	10 f	15 nf
WS ID-No.	P31071	P31073	P31075	P31077
Type	IGMF 005 WS	IGMF 008 WS	IGMF 010 WS	IGMF 015 WS
WO ID-No.	P31070	P31072	P31074	P31076
Type	IGMF 005 WO	IGMF 008 WO	IGMF 010 WO	IGMF 015 WO
Supply voltage WS/WO [V]	20...250 AC			
Switching current WS/WO [mA]	<400			
Current consumption [mA]	<2.5			
Voltage drop max. [V]	<5 eff.			
Switching frequency [Hz]	25			
Ambient temperature [°C]	–25...+120			
Compressive strength [bar]	10			
Minimum load current [mA]	5.0			
EMC-class	A			
Protection [EN 60529]	IP 68 + IP 69K			
Housing material	PTFE / AISI 316 Ti (A4)			
Connection	2 m FEP-cable 3x0.75 mm²			

Switching current





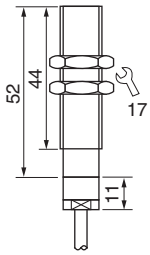
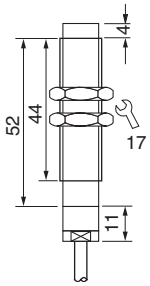
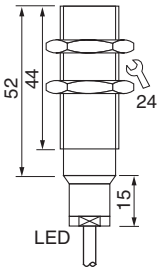
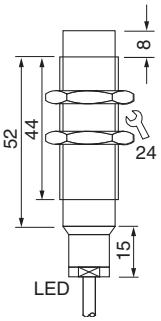
TROPICAL-Series DC • Climatic-proofed 120 °C

Series IGMW - Proximity switches

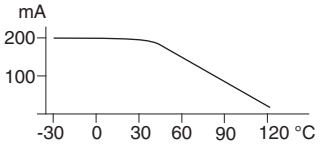
M12 / M18-short form
Stainless steel sleeve

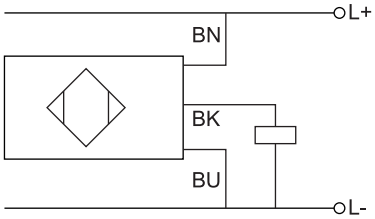
DC 10...30 V

IP 68 Water-proofed
IP 69K Resistant to
high pressure cleaning
Steam proof

Design	DC PNP • M12x1		DC PNP • M18x1	
Dimensions				
Installation flush (f) non flush (nf)				
Operating distance sn [mm]	2 f	4 nf	5 f	7 nf
GSP ID-No.	P31338	P31339	P31340	P31341
Type	IGMW 02 GSP	IGMW 04 GSP	IGMW 05 GSP	IGMW 08 GSP
GOP ID-No.			P31342	P31343
Type			IGMW 05 GOP	IGMW 08 GOP
Supply voltage [V]	10...30 DC			
Switching current [mA]	200			
Overcurrent release [mA]	230			
Current consumption [mA]	4			
Residual current [µA]	1			
Voltage drop max. [V]	2			
Switching frequency [Hz]	1000			
Ambient temperature [°C]	–25...+120			
Compressive strength [bar]	4			
Residual ripple max. [%]	10			
EMC-class	A			
Protection [EN 60529]	IP 68 + IP 69K			
Housing material	PTFE / AISI 316 Ti (A4)			
Connection	2 m FEP-cable 3x0.34 mm²			

Switching current





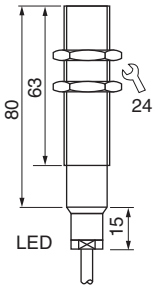
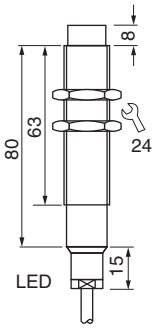
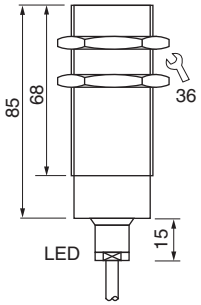
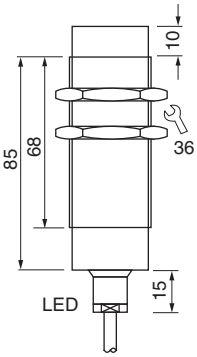
TROPICAL-Series DC • Climatic-proofed 120 °C

Series IGMW - Proximity switches

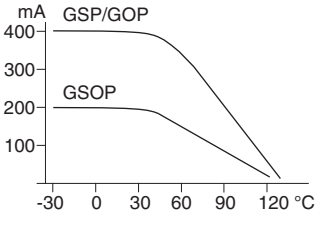
M18 / M30
Stainless steel sleeve

DC 10...55 V

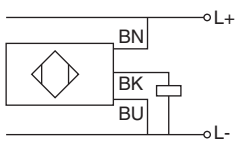
IP 68 Water-proofed
IP 69K Resistant to
high pressure cleaning
Steam proof

Design	DC PNP • M18x1		DC PNP • M30x1,5	
Dimensions				
Installation flush (f) non flush (nf)				
Operating distance sn [mm]	5 f	7 nf	10 f	15 nf
GSP ID-No.	P31344	P31345	P31346	P31347
Type	IGMW 005 GSP	IGMW 008 GSP	IGMW 010 GSP	IGMW 015 GSP
GOP ID-No.	P31348	P31349	P31350	P31351
Type	IGMW 005 GOP	IGMW 008 GOP	IGMW 010 GOP	IGMW 015 GOP
GSOP ID-No.	P31352	P31353	P31354	P31355
Type	IGMW 005 GSOP	IGMW 008 GSOP	IGMW 010 GSOP	IGMW 015 GSOP
Supply voltage [V]	...GSP, ...GOP 10...55 DC / ...GSOP 10...30 DC			
Switching current [mA]	...GSP, ...GOP 400 / ...GSOP 200			
Overcurrent release [mA]	...GSP, ...GOP 430 / ...GSOP 230			
Current consumption [mA]	4			
Residual current [µA]	1			
Voltage drop max. [V]	2			
Switching frequency [Hz]	...GSP, ...GOP 150 / ...GSOP 1000			
Ambient temperature [°C]	–25...+120			
Compressive strenght [bar]	4			
EMC-class	A			
Protection [EN 60529]	IP 68 + IP 69K			
Housing material	PTFE / AISI 316 Ti (A4)			
Connection	2 m FEP-cable 3x0.34 mm² / 2 m FEP-cable 4x0.25 mm²			

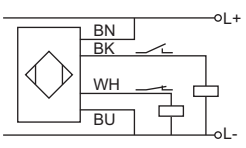
Switching current



GSP/GOP



GSOP



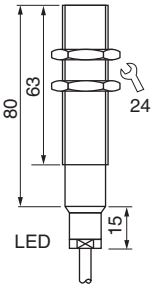
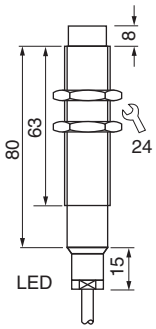
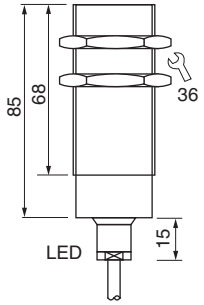
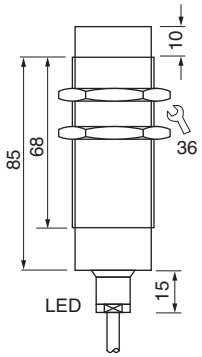
TROPICAL-Series AC • Climatic-proofed 120 °C

Series IGMW - Proximity switches

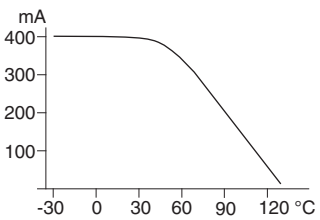
M18 / M30
Stainless steel sleeve

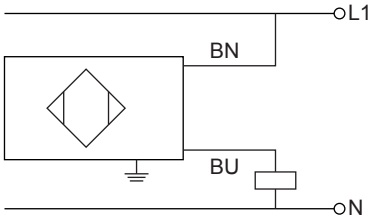
AC 20...250 V

IP 68 Water-proofed
IP 69K Resistant to
high pressure cleaning
Steam proof

Design	AC • M18x1		AC • M30x1.5	
Dimensions				
Installation flush (f) non flush (nf)				
Operating distance sn [mm]	5 f	7 nf	10 f	15 nf
WS ID-No.	P31356	P31357	P31358	P31359
Type	IGMW 005 WS	IGMW 008 WS	IGMW 010 WS	IGMW 015 WS
WO ID-No.	P31360	P31361	P31362	P31363
Type	IGMW 005 WO	IGMW 008 WO	IGMW 010 WO	IGMW 015 WO
Supply voltage WS/WO [V]	20...250 AC			
Switching current WS/WO [mA]	<400			
Current consumption [mA]	<2.5			
Voltage drop max. [V]	<5 eff.			
Switching frequency [Hz]	25			
Ambient temperature [°C]	–25...+120			
Compressive strength [bar]	4			
Minimum load current [mA]	5.0			
EMC-class	A			
Protection [EN 60529]	IP 68 + IP 69K			
Housing material	PTFE / AISI 316 Ti (A4)			
Connection	2 m FEP-cable 3x0.75 mm²			

Switching current





Inductive Sensors

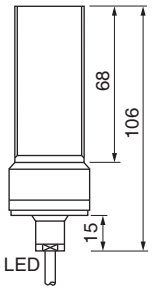
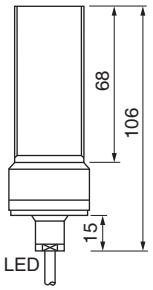
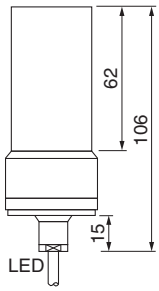
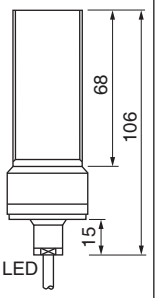
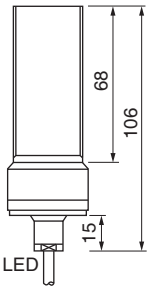
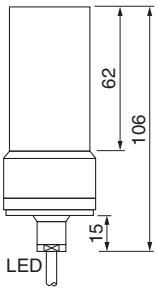
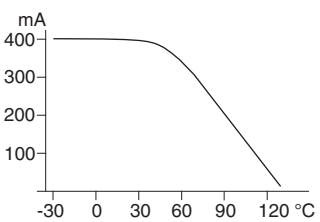
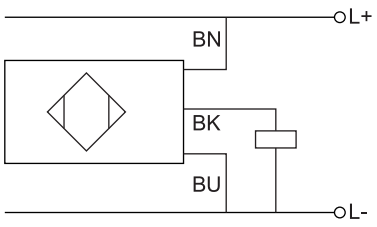
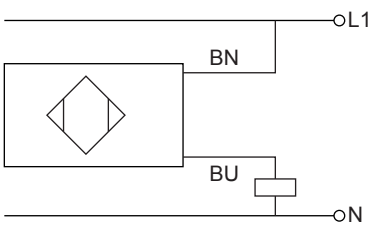
TROPICAL-Series • Resistant to rolling oil

Series IGFW / INFW - Proximity switches

PTFE housing

DC 10...55 V
AC 20...250 V

IP 68 Water-proofed
IP 69K Resistant to high pressure cleaning

Design	DC PNP • M30x1.5		DC • Ø35	AC • M30x1.5		AC • Ø35
Dimensions Installation flush (f) non flush (nf)						
Operating distance sn [mm]	10 f	14 nf	19 nf	10 f	14 nf	19 nf
Switching output (DC PNP)						
ID-No.	P30628	P30640	P30652	P30626	P30638	P30650
Type	IGFW 010 GSP	IGFW 015 GSP	INFW 020 GSP	IGFW 010 WS	IGFW 015 WS	INFW 020 WS
Supply voltage [V]	10...55 DC			20...250 AC		
Switching current [mA]	<400			<400		
Surge current [mA]	short circuit protection			<3000 / 10 ms		
Current consumption [mA]	4			2.5		
Inverse current max. [µA]	1			2500		
Voltage drop [V]	2			5 eff.		
Ambient temperature [°C]	–25...+120					
Temperature deviation [%]	10 (–25...+70 °C), 20 (–25...+120 °C)					
Overcurrent release approx. [mA]	430			–		
Reverse Protection	•			–		
Minimum load current [mA]	–			4.5		
EMC-class	A					
Switching frequency [Hz]	100			20		
Protection [EN 60529]	IP 68 + IP 69K					
Housing material	PTFE					
Connection	2 m FEP-cable 3x0.34 mm²			2 m Silicone-cable 0.75 mm²		
Switching current						
Accessories	nut M30x1.5 (Z00120), clamp Ø35 (Z00125), page 3.71					

Inductive Sensors

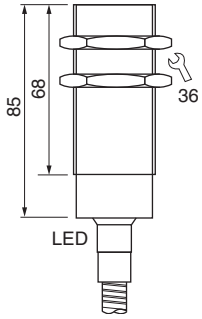
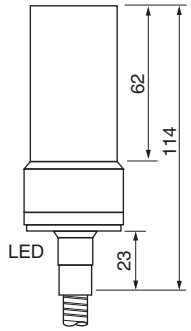
TROPICAL-Series • Resistant to rolling oil

Series IGMF / INFW - Proximity switches

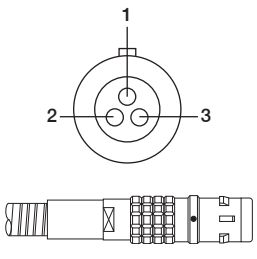
DC 10...55 V

Climatic-proofed
Resistant to acid

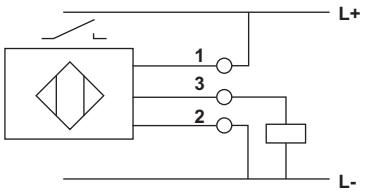
Armoured cable
with IP 68-plug

Design	DC PNP • M30x1.5	DC PNP • Ø35
Dimensions Installation flush (f) non flush (nf)		
Operating distance sn [mm]	10 f	20 nf
Switching output PNP		
ID-No.	**P31215**	**P31216**
Type	IGMF 010 GSP-PZ	INFW 020 GSP-PZ
Supply voltage [V]	10...55 DC	10...55 DC
Switching current max. [mA]	400	400
Current consumption [mA]	4	4
Switching frequency [Hz]	150	100
Ambient temperature [°C]	–25...+120	–25...+120
Compressive strength [bar]	10	–
Protection [EN 60529]	IP 68 + IP 69K	IP 68 + IP 69K
Function indicator	LED	LED
Housing material	PTFE, AISI 316 Ti	PTFE
Connection	5 m FEP-cable 3x0.34mm² armoured cable	5 m FEP-cable 3x0.34mm² armoured cable

Plug, Lemo series K, 3-pol



Sensors without plug
on request



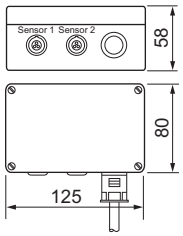
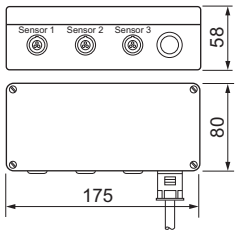
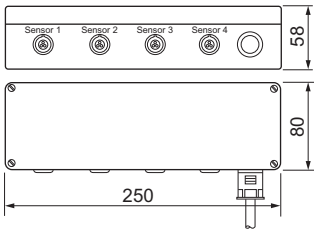
Accessories	junction box GS..., page 3.23

Junction box • Resistant to rolling oil

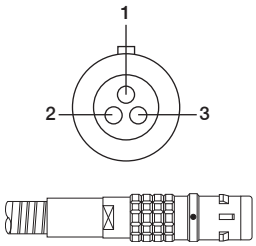
Series GS 125 / GS 175 / GS 250

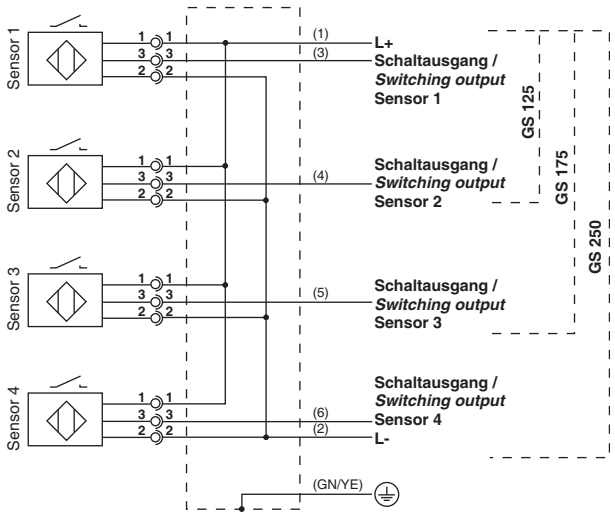
Connection of sensors with armoured cable

IP 68-plug

Design	GS 125	GS 175	GS 250
Dimensions			
ID-No.	**P31212**	**P31217**	**P31218**
Type	GS 125	GS 175	GS 250
Connectable sensors	2	3	4
Supply voltage [V]	10...55 DC	10...55 DC	10...55 DC
Ambient temperature [°C]	–20...+75	–20...+75	–20...+75
Protection [EN 60529]	IP 68	IP 68	IP 68
Housing material	Aluminium	Aluminium	Aluminium
Connection	10 m TPE-numbered cable 7x0.5mm²	10 m TPE-numbered cable 7x0.5mm²	10 m TPE-numbered cable 7x0.5mm²

