**Switch systems –
Economy meets safety**

**Sensor systems –
Compact intelligence**

**Enclosure systems –
Function and design**

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BERNSTEIN

Complete Range Sensor Systems

Complete Range Sensor Systems

BERNSTEIN

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BERNSTEIN AG
A Success Story

Safety for man and machine

In-depth market knowledge, the close proximity to end users as well as years of experience in mechanical engineering and electronics are reflected down to the last detail in our products.

Against this backdrop, BERNSTEIN ranks among the world's leading providers of industrial safety technology. With our comprehensive range of switches, sensors, enclosures and operator terminals, we offer our customers effective and versatile solutions. By conforming to international safety guidelines, our products perfectly integrate in individual system solutions. Our focus is complete commitment to safety for man, machine and industrial processes.

Our expertise for your safety

With sound application expertise we support our customers from all branches of industry in the planning and implementation of systems designed to meet stringent safety requirements. In addition to classic plant and machine construction, we look after customers in the lift construction, automotive, agriculture, conveyor construction, automation engineering, wood-working, renewable energy and medical technology industries.

We welcome direct dialogue with our customers to enable us to provide them with the best possible solutions for their specific applications.

Future-proof solutions

Our objective is to actively influence technical innovation and modern application solutions. BERNSTEIN has therefore always been at the centre of defining trends in technology. With an unwavering commitment to the future we will continue providing the best possible answers in terms of technology, ecology and economic efficiency.

That is our definition of progress!

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BERNSTEIN AG
The Product Lines

Switch Systems

Sensor Systems

Switch systems –
Economy meets safety

BERNSTEIN electromechanical switches offer a convincing price/performance ratio and impress with their extreme reliability for many different operating voltages. The range extends from limit switches, encapsulated in insulating material or metal, through foot switches to safety switching devices. The AS-i compatible products save time and material in installation and provide cost advantages in operation. The comprehensive range of designs and sizes, the possible switching functions and the choice of actuators make virtually any application reality.

Sensor systems –
Compact intelligence

The extremely fast and exceptionally precise BERNSTEIN sensors operate without interference and wear in all applications. The tried-and-tested reliability and the compact dimensions are greatly appreciated in all branches of industry. Matching the specific application, in addition to ultrasonic sensors and float switches, customers can choose from a wide range of inductive, capacitive, magnetic or optical sensors. Alongside the complete standard range of sensors, we also offer comprehensive development and design for individual solutions.

Enclosure Systems

Enclosure systems –
Function and design

With its long tradition in manufacturing enclosures, BERNSTEIN combines superior enclosure technology, designed for encapsulating a diverse range of applications, with ultramodern and variable suspension systems. An extensive range of aluminium and plastic terminal boxes as well as the wiring and circuitry in standard and control enclosures conforming to specific customer requirements round off the product portfolio. Our enclosures conform to standards used in medical technology, industry as well as food and EX applications.

Product Line
Sensor Systems

Sensor systems – Compact intelligence

BERNSTEIN AG is an established manufacturer of high quality electromechanical and electronic low voltage switching devices and sensors. Our products are used in the most diverse range of applications, ranging from lift construction through wood-working and packaging machines through to machine tools.

Contactless sensors are characterised by absolute reliability, suitability for a wide range of applications and optimum cost-benefit ratio. Their main purpose is to convert mechanical movement into electrical signals that are processed in control systems.

In modern day applications, however, sensors directly connected to bus systems are being used to an ever greater extent to monitor mechanical movement and convert it into digital information.

Selecting the right sensor for the job depends on the prevailing ambient and operating conditions as well as corresponding technical requirements. In addition to the detection method (inductive, capacitive, optical, ultrasonic or magnetic) it is also necessary to select the corresponding output function (PNP, NPN, AC, normally-closed or normally-open contact). Sensing distances as well as the direction and type of approach are also important selection criteria. In view of the large number of possible combinations, the scope of application is virtually unlimited.

Maximum functions – minimum space

The range of applications in which limit switches are used has changed in line with increasing automation. Sensors are no longer used purely for the purpose of detecting position but rather they must be able to output analogue values for the purpose of calculating the distance with the necessary signal processing already taking place in the sensor itself. A sensor can also be used to sample two switching points in order to reduce the number of components in machines and systems.

This functionality is achieved by the use of state-of-the-art microcontrollers and advanced sensor technologies. Modern sensors from BERNSTEIN therefore open up new applications, extend the range of functions and as a result significantly increase efficiency.

Complementing our product range we offer attractive customer services:

- Risk assessment training, DIN EN ISO 13849, EN 62061
- Assistance in assessing risk and configuring safety functions
- Preassembly of products with standard power supply lines or customised cables
- Supply of M8, M12 or Ultralock connection technology
- Development of sensors to customer specifications
- Development and manufacture of customer-specific system solutions

Inductive Sensors

	Type	Page
	General	12
	• ø 3 mm • ø 4 mm • ø 6,5 mm • M4 • M5	14
	• M8	16
	• M12	18
	• M18	22
	• M30	28
	• ø 34 mm	32
	• 5 x 5 x 25 mm • 8 x 8 x 40 mm • 8 x 8 x 56 mm • 12 x 12 x 55 mm	32
	• 16 x 8 x 5 mm • 27 x 10 x 5 mm • 28 x 16 x 11 mm • 40 x 26 x 12 mm • 50 x 25 x 10 mm • 60 x 36 x 10 mm	33
	• 68 x 30 x 15 mm • 40 x 40 mm	36

Capacitive Sensors

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	• 50 x 25 x 10 mm • 68 x 30 x 15 mm	47

Optoelectronic Sensors

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Magnetic Monitoring Systems

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Float Switches

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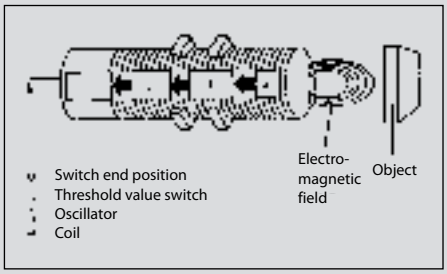
Functional principle

In general, inductive proximity switches consist of four basic elements: a coil, an oscillator, a threshold switch and an output stage with short-circuit protection. The oscillator generates a high frequency, electromagnetic alternating field which is emitted from the active face of the coil. Eddy currents are induced in a metal object that enters this field. These eddy currents draw energy from both the electromagnetic field and from the oscillator which is consequently attenuated. The more energy taken the closer the metal object moves towards the active face. The threshold switch switches on the output stage at a defined attenuation value. In proximity switches with a DC voltage supply, this switch is designed as an NPN transistor which switches the connected load to the negative pole or as a PNP transistor which switches the load to the positive pole. The output stage is a thyristor or a triac in AC voltage switches.

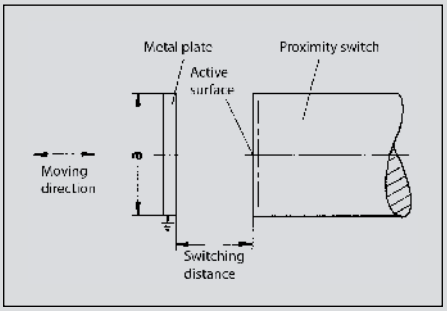


Sensing distance

The sensing distance (gap) is determined by the coil diameter, i.e. larger sensors are required for larger sensing distances. The sensing distance is also dependent on the size of the metal object to be detected as well as the material it is made from.

Target

The sensing distance is measured with a 1 mm thick square measuring plate made of steel (ST 37) referred to as a target. The edge length is equal to the diameter of the active face or equal to three times the sensing distance depending on which value is the greater.



Nominal sensing distance: (Sn)

The nominal sensing distance is a device-specific characteristic value that is dependent on the coil diameter.

Real sensing distance: (Sr)

The real sensing distance is measured at nominal voltage and nominal temperature. It must be between 90 % – 110 % of the nominal sensing distance.

Useable sensing distance: (Su)

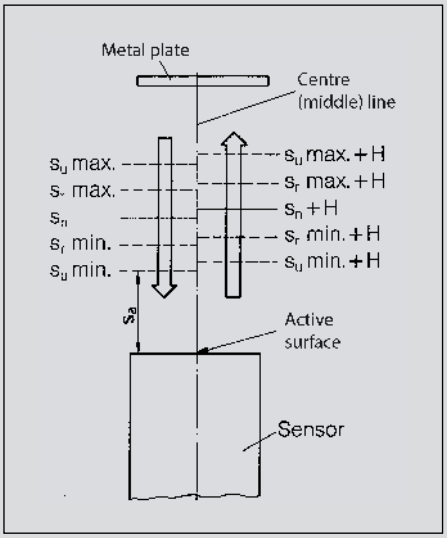
The useable sensing distance is measured within the permissible temperature and voltage ranges and is 90 % – 110 % of the real sensing distance.

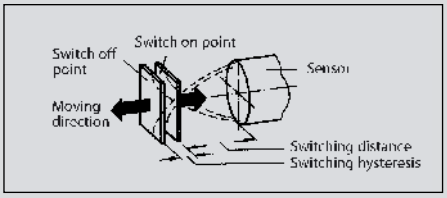
Operational sensing distance: (Sa)
(Assured operation distance)

The operational sensing distance takes into account the influence of the supply voltage, temperature and control systems. Reliable switching under all permissible operating conditions is assured within 0 % – 81 % of the nominal sensing distance. Sa ~ 0.81 Sn

Hysteresis: (H)

Hysteresis refers to the difference between the switch-on point as an object approaches and the switch-off point as the object moves away. This hysteresis is specified as a percentage of the nominal sensing distance and is typically 10 %. It is required to prevent the output chattering in response to slowly approaching objects, temperature drift, electrical interference or vibration.



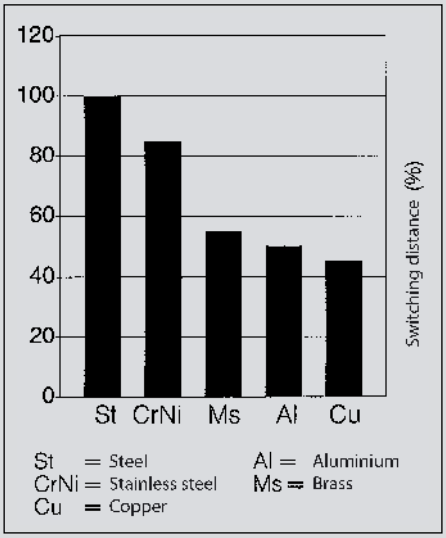


Repeatability

Repeatability is the ability of a sensor to repeatedly detect and object at the same distance away from the sensing surface. The typical deviation is < 5 %.

Reduction factors

The definition of the sensing distance is based on the measurement performed with a standardised square target made of steel. If other materials with the same dimensions are used, the sensing distance will be reduced as shown in the following graphic.



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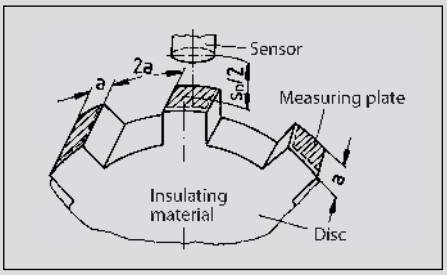
Switching frequency

The switching frequency is measured with a redating, non-conductive plate, on which the standard targets are mounted as illustrated (size of targets as previously defined).



The distance between the targets and sensor is equal to half the nominal sensing distance. The maximum switching frequency is reached when the switch-on or switch-off signal time drops below 50 µs.

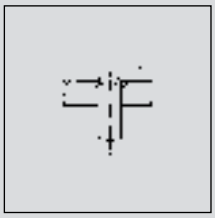
Temperaturee range

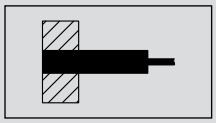
For most sensors, the permissible ambient temperature range is between -25 °C and +70 °C (-13 °F to +158 °F). Sensors with an extended temperature range of -40 °C to +100 °C are also available.

Assembly

Inductive sensors contain a coil on a ferromagnetic core that bundles the electromagnetic alternating field. The core is installed in the enclosure in such a way that the field emerges from the switch at the active face. A part of the magnetic field, however, also emerges from the side of the core. The sensor in a flush mount arrangement would already be influenced by the metal on the sides. For this reason, a metal band is fitted about the core in plastic enclosures, thus restricting the lateral magnetic field in a flush mount configuration. Due to the pre-attenuation attributed to the metal ring or a metal enclosure, flush mount versions have a shorter sensing distance than non-flush mount sensors and can be mounted closer to each other.

Flush mount

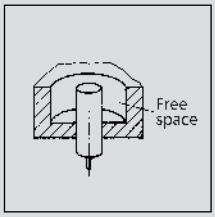


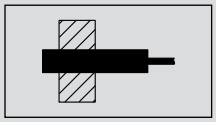


Catalogue symbol for flush mount

The active face can be flush with a metal surface.

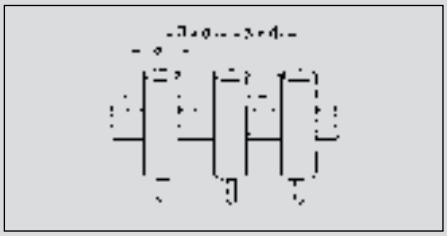
Non-flush mount





Catalogue symbol for non-flush mount

Sensors for non-flush mount require a clearance equal to three times the sensor enclosure diameter and a min. depth of 2x Sn.



Minimum spacing between non-flush mount sensors

Installation with a mounting bracket parallel to a steel wall

NAMUR sensors

(Standardization association for measurement and control in chemical industries)

Protection class

Corresponding to their ID code, the enclosures are dustproof and waterproof in accordance with IP65 or IP67 (EN 60529).

Short-circuit protection

Standard sensors are predected against short-circuit (cyclic) and polarity reversal.

Tightening torque requirements

BERNSTEIN supplies corresponding mounting nuts with its sensors. Refer to the respective datasheets for the required tightening torque.

Tightening torque examples for sensors in brass enclosure:	
M4	0.8 Nm
M5	1.5 Nm
M8	8 Nm
M12	10 Nm
M18	25 Nm
M30	70 Nm

Materials

The sensors are predected by a glass fibre reinforced thermoplastic, brass or stainless steel enclosure. The connection cable has PVC or PU sheathing.

Connection systems

The following connection systems are available for standard sensors:

- Cable variants (2 m) with PVC or PUR sheathing
- Connector variants with M8, M12 connector or connector conforming to DIN 43650
- Quick-connect system with Ultralock connectors

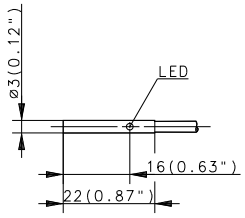
Standards and approvals

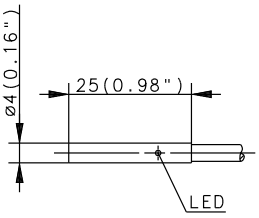
All sensors are CE-certified. The following European standards apply in accordance with CENELEC:

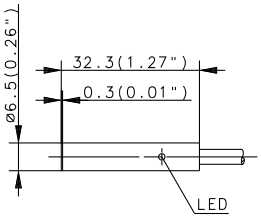
- EN 60947-5-2 Proximity switches
- EN 60947-5-6 NAMUR sensors

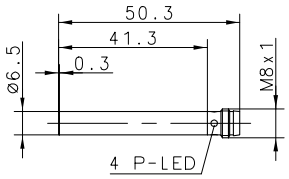
Inductive Sensors (Type Ø 3 mm, Ø 4 mm, Ø 6.5 mm, M4, M5)

Type			**Ø 3 mm**	**Ø 4 mm**	**Ø 6.5 mm**	
Type of installation			Flush	Flush	Flush	Flush
Nominal sensing distance			0.6 mm	0.8 mm	1.5 mm	1.5 mm
Type of connection			Cable 2 m	Cable 2 m	Cable 2 m	Connector M8
Special feature						









PNP	DC	NO contact	**6502999019**	**6502999004**	**6502999010**	**6502999012**
		NC contact	**6502799007**	**6502799002**	**6502799011**	
		Antivalent NO/NC				
NPN	DC	NO contact		**6502399004**	**6502399009**	
		NC contact				
		Antivalent NO/NC				
PNP/NPN	DC	NO/NC prog.				
		push-pull operation				
NAMUR	DC					
Analogue	DC					
2-wire	DC	NO contact				
		NC contact				
	AC	NO contact				
		NC contact				
		Changeover contact				

Technical data

Rated operating voltage	U_B	10-30 VDC	10-30 VDC	10-36 VDC	10-36 VDC
Rated operating current	I_B	≤ 100 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
Switching frequency (max)	F	3000 Hz	3000 Hz	1000 Hz	1000 Hz
Short circuit-protection		Cyclic	Cyclic	Cyclic	Cyclic
Function/operating voltage indicator		LED/-	LED/-	LED/-	LED/-
Sensing distance, adjustable					

Mechanical data

Ambient temperature (min/max)	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Enclosure material	Stainless steel 1.4305	Stainless steel 1.4401	Stainless steel 1.4401	Stainless steel 1.4401
Connection	3 x 0.055 mm²	3 x 0.14 mm²	3 x 0.14 mm²	M8 x 1

Please refer to Accessories for cable couplers, mounting brackets and sensor tester.

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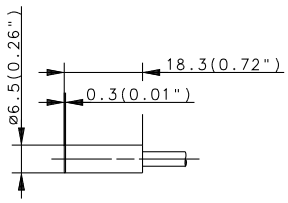
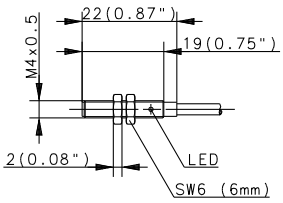
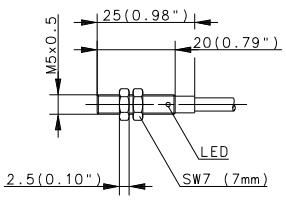
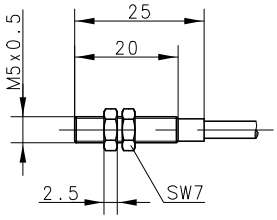
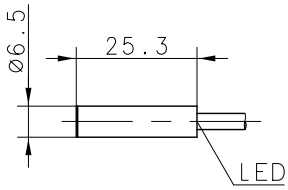
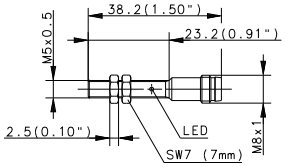
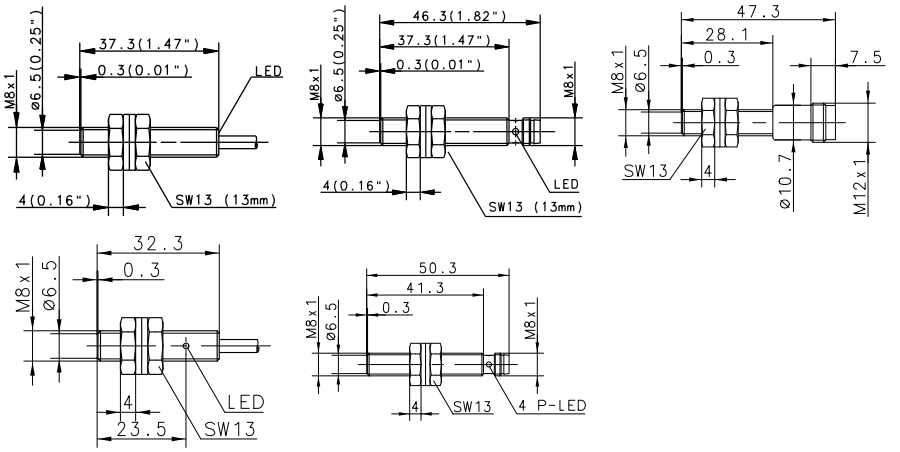
Ø 6.5 mm		M4	M5		M5	
Flush	Flush	Flush	Flush	Flush	Flush	
1.5 mm	1.5 mm	0.6 mm	1 mm	1 mm	1 mm	
Cable 2 m	Cable 5 m	Cable 2 m	Cable 2 m	Connector M8	Cable 2 m NAMUR	
						
						
6502999034	**6602999460**	**6502999020** **6502799008**	**6502999003** **6502799001**	**6502999018** **6502799019**		
			6502399003			
					6501699008	
10-36 VDC	10-36 VDC	10-30 VDC	10-30 VDC	10-30 VDC	5-25 VDC	
≤ 200 mA	≤ 200 mA	≤ 100 mA	≤ 200 mA	≤ 200 mA	-	
1000 Hz	1000 Hz	3000 Hz	3000 Hz	3000 Hz	≈ 3 kHz	
Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	-	
-/-	LED/-	LED/-	LED/-	LED/-	-/-	
-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	
IP67	IP67	IP67	IP67	IP67	IP67	
Stainless steel 1.4401	Stainless steel 1.4401	Stainless steel 1.4305	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	
3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.055 mm²	3 x 0.14 mm²	M8 x 1	2 x 0.14 mm²	

You will find detailed data sheets to the products under www.bernstein.eu

Inductive Sensors (Type M8)

Type			M8		M8		M8
Type of installation			Flush	Flush	Flush	Flush	Flush
Nominal sensing distance			1.5 mm	1.5 mm	1.5 mm	1.5 mm	1.5 mm
Type of connection			Cable 2 m	Cable 6 m	Connector M8	Connector M8	Connector M12
Special feature							



PNP	DC	NO contact	**6932901001**	**6502901004**	**6932942001**		**6502942007**
		NC contact		**6502701001**		**6502742001**	
		Antivalent NO/NC					
NPN	DC	NO contact	**6932301001**		**6932342001**		
		NC contact					
		Antivalent NO/NC					
PNP/NPN	DC	NO/NC prog.					
		push-pull operation					
NAMUR	DC						
Analogue	DC						
2-wire	DC	NO contact					
		NC contact					
	AC	NO contact					
		NC contact					
		Changeover contact					

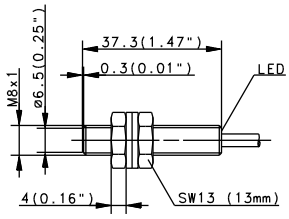
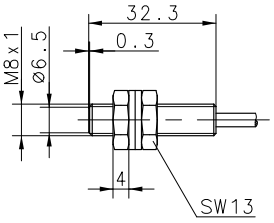
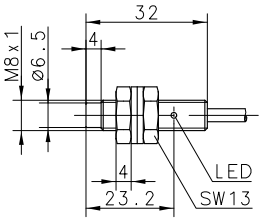
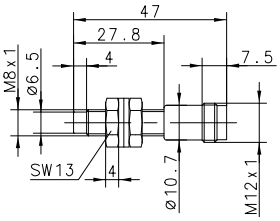
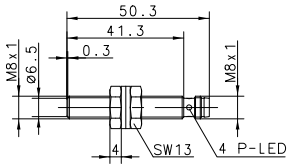
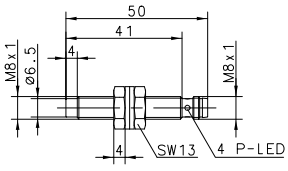
Technical data

Rated operating voltage	U_B	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC
Rated operating current	I_B	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
Switching frequency (max)	F	1000 Hz	1000 Hz	1000 Hz	1000 Hz	1000 Hz
Short circuit-protection		Cyclic	Cyclic	Cyclic	Cyclic	Cyclic
Function/operating voltage indicator		LED/-	LED/-	LED/-	LED/-	-/-
Sensing distance, adjustable						

Mechanical data

Ambient temperature (min/max)	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67	IP67
Enclosure material	Stainless steel 1.4305	Stainless steel 1.4305	Stainless steel 1.4305	Stainless steel 1.4305	Stainless steel 1.4305
Connection	3 x 0.14 mm²	3 x 0.14 mm²	M8 x 1	M8 x 1	M12 x 1

Please refer to Accessories for cable couplers, mounting brackets and sensor tester.

M8		M8	M8		M8	
Flush	Flush	Flush	Non-flush	Non-flush	Non-flush	
1.5 mm	1.5 mm	1.5 mm	2 mm	2 mm	2 mm	
Cable 2 m	Connector M8	Cable 2 m	Cable 2 m	Connector M8	Connector M12	
Temperature	Temperature	NAMUR				
						
						
6502901008	**6502942013**		**6502916003**	**6502942006**	**6502942008**	
6502301006						
		6501601003				

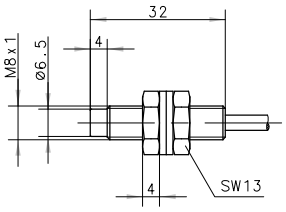
10-36 VDC	10-36 VDC	5-25 VDC	10-36 VDC	10-36 VDC	10-36 VDC	
≤ 200 mA	≤ 200 mA	-	≤ 200 mA	≤ 200 mA	≤ 200 mA	
1000 Hz	1000 Hz	≈ 1 kHz	750 Hz	750 Hz	750 Hz	
Cyclic	Cyclic	-	Cyclic	Cyclic	Cyclic	
LED/-	LED/-	-/-	LED/-	LED/-	-/-	

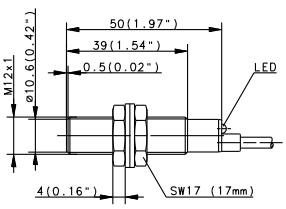
-40°C/+100°	-40°C/+100°	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	
IP67	IP67	IP67	IP67	IP67	IP67	
Stainless steel 1.4305	Stainless steel 1.4305	Stainless steel 1.4305	Stainless steel 1.4305	Stainless steel 1.4305	Stainless steel 1.4305	
3 x 0.14 mm²	M8 x 1	2 x 0.25 mm²	3 x 0.14 mm²	M8 x 1	M12 x 1	

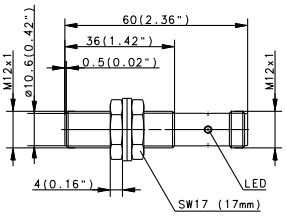
You will find detailed data sheets to the products under www.bernstein.eu

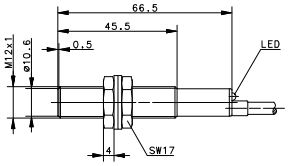
Inductive Sensors (Type M8, M12)

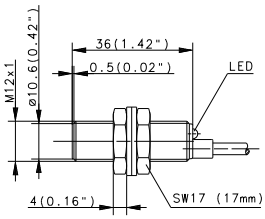
Type			**M8**	**M12**		**M12**	
Type of installation			Non-flush	Flush	Flush	Flush	Flush
Nominal sensing distance			2 mm	2 mm	2 mm	2 mm	2 mm
Type of connection			Cable 2 m	Cable 2 m	Cable 2 m	Connector M12	Cable 2 m
Special feature			NAMUR				











PNP	DC	NO contact		**6932903001**		**6932943001**	**6502903016**
		NC contact				**6602743112**	**6502703005**
		Antivalent NO/NC					
NPN	DC	NO contact		**6932303001**		**6932343001**	**6502303007**
		NC contact					**6502103003**
		Antivalent NO/NC					
PNP/NPN	DC	NO/NC prog.					
		push-pull operation					
NAMUR	DC		**6501601005**				
Analogue	DC						
2-wire	DC	NO contact					
		NC contact					
	AC	NO contact			**6503503001**		
		NC contact			**6503403001**		
		Changeover contact					

Technical data

Rated operating voltage	U_B	5-25 VDC	10-36 VDC	76-250 V AC	10-36 VDC	10-36 VDC
Rated operating current	I_B	-	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
Switching frequency (max)	F	≈ 1 kHz	800 Hz	≈ 10 Hz	800 Hz	800 Hz
Short circuit-protection		-	Cyclic	-	Cyclic	Cyclic
Function/operating voltage indicator		-/-	LED/-	LED/-	LED/-	LED/-
Sensing distance, adjustable						

Mechanical data

Ambient temperature (min/max)		-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN60 529		IP67	IP67	IP67	IP67	IP67
Enclosure material		Stainless steel 1.4305	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Connection		2 x 0.25 mm²	3 x 0.14 mm²	2 x 0.14 mm²	M12 x 1	3 x 0.14 mm²

Please refer to Accessories for cable couplers, mounting brackets and sensor tester.