Plug, Lemo series K, 3-pol





Notice	for sensors IGMF 010 GSP-PZ / INFW 020 GSP-PZ, page 3.22

Inductive Sensors

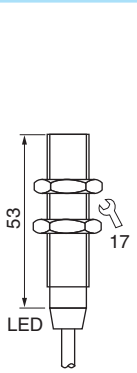
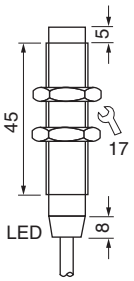
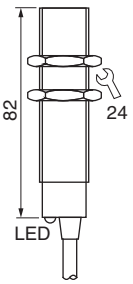
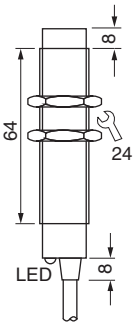
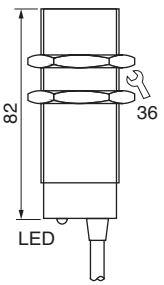
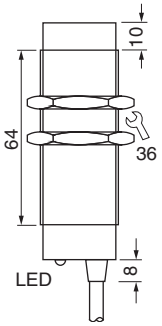
High temperature 120 °C

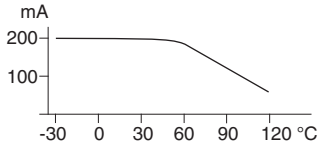
Series IGMT - Proximity switches

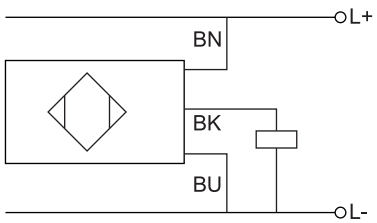
M12 / M18 / M30
Metal sleeve

DC 10...48 V

Extended temperature range –25 ºC...+120 ºC

Design	DC PNP • M12x1		DC PNP • M18x1		DC PNP • M30x1.5	
Dimensions Installation flush (f) non flush (nf)						
Operating distance sn [mm]	2 f	4 nf	5 f	8 nf	10 f	15 nf
Switching output PNP						
ID-No.	P31282	P31283	P31290	P31291	P31292	P31293
Type	IGMT 02 GSP	IGMT 04 GSP	IGMT 005 GSP	IGMT 008 GSP	IGMT 010 GSP	IGMT 015 GSP
Supply voltage [V]	10...48 DC					
Switching current [mA]	200					
Short circuit proof	•					
Reverse protection	•					
Voltage drop max. [V]	2					
Current consumption [mA]	4					
Switching frequency [Hz]	500					
Ambient temperature [°C]	–25...+120					
EMC-class	A					
Protection [EN 60529]	IP 67					
LED display	•					
Housing material	Br-Ni / PBT					
Connection	2 m Silicone-cable 3x0.34 mm²					
Switching current						





Notes	design with M12 connector on request

Inductive Sensors

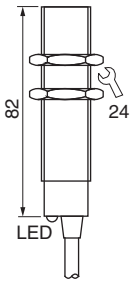
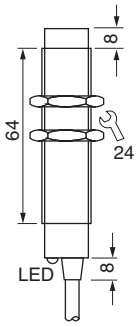
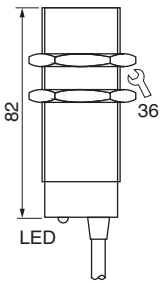
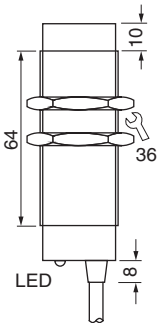
High temperature 120 °C

Series IGMT - Proximity switches

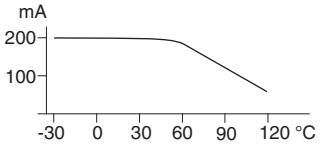
M18 / M30
Metal sleeve

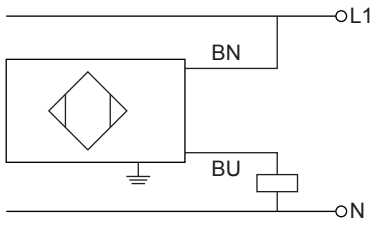
AC 20...250 V

Extended temperature range
–25 ºC...+120 ºC

Design	AC • M18x1		AC • M30x1.5	
Dimensions				
Installation flush (f) non flush (nf)				
Operating distance sn [mm]	5 f	8 nf	10 f	15 nf
Switching output				
ID-No.	**P31118**	**P31119**	**P31120**	**P31121**
Type	IGMT 005 WS	IGMT 008 WS	IGMT 010 WS	IGMT 015 WS
Supply voltage [V]	20…250 AC			
Switching current [mA]	200			
Short circuit proof	–			
Reverse protection	–			
Voltage drop max. [V]	5 eff.			
Minimum load current [mA]	5			
Current consumption [mA]	2.5			
Switching frequency [Hz]	25			
Ambient temperature [°C]	–25...+120			
EMC-class	A			
Protection [EN 60529]	IP 67			
LED display	•			
Housing material	Br-Ni / PBT			
Connection	2 m Silicone-cable 3x0.75 mm²			

Switching current





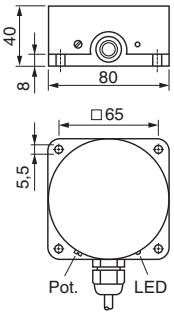
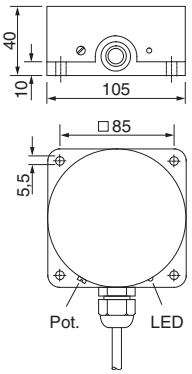
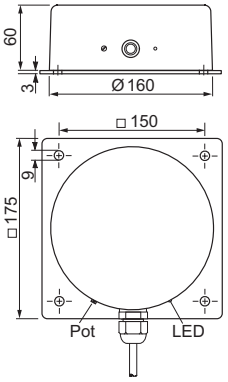
Inductive Sensors

High temperature 120 °C

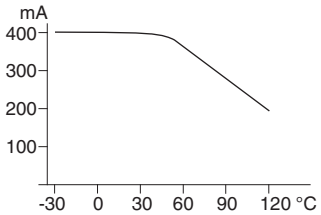
Series IDT - Proximity switches

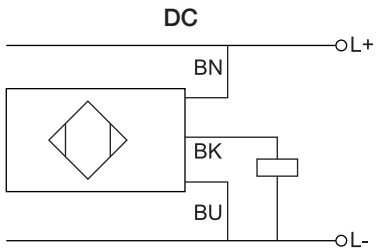
DC 10...55 V
AC 20...250 V

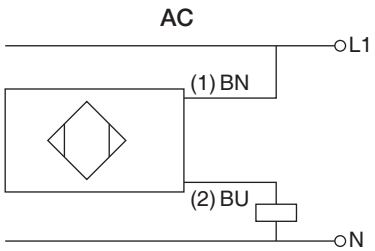
Extended sensing range

Design	Ø 80 mm		Ø 105 mm		Ø 160 mm	
Dimensions						
Installation non flush (nf)						
Operating distance sn [mm]	50 nf	45 nf	80 nf	60 nf	110 nf	100 nf
Switching output (DC PNP)						
ID-No.	P31276	P31279	P31277	P31280	P31278	P31281
Type	IDT 080 GSP	IDT 080 WS	IDT 105 GSP	IDT 105 WS	IDT 160 GSP	IDT 160 WS
Supply voltage [V]	10...55 DC	20...250 AC	10...55 DC	20...250 AC	10...55 DC	20...250 AC
Switching current [mA]	400	400	400	400	400	400
Short circuit proof	•	–	•	–	•	–
Reverse protection	•	–	•	–	•	–
Voltage drop max. [V]	2	5 eff.	2	5 eff.	2	5 eff.
Minimum load current [mA]	–	5	–	5	–	5
Current consumption [mA]	4	2.5	4	2.5	4	2.5
Switching frequency [Hz]	20	10	20	10	20	10
Ambient temperature [°C]	–25...+120					
EMC-class	A					
Protection [EN 60529]	IP 67					
Housing material	PBT / Aluminium					
Connection	2 m Silicone-cable 3x0.34 mm²	2 m Silicone-cable 2x0.75 mm²	2 m Silicone-cable 3x0.34 mm²	2 m Silicone-cable 2x0.75 mm²	2 m Silicone-cable 3x0.34 mm²	2 m Silicone-cable 2x0.75 mm²

Switching current







Inductive Sensors

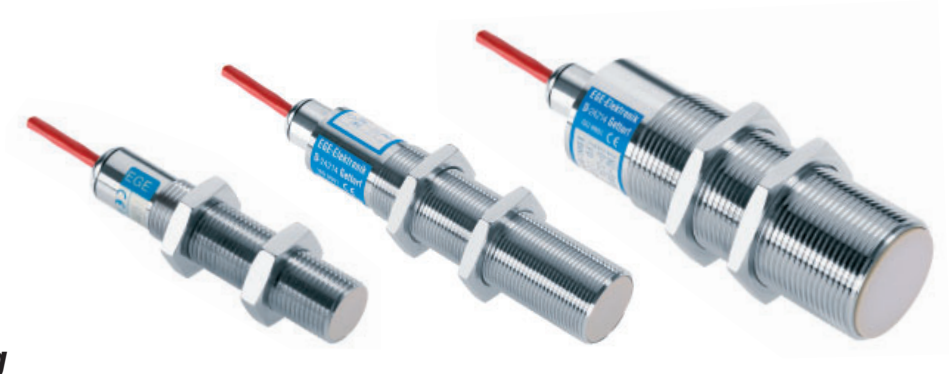
High temperature 160 °C

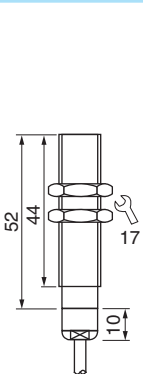
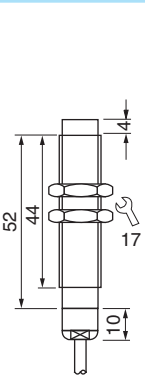
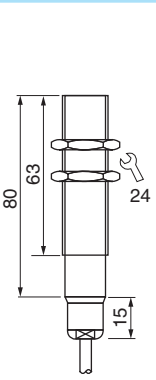
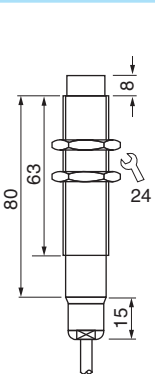
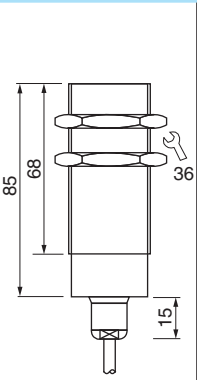
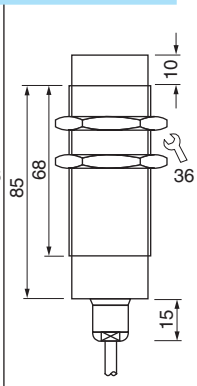
Series IGMH - Proximity switches

M12 / M18 / M30
Stainless steel sleeve

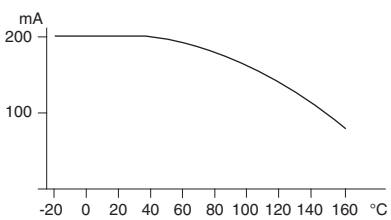
DC 10...30 V

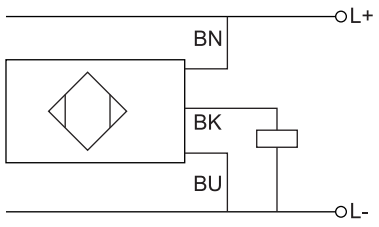
IP 68 Water-proofed
IP 69K Resistant to
high pressure cleaning



Design	DC PNP • M12x1		DC PNP • M18x1		DC PNP • M30x1.5	
Dimensions Installation flush (f) non flush (nf)						
Operating distance sn [mm]	2 f	4 nf	5 f	8 nf	10 f	15 nf
Switching output PNP						
ID-No.	P31288	P31289	P31161	P31162	P31163	P31164
Type	IGMH 02 GSP	IGMH 04 GSP	IGMH 005 GSP	IGMH 008 GSP	IGMH 010 GSP	IGMH 015 GSP
Supply voltage [V]	10...30 DC					
Switching current [mA]	200					
Short circuit proof	•					
Reverse protection	•					
Voltage drop max. [V]	2					
Residual current max. [mA]	0.02					
Current consumption (not actuated) [mA]	7					
Switching frequency [Hz]	200					
Temperature deviation [%]	15					
Ambient temperature [°C]	–25...+150		–25...+160			
EMC-class	A					
Protection [EN 60529]	IP 68 + IP 69K					
LED display	–					
Housing material	AISI 316 Ti / PEEK					
Connection	2 m FEP-cable 3x0.34 mm²					

Switching current





Notes	temperature depending parameters are described in the technical manual

Inductive Sensors

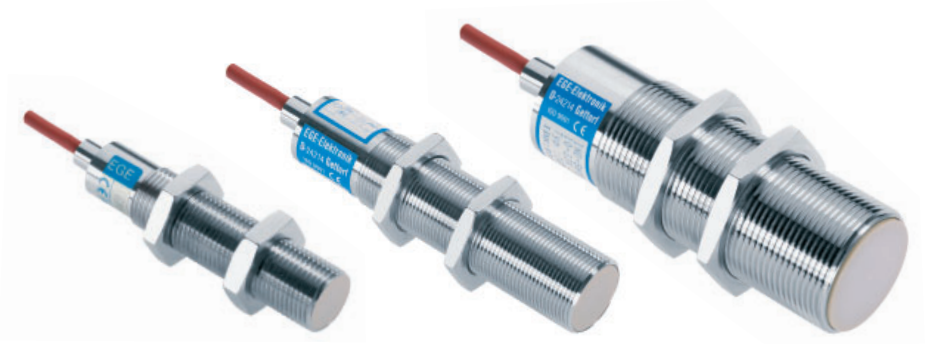
High temperature 160 °C

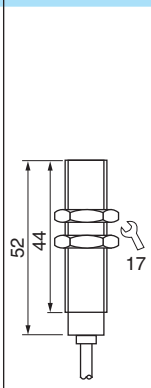
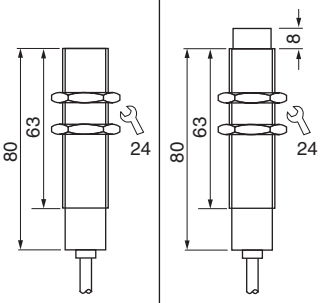
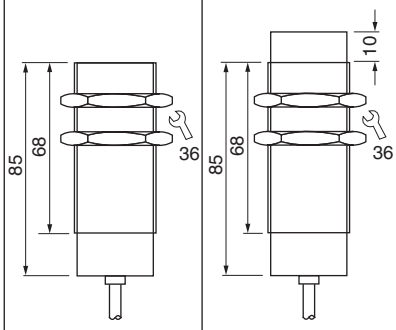
Series IGMH - Proximity switches

M12 / M18 / M30
Stainless steel sleeve

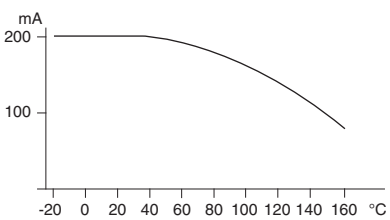
DC 10...30 V

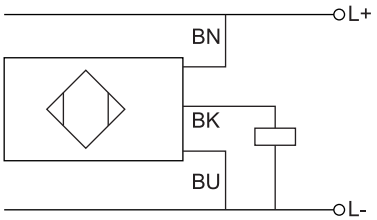
Moisture resistant
Silicone-cable



Design	DC PNP • M12x1		DC PNP • M18x1		DC PNP • M30x1.5	
Dimensions Installation flush (f) non flush (nf)						
Operating distance sn [mm]	2 f	4 nf	5 f	8 nf	10 f	15 nf
Switching output PNP						
ID-No.	P31299	P31300	P31301	P31302	P31303	P31304
Type	IGMH 02 GSP-K	IGMH 04 GSP-K	IGMH 005 GSP-K	IGMH 008 GSP-K	IGMH 010 GSP-K	IGMH 015 GSP-K
Supply voltage [V]	10...30 DC					
Switching current [mA]	200					
Short circuit proof	•					
Reverse protection	•					
Voltage drop max. [V]	2					
Residual current max. [mA]	0.02					
Current consumption (not actuated) [mA]	7					
Switching frequency [Hz]	200					
Temperature deviation [%]	15					
Ambient temperature [°C]	−25...+150		−25...+160			
EMC-class	A					
Protection [EN 60529]	IP 67					
LED display	–					
Housing material	AISI 316 Ti / PEEK					
Connection	2 m Silicone-cable 3x0.34 mm²					