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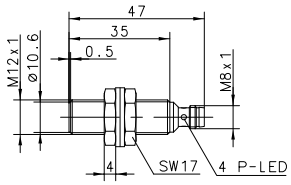
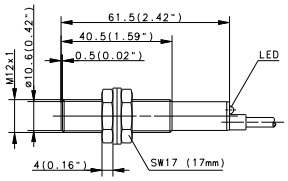
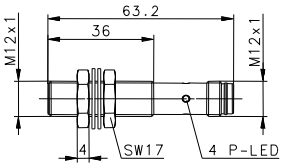
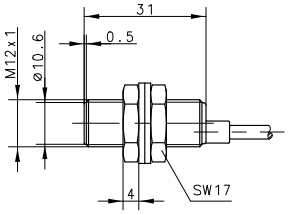
Site web : www.hvssystem.com

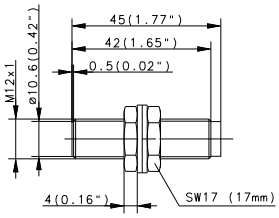
M12		M12		M12	M12	
Flush	Flush	Flush	Flush	Flush	Flush	
2 mm	2 mm	2 mm	2 mm	2 mm	2 mm	
Connector M8	Connector M12	Cable 2 m	Cable 2 m	Connector M12	Cable 2 m	
		4000 Hz	Temperature	Ultralock	NAMUR	

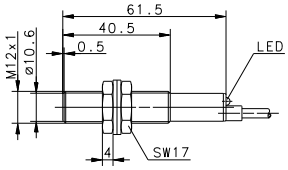












6502943008	**6502943006** **6502743005**	**6502903012**	**6502903026**	**6502943017**		
				6502343009		
					6501624760	

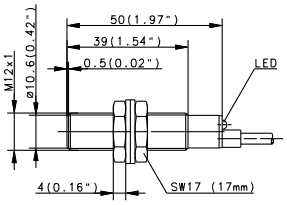
10-30 VDC	10-36 VDC	10-60 VDC	10-30 VDC	10-36 VDC	5-25 VDC	
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	-	
800 Hz	800 Hz	4000 Hz	800 Hz	800 Hz	≤ 800 Hz	
Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	-	
LED/-	-/-	LED/-	LED/-	LED/-	-/-	

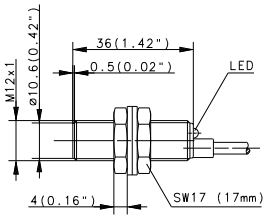
-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-40°C/+100°	-25°C/+70°C	-25°C/+70°C	
IP67	IP67	IP67	IP67	IP67	IP67	
CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	
M8 x 1	M12 x 1	3 x 0.14 mm²	3 x 0.14 mm²	M12 x 1	2 x 0.25 mm²	

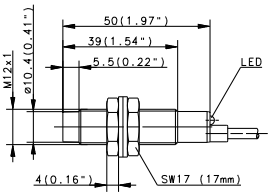
You will find detailed data sheets to the products under www.bernstein.eu

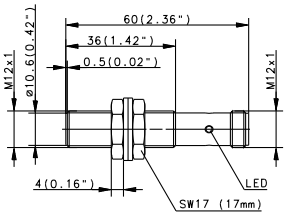
Inductive Sensors (Type M12)

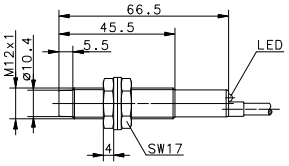
Type			**M12**		**M12**	**M12**	
Type of installation			Flush	Flush	Flush	Non-flush	Non-flush
Nominal sensing distance			4 mm	4 mm	4 mm	4 mm	4 mm
Type of connection			Cable 2 m	Connector M12	Cable 2 m	Cable 2 m	Cable 2 m
Special feature			Sensing dist.	Sensing dist.	Sensing dist.		











PNP	DC	NO contact	**6502903025**	**6502943015**	**6502903023**	**6932904001**	
		NC contact				**6932704001**	
		Antivalent NO/NC					
NPN	DC	NO contact				**6932304001**	
		NC contact				**6932104001**	
		Antivalent NO/NC					
PNP/NPN	DC	NO/NC prog.					
		push-pull operation					
NAMUR	DC						
Analogue	DC						
2-wire	DC	NO contact					
		NC contact					
	AC	NO contact					**6503504001**
		NC contact					**6503404001**
		Changeover contact					

Technical data						
Rated operating voltage	U_B	10-30 VDC	10-36 VDC	10-36 VDC	10-36 VDC	76-250 V AC
Rated operating current	I_B	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
Switching frequency (max)	F	800 Hz	800 Hz	800 Hz	400 Hz	≈ 10 Hz
Short circuit-protection		Cyclic	Cyclic	Cyclic	Cyclic	-
Function/operating voltage indicator		LED/-	LED/-	LED/-	LED/-	LED/-
Sensing distance, adjustable						

Mechanical data					
Ambient temperature (min/max)	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67	IP67
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Connection	3 x 0.14 mm²	M12 x 1	3 x 0.14 mm²	3 x 0.14 mm²	2 x 0.14 mm²

Please refer to Accessories for cable couplers, mounting brackets and sensor tester.

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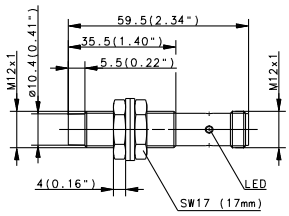
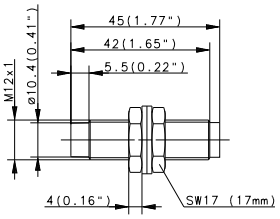
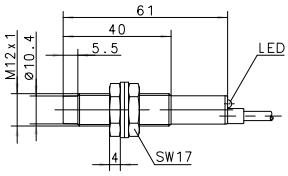
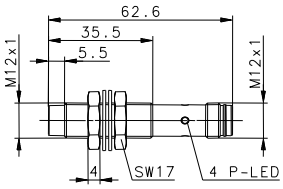
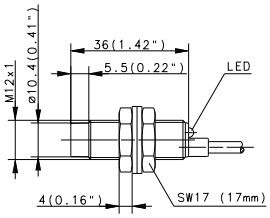
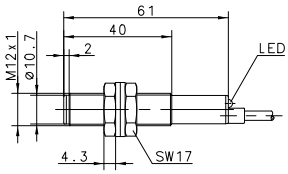
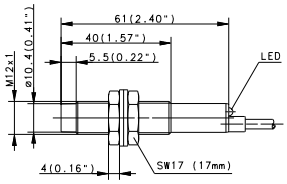
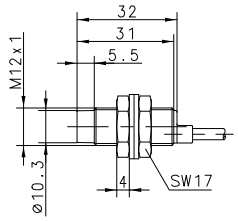
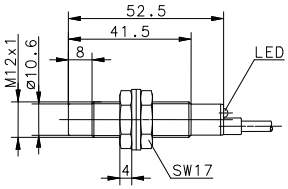
M12		M12		M12		M12	
Non-flush	Non-flush	Non-flush	Non-flush	Non-flush	Non-flush	Non-flush	
4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	
Connector M12	Cable 2 m	Connector M12	Cable 2 m Plastic	Cable 2 m	Cable 2 m 3000 Hz	Connector M12 Ultralock	
							
							
6932944001 **6502744003**	**6502904014**	**6502944006**	**6502919001**		**6502904010**	**6502944015**	
6932344001	**6502304007**					**6502344010**	
				6501304001			
10-36 VDC	10-36 VDC	10-36 VDC	10-30 VDC	10-60 VDC	10-60 VDC	10-36 VDC	
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	
400 Hz	400 Hz	400 Hz	400 Hz	400 Hz	3000 Hz	400 Hz	
Cyclic	Cyclic	Cyclic	Cyclic	-	Cyclic	Cyclic	
LED/-	LED/-	-/-	LED/-	LED/-	LED/-	LED/-	
-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	
IP67	IP67	IP67	IP67	IP67	IP67	IP67	
CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	PA, red	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	
M12 x 1	3 x 0.14 mm²	M12 x 1	3 x 0.14 mm²	2 x 0.14 mm²	3 x 0.14 mm²	M12 x 1	

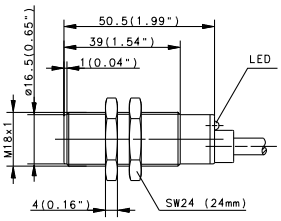
You will find detailed data sheets to the products under www.bernstein.eu

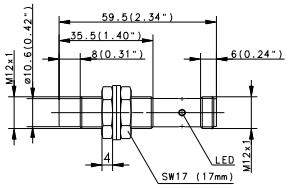
Inductive Sensors (Type M12, M18)

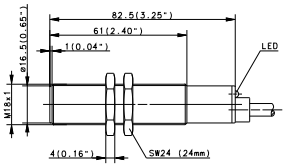
Type			M12	M12		M18	
Type of installation			Non-flush	Non-flush	Non-flush	Flush	Flush
Nominal sensing distane			4 mm	8 mm	8 mm	5 mm	5 mm
Type of connection			Cable 2 m	Cable 2 m	Connector M12	Cable 2 m	Cable 2 m
Special feature			NAMUR	Sensing dist.	Sensing dist.		











PNP	DC	NO contact		**6502904021**	**6502944013**	**6932905001**	
		NC contact				**6932705001**	
		Antivalent NO/NC					
NPN	DC	NO contact			**6602344458**		
		NC contact				**6932105001**	
		Antivalent NO/NC					
PNP/NPN	DC	NO/NC prog.					
		push-pull operation					
NAMUR	DC		**6501625761**				
Analogue	DC						
2-wire	DC	NO contact					
		NC contact					
	AC	NO contact					**6503505004**
		NC contact					**6503405001**
		Changeover contact					

Technical data

Rated operating voltage	U_B	5-25 VDC	10-36 VDC	10-36 VDC	10-36 VDC	20-250 V AC
Rated operating current	I_B	-	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 400 mA
Switching frequency (max)	F	≤ 400 Hz	400 Hz	400 Hz	500 Hz	≈ 10 Hz
Short circuit-protection		-	Cyclic	Cyclic	Cyclic	-
Function/operating voltage indicator		-/-	LED/-	LED/-	LED/-	LED/-
Sensing distance, adjustable						

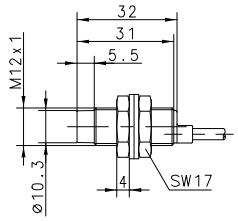
Mechanical data

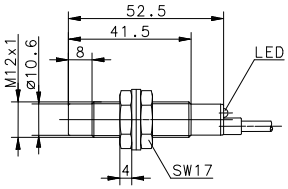
Ambient temperature (min/max)		-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67	IP67	IP67
Enclosure material		CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Connection		2 x 0.25 mm²	3 x 0.14 mm²	M12 x 1	3 x 0.5 mm²	2 x 0.5 mm²

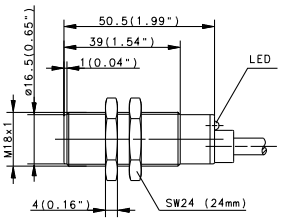
Please refer to Accessories for cable couplers, mounting brackets and sensor tester.

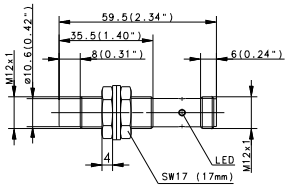
Inductive Sensors (Type M12, M18)

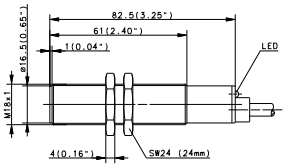
Type			M12	M12		M18	
Type of installation			Non-flush	Non-flush	Non-flush	Flush	Flush
Nominal sensing distane			4 mm	8 mm	8 mm	5 mm	5 mm
Type of connection			Cable 2 m	Cable 2 m	Connector M12	Cable 2 m	Cable 2 m
Special feature			NAMUR	Sensing dist.	Sensing dist.		











PNP	DC	NO contact		**6502904021**	**6502944013**	**6932905001**	
		NC contact				**6932705001**	
		Antivalent NO/NC					
NPN	DC	NO contact			**6602344458**		
		NC contact				**6932105001**	
		Antivalent NO/NC					
PNP/NPN	DC	NO/NC prog.					
		push-pull operation					
NAMUR	DC		**6501625761**				
Analogue	DC						
2-wire	DC	NO contact					
		NC contact					
	AC	NO contact					**6503505004**
		NC contact					**6503405001**
		Changeover contact					

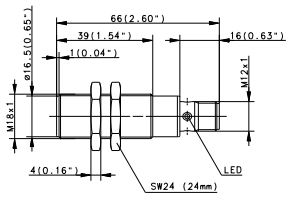
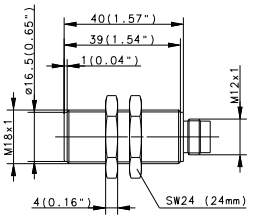
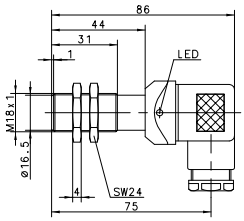
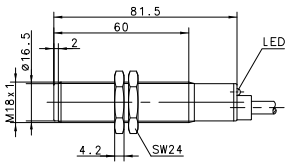
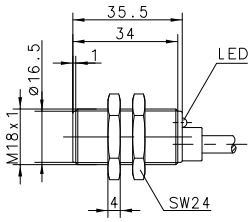
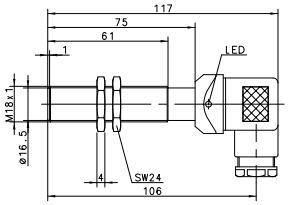
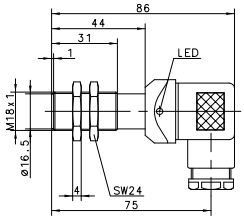
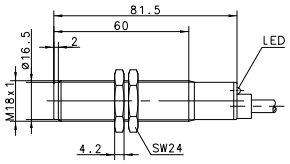
Technical data

Rated operating voltage	U_B	5-25 VDC	10-36 VDC	10-36 VDC	10-36 VDC	20-250 V AC
Rated operating current	I_B	-	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 400 mA
Switching frequency (max)	F	≤ 400 Hz	400 Hz	400 Hz	500 Hz	≈ 10 Hz
Short circuit-protection		-	Cyclic	Cyclic	Cyclic	-
Function/operating voltage indicator		-/-	LED/-	LED/-	LED/-	LED/-
Sensing distance, adjustable						

Mechanical data

Ambient temperature (min/max)		-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67	IP67	IP67
Enclosure material		CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Connection		2 x 0.25 mm²	3 x 0.14 mm²	M12 x 1	3 x 0.5 mm²	2 x 0.5 mm²

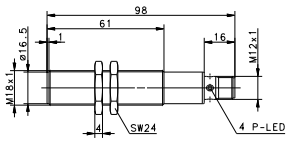
Please refer to Accessories for cable couplers, mounting brackets and sensor tester.

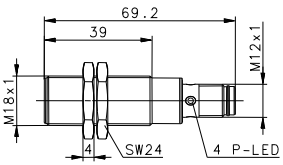
M18		M18		M18		M18		
Flush	Flush	Flush	Flush	Flush	Flush	Flush	Flush	
5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	
Connector M12	Cable 6 m	Connector M12	DIN Connector	DIN Connector	DIN Connector	Cable 2 m Plastic	Cable 2 m Plastic	
							
							
6932905004	**6502905013**	**6502905012** **6502705007**	**6602905662** **6502705001**	**6502940001**	**6502840002**	**6502920990**		
6932305004								
							6503520697	
10-36 VDC	10-60 VDC	10-60 VDC	10-60 VDC	10-60 VDC	10-60 VDC	10-60 VDC	24-250 V AC	
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	
500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	≈ 10 Hz	
Cyclic	Cyclic	Cyclic	-	Cyclic	Cyclic	Cyclic	-	
LED/-	LED/-	-/-	LED/-	LED/-	-/-	LED/-	LED/-	
-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	
IP67	IP67	IP67	IP65	IP65	IP65	IP67	IP67	
CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	PA, red	PA, red	
M12 x 1	3 x 0.5 mm²	M12 x 1	DIN 43650	DIN 43650	DIN 43650	3 x 0.5 mm²	2 x 0.5 mm²	

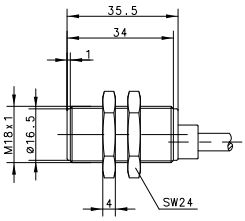
You will find detailed data sheets to the products under www.bernstein.eu

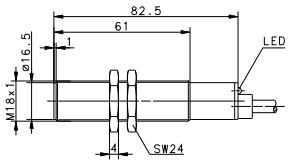
Inductive Sensors (Type M18)

Type			M18		M18	M18
Type of installation			Flush	Flush	Flush	Flush
Nominal sensing distance			5 mm	5 mm	5 mm	5 mm
Type of connection			Connector M12	Cable 2 m	Connector M12	Cable 2 m
Special feature			Temperature	Temperature	Ultralock	NAMUR









PNP	DC	NO contact	**6502940006**	**6502905023**	**6502905026**	
		NC contact				
		Antivalent NO/NC				
NPN	DC	NO contact			**6502305013**	
		NC contact				
		Antivalent NO/NC				
PNP/NPN	DC	NO/NC prog.				
		push-pull operation				
NAMUR	DC					**6501626762**
Analogue	DC					
2-wire	DC	NO contact				
		NC contact				
	AC	NO contact				
		NC contact				
		Changeover contact				

Technical data

Rated operating voltage	U_B	10-30 VDC	10-30 VDC	10-36 VDC	5-25 VDC
Rated operating current	I_B	≤ 200 mA	≤ 200 mA	≤ 200 mA	-
Switching frequency (max)	F	500 Hz	500 Hz	500 Hz	≤ 400 Hz
Short circuit-protection		Cyclic	Cyclic	Cyclic	-
Function/operating voltage indicator		LED/-	LED/-	LED/-	-/-
Sensing distance, adjustable					

Mechanical data

Ambient temperature (min/max)	-40°C/+100°	-40°C/+100°	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Connection	M12 x 1	3 x 0.5 mm²	M12 x 1	2 x 0.5 mm²

Please refer to Accessories for cable couplers, mounting brackets and sensor tester.

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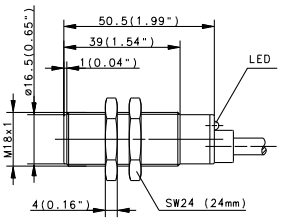
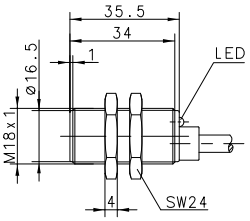
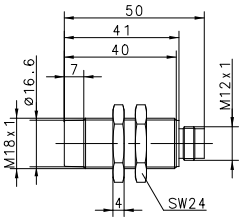
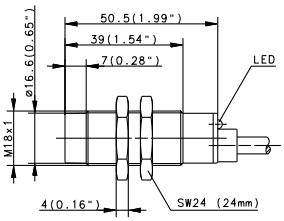
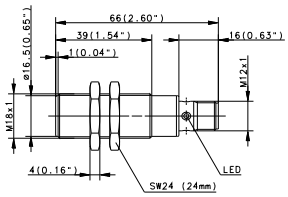
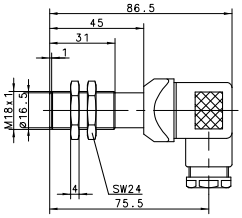
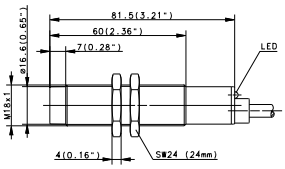
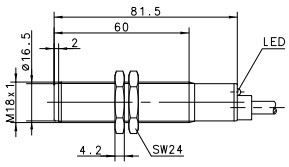
E-mail:hvssystem@hvssystem.com
Site web : www.hvssystem.com

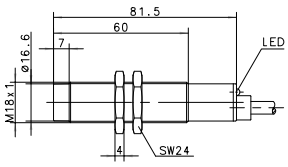
M18		M18		M18	M18		
Flush	Flush	Flush	Flush	Flush	non-Flush	non-Flush	
8 mm	8 mm	8 mm	8 mm	8 mm	8 mm	8 mm	
Cable 2 m	Connector M12	Cable 2 m	DIN Connector	Connector M12	Cable 2 m	Cable 2 m	
Sensing dist.	Sensing dist.	Sensing dist.	Sensing dist.	Sensing dist.			
							
							
6502905022	**6502940005**	**6502905010**	**6602840128**	**6502906009**	**6932906001** **6932706001**		
					6932306001		
						6503506002 **6503406001**	
10-36 VDC	10-36 VDC	10-36 VDC	12-48 VDC	10-60 VDC	10-36 VDC	20-250 V AC	
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 400 mA	≤ 200 mA	≤ 200 mA	≤ 400 mA	
500 Hz	500 Hz	500 Hz	500 Hz	200 Hz	200 Hz	≈ 10 Hz	
Cyclic	Cyclic	Cyclic	-	Cyclic	Cyclic	-	
LED/-	LED/-	LED/-	-/-	-/-	LED/-	LED/-	
-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	
IP67	IP67	IP67	IP65	IP67	IP67	IP67	
CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	
3 x 0.5 mm²	M12 x 1	3 x 0.5 mm²	DIN 43650	M12 x 1	3 x 0.5 mm²	2 x 0.5 mm²	

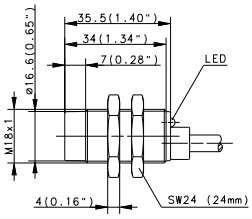
You will find detailed data sheets to the products under www.bernstein.eu

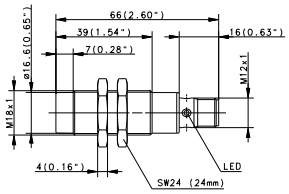
Inductive Sensors (Type M18)

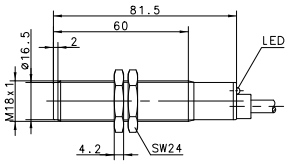
Type			M18		M18		M18
Type of installation			Non-flush	Non-flush	Non-flush	Non-flush	Non-flush
Nominal sensing distance			8 mm	8 mm	8 mm	8 mm	8 mm
Type of connection			Cable 2 m	Connector M12	Cable 2 m	Cable 2 m	Cable 2 m
Special feature			Plastic			Plastic	











PNP	DC	NO contact		**6932906004**		**6502921975**	**6502906006**
		NC contact		**6932706002**			**6502706002**
		Antivalent NO/NC					
NPN	DC	NO contact		**6932306004**			**6502306004**
		NC contact					
		Antivalent NO/NC					
PNP/NPN	DC	NO/NC prog.					
		push-pull operation					
NAMUR	DC						
Analogue	DC						
2-wire	DC	NO contact					
		NC contact				**6501306001**	
	AC	NO contact		**6503521705**			
		NC contact		**6503421704**			
		Changeover contact					

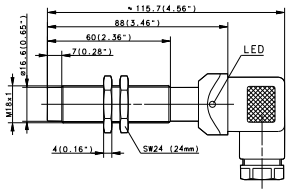
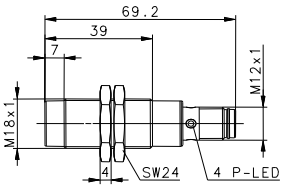
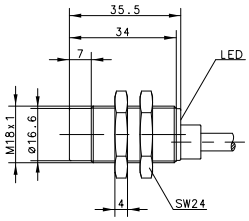
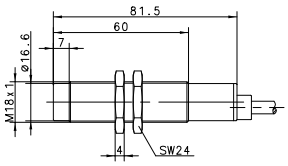
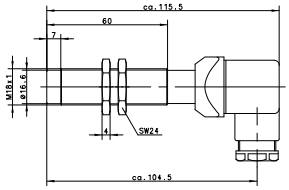
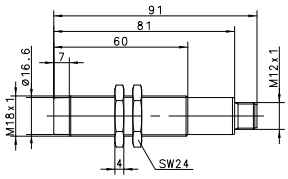
Technical data

Rated operating voltage	U_B	24-250 V AC	10-36 VDC	10-60 VDC	10-60 VDC	10-60 VDC
Rated operating current	I_B	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
Switching frequency (max)	F	≈ 10 Hz	200 Hz	200 Hz	200 Hz	200 Hz
Short circuit-protection		-	Cyclic	-	Cyclic	Cyclic
Function/operating voltage indicator		LED/-	LED/-	LED/-	LED/-	LED/-
Sensing distance, adjustable						

Mechanical data

Ambient temperature (min/max)	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67	IP67
Enclosure material	PA, red	CuZn39Pb3	CuZn39Pb3	PA, red	CuZn39Pb3
Connection	2 x 0.5 mm^2	M12 x 1	2 x 0.5 mm^2	3 x 0.5 mm^2	3 x 0.5 mm^2

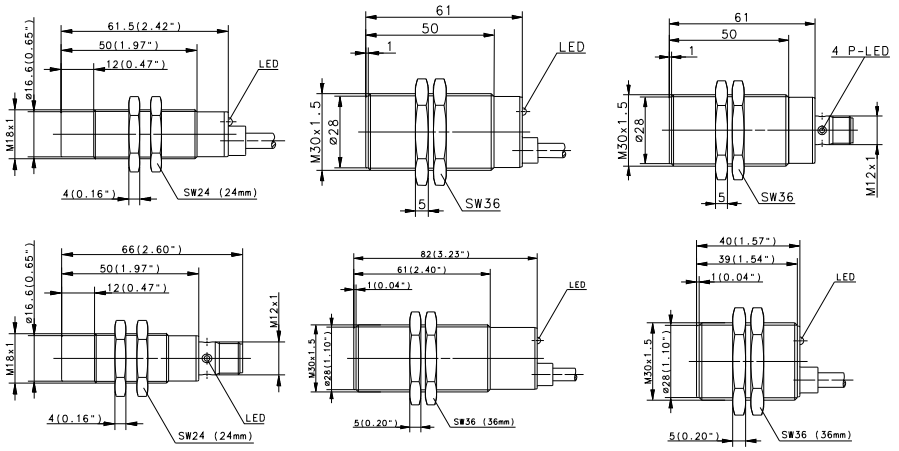
Please refer to Accessories for cable couplers, mounting brackets and sensor tester.

M18		M18	M18	M18	
Non-flush	Non-flush	Non-flush	Non-flush	Non-flush	Non-flush
8 mm	8 mm	8 mm	8 mm	8 mm	8 mm
DIN Connector	DIN Connector	Connector M12	Cable 2 m	Cable 2 m	Connector M12
		Ultralock	NAMUR		
					
					
6502941001 **6502741001**	**6602841421**	**6502906021**			
		6502306011			
			6501627763		
				6502006001	**6602006111**
10-60 VDC	10-60 VDC	10-36 VDC	5-25 VDC	10-36 VDC	10-36 VDC
≤ 200 mA	≤ 200 mA	≤ 200 mA	-	-	-
200 Hz	200 Hz	200 Hz	≤ 200 Hz	-	-
Cyclic	-	Cyclic	-	Cyclic	-
LED/-	-/-	LED/-	-/-	-/-	-/-
-25°C/+70°C	-40°C/+80°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
IP65	IP65	IP67	IP67	IP67	IP67
CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
DIN 43650	DIN 43650	M12 x 1	2 x 0.5 mm^2	3 x 0.5 mm^2	M12 x 1

You will find detailed data sheets to the products under www.bernstein.eu

Inductive Sensors (Type M18, M30)

Type			M18		M30		M30	
Type of installation			Non-flush	Non-flush	Flush	Flush	Flush	Flush
Nominal sensing distance			16 mm	16 mm	10 mm	10 mm	10 mm	10 mm
Type of connection			Cable 2 m	Connector M12	Cable 2 m	Cable 2 m	Connector M12	Cable 2 m
Special feature			Sensing dist.	Sensing dist.				