Switching current





Notes	temperature depending parameters are described in the technical manual

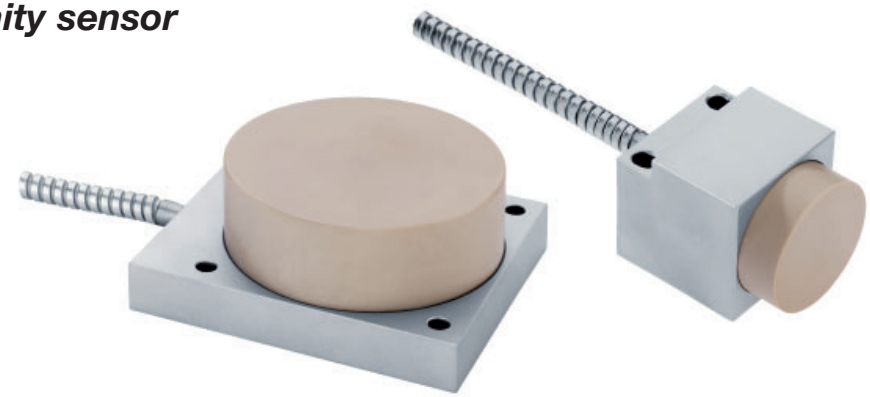
Inductive Sensors

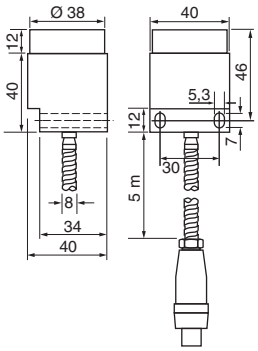
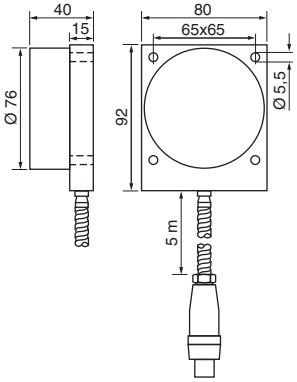
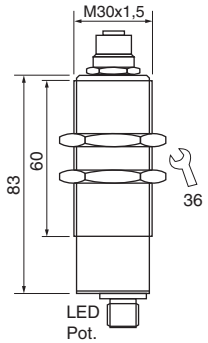
High temperature 250 °C

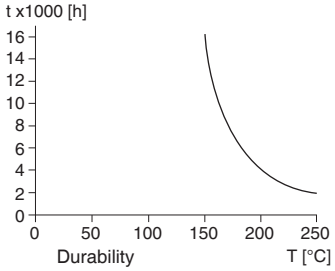
Series IRH / IDH - Proximity sensor

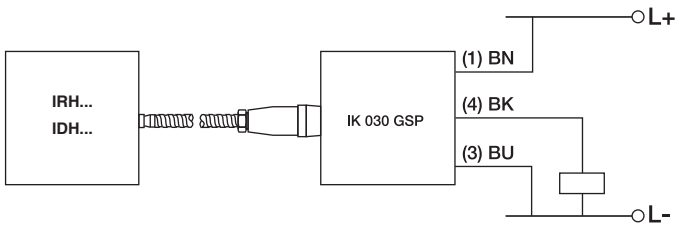
Armoured cable

With connector for cable amplifier



Design	Cuboid 40 mm	Ø 80 mm	DC PNP • M30x1.5
Dimensions Installation non flush (nf)			
Operating distance sn [mm]	20 nf, adjustable	40 nf, adjustable	amplifier
Switching output PNP			
ID-No.	**P31294**	**P31295**	**P31204**
Type	IRH 040 S250	IDH 080 S250	IK 030 GSP
Supply voltage [V]	–		10...30
Switching current [mA]	–		200
Current consumption [mA]	–		15
Voltage drop max. [V]	–		1.5
Ambient temperature [°C]	0...+250		0...+70
Short circuit proof	–		•
Reverse protection	–		•
EMC-class	A		A
Switching frequency [Hz]	30		30
Protection [EN 60529]	IP 60		IP 67
Function indicator	–		LED yellow
Stand-by indicator	–		LED green
Housing material	Aluminium / PEEK		AISI 316 Ti
Connection cable	5 m FEP-cable, Ø 8 mm armoured cable		–
Connection	M12 connector		M12 connector





Accessories	connecting cable SLG 3-2 (Z01076), page 3.69

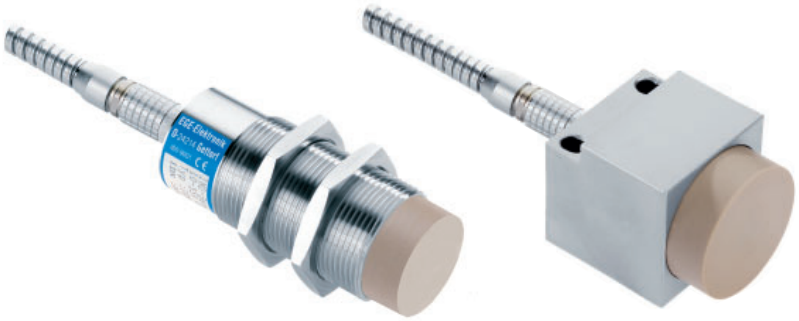
Inductive Sensors

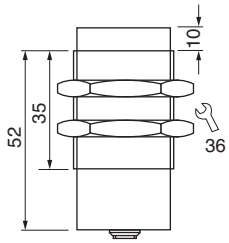
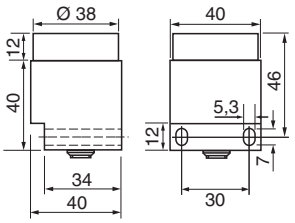
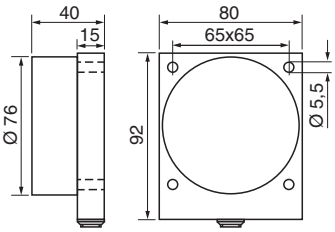
High temperature 250 °C

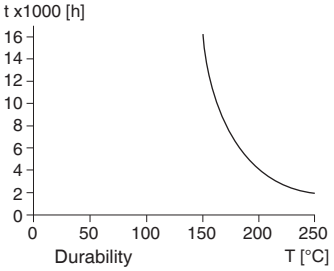
Series IGHS / IRHS / IDHS - Proximity sensor

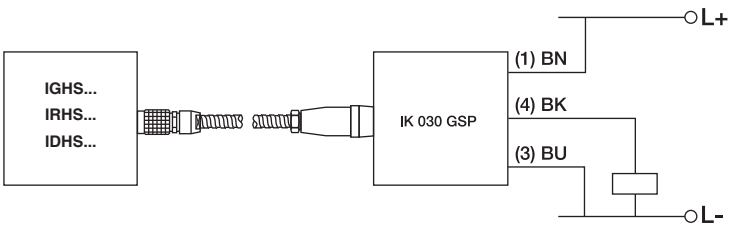
Armoured cable

With connector for cable amplifier and sensor



Design	M30x1.5	Cuboid 40 mm	Ø 80 mm
Dimensions Installation non flush (nf)			
Operating distance sn [mm]	15 nf, adjustable	20 nf, adjustable	40 nf, adjustable
ID-No.	**P31298**	**P31296**	**P31297**
Type	IGHS 030 S250	IRHS 040 S250	IDHS 080 S250
Supply voltage [V]	–		
Switching current [mA]	–		
Current consumption [mA]	–		
Voltage drop [V]	–		
Ambient temperature [°C]	0...+250		
Short circuit proof	–		
Reverse protection	–		
EMC-class	A		
Switching frequency [Hz]	30		
Protection [EN 60529]	IP 60		
Housing material	AISI 316 Ti / PEEK	Aluminium / PEEK	
Connection	M12 connector		
Connection cable (Accessories)	5 m FEP-cable, Ø 8 mm armoured cable (KAP 08-DS5, Z01190) 		





Accessories	connecting cable SLG 3-2 (Z01076), page 3.69

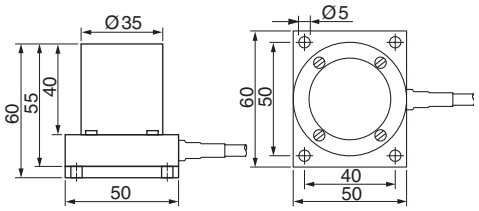
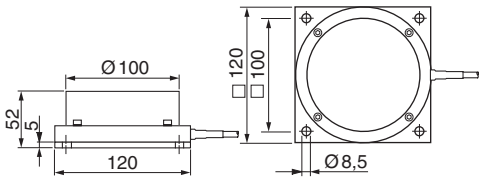
Inductive Sensors

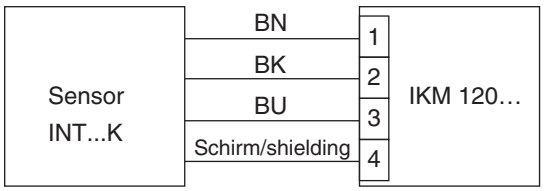
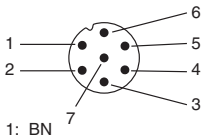
High temperature 200 °C

Series INT - Proximity sensor

PTFE housing

No cooling

Design	INT020-S200		INT100-S180	
Dimensions Installation non flush (nf)				
Operating distance sn [mm]	15 nf		50 nf	
Adjustable range [mm]	5...20		10...80	
ID-No.	P31101	P30411	P31103	P30427
Type	INT020-S200 K	INT020-S200 GC	INT100-S180 K	INT100-S180 GC
Limiting temperature [°C]	250		200	
Nominal temperature [°C]	200		180	
Temperature deviation (not linear) [mm/°C]	0.05		0.06	
EMC-class	B			
Protection [EN 60529]	IP 40			
Housing material	PTFE			
Mounting	Aluminium plate			
Sensing material [ST 37]	40x40x1		100x100x1	
Connecting cable	5 m PTFE shielded			
Connection and required Amplifier	clamp connection IKM 120 GPP	plug C 16 IU 130...	clamp connection IKM 120 GPP	plug C 16 IU 130...
Special notes	If the ambient temperature exeeds 230 °C, there might be failed reactions from the sensor, but it will nor be destroyed by this. The inductive high temperature proximity switches must be used with an amplifier. The connection cable can be up to 10 m long. We can supply the cable with a flexible aluminium tube on request.			

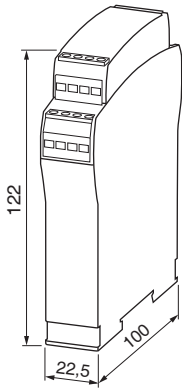
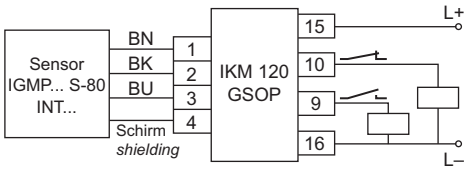
	Sensor-Connection sensors INT...K to IKM 120 GPP	Plug C 16: connection for Sensors INT...to IU 130...
Connection diagram Amplifiers see page 3.32 - 3.33 Temperature depending parameters are described in the technical manual		 1: BN 2: BK 3: BU 7: Schirm
Accessories		plug C 16

Amplifier

Series IKM

For the connection of separate sensors for extreme temperatures

LED display

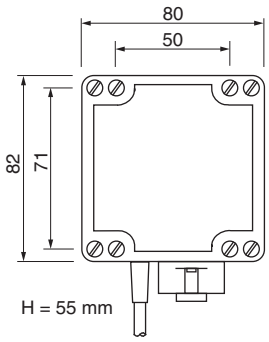
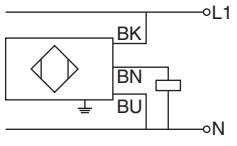
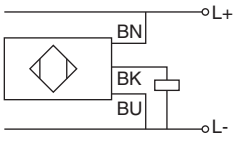
Design	IKM 120 GSOP
Dimensions	
ID-No.	P31334
Type	IKM 120 GSOP
Switching output	PNP
Supply voltage [V]	24 V DC ±20%
Switching current [mA]	400
Short circuit proof	•
Current consumption [mA]	max. 18
Operating distance	adjustable
Hysteresis max. [%]	10
Switching frequency [Hz]	100
Ambient temperature [°C]	–25...+75
EMC-class	A
Protection [EN 60529]	terminal: IP 20 / housing: IP 40
Function indicator	LED yellow
Stand-by indicator	LED green
Housing material	PA
Connection sensor	terminal screws
Connection Amplifier	terminal screws
	

Amplifiers

Series IU

For the connection of separate sensors

LED display

Design	IU 130...	
Dimensions		
ID-No.	P30438	P30439
Type	IU 130 WP	IU 130 GPP
Supply voltage [V]	230 AC ±10%	24 DC ±10%
Switching current [mA]	400	
Short circuit proof	–	
Current consumption [mA]	15	
Operating distance	adjustable	
Hysteresis max. [%]	adjustable	
Output	programmable	
Switching frequency [Hz]	5	15
Ambient temperature [°C]	–20...+70	
EMC-class	A	
Protection [EN 60529]	IP 67	
Function indicator	LED yellow	
Stand-by indicator	LED green	
Housing material	PBT	
Connection sensor	C 16 plug connection	
Connection amplifier	2 m PVC-cable 4x0.75 mm²	2 m PVC-cable 3x0.50 mm²
	connection amplifier 	connection amplifier 
Accessories	external plug C 16 (Z00039)	

Inductive Sensors

Demanding environment

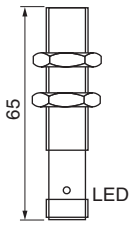
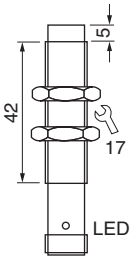
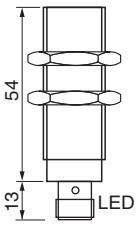
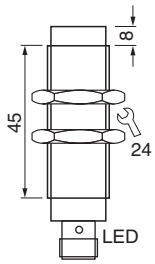
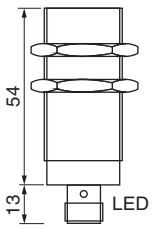
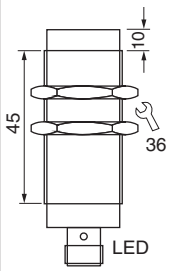
Series IGM - Proximity switches

M12 / M18 / M30
Metal sleeve

DC 10...48 V

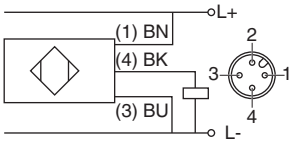
Short form

Increased EMC

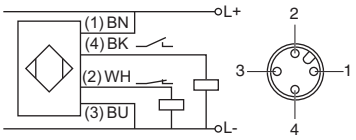
Design	DC PNP • M12x1		DC PNP • M18x1		DC PNP • M30x1.5	
Dimensions Installation flush (f) non flush (nf)						
Operating distance sn [mm]	2 f	4 nf	5 f	8 nf	10 f	15 nf
GSP ID-No.	P31246	P31247	P31305	P31306	P31307	P31308
Type	IGMU 02 GSP	IGMU 04 GSP	IGMU 05 GSP	IGMU 08 GSP	IGMU 10 GSP	IGMU 15 GSP
GSOP ID-No.	–	–	P31250	P31251	P31254	P31255
Type			IGMU 05 GSOP	IGMU 08 GSOP	IGMU 10 GSOP	IGMU 15 GSOP

Supply voltage	[V]	10...48 DC
Switching current	[mA]	200
Short circuit proof		•
Reverse protection		•
Voltage drop max.	[V]	2
Current consumption	[mA]	2.5
Switching frequency	[Hz]	500
Ambient temperature	[°C]	–25...+75
EMC-class		A
Protection	[EN 60529]	IP 67
LED display		•
Housing material		Br-Ni / PBT
Connection		M12 connector

GSP



GSOP



Accessories	connecting cable SLG 3-2 (GSP) / SLG 4-2 (GSOP), page 3.69

Inductive Sensors

Demanding environment

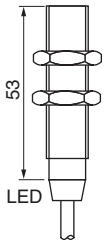
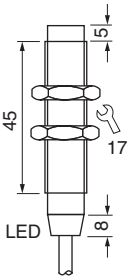
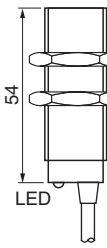
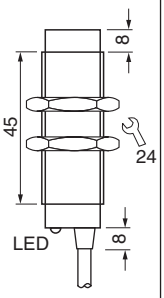
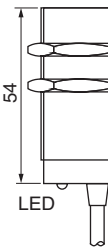
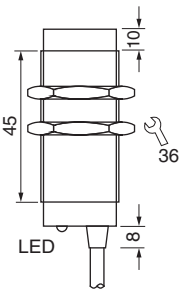
Series IGM - Proximity switches

M12 / M18 / M30
Metal sleeve

DC 10...48 V

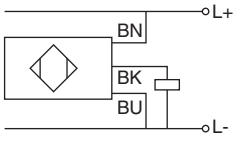
Short form

Increased EMC

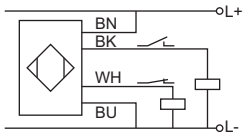
Design	DC PNP • M12x1		DC PNP • M18x1		DC PNP • M30x1.5	
Dimensions						
Installation flush (f) non flush (nf)						
Operating distance sn [mm]	2 f	4 nf	5 f	8 nf	10 f	15 nf
GSP ID-No.	P31244	P31245	P31309	P31310	P31311	P31312
GSP Type	IGM 02 GSP	IGM 04 GSP	IGM 05 GSP	IGM 08 GSP	IGM 10 GSP	IGM 15 GSP
GSOP ID-No.	–	–	P31248	P31249	P31252	P31253
GSOP Type			IGM 05 GSOP	IGM 08 GSOP	IGM 10 GSOP	IGM 15 GSOP

Supply voltage	[V]	10...48 DC
Switching current	[mA]	200
Short circuit proof		•
Reverse protection		•
Voltage drop max.	[V]	2
Current consumption	[mA]	2.5
Switching frequency	[Hz]	500
Ambient temperature	[°C]	–25...+75
EMC-class		A
Protection	[EN 60529]	IP 67
LED display		•
Housing material		Br-Ni / PBT
Connection		**GSP:** 2 m PVC-cable 3x0.34 mm² | **GSOP:** 2 m PVC-cable 4x0.34 mm²

GSP



GSOP



Inductive Sensors

Demanding environment

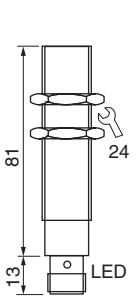
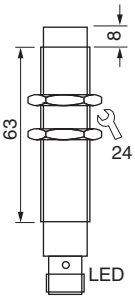
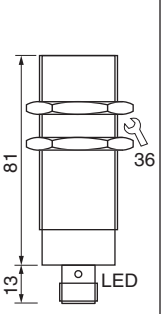
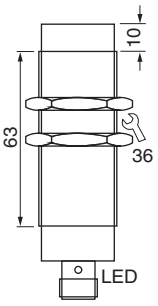
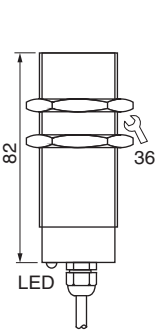
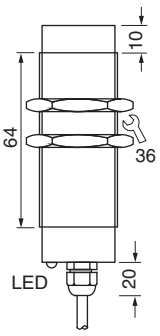
Series IGM - Proximity switches

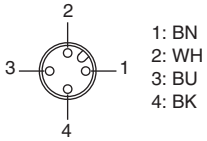
M18 / M30
Metal sleeve

DC 10...48 V
AC 20...250 V

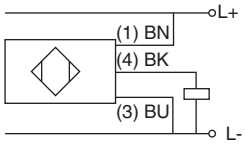
Long form

Increased EMC

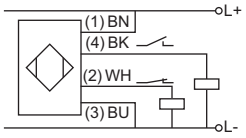
Design	DC PNP • M18x1		DC PNP • M30x1.5		AC • M30x1.5 programmable	
Dimensions						
Installation flush (f) non flush (nf)						
Operating distance sn [mm]	5 f	8 nf	10 f	15 nf	10 f	15 nf
GSP ID-No.	P31313	P31314	P31315	P31316	–	–
GSP Type	IGMU 005 GSP	IGMU 008 GSP	IGMU 010 GSP	IGMU 015 GSP		
GSOP ID-No.	P31258	P31259	P31262	P31263	–	–
GSOP Type	IGMU 005 GSOP	IGMU 008 GSOP	IGMU 010 GSOP	IGMU 015 GSOP		
WP ID-No.	–	–	–	–	P30015	P30019
WP Type					IGMS 010 WP	IGMS 015 WP
Supply voltage [V]	10...48 DC				20...250 AC	
Switching current [mA]	200				400	
Short circuit proof	•				3000 mA/10 ms	
Reverse protection	•				–	
Voltage drop max. [V]	2				6	
Minimum load current [mA]	–				5	
Current consumption [mA]	2.5				2.5	
Switching frequency [Hz]	500				25	
Ambient temperature [°C]	–25...+75				–25...+75	
EMC-class	A				A	
Protection [EN 60529]	IP 67				IP 67	
LED display	•				•	
Housing material	Br-Ni / PBT				Br-Ni / PBT	
Connection	M12 connector				PG-plug connection 2 m PVC-cable 3x0.5 mm²	



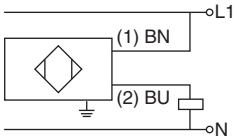
GSP



GSOP



WP



Accessories	connecting cable SLG 3-2 (GSP) / SLG 4-2 (GSOP), page 3.69	

Inductive Sensors

Demanding environment

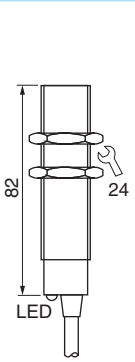
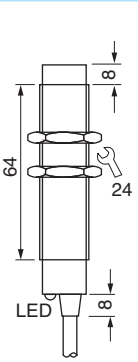
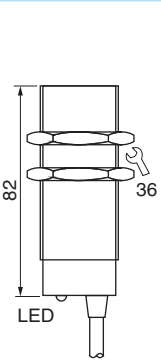
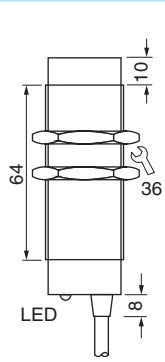
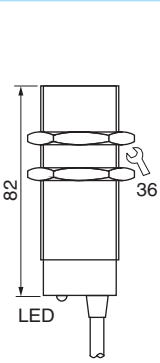
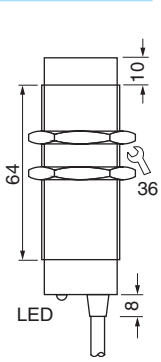
Series IGM - Proximity switches

M18 / M30
Metal sleeve

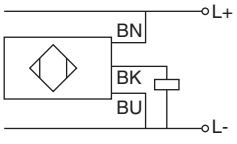
DC 10...48 V
AC 20...250 V

Long form

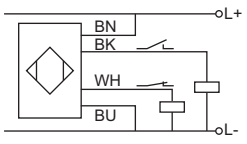
Increased EMC

Design	DC PNP • M18x1		DC PNP • M30x1.5		AC • M30x1.5	
Dimensions Installation flush (f) non flush (nf)						
Operating distance sn [mm]	5 f	8 nf	10 f	15 nf	10 f	15 nf
GSP ID-No.	P31317	P31318	P31319	P31320	–	–
GSP Type	IGM 005 GSP	IGM 008 GSP	IGM 010 GSP	IGM 015 GSP		
GSOP ID-No.	P31256	P31257	P31260	P31261	–	–
GSOP Type	IGM 005 GSOP	IGM 008 GSOP	IGM 010 GSOP	IGM 015 GSOP		
WS ID-No.	–	–	–	–	P30016	P30020
WS Type					IGM 010 WS	IGM 015 WS
Supply voltage [V]	10...48 DC				20...250 AC	
Switching current [mA]	200				400	
Short circuit proof	•				3000 mA/10 ms	
Reverse protection	•				–	
Voltage drop max. [V]	2				6	
Minimum load current [mA]	–				5	
Current consumption [mA]	2.5				2.5	
Swiching frequency [Hz]	500				25	
Ambient temperature [°C]	–25...+75				–25...+75	
EMC-class	A				A	
Protection [EN 60529]	IP 67				IP 67	
LED display	•				•	
Housing material	Br-Ni / PBT				Br-Ni / PBT	
Connection	**GSP:** 2 m PVC-cable, 3x0.34 mm²				2 m PVC-cable	
	GSOP: 2 m PVC-cable, 4x0.34 mm²				3x0.5 mm²	

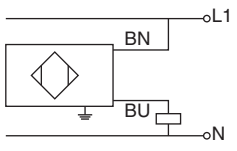
GSP



GSOP



WS



Inductive Sensors

Demanding environment

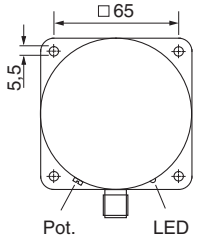
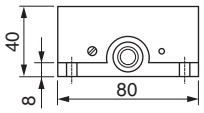
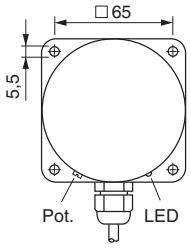
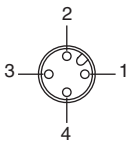
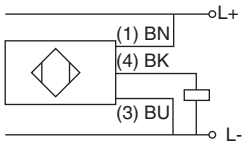
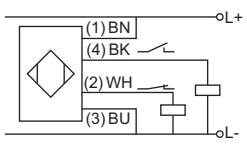
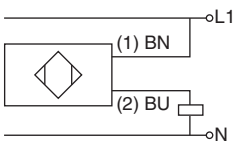
Series ID - Proximity switches

Ø80 mm

DC 10...55 V
AC 20...250 V

Sensing range adjustable

Increased EMC

Design	DC PNP • Ø80 mm	DC PNP • Ø80 mm	AC • Ø80 mm programmable
Dimensions Installation non flush (nf)			
Operating distance sn [mm] (Adjustable range)	55 nf (25…80)	55 nf (25…80)	55 nf (25…80)
GSP ID-No. / Type	**P31321** IDU 080 GSP	**P31322** ID 080 GSP	–
GSOP ID-No. / Type	**P31264** IDU 080 GSOP	**P31265** ID 080 GSOP	–
WP ID-No. / Type	–	–	**P31266** IDS 080 WP
Supply voltage [V]	10...55 DC	10...55 DC	20...250 AC
Switching current [mA]	400	400	400
Short circuit proof	•	•	3000 mA/10 ms
Reverse protection	•	•	–
Voltage drop max. [V]	2	2	6 eff.
Minimum load current [mA]	–	–	8
Current consumption [mA]	4	4	2.5
Switching frequency [Hz]	20	20	10
Ambient temperature [°C]	–25...+75	–25...+75	–25...+75
EMC-class	A	A	A
Protection [EN 60529]	IP 67	IP 67	IP 67
LED display	•	•	•
Housing material	PBT	PBT	PBT
Connection	M12 connector	**GSP:** 2 m PVC-cable, 3x0.5 mm² **GSOP:** 2 m PVC-cable, 4x0.5 mm²	PG-plug connection 2 m, 2x0.75 mm², PVC
 1: BN 2: WH 3: BU 4: BK	**GSP** 	**GSOP** 	**WP** 
Accessories	connecting cable SLG 3-2 (GSP) / SLG 4-2 (GSOP), page 3.69		

Inductive Sensors

Demanding environment

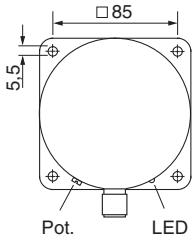
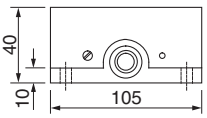
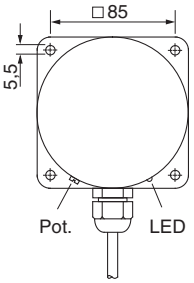
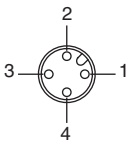
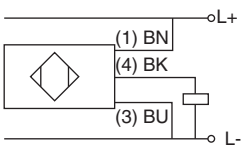
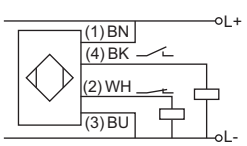
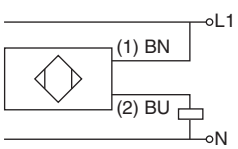
Series ID - Proximity switches

Ø 105 mm

DC 10...55 V
AC 20...250 V

Sensing range adjustable

Increased EMC

Design	DC PNP • Ø 105 mm	DC PNP • Ø 105 mm	AC • Ø 105 mm programmable
Dimensions Installation non flush (nf)			
Operating distance sn [mm] (Adjustable range)	100 nf (20…110)	100 nf (20…110)	70 nf (20…110)
GSP ID-No. / Type	**P31323** IDU 105 GSP	**P31324** ID 105 GSP	–
GSOP ID-No. / Type	**P31267** IDU 105 GSOP	**P31268** ID 105 GSOP	–
WP ID-No. / Type	–	–	**P31269** IDS 105 WP
Supply voltage [V]	10...55 DC	10...55 DC	20...250 AC
Switching current [mA]	400	400	400
Short circuit proof	•	•	3000 mA/10 ms
Reverse protection	•	•	–
Voltage drop max. [V]	2	2	6 eff.
Minimum load current [mA]	–	–	8
Current consumption [mA]	4	4	2.5
Switching frequency [Hz]	20	20	10
Ambient temperature [°C]	–25...+75	–25...+75	–25...+75
EMC-class	A	A	A
Protection [EN 60529]	IP 67	IP 67	IP 67
LED display	•	•	•
Housing material	PBT	PBT	PBT
Connection	M12 connector	**GSP:** 2 m PVC-cable, 3x0.5 mm² **GSOP:** 2 m PVC-cable, 4x0.5 mm²	PG-plug connection 2 m, 2x0.75 mm², PVC
 1: BN 2: WH 3: BU 4: BK	**GSP** 	**GSOP** 	**WP** 
Accessories	connecting cable SLG 3-2 (GSP) / SLG 4-2 (GSOP), page 3.69		

Inductive Sensors

Demanding environment

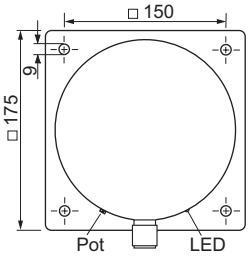
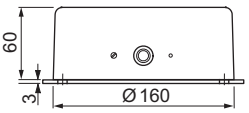
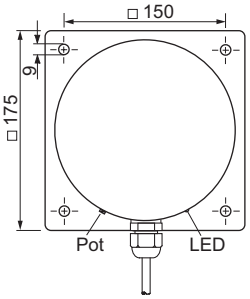
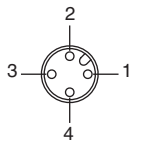
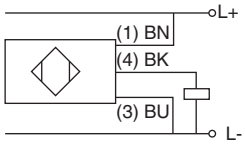
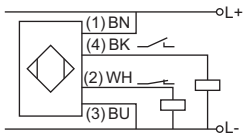
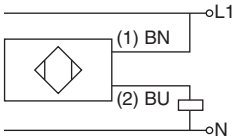
Series ID - Proximity switches

Ø 160 mm

DC 10...55 V
AC 20...250 V

Sensing range adjustable

Increased EMC

Design	DC PNP • Ø 160 mm	DC PNP • Ø 160 mm	AC • Ø 160 mm programmable
Dimensions Installation non flush (nf)			
Operating distance sn [mm] (Adjustable range)	120 nf (20…150)	120 nf (20…150)	120 nf (20...150)
GSP ID-No. / Type	**P31325** IDU 160 GSP	**P31326** ID 160 GSP	–
GSOP ID-No. / Type	**P31270** IDU 160 GSOP	**P31271** ID 160 GSOP	–
WP ID-No. / Type	–	–	**P31272** IDS 160 WP
Supply voltage [V]	10...55 DC	10...55 DC	20...250 AC
Switching current [mA]	400	400	400
Short circuit proof	•	•	3000 mA/10 ms
Reverse protection	•	•	–
Voltage drop max. [V]	2	2	6 eff.
Minimum load current [mA]	–	–	8
Current consumption [mA]	4	4	2.5
Switching frequency [Hz]	20	20	10
Ambient temperature [°C]	–25...+75	–25...+75	–25...+75
EMC-class	A	A	A
Protection [EN 60529]	IP 67	IP 67	IP 67
LED display	•	•	•
Housing material	PBT / Aluminium	PBT / Aluminium	PBT / Aluminium
Connection	M12 connector	**GSP:** 2 m PVC-cable, 3x0.5 mm² **GSOP:** 2 m PVC-cable, 4x0.5 mm²	PG-plug connection 2 m, 2x0.75 mm², PVC
 1: BN 2: WH 3: BU 4: BK	**GSP** 	**GSOP** 	**WP** 
Accessories	connecting cable SLG 3-2 (GSP) / SLG 4-2 (GSOP), page 3.69		

Inductive Sensors

Demanding environment

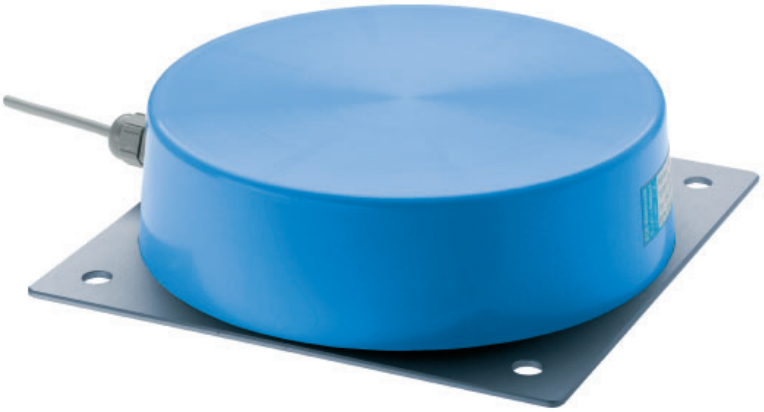
Series ID - Proximity switches

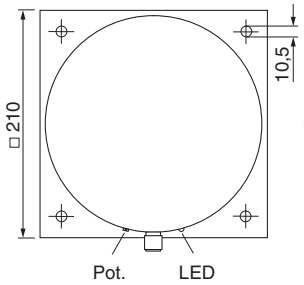
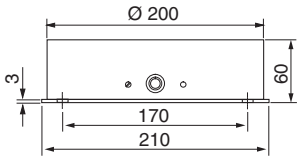
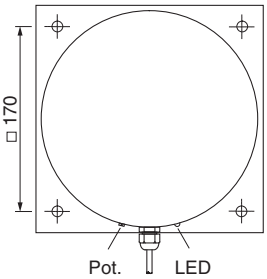
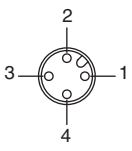
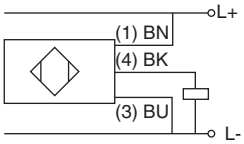
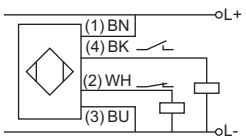
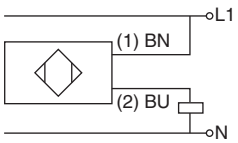
Ø 200 mm