PNP	DC	NO contact	**6502906018**	**6502941004**	**6932907001**		**6932907002**	**6502907003**
		NC contact						**6502707001**
		Antivalent NO/NC						
NPN	DC	NO contact						
		NC contact						
		Antivalent NO/NC						
PNP/NPN	DC	NO/NC prog.						
		push-pull operation						
NAMUR	DC							
Analogue	DC							
2-wire	DC	NO contact						
		NC contact						
	AC	NO contact				**6503507378**		
		NC contact				**6503407240**		
		Changeover contact						

Technical data

Rated operating voltage	U_B	10-36 VDC	10-36 VDC	10-36 VDC	20-250 V AC	10-36 VDC	10-60 VDC
Rated operating current	I_B	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 400 mA	≤ 200 mA	≤ 200 mA
Switching frequency (max)	F	200 Hz	200 Hz	300 Hz	≈ 10 Hz	300 Hz	300 Hz
Short circuit-protection		Cyclic	Cyclic	Cyclic	-	Cyclic	Cyclic
Function/operating voltage indicator		LED/-	LED/-	LED/-	LED/-	LED/-	LED/-
Sensing distance, adjustable							

Mechanical data

Ambient temperature (min/max)		-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67	IP67	IP67	IP67
Enclosure material		CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Connection		3 x 0.5 mm²	M12 x 1	3 x 0.5 mm²	2 x 0.5 mm²	M12 x 1	3 x 0.5 mm²

Please refer to Accessories for cable couplers, mounting brackets and sensor tester.

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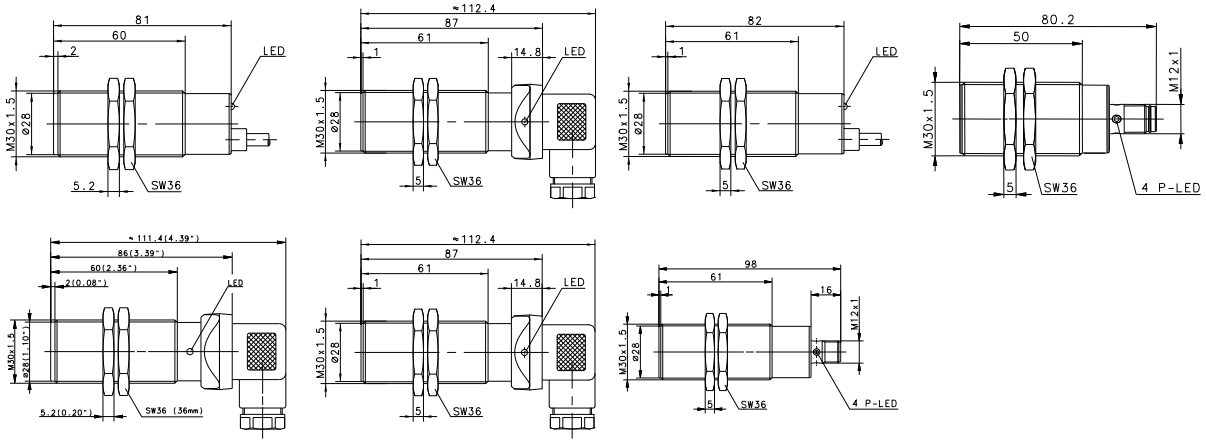
M30		**M30**		**M30**		**M30**	
Flush	Flush	Flush	Flush	Flush	Flush	Flush	
10 mm	10 mm	10 mm	10 mm	10 mm	10 mm	10 mm	
Cable 2 m	DIN Connector	DIN Connector	DIN Connector	Cable 2 m	Connector M12	Connector M12	
Plastic	Plastic			Temperature	Temperature	Ultralock	

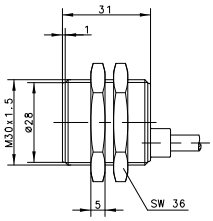


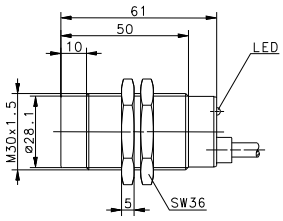
6502722708		**6502939001**		**6502907013**	**6502939006**	**6502907014**	
	6502822862						
			6503535960 **6503435959**				
10-60 VDC	10-60 VDC	10-60 VDC	20-265 V AC	10-30 VDC	10-30 VDC	10-36 VDC	
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 500 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	
300 Hz	300 Hz	300 Hz	20 Hz	300 Hz	300 Hz	300 Hz	
Cyclic	Cyclic	Cyclic	-	Cyclic	Cyclic	Cyclic	
LED/-	LED/-	LED/-	LED/-	LED/-	LED/-	LED/-	
-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-40°C/+100°	-40°C/+100°	-25°C/+70°C	
IP67	IP65	IP65	IP65	IP67	IP67	IP67	
PA, red	PA, red	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	
3 x 0.5 mm^2	DIN 43650	DIN 43650	DIN 43650	3 x 0.5 mm^2	M12 x 1	M12 x 1	

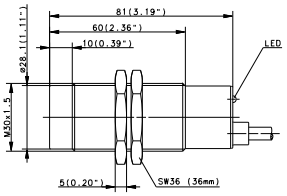
You will find detailed data sheets to the products under www.bernstein.eu

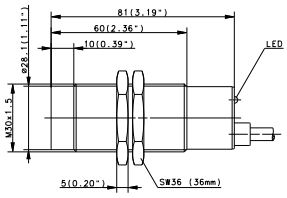
Inductive Sensors (Type M30)

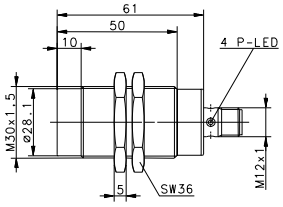
Type			M30	M30		M30	
Type of installation			Flush	Non-flush	Non-flush	Non-flush	Non-flush
Nominal sensing distance			10 mm	15 mm	15 mm	15 mm	15 mm
Type of connection			Cable 2 m	Cable 2 m	Cable 2 m	Cable 2.5 m	Connector M12
Special feature			NAMUR				











PNP	DC	NO contact		**6932908001**	**6502908002**		**6932908002**
		NC contact					**6602308459**
		Antivalent NO/NC			**6502808001**		
NPN	DC	NO contact			**6502308001**		
		NC contact					
		Antivalent NO/NC					
PNP/NPN	DC	NO/NC prog.					
		push-pull operation					
NAMUR	DC		**6501699012**				
Analogue	DC						
2-wire	DC	NO contact					
		NC contact					
	AC	NO contact					**6503508246**
		NC contact					
		Changeover contact					

Technical data

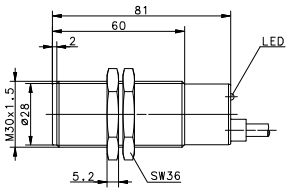
Rated operating voltage	U_B	5-25 VDC	10-36 VDC	10-60 VDC	20-250 V AC	10-36 VDC
Rated operating current	I_B	-	≤ 200 mA	≤ 200 mA	≤ 400 mA	≤ 200 mA
Switching frequency (max)	F	≤ 300 Hz	100 Hz	100 Hz	≈ 10 Hz	100 Hz
Short circuit-protection		-	Cyclic	Cyclic	-	Cyclic
Function/operating voltage indicator		-/-	LED/-	LED/-	LED/-	LED/-
Sensing distance, adjustable						

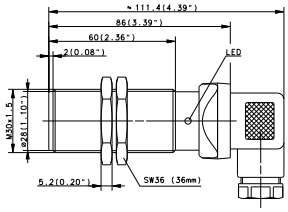
Mechanical data

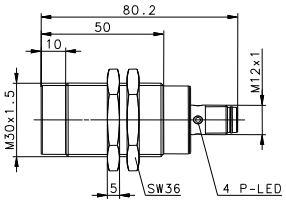
Ambient temperature (min/max)	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67	IP67
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Connection	2 x 0.5 mm²	3 x 0.5 mm²	3 x 0.5 mm²	2 x 0.5 mm²	M12 x 1

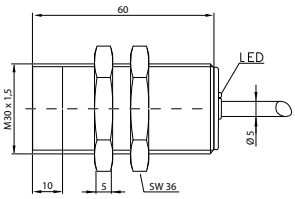
Please refer to Accessories for cable couplers, mounting brackets and sensor tester.

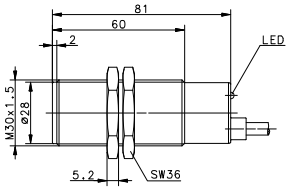
M30		M30		M30	M30	
Non-flush	Non-flush	Non-flush	Non-flush	Non-flush	Non-flush	
15 mm	15 mm	15 mm	15 mm	15 mm	40 mm	
Cable 2 m	Cable 2.5 m	DIN Connector	DIN Connector	Connector M12	Cable 2 m	
Plastic	Plastic	Plastic		Ultralock	Sensing dist.	

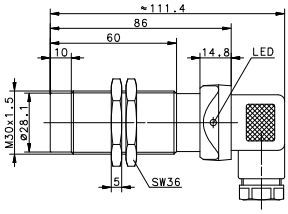












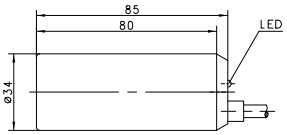
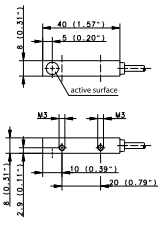
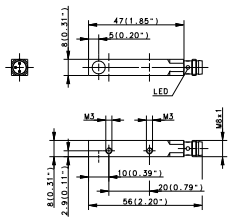
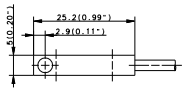
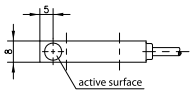
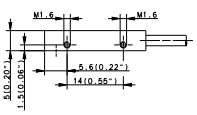
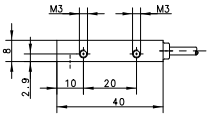
6502923981		6502935001		6502908008	6502908009	
		6502836860				
				6502008001		
	6503523956 6503423955					

10-60 VDC	20-250 V AC	10-60 VDC	10-60 VDC	10-36 VDC	10-30 VDC	
≤ 200 mA	≤ 400 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	
100 Hz	≈ 10 Hz	100 Hz	100 Hz	100 Hz	≤ 100 Hz	
Cyclic	-	Cyclic	Cyclic	Cyclic	Cyclic	
LED/-	LED/-	LED/-	LED/-	LED/-	LED/-	

-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	
IP67	IP67	IP65	IP65	IP67	IP67	
PA, red	PA, red	PA, red	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	
3 x 0.5 mm²	2 x 0.5 mm²	DIN 43650	DIN 43650	M12 x 1	3 x 0.34 mm²	

You will find detailed data sheets to the products under www.bernstein.eu

Inductive Sensors (Type Ø 34 mm, 5 x 5, 8 x 8, 12 x 12, 16 x 8, 27 x 10, 28 x 16)

Type			Ø 34 mm	5 x 5 x 25 mm	8 x 8 x 40 mm		8 x 8 x 56 mm
Type of installation			non-flush	Flush	Flush	Flush	Flush
Nominal sensing distance			20.0 mm	1.5 mm	1.5 mm	1.5 mm	1.5 mm
Type of connection			Cable 2 m	Cable	Cable 2 m	Cable 2 m	Connector M8
Special feature							
							
							
							
PNP	DC	NO contact	**6502915002**	**6502999026**	**6502980004**	**6602980087**	**6502980002**
		NC contact	**6502715001**	**6502799010**	**6502780001**		**6502780002**
		Antivalent NO/NC					
NPN	DC	NO contact			**6502380001**		
		NC contact					
		Antivalent NO/NC					
PNP/NPN	DC	NO/NC prog.	**6502915001**				
		push-pull operation					
NAMUR	DC						
Analogue	DC						
2-wire	DC	NO contact					
		NC contact					
	AC	NO contact					
		NC contact					
		Changeover contact					

Technical data

Rated operating voltage	U_B	10-60 VDC	10-30 VDC	10-36 VDC	10-36 VDC	10-36 VDC
Rated operating current	I_B	≤ 200 mA	200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
Switching frequency (max)	F	100 Hz	1000 Hz	1000 Hz	1000 Hz	1000 Hz
Short circuit-protection		Cyclic	Cyclic	Cyclic	Cyclic	Cyclic
Function/operating voltage indicator		LED/-	-/-	-/-	-/-	LED/-
Sensing distance, adjustable						

Mechanical data

Ambient temperature (min/max)	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	0°C/+100°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67	IP67
Enclosure material	PBT, red	CuZn39PB3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Connection	3 x 0.5 mm^2	3 x 0.05 mm^2	3 x 0.14 mm^2	3 x 0.14 mm^2	M8 x 1

Please refer to Accessories for cable couplers, mounting brackets and sensor tester.

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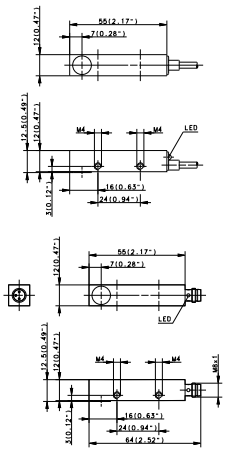
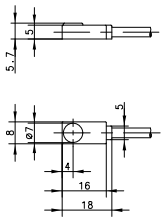
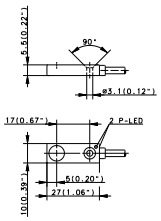
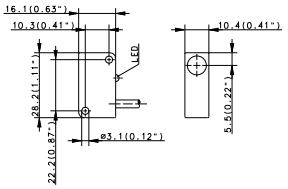
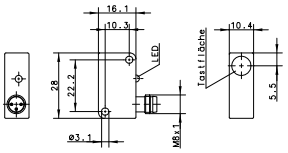
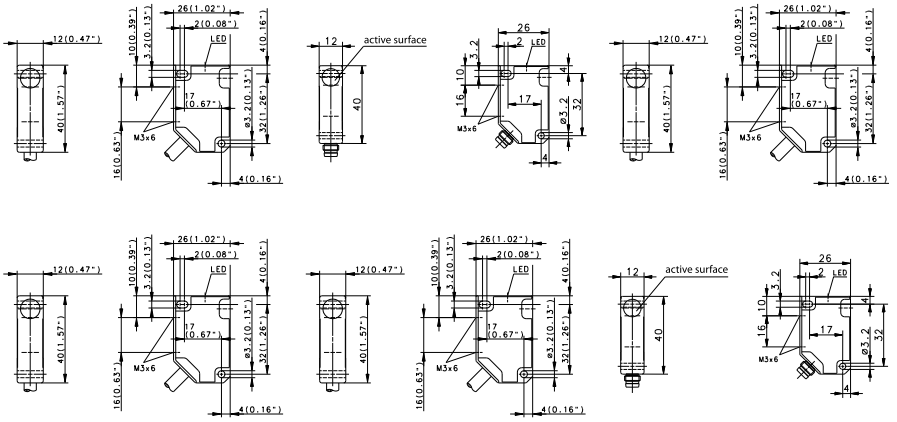
12x12x55mm		16 x 8 x 5 mm	27 x 10 x 5 mm	28x16x11mm		
Flush	Flush	Flush	Flush	Flush	Flush	
4 mm	4 mm	1.5 mm	1.5 mm	2 mm	2 mm	
Cable 2 m	Connector M8	Cable 2 m	Cable 2 m	Cable 2 m	Connector M8	
						
						
6502999028	**6502999030**	**6502985002**	**6502993001**	**6502973001**	**6502973002**	
				6502773002	**6502773001**	
	6502399021		**6502393001**			
10-60 VDC	10-60 VDC	10-36 VDC	10-30 VDC	10-30 VDC	10-30 VDC	
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	
800 Hz	800 Hz	1000 Hz	1000 Hz	800 Hz	800 Hz	
Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	
LED/-	LED/-	-/-	LED/-	LED/-	LED/-	
-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	
IP67	IP67	IP67	IP67	IP67	IP67	
CuZn39Pb3	CuZn39Pb3	PA, black	PA, black	PA, black	PA, black	
3 x 0.14 mm²	M8 x 1	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	M8 x 1	

You will find detailed data sheets to the products under www.bernstein.eu

Inductive Sensors (Type 28 x 16 mm, 40 x 26 mm, 50 x 25 mm, 60 x 36 mm)

Type			**40x26x12mm**		**40x26x12mm**		**40x26x12mm**	
Type of installation			Flush	Flush	Flush	Non-flush	Non-flush	Non-flush
Nominal sensing distance			2 mm	2 mm	2 mm	4 mm	4 mm	4 mm
Type of connection			Cable 2 m	Cable 2 m	Connector M8	Cable 2 m	Cable 2 m	Connector M8
Special feature								
								
PNP	DC	NO contact	**6502984023**		**6502984025**	**6502984024**		**6502984026**
		NC contact	**6502784006**			**6502784007**		**6502784008**
		Antivalent NO/NC						
NPN	DC	NO contact						
		NC contact						
		Antivalent NO/NC						
PNP/NPN	DC	NO/NC prog.						
		push-pull operation						
NAMUR	DC							
Analogue	DC							
2-wire	DC	NO contact						
		NC contact						
	AC	NO contact		**6503584004**			**6503584005**	
		NC contact		**6503484003**			**6503484004**	
		Changeover contact						
Technical data								
Rated operating voltage		U_B	10-36 VDC	20-250 V AC	10-36 VDC	10-36 VDC	20-250 V AC	10-36 VDC
Rated operating current		I_B	≤ 200 mA	≤ 300 mA	≤ 200 mA	≤ 200 mA	≤ 300 mA	≤ 200 mA
Switching frequency (max)		F	800 Hz	10 Hz	800 Hz	400 Hz	10 Hz	400 Hz
Short circuit-protection			Cyclic	-	Cyclic	Cyclic	-	Cyclic
Function/operating voltage indicator			LED/-	LED/-	LED/-	LED/-	LED/-	LED/-
Sensing distance, adjustable								
Mechanical data								
Ambient temperature (min/max)			-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529			IP67	IP67	IP67	IP67	IP67	IP67
Enclosure material			PBT, black	PBT, black	PBT, black	PBT, black	PBT, black	PBT, black
Connection			3 x 0.5 mm^2	2 x 0.5 mm^2	M8 x 1	3 x 0.5 mm^2	2 x 0.5 mm^2	M8 x 1

Please refer to Accessories for cable couplers, mounting brackets and sensor tester.

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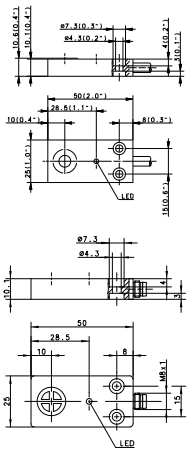
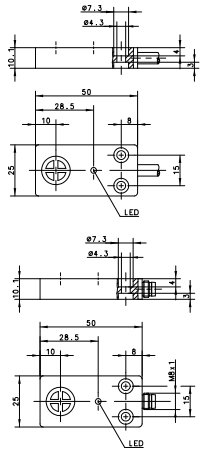
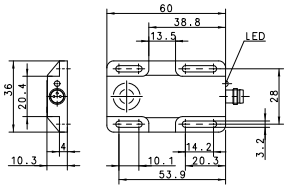
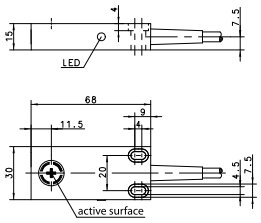
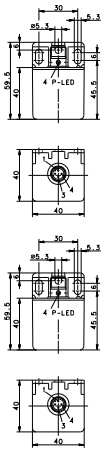
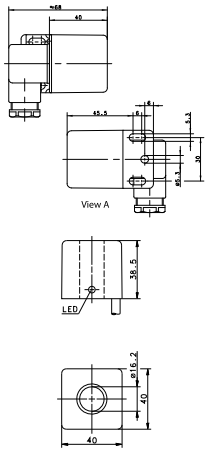
Site web : www.hvssystem.com

50x25x10mm		**50x25x10mm**		**60x36x10mm**		
Flush	Flush	Non-flush	Non-flush	Non-flush		
5 mm	5 mm	8 mm	8 mm	8 mm		
Cable 2 m	Connector M8	Cable 2 m	Connector M8	Connector M8		
						
6502990001	**6502990005**	**6502990003**	**6502990006**			
		6502790002		**6602799048**		
6502390001		**6502390002**				
10-60 VDC	10-60 VDC	10-60 VDC	10-60 VDC	10-60 VDC		
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 400 mA		
500 Hz	500 Hz	200 Hz	200 Hz	200 Hz		
Cyclic	Cyclic	Cyclic	Cyclic	Cyclic		
LED/-	LED/-	LED/-	LED/-	LED/-		
-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C		
IP67	IP67	IP67	IP67	IP67		
PA, black	PA, black	PA, black	PA, black	PA, black		
3 x 0.5 mm^2	M8 x 1	3 x 0.5 mm^2	M8 x 1	M8 x 1		

You will find detailed data sheets to the products under www.bernstein.eu

Inductive Sensors (Type 68 x 30 mm, 40 x 40 mm)

Type			**68x30x15mm**	**40 x 40 mm**		**40 x 40 mm**	
Type of installation			Non-flush	Flush	Non-flush	Non-flush	Non-flush
Nominal sensing distance			7 mm	15 mm	20 mm	15 mm	0 mm
Type of connection			Cable 2 m	Connector M12	Connector M12	DIN Connector	Cable 6 m
Special feature							Ring sensor
							
PNP	DC	NO contact	**6502956076**	**6502988001**	**6502982003**		**6502999036**
		NC contact					
		Antivalent NO/NC					
NPN	DC	NO contact	**6502156058**				
		NC contact					
		Antivalent NO/NC					
PNP/NPN	DC	NO/NC prog.				**6502982001**	
		push-pull operation					
NAMUR	DC						
Analogue	DC						
2-wire	DC	NO contact					
		NC contact					
	AC	NO contact					
		NC contact					
		Changeover contact					
Technical data							
Rated operating voltage		U_B	10-60 VDC	10-36 VDC	10-36 VDC	10-60 VDC	10-30 VDC
Rated operating current		I_B	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 400 mA	≤ 200 mA
Switching frequency (max)		F	200 Hz	100 Hz	50 Hz	100 Hz	-
Short circuit-protection			Cyclic	Cyclic	Cyclic	Cyclic	Cyclic
Function/operating voltage indicator			LED/-	LED/-	LED/-	LED/-	LED/-
Sensing distance, adjustable							
Mechanical data							
Ambient temperature (min/max)			-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529			IP67	IP67	IP67	IP65	IP67
Enclosure material			PBT, black	PA, red/black	PA, red/black	PA, red	PA, black
Connection			3 x 0.5 mm²	M12 x 1	M12 x 1	DIN 43650	3 x 0.5 mm²

Please refer to Accessories for cable couplers, mounting brackets and sensor tester.

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Notes

Capacitive Sensors

Functional principle

Capacitive proximity switches detect conductive and non-conductive materials that can be in a solid or liquid state. They serve the purpose of monitoring product levels in containers, checking contents in filling and packaging systems as well as detecting, positioning, monitoring and counting objects, e.g. in sequence control systems, conveyor belts.

Used for detecting media such as:

- **Solid:**
  Wood, ceramic, glass, paper stacks, plastic, stone, rubber, ice, nonferrous metals, potatoes
- **Liquid:**
  Water, oil, beverages, adhesives, paints
- **Granular:**
  Plastic pellets, granulated products, grain, fodder, wood chip
- **Powder:**
  Dyes, detergents, sand, cement, fertilizer, salt, sugar, flour, coffee

Technical description

The function of the capacitive proximity switch is based on evaluating the influence exerted by an actuator on the electrical field at the active face of the switch. The approach of an influencing object increases the capacitance of the capacitor, which consists of a sensor electrode located behind the active face and the actuator connected to earth/mass.
This increase in capacitance is dependent on the conductance and the dielectric constant of the actuator as well as its mass, surface area and its distance from the sensor electrode. The capacitive limit switch is equipped with an RC oscillator with a gain factor that increases as a result of the rise in capacitance of the previously described capacitor to such an extent that oscillation is induced. In limit switches, the capacitance required to induce oscillation can be determined by the built-in potentiometer intervening in the feedback of the oscillator.

The response sensitivity, i.e. the sensing distance with a given actuator can be ad-justed in this way. The oscillator output signal is fed to an evaluation circuit that actuates the switching amplifier.

In response to the approach of **conductive** material the actuating object and the active face of the sensor form the plates of a capacitor. The change in capacitance and the consequently achievable sensing distance are large.

In response to the approach of **non-conductive** material ε > 1 only the change in the dielectric constant is effective. The increase in capacitance is less than is the case for conductive materials. The resulting sensing distance is small.

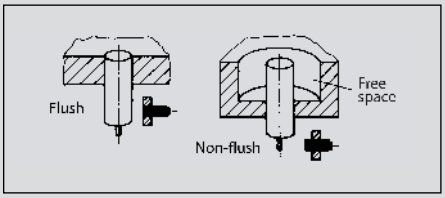
Sensitivity table	
St37 or other metals, earthed	1.00
Surface of water	1.00
St37 150 x 150 x 1 mm, not earthed	0.85
Marble 150 x 150 x 12.5 mm	0.65
Glass 150 x 150 x 7.5 mm	0.55
Stack of paper DIN A 4, 80 g/m^2, 500 sheets	0.55
Fibre board 150 x 150 x 16 mm	0.45
Ceramic tile 150 x 150 x 6 mm	0.25
PVC 150 x 150 x 4 mm	0.15

These values only indicate the expected magnitude of the response sensitivity as the specific properties of the actuating object and of the surroundings in actual applications have a considerable influence on the response distance. It is important to take into account the influence of moisture in order to ensure trouble-free operation. A high water content in the material to be detected, e.g. wood or paper, increases the sensing distance considerably.

In terms of capacitive proximity switches a distinction is made between

- flush mount and
- non-flush mount

limit switches.



In the case of non-flush mount limit switches a clearance that must contain no influencing material must be created about the switch. Due to the adjustment facility available in capacitive proximity switches, the installation of non-flush mount devices is not problematic in connection with reduced clearance. Non-flush mount capacitive proximity switches are characterised by low sensitivity to soiling or condensation.

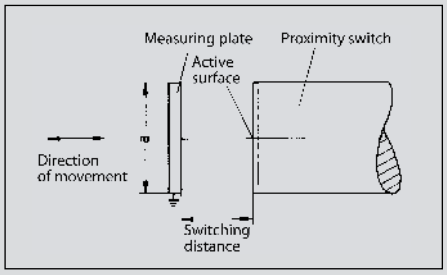
A screening electrode built into flush mount limit switches is connected to circuit ground. As both electrodes of the capacitor are now close together, flush mount capacitive proximity switches are particularly suitable for sensing dielectrics. The disadvantage is that this configuration has an increased sensitivity to condensation or soiling.

Capacitive proximity switches can mutually influence each other if they are mounted next to or opposite each other. In such configurations, the response of flush mount switches is considerably less sensitive than non-flush mount switches. Trials under actual application conditions should be carried out at distances from > 2x to <8x enclosure diameter. Arrangements with distances > 8x enclosure diameter are not problematic.

Active face: The active face of a capacitive proximity switch is the point at which the electrical field emerges. This point is located at the end face on types designed as threaded sleeves or smooth cylinders. Non-cylindrical limit switches are identified by a symbol on the corresponding face.

Influencing: In relation to a capacitive proximity switch the term influencing refers to the change in the switching status in response to the medium to be detected entering the electrical field.

Standard target: The standard target is defined as a square plate, 1 mm thick and made from FE 360.



The side length "a" of the square target corresponds to the diameter of the circle described by the active face. The length of its side is defined as the larger of either the active face diameter or three times the nominal sensing distance. The target must be earthed in order to ensure comparable sensing distances. The sensing distance of rectangular, capacitive proximity switches is determined by means of an earthed target with a size equal to the surface of the active side of the limit switch.