DC 10...55 V
AC 20...250 V

Sensing range adjustable

Increased EMC



Design	DC PNP • Ø200 mm	DC PNP • Ø200 mm	AC • Ø200 mm programmable
Dimensions Installation non flush (nf)			
Operating distance sn [mm] (Adjustable range)	140 nf (40…170)	140 nf (40…170)	140 nf (40…170)
GSP ID-No. Type	**P31327** IDU 200 GSP	**P31328** ID 200 GSP	–
GSOP ID-No. Type	**P31273** IDU 200 GSOP	**P31274** ID 200 GSOP	–
WP ID-No. Type	–	–	**P31275** IDS 200 WP
Supply voltage [V]	10...55 DC	10...55 DC	20...250 AC
Switching current [mA]	400	400	400
Short circuit proof	•	•	3000 mA/10 ms
Reverse protection	•	•	–
Voltage drop max. [V]	2	2	6 eff.
Minimum load current [mA]	–	–	8
Current consumption [mA]	4	4	2.5
Switching frequency [Hz]	20	20	10
Ambient temperature [°C]	–25...+75	–25...+75	–25...+75
EMC-class	A	A	A
Protection [EN 60529]	IP 67	IP 67	IP 67
LED display	•	•	•
Housing material	PBT / Aluminium	PBT / Aluminium	PBT / Aluminium
Connection	M12 connector	**GSP:** 2 m PVC-cable, 3x0.5 mm² **GSOP:** 2 m PVC-cable, 4x0.5 mm²	PG-plug connection 2 m, 2x0.75 mm², PVC
 1: BN 2: WH 3: BU 4: BK	**GSP** 	**GSOP** 	**WP** 
Accessories	connecting cable SLG 3-2 (GSP) / SLG 4-2 (GSOP), page 3.69		

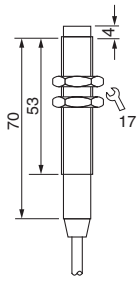
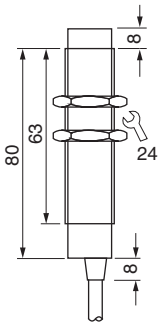
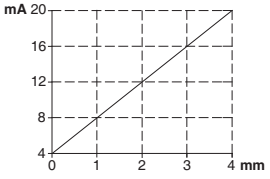
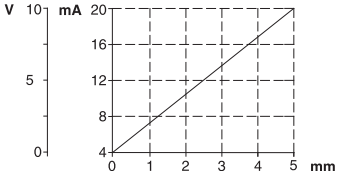
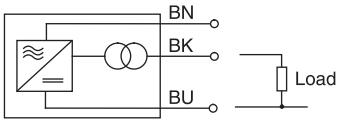
Inductive Sensors

Analog output

Series IGA - Proximity sensors

M12 / M18
Metal sleeve

0...10 V
4...20 mA

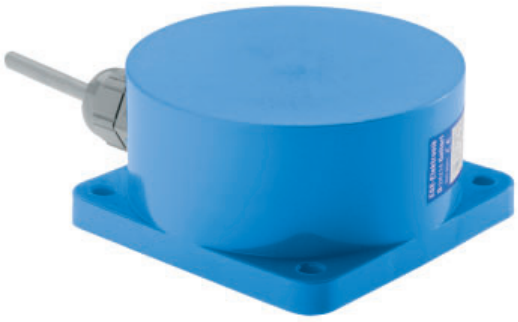
Design	M12x1	M18x1	M18x1
Dimensions			
Installation non flush (nf)			
Analog range [mm]	0...4 nf	0...5 nf	0...5 nf
Output			
	4...20 mA	0...10 V	4...20 mA
ID-No.	P31128	P31040	P31129
Type	IGA 104 GI	IGA 005 GU	IGA 005 GI
Supply voltage [V]	18...27 DC	18...27 DC	18...27 DC
Current consumption max. [mA]	40	25	40
Voltage output max. [V]	–	11	–
Output current max. [mA]	23	–	23
Linearity deviation [%]	10	5	5
Load resistance R_L [kΩ]	<0.4	>2	<0.4
Ambient temperature [°C]	–25...+70		
Temperature deviation [%]	10		
Protection [EN 60529]	IP 67		
Housing material	Br-Ni / PBT		
Connecting	2 m PVC-cable 3x0.34 mm²	2 m PVC-cable 3x0.5 mm²	
Output signal with approaching iron plate ST37			
Connection diagram			

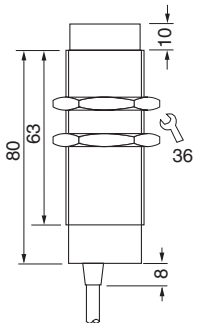
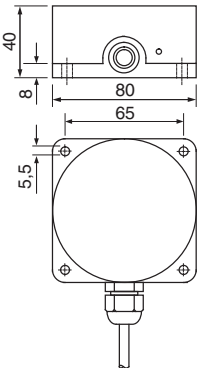
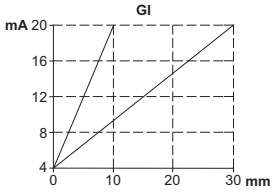
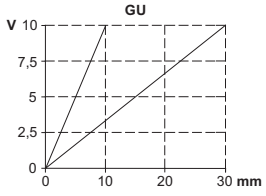
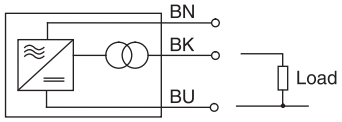
Analog output

Series IGA / IDA - Proximity sensors

M30
Ø 80 mm

0...10 V
4...20 mA



Design	M30x1.5		Ø 80 mm	
Dimensions Installation non flush (nf)				
Analog range [mm]	0...10 nf	0...10 nf	0...30 nf	0...30 nf
Output	⎓	⎓	⎓	⎓
	0...10 V	4...20 mA	0...10 V	4...20 mA
ID-No.	P31041	P31130	P31043	P31131
Type	IGA 010 GU	IGA 010 GI	IDA 030 GU	IDA 030 GI
Supply voltage [V]	18...27 DC	18...27 DC	18...27 DC	18...27 DC
Current consumption max. [mA]	25	40	25	40
Voltage output max. [V]	11	–	11	–
Output current max. [mA]	–	23	–	23
Linearity deviation [%]	5			
Load resistance R_L [kΩ]	>2	<0.4	>2	<0.4
Ambient temperature [°C]	–25...+70			
Temperature deviation [%]	10			
Protection [EN 60529]	IP 67			
Housing material	Br-Ni / PBT		PBT	
Connection	2 m PVC-cable 3x0.5 mm²			
Output signal with approaching iron plate ST37				
Connection diagram				

Analog • High temperature 160 °C

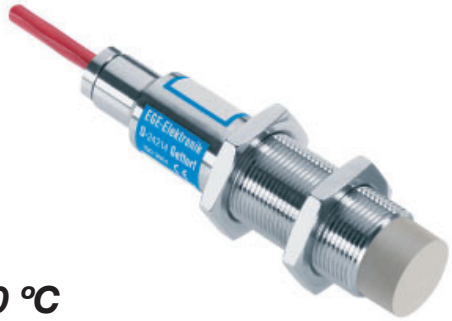
Series IGT - Proximity sensors

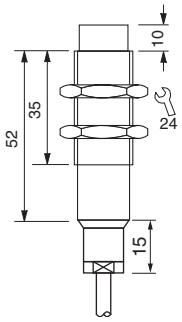
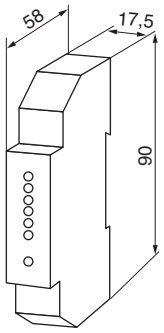
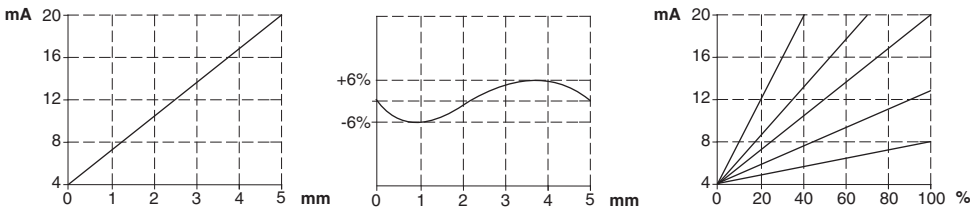
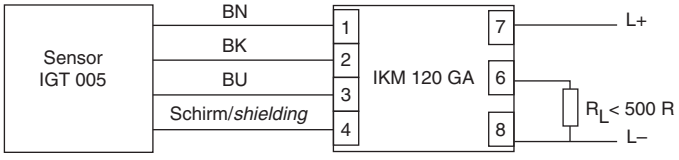
M18

4...20 mA

For the connection to amplifier IKM 120 GA

Permanent temperature 160 °C



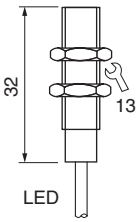
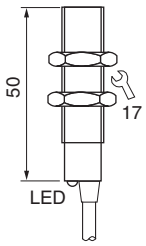
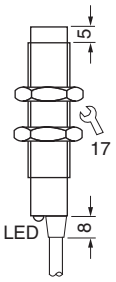
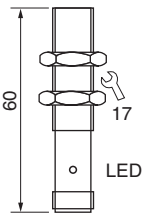
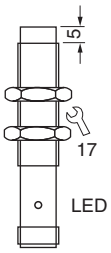
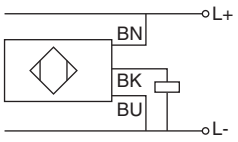
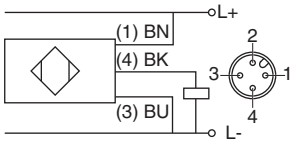
Design	IGT 005	IKM 120 GA
Dimensions Installation non flush (nf)		
Analog range [mm]	0...5 nf	–
ID-No.	P31143	P31144
Type	IGT 005	IKM 120 GA
Supply voltage [V]	–	24 DC ±20%
Current consumption [mA]	–	30
Current output [mA]	–	4...20 mA
Linearity [%]	6	0.5
Load R_L [Ω]	–	50...500
Ambient temperature [°C]	–25...+160	–20...+60
Temperature deviation [%]	10	2
Protection [EN 60529]	IP 67	IP 40
Housing material	AISI 316 Ti / PKS	PC
Connection	2 m PTFE 3x0.75 mm²	terminal screws
Output signal with approaching iron plate ST37		
Connection diagramm		

Series IGM - Proximity switches

M8 / M12
Metal sleeve

DC 10...30 V

Euronorm

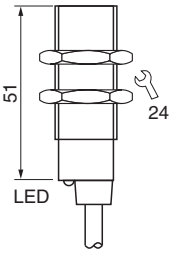
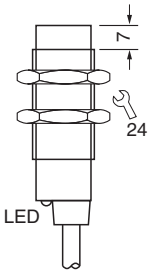
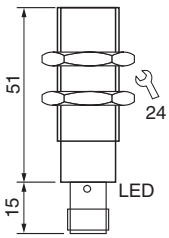
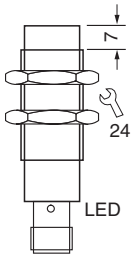
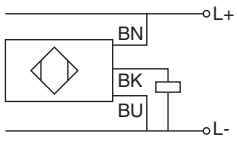
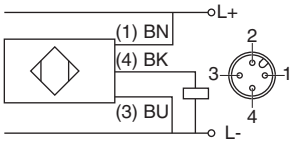
Design	M8x1	DC PNP • M12x1		DC PNP • M12x1	
Dimensions					
Installation flush (f) non flush (nf)					
Operating distance sn [mm]	1.5 f	2 f	4 nf	2 f	4 nf
Switching output PNP					
ID-No.	**P31013**	**P31104**	**P31105**	**P31106**	**P31107**
Type	IGM 1 GSP	IGM 102 GSP	IGM 104 GSP	IGMU 102 GSP	IGMU 104 GSP
Supply voltage [V]	10...30 DC	10...30 DC	10...30 DC	10...30 DC	10...30 DC
Switching current [mA]	200	200	200	200	200
Short circuit proof	•	•	•	•	•
Overcurrent release [mA]	250	250	250	250	250
Reverse protection	•	•	•	•	•
Voltage drop max. [V]	2	2	2	2	2
Residual current [mA]	–	–	–	–	–
Current consumption (not actuated) [mA]	<11	<5	<5	<5	<5
Switching frequency [Hz]	1000	800	400	800	400
Ambient temperature [°C]	–25...+70	–25...+70	–25...+70	–25...+70	–25...+70
EMC-class	A	A	A	A	A
Protection [EN 60529]	IP 67	IP 67	IP 67	IP 67	IP 67
LED display	•	•	•	•	•
Housing material	Stainless steel / PA	Br-Ni / PPO	Br-Ni / PPO	Br-Ni / PPO	Br-Ni / PPO
Connection	2 m PVC-cable 3x0.14 mm²	2 m PVC-cable 3x0.14 mm²	2 m PVC-cable 3x0.14 mm²	M12 connector	M12 connector
					
Accessories				connecting cable SLG 3-2, page 3.69	

Serie IGM - Proximity switches

M18
Metal sleeve

DC 10...30 V

Euronorm

Design	DC PNP • M18x1		DC PNP • M18x1	
Dimensions				
Installation flush (f) non flush (nf)				
Operating distance sn [mm]	5 f	8 nf	5 f	8 nf
Switching output PNP				
ID-No.	**P31110**	**P31111**	**P31112**	**P31113**
Type	IGM 105 GSP	IGM 108 GSP	IGMU 105 GSP	IGMU 108 GSP
Supply voltage [V]	10...30 DC	10...30 DC	10...30 DC	10...30 DC
Switching current [mA]	200	200	200	200
Short circuit proof	•	•	•	•
Overcurrent release [mA]	250	250	250	250
Reverse protection	•	•	•	•
Voltage drop max. [V]	1.5	1.5	1.5	1.5
Residual current [mA]	–	–	–	–
Current consumption (not actuated) [mA]	1	1	1	1
Switching frequency [Hz]	500	200	500	200
Ambient temperature [°C]	–25...+70	–25...+70	–25...+70	–25...+70
EMC-class	A	A	A	A
Protection [EN 60529]	IP 67	IP 67	IP 67	IP 67
LED display	•	•	•	•
Housing material	Br-Ni / PPO	Br-Ni / PPO	Br-Ni / PPO	Br-Ni / PPO
Connection	2 m PVC-cable 3x0.5 mm²	2 m PVC-cable 3x0.5 mm²	M12 connector	M12 connector
				
Accessories			connecting cable SLG 3-2, page 3.69	

Inductive Sensors

Standard switches

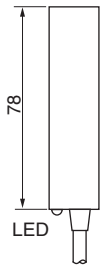
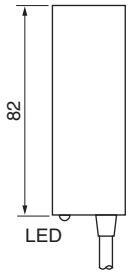
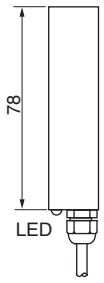
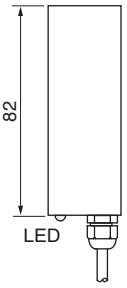
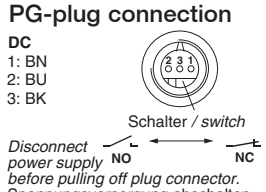
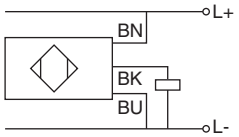
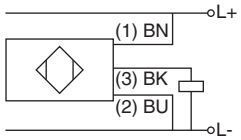
Series INK - Proximity switches

Smooth-bodied switch

Ø 20 mm / Ø 34 mm

DC 10...55 V

Sensors for AC voltage are available on request

Design	DC PNP Ø 20 mm	DC PNP Ø 34 mm	DC PNP Ø 20 mm programmable	DC PNP Ø 34 mm programmable
Dimensions Installation non flush (nf)				
Operating distance sn [mm]	10 nf	20 nf	10 nf	20 nf
Switching output PNP				
ID-No.	**P30159**	**P30166**	**P30158**	**P30165**
Type	INK 010 GSP	INK 020 GSP	INKS 010 GPP	INKS 020 GPP
Supply voltage [V]	10...55 DC	10...55 DC	10...55 DC	10...55 DC
Switching current [mA]	400	400	400	400
Short circuit proof	•	•	•	•
Overcurrent release [mA]	450	450	450	450
Reverse protection	•	•	•	•
Voltage drop max. [V]	2	2	2	2
Residual current [mA]	–	–	–	–
Current consumption (not actuated) [mA]	2.5	2.5	2.5	2.5
Switching frequency [Hz]	1500	500	1500	500
Ambient temperature [°C]	–25...+75	–25...+75	–25...+75	–25...+75
EMC-class	A	A	A	A
Protection [EN 60529]	IP 67	IP 67	IP 67	IP 67
LED display	•	•	•	•
Housing material	PBT	PBT	PBT	PBT
Connection	2 m PVC-cable 3x0.5 mm²	2 m PVC-cable 3x0.5 mm²	2 m PVC-cable 3x0.5 mm² (PG-plug connection)	2 m PVC-cable 3x0.5 mm² (PG-plug connection)
PG-plug connection				
Accessories	mounting clamps Ø 20 mm (Z00100), Ø 34 mm (Z00102) are part of delivery			