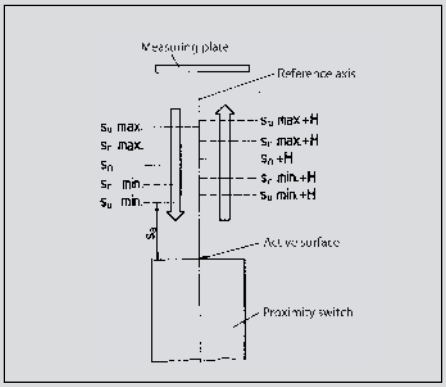
Sensing distance: The sensing distance, that changes the status of the output stage, is the distance of the influencing object in relation to the active face.

Nominal sensing distance (s_n): This is a device-specific characteristic value that does not take into account influences such as tolerance, temperature and changes in voltage.

Real sensing distance (s_r): The real sensing distance is measured at a rated voltage and an ambient temperature of 23 °C +/–5 °C. It must be between 90 % and 110 % of the nominal sensing distance.

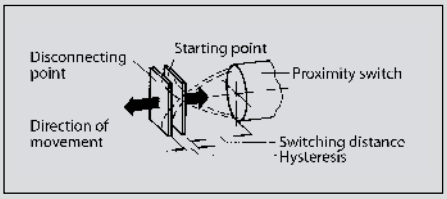
Useable sensing distance (s_u): The useable sensing distance is measured within the permissible temperature and voltage ranges and is 80 % – 120 % of the real sensing distance.

Assured sensing distance (s_a): (operational sensing distance): This is the distance that can be used effectively under the influence of temperature, voltage as well as tolerance variables. It is between 0 % and 72 % of the nominal sensing distance.

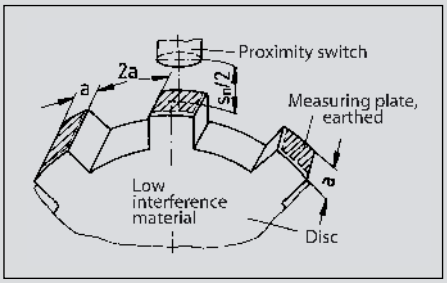


Reproducibility: The reproducibility of the switching distance is the repeat accuracy of the real sensing distance of two successive switching operations within a period of 8 hours at an ambient temperature between 18 °C and 28 °C and a supply voltage that may not deviate by more than 5 % from the rated voltage. The difference between any two measurements must not be more than 10 % of the real sensing distance.

Switching hysteresis: The switching hysteresis refers to the difference between the switch-on point as an object approaches the target and the switch-off point as the object moves away from the proximity switch. The value is specified as a percentage of the real sensing distance.



Switching frequency: The switching frequency is measured in accordance with EN 60947-5-2. The standard targets with the side length "a" are mounted on a plate that exerts minimum influence at "2a" intervals and are moved passed the proximity switch to be tested at half the nominal sensing distance. The maximum switching frequency is reached when the switch-on or switch-off time of the proximity switch is 50 µs. In the case of AC proximity switches, the maximum switching frequency is reached when the switch-on and switch-off time is equal to the half wave period of the supply frequency.



Temperature range: In accordance with DIN, the temperature range is from -25 °C to +70 °C. Reliable operation is ensured within this range.

Protection class

Corresponding to their ID code, the enclosures are dustproof and waterproof in accordance with IP65 or IP67 (DIN 40050).

Connection cable

A PVC-insulated connection cable is supplied as standard. Special versions with silicone sheathing, polyurethane sheathing, irradiation cross-linked PVC or Teflon insulation are also available.

Plug connection

Nowadays the plug connection is just as significant as the fixed cable on electronic proximity switches. The capacitive proximity switches in the BERNSTEIN range can be equipped with a wide variety of plug connections. As standard, this catalogue contains connector versions of virtually all types of limit switch.

Standards

All sensors conform to EN 60947-5-2

CE

Capacitive Sensors

Important information

Capacitive sensors are able to detect conductive and non-conductive materials in solid, liquid, granular or powder form. However, certain criteria must be taken into account in practical applications.

Sensing distance

The nominal sensing distances are specified and set at the factory in accordance with DIN EN 60947-5-2/98. The maximum sensing distance is achieved on approach of **conductive** materials of corresponding size.

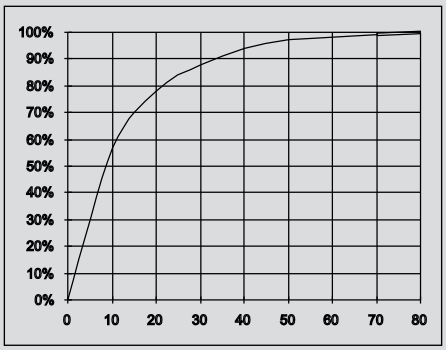
On approach of **non-conductive** materials, the dielectric constant ε of the material to be detected is of decisive significance. Depending on the application, the specified sensing distances vary by a certain factor in relation to the dielectric constant. The values determined according to the table only indicate the expected magnitude of the response sensitivity as the specific properties of the actuating object (diameter, thickness, moisture content etc.) and of the surroundings (earthing) in actual applications have a considerable influence on the response distance. In most cases adaptation to the specific application can be achieved by adjustment with the built-in potentiometer.

Clearance

In the case of non-flush mount capacitive sensors a clearance that must contain no influencing material must be created about the sensor. Non-flush mount capacitive sensors are characterised by low sensitivity to soiling or condensation. On account of their design, flush mount capacitive sensors are particularly suitable for sensing dielectrics. The increased sensitivity, however, may be detrimental in terms of the above mentioned parasitic effects.

If capacitive proximity switches are to be mounted opposite or next to each other, trials under actual application conditions should be carried out at distances between 2x and 8x enclosure diameter. Thanks to the adjustment facility, however, adaptation to specific applications is almost always possible.

Examples of dielectric constants	
Glass	3 ... 14
Rubber	2.5 ... 3
Laminated paper	3.5 ... 6
Wood	2.5 ... 6.8
Marble	8.4 ... 14
Mineral oil	2.15
Epoxy resin	3.3 ... 3.6
Petroleum	2.2
Plexiglass	3.6
Polyamide	3 ... 8
PVC	3.3 ... 4.1
Porcelain	4.2 ... 6.5
Teflon PTFE	2
Air	1
Water	80.8
Paper (dry)	2



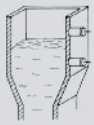
Variance of sensing distance as a function of ε ε

Application descriptions

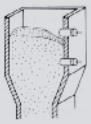
A particular application of capacitive proximity switches is to detect levels in non-metallic containers from the outside. Advantage: There is no need to make a hole in the container wall for the purpose of detecting product level. The medium to be detected does not come in contact with the limit switch. The prerequisite is that the dielectric constant and the mass of the material to be detected are greater than that of the container. The response sensitivity of the proximity switch must be reduced with the built-in potentiometer to such an extent that the limit switch does not respond to the container wall but rather to the medium to be detected.

Above: Insulation glass production lines equipped with BERNSTEIN capacitive sensors

Further fields of application are illustrated below.



Level monitoring in non-metallic containers



Level monitoring of bulk material, e.g. granulated material, fodder

Stack height scanning, e.g. paper, chip board

Fill level monitoring in paint and adhesive containers

Registering, counting, sorting or monitoring in conveyor belt systems

Detecting, positioning in sequence control systems

Detection in woodworking applications

Belt breakage signalling

Level monitoring in packing systems

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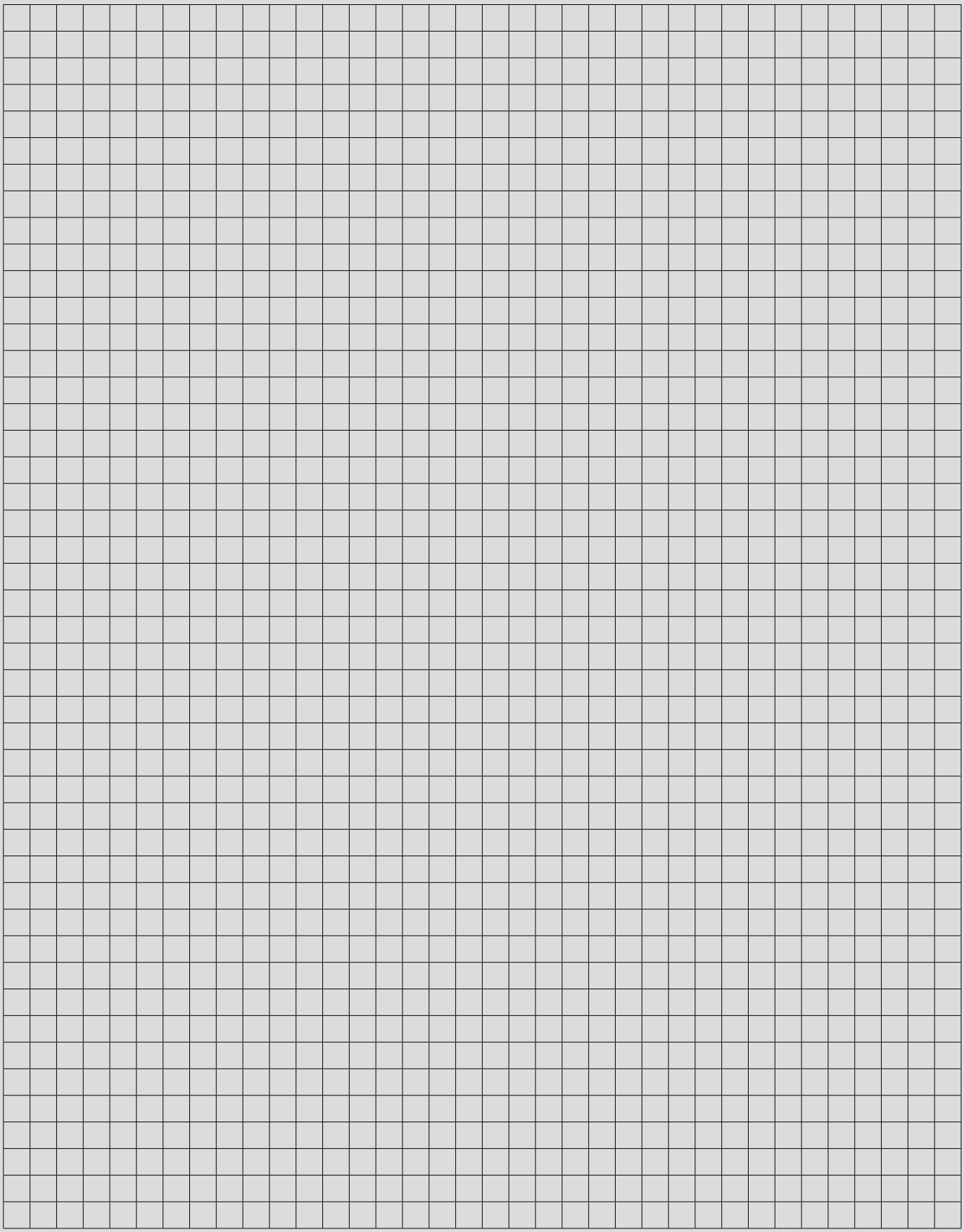
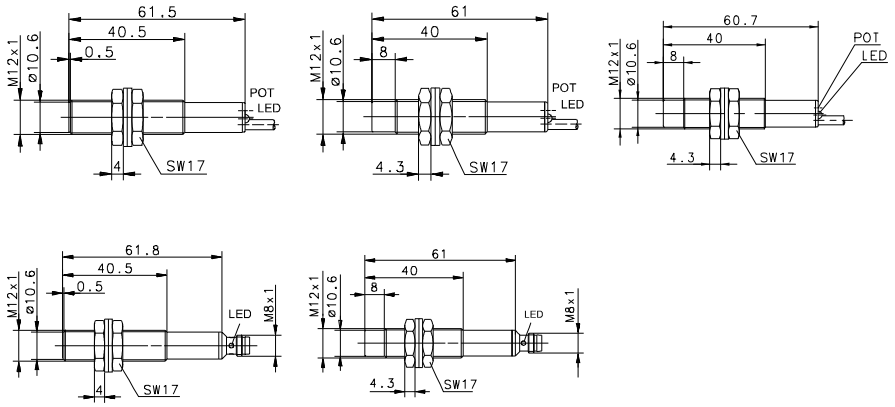


Capacitive Sensors (Type M12, M18)

Type			M12		M12		M12
Type of installation			Flush	Flush	Non-flush	Non-flush	Non-flush
Nominal sensing distance			2 mm	2 mm	4 mm	4 mm	6 mm
Type of connection			Cable 2 m	Connector M8	Cable 2 m	Connector M8	Cable 2 m
Special feature							Sensing dist.



PNP	DC	NO contact	**6507903001**	**6507903004**	**6507919001**	**6507919004**	**6607919110**
		NC contact	**6507703001**				
		Antivalent NO/NC					
NPN	DC	NO contact	**6507303001**		**6507319001**		
		NC contact					
		Antivalent NO/NC					
PNP/NPN	DC	NO/NC prog.					
		push-pull operation					
NAMUR	DC						
Analogue	DC						
2-wire	DC	NO contact					
		NC contact					
	AC	NO contact					
		NC contact					
		Changeover contact					

Technical data

Rated operating voltage	U_B	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC
Rated operating current	I_B	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
Switching frequency (max)	F	25 Hz	25 Hz	25 Hz	25 Hz	25 Hz
Short circuit-protection		Cyclic	Cyclic	Cyclic	Cyclic	Cyclic
Function/operating voltage indicator		LED/-	LED/-	LED/-	LED/-	LED/-
Sensing distance, adjustable		Poti	-	Poti	-	Poti

Mechanical data

Ambient temperature (min/max)	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP65	IP65	IP65	IP65	IP65
Enclosure material	CuZn39Pb3	CuZn39Pb3	PBT, black	PBT, black	PBT, black
Connection	3 x 0.14 mm²	M8 x 1	3 x 0.14 mm²	M8 x 1	3 x 0.14 mm²

Please refer to Accessories for cable couplers, mounting brackets and sensor tester.