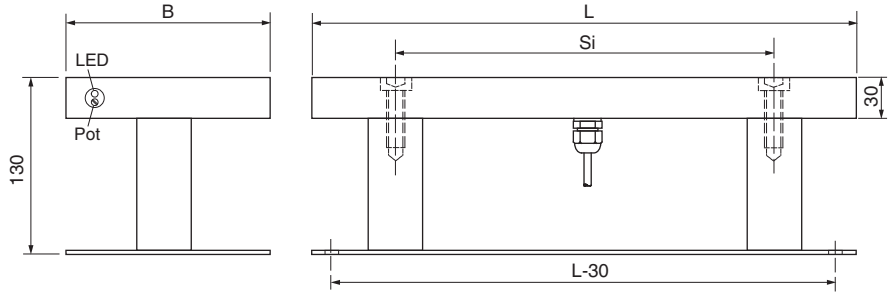
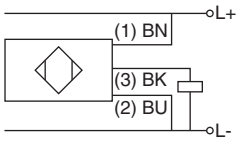
Special functions • Surface sensor

Series IFE - Proximity switches

Wide detection range

DC 10...55 V

Sensitivity adjustable
Moisture-resistant
PG-plug IP 68

Design	DC PNP				
Dimensions					
Installation non flush (nf)					
Operating distance sn [mm]	100 nf	100 nf	130 nf	150 nf	180 nf
Adjustable range max.	120	150	170	200	250
Switching output PNP					
ID-No.	**P31016**	**P31018**	**P31020**	**P31022**	**P31024**
Type	IFE 200/100 GSP	IFE 400/100 GSP	IFE 400/150 GSP	IFE 700/150 GSP	IFE 900/150 GSP
Dimensions L	200	400	400	700	900
B	100	100	150	150	150
Si	108	280	230	190	182
Supply voltage [V]	10...55 DC				
Switching current [mA]	<400				
Short circuit protection	•				
Overcurrent release approx. [mA]	430				
Reverse protection	•				
Current consumption approx. [mA]	4				
Inverse current max. [µA]	1				
Residual ripple max. [%]	15				
Voltage drop max. [V]	2				
Switching frequency [Hz]	10				
Hysteresis [%]	10				
Ambient temperature [°C]	–25...+75				
Correction factors	St 37: 1	AL: 0.4	VA 4: 0.65	Cu: 0.45	ZN: 0.5 MS: 0.6
EMC-class	A				
Protection [EN 60529]	IP 68				
Housing material	PVC / Aluminium				
Connection	PG-plug connection, 2 m PVC-cable 3x0.5 mm²				
					
Notes	see page 3.06				

Special functions • Surface sensor

Series IFE - Proximity switches

Wide detection range

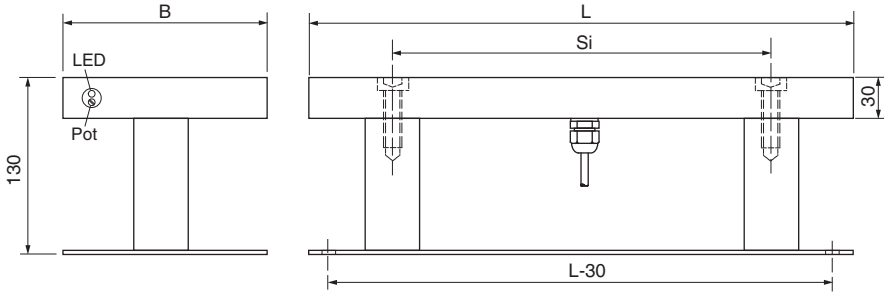
AC 20...250 V

Sensitivity adjustable
Moisture-resistant
PG-plug IP 68

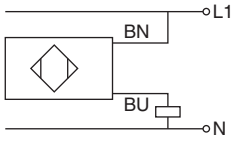
Design	AC

Dimensions

Installation
non flush (nf)



Operating distance sn [mm]	100 nf	100 nf	130 nf	150 nf	180 nf
Adjustable range max.	120	150	170	200	250
Switching output					
ID-No.	**P31015**	**P31017**	**P31019**	**P31021**	**P31023**
Type	IFE 200/100 WS	IFE 400/100 WS	IFE 400/150 WS	IFE 700/150 WS	IFE 900/150 WS
Dimensions L	200	400	400	700	900
B	100	100	150	150	150
Si	108	280	230	190	182
Supply voltage [V]	20...250 AC				
Switching current [mA]	<400				
Surge current [mA]	<3000 / 10 ms				
Overcurrent release approx. [mA]	–				
Current consumption approx. [mA]	2.5				
Inverse current approx. [mA]	2.5				
Minimum load current approx. [mA]	6				
Voltage drop max. [V]	6 eff.				
Switching frequency [Hz]	10				
Hysteresis [%]	10				
Ambient temperature [°C]	–25...+75				
Correktion factors	St 37: 1 AL: 0.4 VA 4: 0.65 Cu: 0.45 ZN: 0.5 MS: 0.6				
EMC-class	A				
Protection [EN 60529]	IP 68				
Housing material	PVC				
Connection	PG-plug connection, 2 m PVC-cable 2x0.75 mm²				



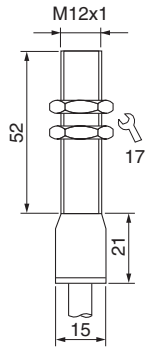
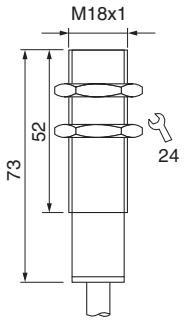
Notes: see page 3.06

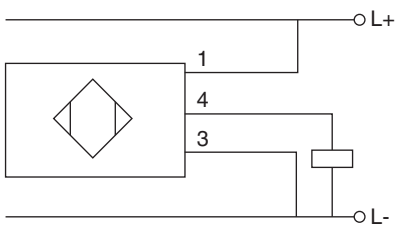
Series IGMO - Proximity switches

M12 / M18
Stainless steel sleeve

DC 10...30 V

High compressive strength
Longitudinal water blocked cable
Sea water proofed

Design	DC PNP • M12x1	DC PNP • M18x1
Dimensions		
Installation flush (f)		
Operating distance sn [mm]	2 f	5 f
Switching output PNP		
ID-No.	**P31223**	**P31224**
Type	IGMO 02 GSP	IGMO 05 GSP
Supply voltage [V]	10...30 DC	
Switching current [mA]	200	
Short circuit proof	•	
Reverse protection	•	
Current consumption [mA]	4	
Switching frequency [Hz]	200	
Ambient temperature [°C]	–25...+70	
Compressive strength [bar]	30	
Protection [EN 60529]	IP 68	
Housing material	PTFE / AISI 316 Ti	
Sealing material	FKM	
Connection	1 m longitudinal water blocked cable	



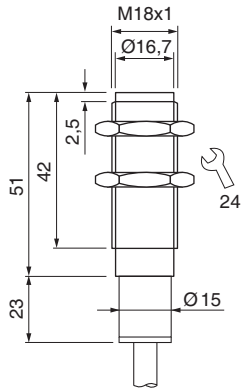
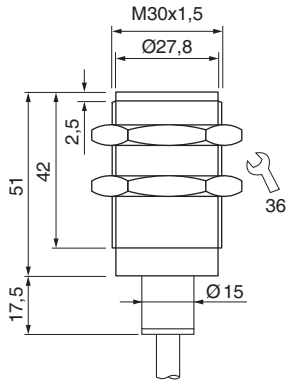
Special functions • Offshore

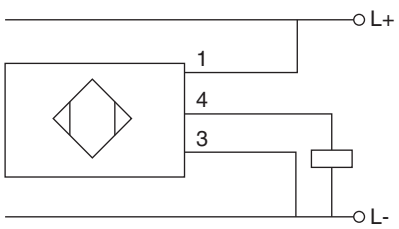
Series IGVO - Proximity switches

M18 / M30
One piece stainless steel housing

DC 10...30 V

High compressive strength
Longitudinal water blocked cab
Sea water proofed

Design	DC PNP • M18x1	DC PNP • M30x1.5
Dimensions		
Installation flush (f)		
Operating distance sn [mm]	5 b	10 b
Switching output PNP		
ID-No.	**P31365**	**P31366**
Type	IGVO 05 GSP	IGVO 10 GSP
Supply voltage [V]	10...30 DC	
Switching current [mA]	250	
Short circuit proof	•	
Reverse protection	•	
Current consumption max. [mA]	5	
Switching frequency [Hz]	180	150
Ambient temperature [°C]	–25...+70	
Compressive strength [bar]	30	
Protection [EN 60529]	IP 68 + IP 69K	
EMC-class	A	
Housing material	AISI 316 L	
Sealing material	FKM	
Connection	1 m longitudinal water blocked cable PLWDC-cable 3x0.5 mm²	



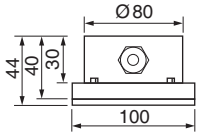
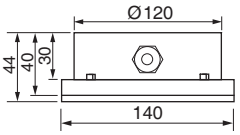
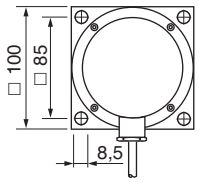
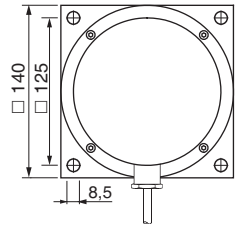
Special functions • Washing resistant

Series IDKW - Proximity switches

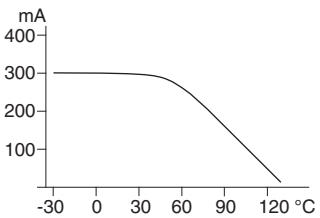
DC 10...30 V

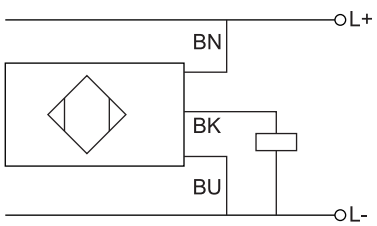
110 °C Permanent temperature
Resistant to hot steam
Resistant to detergents

IP 68 + IP 69K

Design	DC PNP • Ø 80 mm	DC PNP • Ø 120 mm
Dimensions		
Installation non flush (nf)		
Operating distance sn [mm]	55 nf	90 nf
Switching output PNP		
ID-No.	**P31214**	**P31177**
Type	IDKW 080 GSP	IDKW 120 GSP
Supply voltage [V]	10...30 DC	
Switching current [mA]	300	
Hysteresis	<0.1 Sn	
Voltage drop max. [V]	2	
Current consumption [mA]	10	
Switching frequency [Hz]	30	
Ambient temperature [°C]	–20...+110	
Limiting temperature [°C]	120	
Temperature deviation [%]	≤10	
EMC-class	A	
Protection [EN 60529]	IP 68 + IP 69K	
Housing material	PP / AISI 316 Ti	
Sealing material	EPDM	
Connection	5 m FEP-cable 3x0.75 mm², shielded	

Switching current



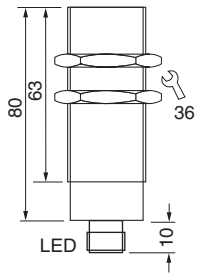
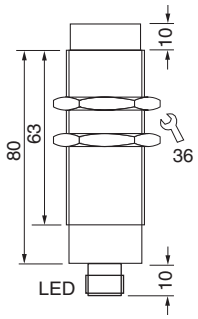
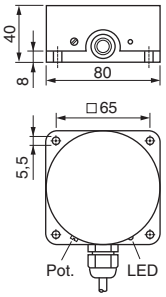
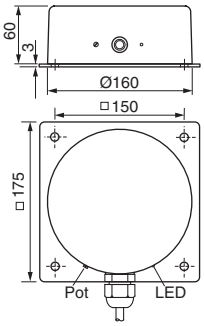


Series IGB / IDB - Proximity switches

M30
Ø 80 mm / Ø 160 mm

DC 10...30 V

Correction factor 1
for all metals

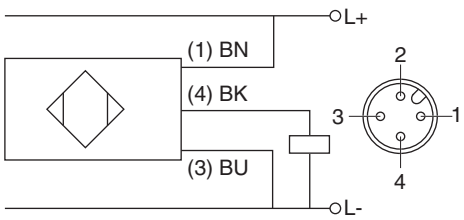
Design	M30x1.5	M30x1.5	Ø 80 mm	Ø 160 mm
Dimensions Installation flush (f) non flush (nf) adjustable (a)				
Operating distance sn [mm]	10 f	20 nf	70 nf-a	150 nf-a
Switching output PNP				
ID-No.	**P31135**	**P31136**	**P31141**	**P31142**
Type	IGBS 010 GSP	IGBS 020 GSP	IDBS 080 GPP	IDBS 160 GPP
Supply voltage [V]	10...30 DC			
Switching current [mA]	200			
Short circuit proof	•			
Current consumption [mA]	25			
Reverse protection	•			
Voltage drop max. [V]	2			
Switching frequency [Hz]	300		20	
Ambient temperature [°C]	–25...+75			
EMC-class	A			
Protection [EN 60529]	IP 67			
Housing material	Br-Ni / PBT		PBT / Aluminium	
Connection	M12 connector		PG-plug connection 2 m, 3x0.5 mm² PVC	
PG-plug-system				

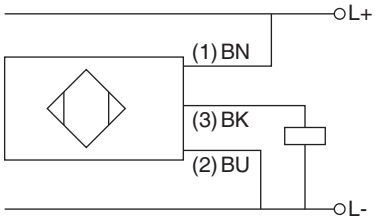
AC
1: BN
2: BU
3:

DC
1: BN
2: BU
3: BK

Schalter / *switch*

Disconnect power supply NO NC *before pulling off plug connector.*
Spannungsversorgung abschalten bevor Steckverbindung gezogen wird.





Metal face sensors • Speed sensor • –40...+150 °C

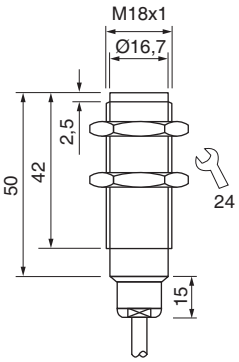
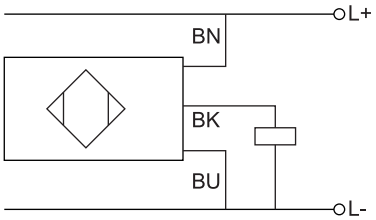
Series HGVH

Detection of ferromagnetic targets

One piece stainless steel housing

–40...+150 °C

IP 68 Water-proofed
IP 69K Resistant to high pressure cleaning

Design	DC PNP • M18x1
Dimensions	
Operating distance sn [mm]	3
Switching output PNP	
ID-No.	**P31364**
Type	HGVH 03 GSP
Supply voltage [V]	10...30 DC
Switching current max. [mA]	100
Short circuit proof	•
Reverse protection	•
Voltage drop max. [V]	1.5
Current consumption max. [mA]	20
Switching frequency [Hz]	6000
Ambient temperature [°C]	–40...+150
EMC-class	A
Protection [EN 60529]	IP 68 + IP 69K
Housing material	AISI 316 L
Connection	2 m FEP-cable 3x0.34 mm²
	

Probes
Compact models
Amplifiers

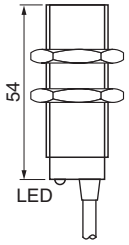
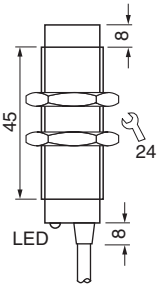
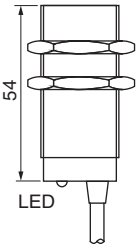
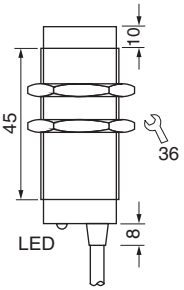
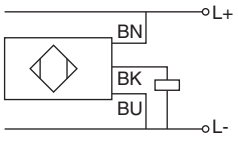
Inductive Sensors

Dust - Ex Compact model • Zone 20

Series IGEX20 - Proximity switches

Category 1
Dust Ex Zone 20

Direct connection to DC 24 V
PNP switching output

Design	DC PNP • M18x1		DC PNP • M30x1.5	
Dimensions Installation flush (f) non flush (nf)				
Operating distance [mm]	5 f	8 nf	10 f	15 nf
Switching output PNP				
ID-No.	**P31178**	**P31179**	**P31180**	**P31181**
Type	IGEX20 05 GSP	IGEX20 08 GSP	IGEX20 10 GSP	IGEX20 15 GSP
Ex marking	II 1D T80 °C IP 67			
Certificate No.	Ex ÜV 05 ATEX 2845 X			
Supply voltage [V]	10...30 DC			
Switching current [mA]	100			
Short circuit proof	•			
Reverse protection	•			
Voltage drop max. [V]	2			
Residual current [mA]	–			
Current consumption [mA]	7			
Switching frequency [Hz]	200			
Ambient temperature [°C]	–20...+70			
EMC-class	A			
Protection [EN 60529]	IP 67			
LED display	•			
Housing material	Br-Ni / PA			
Connection	2 m PVC-cable 3x0.5 mm²			
				
Accessories	housing for screw terminals series GK...			

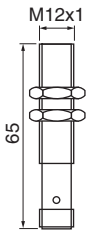
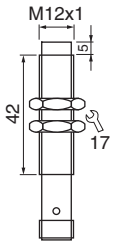
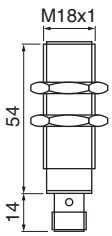
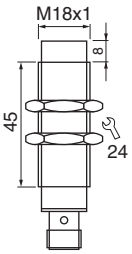
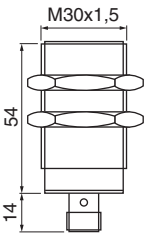
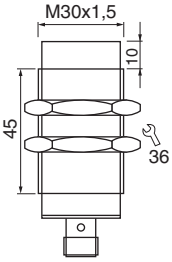
Inductive Sensors

Dust / Gas - Ex Intrinsically safe • Zone 0/20

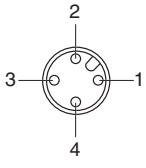
Series IGEXU - Proximity switches

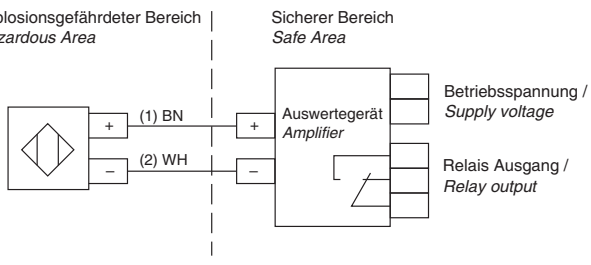
Gas-Ex Category 1
Ex II 1G Ex ia IIC T6 Ga

Dust-Ex Category 1
Ex II 1D Ex ia IIIC T80 °C Da

Design	M12x1		M18x1		M30x1.5	
Dimensions Installation flush (f) non flush (nf)						
Operating distance [mm]	2 f	4 nf	5 f	8 nf	10 f	15 nf
ID-No.	**P31196**	**P31197**	**P31198**	**P31199**	**P31200**	**P31201**
Type	IGEXU 02	IGEXU 04	IGEXU 05	IGEXU 08	IGEXU 10	IGEXU 15
Ex area of use	Gas: Zone 0/1 / Dust: Zone 20/21					
Certificate No.	TÜV 15 ATEX 163839 X					
Ex marking	Gas: Ex II 1G Ex ia IIC T6 Ga Dust: Ex II 1D Ex ia IIIC T80 °C Da					
Ambient temperature [°C] and medium temperature	Gas Zone 0: T6: −20 ≤ Ta ≤ +60 T5: −20 ≤ Ta ≤ +60 T4: −20 ≤ Ta ≤ +60 T3: −20 ≤ Ta ≤ +60 Dust Zone 20: −25 ≤ Ta ≤ +75			Gas Zone 1: T6: −25 ≤ Ta ≤ +75 T5: −25 ≤ Ta ≤ +75 T4: −25 ≤ Ta ≤ +75 T3: −25 ≤ Ta ≤ +75 Dust Zone 21: −25 ≤ Ta ≤ +75		
Maximum values	Ui = 12.6 V / Ii = 15.9 mA / Pi = 50 mW / Ci = 22 nF / Li = 3 mH					
Housing material	Br-Ni / PA					
Protection [EN 60529]	IP 67					
Connection	M12 connector					

For the connection to amplifiers IKM 122 Ex..., see page 3.67





Accessories	plug-lock type PL-M12 (Z01182), page 3.69

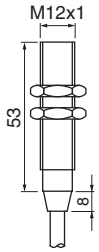
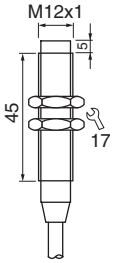
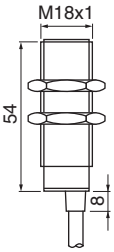
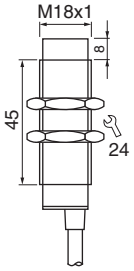
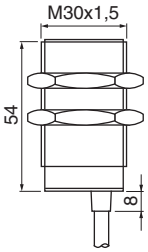
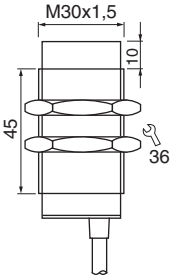
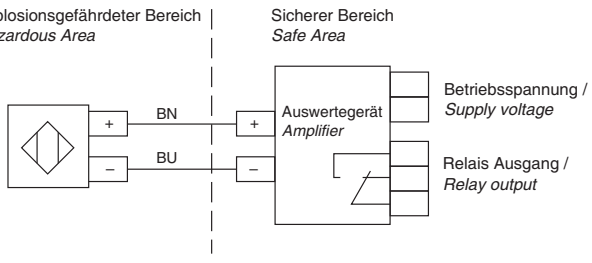
Inductive Sensors

Dust / Gas - Ex Intrinsically safe • Zone 0/20

Series IGEX - Proximity switches

Gas-Ex Category 1
Ex II 1G Ex ia IIC T6 Ga

Dust-Ex Category 1
Ex II 1D Ex ia IIIC T80 °C Da

Design	M12x1		M18x1		M30x1.5	
Dimensions Installation flush (f) non flush (nb)						
Operating distance [mm]	2 f	4 nf	5 f	8 nf	10 f	15 nf
ID-No.	**P31151**	**P31152**	**P31153**	**P31154**	**P31155**	**P31156**
Type	IGEX 02	IGEX 04	IGEX 05	IGEX 08	IGEX 10	IGEX 15
Ex area of use	Gas: Zone 0/1 / Dust: Zone 20/21					
Certificate No.	TÜV 15 ATEX 163839 X					
Ex marking	Gas: Ex II 1G Ex ia IIC T6 Ga Dust: Ex II 1D Ex ia IIIC T80 °C Da					
Ambient temperature [°C] and medium temperature	Gas Zone 0: T6: −20 ≤ Ta ≤ +60 T5: −20 ≤ Ta ≤ +60 T4: −20 ≤ Ta ≤ +60 T3: −20 ≤ Ta ≤ +60 Dust Zone 20: −25 ≤ Ta ≤ +75		Gas Zone 1: T6: −25 ≤ Ta ≤ +75 T5: −25 ≤ Ta ≤ +75 T4: −25 ≤ Ta ≤ +75 T3: −25 ≤ Ta ≤ +75 Dust Zone 21: −25 ≤ Ta ≤ +75			
Maximum values	Ui = 12.6 V / Ii = 15.9 mA / Pi = 50 mW / Ci = 22 nF / Li = 3 mH					
Housing material	Br-Ni / PA					
Protection [EN 60529]	IP 67					
Connection	2 m PVC-cable 2x0.5 mm²					
For the connection to amplifiers IKM 122 Ex..., see page 3.67						
Note	proximity switches with cable length >2 m are available on request					

Inductive Sensors

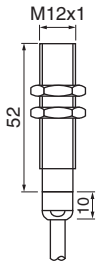
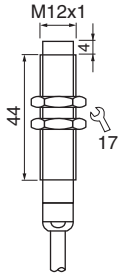
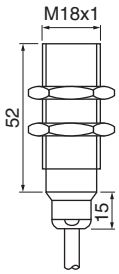
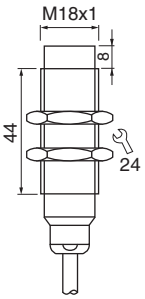
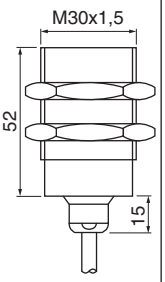
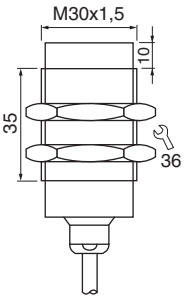
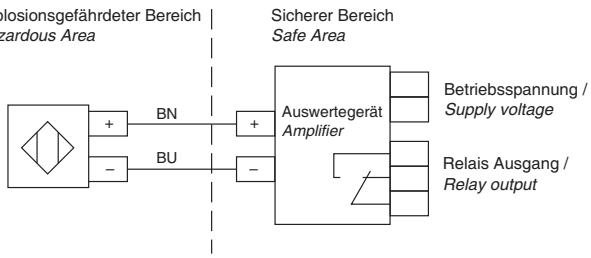
Dust / Gas - Ex Intrinsically safe • Zone 0/20

Series IGEXH - Proximity switches

Gas-Ex Category 1
Ex II 1G Ex ia IIC T6 Ga

Dust-Ex Category 1
Ex II 1D Ex ia IIIC T145 °C Da

High temperature sensors +140 °C

Design	M12x1		M18x1		M30x1.5	
Dimensions Installation flush (f) non flush (nf)						
Operating distance [mm]	2 f	4 nf	5 f	8 nf	10 f	15 nf
ID-No.	**P31367**	**P31368**	**P31369**	**P31370**	**P31371**	**P31372**
Type	IGEXH 02	IGEXH 04	IGEXH 05	IGEXH 08	IGEXH 10	IGEXH 15
Ex area of use	Gas: Zone 0/1 / Dust: Zone 20/21					
Certificate No.	TÜV 15 ATEX 163839 X					
Ex marking	Gas: Ex II 1G Ex ia IIC T6 Ga Dust: Ex II 1D Ex ia IIIC T145 °C Da					
Ambient temperature [°C] and medium temperature	Gas Zone 0: T6: −20 ≤ Ta ≤ +60 T5: −20 ≤ Ta ≤ +60 T4: −20 ≤ Ta ≤ +60 T3: −20 ≤ Ta ≤ +60 Dust Zone 20: −25 ≤ Ta ≤ +140		Gas Zone 1: T6: −25 ≤ Ta ≤ +75 T5: −25 ≤ Ta ≤ +90 T4: −25 ≤ Ta ≤ +125 T3: −25 ≤ Ta ≤ +140 Dust Zone 21: −25 ≤ Ta ≤ +140			
Maximum values	Ui = 12.6 V / Ii = 15.9 mA / Pi = 50 mW / Ci = 22 nF / Li = 3 mH					
Housing material	AISI 316 Ti / PEEK					
Protection [EN 60529]	IP 68					
Connection	2 m FEP-cable 2x0.34 mm²					
For the connection to amplifiers IKM 122 Ex..., see page 3.67						
Note	proximity switches with cable length >2 m are available on request					

Inductive Sensors

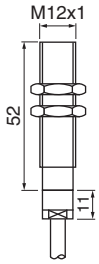
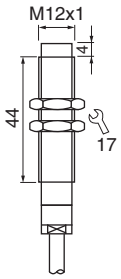
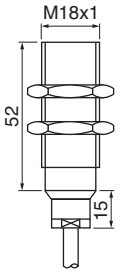
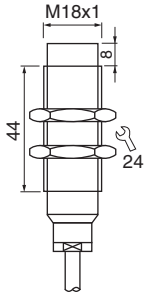
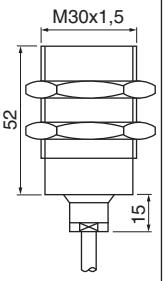
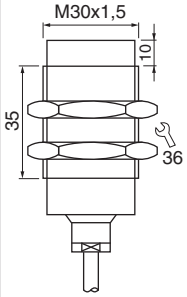
Dust / Gas - Ex Intrinsically safe • Zone 0/20

Series IGEXP - Proximity switches

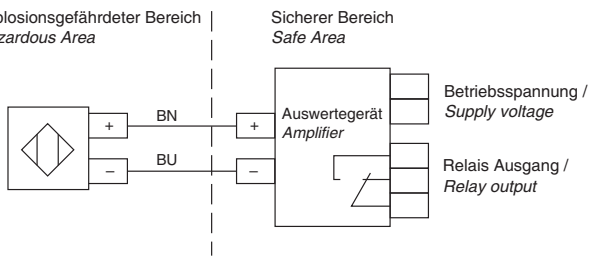
Gas-Ex Category 1
Ex II 1G Ex ia IIC T6 Ga

Dust-Ex Category 1
Ex II 1D Ex ia IIIC T65 °C Da

POLAR-Sensors –60 °C

Design	M12x1		M18x1		M30x1.5	
Dimensions Installation flush (f) non flush (nf)						
Operating distance [mm]	2 f	4 nf	5 f	8 nf	10 f	15 nf
ID-No.	**P31373**	**P31374**	**P31375**	**P31376**	**P31377**	**P31378**
Type	IGEXP 02	IGEXP 04	IGEXP 05	IGEXP 08	IGEXP 10	IGEXP 15
Ex area of use	Gas: Zone 0/1 / Dust: Zone 20/21					
Certificate No.	TÜV 15 ATEX 163839 X					
Ex marking	Gas: Ex II 1G Ex ia IIC T6 Ga Dust: Ex II 1D Ex ia IIIC T65 °C Da					
Ambient temperature [°C] and medium temperature	Gas Zone 0: T6: –20 ≤ Ta ≤ +60 T5: –20 ≤ Ta ≤ +60 T4: –20 ≤ Ta ≤ +60 T3: –20 ≤ Ta ≤ +60 Dust Zone 20: –60 ≤ Ta ≤ +60		Gas Zone 1: T6: –60 ≤ Ta ≤ +60 T5: –60 ≤ Ta ≤ +60 T4: –60 ≤ Ta ≤ +60 T3: –60 ≤ Ta ≤ +60 Dust Zone 21: –60 ≤ Ta ≤ +60			
Maximum values	Ui = 12.6 V / Ii = 15.9 mA / Pi = 50 mW / Ci = 22 nF / Li = 3 mH					
Housing material	AISI 316 Ti / PTFE					
Protection [EN 60529]	IP 68					
Connection	2 m FEP-cable 2x0.34 mm²					

For the connection to amplifiers IKM 122 Ex..., see page 3.67

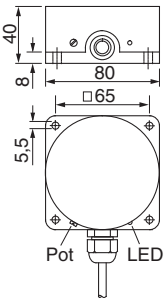
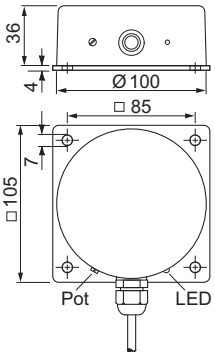
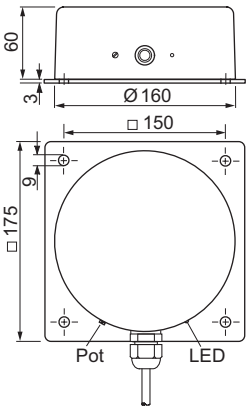


Note	proximity switches with cable length >2 m are available on request

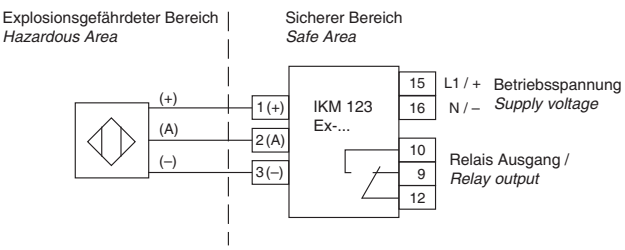
Dust / Gas - Ex Intrinsically safe • Zone 0/20

Series IDEX - Proximity switches

Category 1
Dust Ex Zone 20
Gas Ex Zone 0

Design	Ø 80 mm	Ø 100 mm	Ø 160 mm
Dimensions Installation non flush (nf)			
Operating distance [mm] (Adjustable range)	55 nf (10...70)	70 nf (10...100)	120 nf (20...150)
ID-No.	**P31157**	**P31158**	**P31159**
Type	IDEX 080	IDEX 100	IDEX 160
Ambient temperature [°C]	−25...+75 Ex-Sensors for higher ambient temperatures on request		
Ex marking	Ex II 1G Ex ia IIC T6 / Ex II 1D T100 °C		
Certificate No.	TÜV 03 ATEX 2037		
Ambient temperatures for temperature classes [°C]	T6 : 75 T5 : 90		
Maximum values	Ci = 120 nF Li = negligibly small		
Only for the connection to certified intrinsically safe circuits with the following maximum values:	Ii = 80 mA Ui = 12.6 V Pi = 252 mW		
Housing material	PA / Aluminium		
Protection [EN 60529]	IP 67		
Connection	2 m PVC-cable 3x0.5 mm²		

For the connection to amplifiers IKM 123 Ex..., see page 3.68



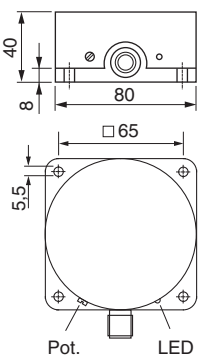
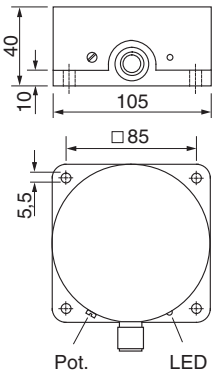
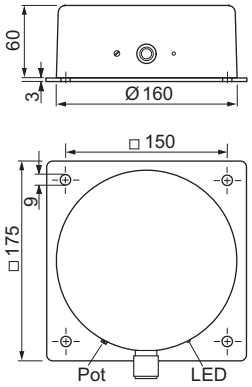
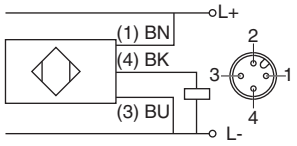
Inductive Sensors

Dust - Ex Compact model • Zone 22

Series IDEX22 - Proximity switches

Category 3
Dust Ex Zone 22

DC 24 V
PNP switching output

Design	DC PNP • Ø80 mm	DC PNP • Ø105 mm	DC PNP • Ø160 mm
Dimensions			
Installation non flush (nf)			
Operating distance [mm] (Adjustable range)	55 nf (10...80)	100 nf (10...110)	120 nf (20...150)
Switching output PNP			
ID-No.	**P31329**	**P31330**	**P31331**
Type	IDEX22 080 GSPU	IDEX22 105 GSPU	IDEX22 160 GSPU
Ex marking	Ex II 3D Ex mc IIIC T 80 °C Dc IP 67 X		
Supply voltage [V]	10...30 DC		
Switching current [mA]	200		
Short circuit proof	•		
Overcurrent release [mA]	450		
Reverse protection	•		
Voltage drop max. [V]	2		
Residual current [mA]	–		
Current consumption [mA]	7		
Switching frequency [Hz]	20		
Ambient temperature [°C]	–20...+70		
EMC-class	A		
Protection [EN 60529]	IP 67		
LED display		•	
Housing material	PBT	PBT	PBT / Aluminium
Connection	M12 connector	M12 connector	M12 connector
			
Accessories	connection cable SLG 3-2 (Z01076), page 3.69		

- Amplifiers

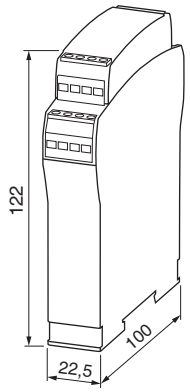
Series IKM 122 Ex

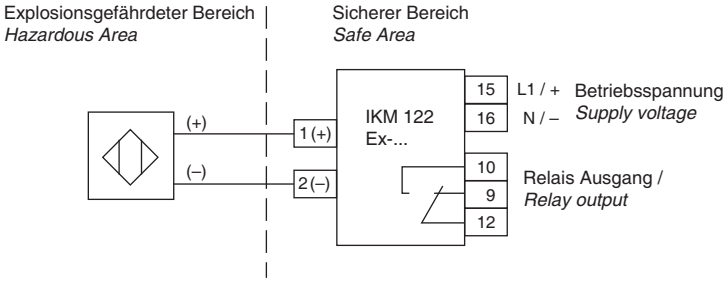
Dust
Gas

Cable break and short circuit monitoring

Connection to intrinsically safe 2-lead sensors

Output function programmable

Design	IKM 122 Ex...	
Dimensions		
ID-No.	**P31332**	**P31333**
Type	IKM 122 Ex-230	IKM 122 Ex-24
Output	relay / change over	
Ex area of use	outside of the hazardous areas (gas or dust)	
Certificate No.	TÜV 11 ATEX 556280	
Ex marking	Gas: ⟨Ex⟩ II (1) G [Ex ia Ga] IIC Dust: ⟨Ex⟩ II (1) D [Ex ia Da] IIIC	
Ambient temperature [°C]	−20 ≤ Ta ≤ +60	
Maximum values	Uo = 9.6 V / Io = 10.1 mA / Po = 24.2 mW / Co = 0.84 µF / Lo = 5.00 mH	
Supply voltage [V]	230 AC ±10%	24 DC ±10%
Switching voltage max [V]	250 AC / 60 DC / 24 DC	
Switching current max. [A]	4 AC / 0.8 DC / 4 DC	
Switching power	cos φ >0.7 / L/R ≤200 ms / L/R ≤200 ms	
Protection [EN 60529]	IP 40	
Connection	terminal screws	



- Amplifiers

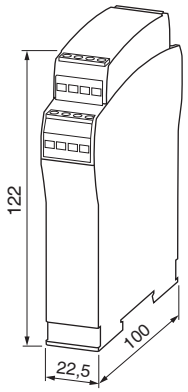
Series IKM 123 Ex

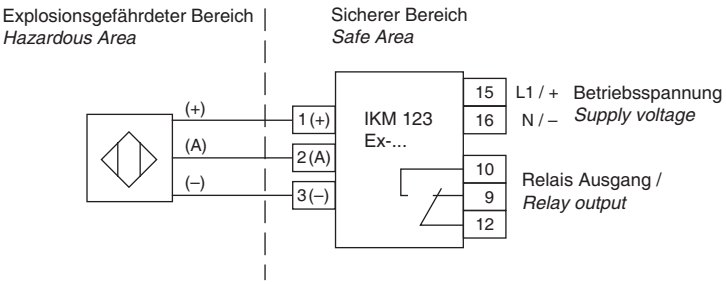
Dust
Gas

Cable break and short circuit monitoring

Connection to intrinsically safe 3-lead sensors

Output function programmable

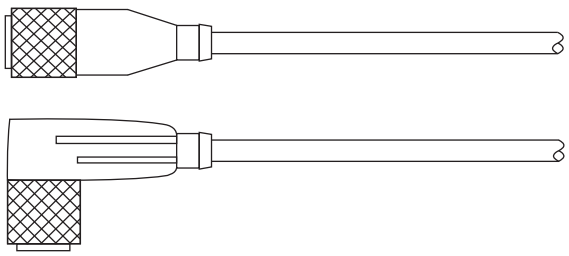
Design	IKM 122 Ex...	
Dimensions		
ID-No.	**P31335**	**P31336**
Type	IKM 123 Ex-230	IKM 123 Ex-24
Output	relay / change over	
Ex area of use	outside of the hazardous areas (gas or dust)	
Certificate No.	TÜV 11 ATEX 556280	
Ex marking	Gas: ⟨Ex⟩ II (1) G [Ex ia Ga] IIC Dust: ⟨Ex⟩ II (1) D [Ex ia Da] IIIC	
Ambient temperature [°C]	$-20 \leq Ta \leq +60$	
Maximum values	Uo = 9.6 V / Io = 50.5 mA / Po = 121.3 mW / Co = 0.68 µF / Lo = 5.00 mH	
Supply voltage [V]	230 AC ±10%	24 DC ±10%
Switching voltage max [V]	250 AC / 60 DC / 24 DC	
Switching current max. [A]	4 AC / 0.8 DC / 4 AC	
Switching power	cos φ >0.7 / L/R ≤200 ms / L/R ≤200 ms	
Protection [EN 60529]	IP 40	
Connection	terminal screws	



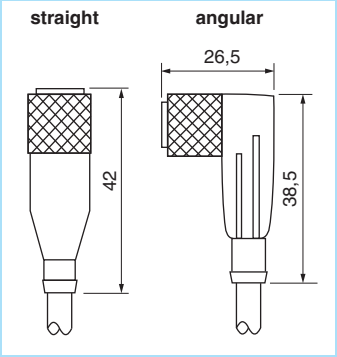
Accessories • M12 connector

System SL

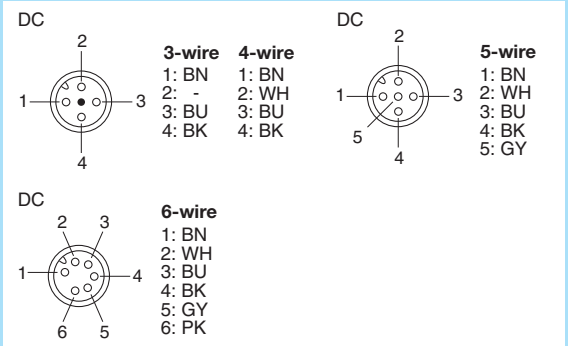
Finished cable plug housing
Self locking screw plug
Protection IP 67



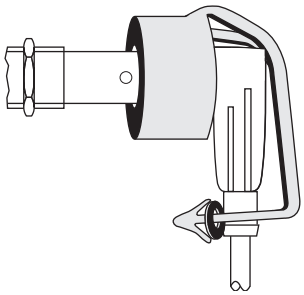
Cable plug housing



Pin-assignment



Plug-lock



SLG... SLW... DC PL-M12

TYPE	ID-NO.	DESIGN
SLG 3-2	Z01076	Cable plug housing straight, 2 m cable 3x0.34 mm² max. 250 V / 4 A
SLG 3-5	Z01077	Cable plug housing straight, 5 m cable 3x0.34 mm² max. 250 V / 4 A
SLW 3-2	Z01078	Cable plug housing angular, 2 m cable 3x0.34 mm² max. 250 V / 4 A
SLW 3-5	Z01079	Cable plug housing angular, 5 m cable 3x0.34 mm² max. 250 V / 4 A
SLW 3-2-LED	Z00052	Cable plug housing angular, 2 m cable 3x0.34 mm² max. 250 V / 4 A PNP with LED
SLG 4-2	Z00445	Cable plug housing straight, 2 m cable 4x0.25 mm² max. 250 V / 4 A
SLG 4-5	Z00449	Cable plug housing straight, 5 m cable 4x0.25 mm² max. 250 V / 4 A
SLW 4-2	Z00446	Cable plug housing angular, 2 m cable 4x0.25 mm² max. 250 V / 4 A
SLW 4-5	Z00450	Cable plug housing angular, 5 m cable 4x0.25 mm² max. 250 V / 4 A
SLW 4-2-LED	Z01157	Cable plug housing angular, 2 m cable 4x0.25 mm² max. 250 V / 4 A PNP with LED
SLG 5-2	Z01150	Cable plug housing straight, 2 m cable 5x0.34 mm² max. 60 V / 2 A
SLW 5-2	Z01151	Cable plug housing angular, 2 m cable 5x0.34 mm² max. 60 V / 2 A
SLG 6-2	Z01197	Cable plug housing straight, 2 m cable 6x0.25 mm² max. 36 V / 2 A
SLW 6-2	Z01198	Cable plug housing angular, 2 m cable 6x0.25 mm² max. 36 V / 2 A
PL-M12	Z01182	Plug-lock for sensors in Ex areas

DATA

Thread	M12x1	Contact resistance	≤ 5 mΩ
Material	PVC	Insulation resistance	>10^9
Protection	IP 67	Testing voltage	2.0 KV eff. / 5 and 6 pol. 1.5 KV eff.
Temperature range	–25...+80 °C		

Note

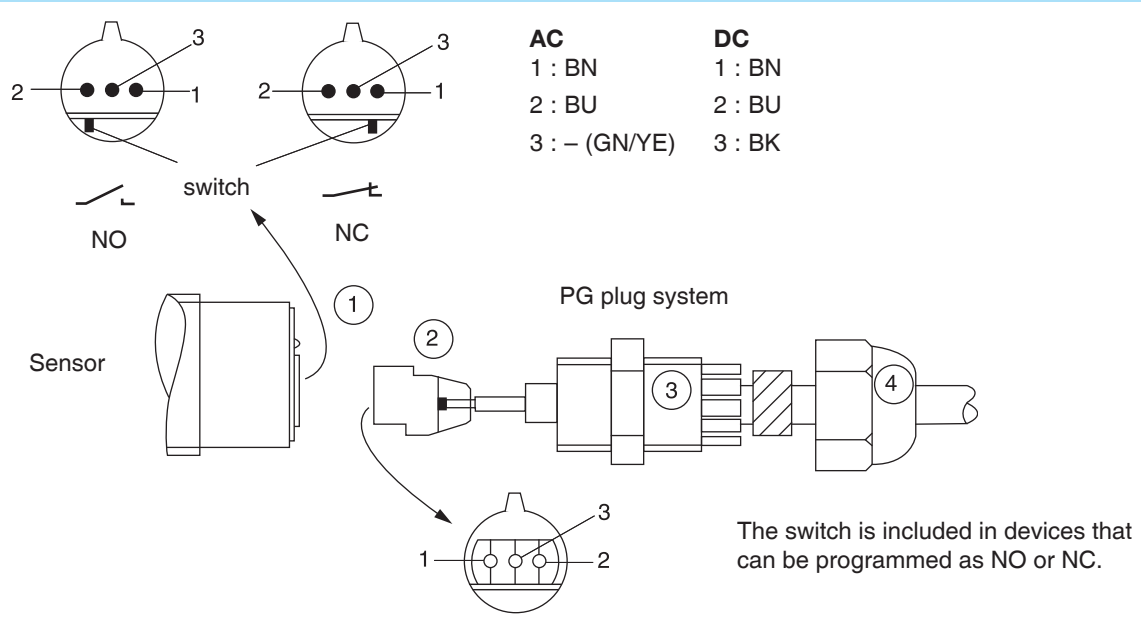
Sensors with NC output are connected to 4 pole cable plug housings. In this case, the break output is connected to the white lead (connection 2).

Accessories • PG plug system

PG plug system

PG plug type connection with PVC-cable
Protection IP 68

PG-plug connection



	AC	DC
1 :	BN	BN
2 :	BU	BU
3 :	– (GN/YE)	BK

Mounting of PG plug system

Connect the cable to the EGE-plug (2) and put it into the plug-housing (1) until it is at the stop. Make sure that the ”nose“ of the plug fits exactly into the housing. If this is done in the right way, the plug is hidden in the plug-housing.

Screw part (3) into the plug-housing (1) and fix it rightly with a spanner. After about 2 hours righten it again with the spanner.

Now fit the nut (4) by hand and afterwards with a spanner. Do not apply too much force. For a good sealing there should be stet 2 mm between nut (4) and part (3).

TYPE	ID-NO.	DESIGN		
PG 2-2	Z00025	PG-plug connection,	2 m PVC-cable 2x0.75 mm²	AC
PG 2-3	Z00026	PG-plug connection,	3 m PVC-cable 2x0.75 mm²	AC
PG 2-5	Z00027	PG-plug connection,	5 m PVC-cable 2x0.75 mm²	AC
PG 2-10	Z00028	PG-plug connection,	10 m PVC-cable 2x0.75 mm²	AC
PG 2-20	Z00029	PG-plug connection,	20 m PVC-cable 2x0.75 mm²	AC
PG 3-2	Z00020	PG-plug connection,	2 m PVC-cable 3x0.5 mm²	DC
PG 3-3	Z00021	PG-plug connection,	3 m PVC-cable 3x0.5 mm²	DC
PG 3-5	Z00022	PG-plug connection,	5 m PVC-cable 3x0.5 mm²	DC
PG 3-10	Z00023	PG-plug connection,	10 m PVC-cable 3x0.5 mm²	DC
PG 3-20	Z00024	PG-plug connection,	20 m PVC-cable 3x0.5 mm²	DC

Note

The power supply must be disconnected before the plug will be installed or removed.

Code: BK = black BN = brown BU = blue GN = green YE = yellow GY = grey PK = pink WH = white

Accessories • Assembly parts

Lock nuts, brass-nickel - plated

ID-NO.	Z00106	Z00107	Z00114	Z00109	Z00110
Nut thickness [mm]	4	4	4	5	5
Thread	M12x1	M18x1	M22x1	M30x1.5	M38x1.5
Spanner size	17	24	27	36	50

Lock nuts, special steel

ID-NO.	Z01098	Z00112	Z00113	Z00115
Nut thickness [mm]	4	4	4	5
Thread	M8x1	M12x1	M18x1	M30x1.5
Spanner size	13	17	24	36

Lock nuts, plastics

ID-NO.	Z00180	Z00120	Z00117	Z00118	Z00119	Z01092	Z01052
Nut thickness [mm]	6	8	4	5	5,5	8	8
Thread	M14x1	M30x1.5	M12x1	M18x1	M30x1.5	G 3/4	G 1
Spanner size	22	41	17	24	36	41	50
Material	PTFE	PTFE	PPE	PPE	PPE	PTFE	PTFE

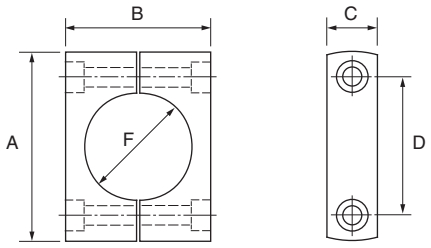
Central screw, polyamide

Z00104	M12, length 70 mm, hexagon socket 10 mm, material PA
Z00105	M16, length 90 mm, hexagon socket 14 mm, material PA

MOUNTING CLAMPS

KLS 20 Ø20 / KLS 34 Ø34

ID-NO.: Z00100, Z00102



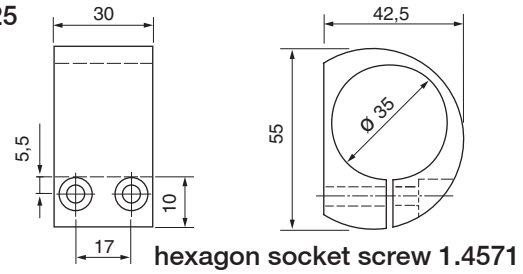
E: hexagon socket screw 1.4305

Clamps of PA, for smooth-bodied switches

F	Ø20	Ø34
A	47	61
B	30	47
C	17	15
D	32	45
E	M5x30	M5x50

KLB 35 Ø35

ID-NO.: Z00125

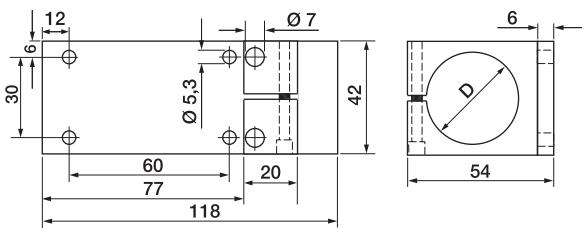


hexagon socket screw 1.4571

Clamp of PTFE (Teflon), for smooth-bodied switches hexagon socket screw M5x40

KBM 025 Ø25 / KBM 030 Ø30 / KBM 035 Ø35

ID-NO.: Z01189, Z01188, Z01187



Mounting clamp of Aluminium

Type	D
KBM 025	Ø25
KBM 030	Ø30
KBM 035	Ø35

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