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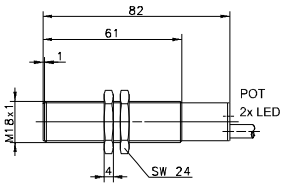
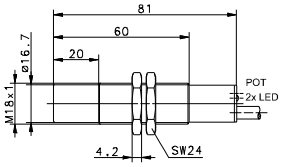
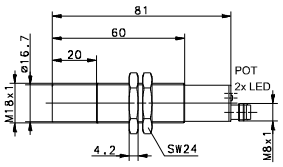
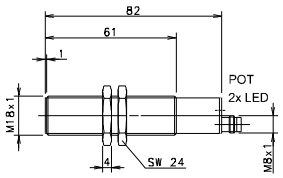
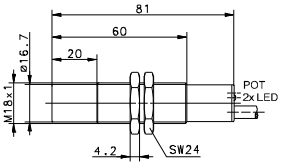
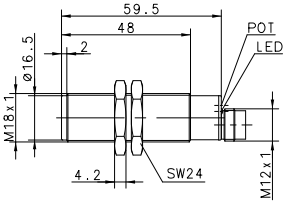
M18		M18		M18			
Flush	Flush	Non-flush	Non-flush	Non-flush	Non-flush		
5.0 mm	5.0 mm	8.0 mm	8.0 mm	8.0 mm	13.5 mm		
Cable 2 m	Connector M8	Cable 2 m	Cable 2 m	Connector M8	Connector M12 Sensing dist.		
							
							
6507905001	**6507905004**	**6507921724** **6507821001**①		**6507921002**	**6507921004**		
6507305001		**6507321723**					
			6508521001 **6508421001**				
10-60 VDC	10-60 VDC	10-60 VDC	20-250 V AC	10-60 VDC	10-60 VDC		
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 300 mA	≤ 200 mA	≤ 200 mA		
25 Hz	25 Hz	25 Hz	15 Hz	25 Hz	25 Hz		
Cyclic	Cyclic	Cyclic	-	Cyclic	Cyclic		
LED/LED	LED/LED	LED/LED	LED/LED	LED/LED	LED/LED		
Poti	Poti	Poti	Poti	Poti	Poti		
-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C		
IP65	IP65	IP65	IP65	IP65	IP65		
CuZn39Pb3	CuZn39Pb3	PBT, black	PBT, black	PBT, black	PBT, black		
3 x 0.5 mm²	M8 x 1	3 x 0.5 mm²	2 x 0.5 mm²	M8 x 1	M12 x 1		

You will find detailed data sheets to the products under www.bernstein.eu

① Length 65 mm

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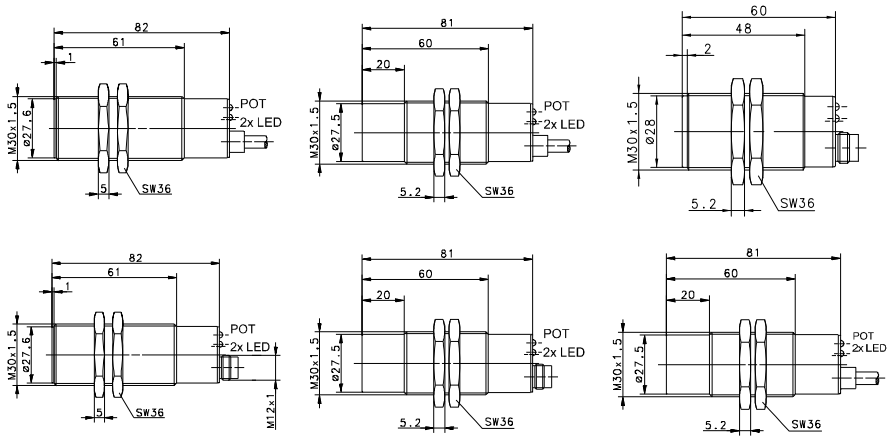
Capacitive Sensors (Type M30, M32)

Type			M30		M30		M30	
Type of installation			Flush	Flush	Non-flush	Non-flush	Non-flush	Non-flush
Nominal sensing distance			10 mm	10 mm	20 mm	20 mm	20 mm	20 mm
Type of connection			Cable 2 m	Connector M12	Cable 2 m	Connector M12	Connector M12	Cable 2 m
Special feature							Short form	



PNP	DC	NO contact	**6507907001**	**6507907004**	**6507923727**	**6507923004**	**6507923006**	
		NC contact						
		Antivalent NO/NC	**6507707001**					
NPN	DC	NO contact			**6507323001**	**6507323004**		
		NC contact						
		Antivalent NO/NC						
PNP/NPN	DC	NO/NC prog.						
		push-pull operation						
NAMUR	DC							
Analogue	DC							
2-wire	DC	NO contact						
		NC contact						
	AC	NO contact						**6508523001**
		NC contact						**6508423001**
		Changeover contact						

Technical data

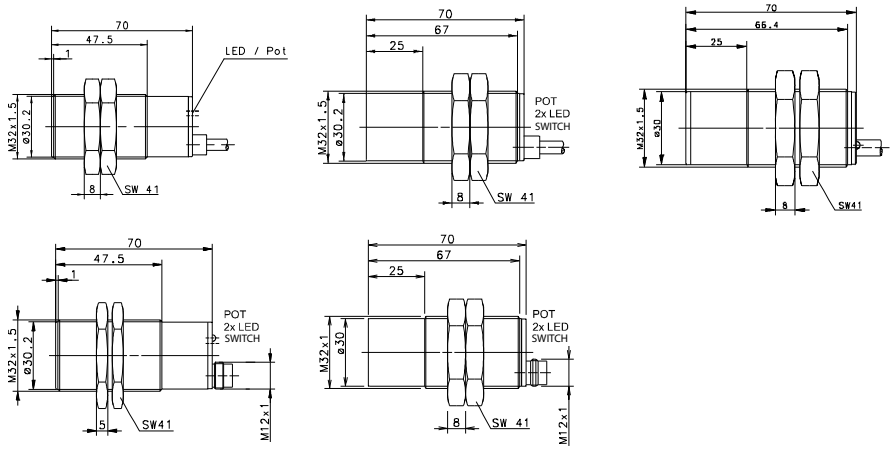
Rated operating voltage	U_B	10-60 VDC	10-60 VDC	10-60 VDC	10-60 VDC	10-60 VDC	20-250 V AC
Rated operating current	I_B	≤ 400 mA	≤ 400 mA	≤ 400 mA	≤ 400 mA	≤ 400 mA	≤ 300 mA
Switching frequency (max)	F	25 Hz	25 Hz	25 Hz	25 Hz	25 Hz	15 Hz
Short circuit-protection		Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	-
Function/operating voltage indicator		LED/LED	LED/LED	LED/LED	LED/LED	LED/LED	LED/LED
Sensing distance, adjustable		Poti	Poti	Poti	Poti	Poti	Poti

Mechanical data

Ambient temperature (min/max)	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP65	IP65	IP65	IP65	IP65	IP65
Enclosure material	CuZn39Pb3	CuZn39Pb3	PBT, black	PBT, black	PBT, black	PBT, black
Connection	3 x 0.5 mm²	M12 x 1	3 x 0.5 mm²	M12 x 1	M12 x 1	2 x 0.5 mm²

Please refer to Accessories for cable couplers, mounting brackets and sensor tester.

M32		M32		M32		
Flush	Flush	Non-flush	Non-flush	Non-flush		
15 mm	15 mm	30 mm	30 mm	30 mm		
Cable 6 m	Connector M12	Cable 2 m	Connector M12	Cable 2 m		
				Timer/Relay		

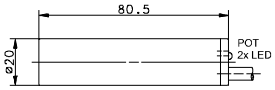


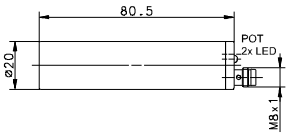
6507013013	**6507013015**	**6507013001**	**6507013004**			
6507013012						
				6508613001		
10-60 VDC	10-60 VDC	10-60 VDC	10-60 VDC	180-250 V AC		
≤ 400 mA	≤ 400 mA	≤ 400 mA	≤ 400 mA	≤ 8 A		
25 Hz	25 Hz	25 Hz	25 Hz	-		
Cyclic	Cyclic	Cyclic	Cyclic	-		
LED/LED	LED/-	LED/-	LED/-	LED/LED		
Poti	Poti	Poti	Poti	Poti		
-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C		
IP65	IP65	IP65	IP65	IP65		
CuZn39Pb3	CuZn39Pb3	PBT, black	PBT, black	PBT, black		
3 x 0.5 mm^2	M12 x 1	3 x 0.5 mm^2	M12 x 1	5 x 0.5 mm^2		

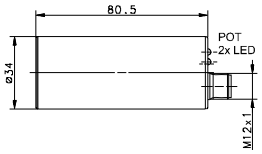
You will find detailed data sheets to the products under www.bernstein.eu

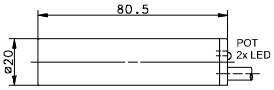
Capacitive Sensors (Type Ø 20 mm, Ø 34 mm, E50, E68)

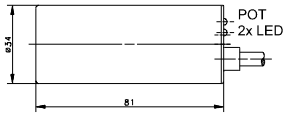
Type			Ø 20 mm		Ø 20 mm	Ø 34 mm	
Type of installation			Non-flush	Non-flush	Non-flush	Flush	Non-flush
Nominal sensing distance			15 mm	15 mm	15 mm	20 mm	30 mm
Type of connection			Cable 2 m	Cable 2 m	Connector M8	Connector M12	Cable 2 m
Special feature							











PNP	DC	NO contact	**6507910001**		**6507910004**	**6507915006**	**6507915001**
		NC contact					
		Antivalent NO/NC					
NPN	DC	NO contact	**6507310002**		**6507310004**		**6507315001**
		NC contact					
		Antivalent NO/NC					
PNP/NPN	DC	NO/NC prog.					
		push-pull operation					
NAMUR	DC						
Analogue	DC						
2-wire	DC	NO contact					
		NC contact					
	AC	NO contact		**6508510001**			
		NC contact		**6508410001**			
		Changeover contact					

Technical data

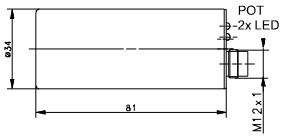
Rated operating voltage	U_B	10-60 VDC	20-250 V AC	10-60 VDC	10-60 VDC	10-60 VDC
Rated operating current	I_B	≤ 400 mA	≤ 300 mA	≤ 400 mA	≤ 200 mA	≤ 400 mA
Switching frequency (max)	F	25 Hz	15 Hz	25 Hz	25 Hz	25 Hz
Short circuit-protection		Cyclic	-	Cyclic	Cyclic	Cyclic
Function/operating voltage indicator		LED/LED	LED/LED	LED/LED	LED/LED	LED/LED
Sensing distance, adjustable		Poti	Poti	Poti	Poti	Poti

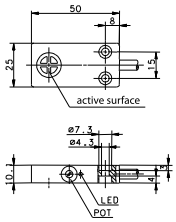
Mechanical data

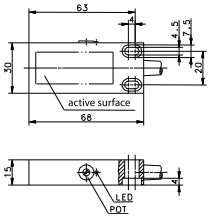
Ambient temperature (min/max)	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP65	IP65	IP65	IP65	IP65
Enclosure material	PBT, red	PBT, red	PBT, red	CuZn39Pb3	PBT, red
Connection	3 x 0.5 mm²	2 x 0.5 mm	M8 x 1	M12 x 1	3 x 0.5 mm²

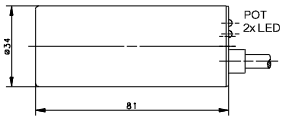
Please refer to Accessories for cable couplers, mounting brackets and sensor tester.

Ø 34 mm		E50	E68		
Non-flush	Non-flush	Flush	Flush		
30 mm	30 mm	8 mm	10 mm		
Connector M12	Cable 2 m	Cable 2 m	Cable 2 m		









6507915004		6507990001	6507956001		
		6507390001	6507356001		
	6508515001 6508415001				
10-60 VDC	20-250 V AC	10-36 VDC	10-36 VDC		
≤ 400 mA	≤ 300 mA	≤ 200 mA	≤ 200 mA		
25 Hz	15 Hz	25 Hz	25 Hz		
Cyclic	-	Cyclic	Cyclic		
LED/LED	LED/LED	LED/-	LED/-		
Poti	Poti	Poti	Poti		
-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C		
IP65	IP65	IP65	IP65		
PBT, red	PBT, red	PBT, black	PBT, black		
M12 x 1	2 x 0.5 mm²	3 x 0.34 mm²	3 x 0.5 mm²		

You will find detailed data sheets to the products under www.bernstein.eu

BERNSTEIN optoelectronic sensors can be divided into three basic types (operating modes):

- Through-beam sensor
- Retro-reflective sensor
- Diffuse-reflection sensor

In accordance with EN 60947-5-2 the sensors are described as "photoelectric proximity switches" and CE-certified.

The use of the sensor systems depends primarily on the specific application and operating environment.

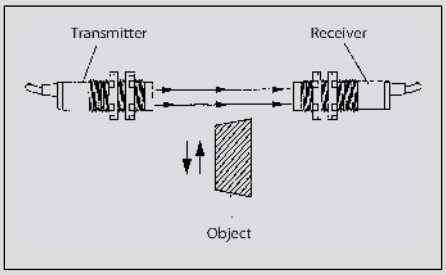
Several applications are outlined on these pages, illustrating the advantages and disadvantages of the individual operating modes.

Dividing all optoelectronic sensors into type groups simplifies device selection. The distinguishing criteria for the type families are the shape and material of the enclosure. The available operating modes of the individual type groups are specified in the Technical Data section of this catalogue.

In general, BERNSTEIN optoelectric sensors operate using pulsating red or infrared light. This technology offers the following advantages:

- High immunity to ambient light
- Maximum sensing range
- Lower heat built-up and therefore longer service life of transmit diodes

Through-beam sensors



Through-beam sensors consist of an light transmitter (light source) and a spatially separated receiver. The light emitted by the transmitter is analysed by the receiver. An interruption in the light path, e.g. by an object, is evaluated and causes the output to switch.

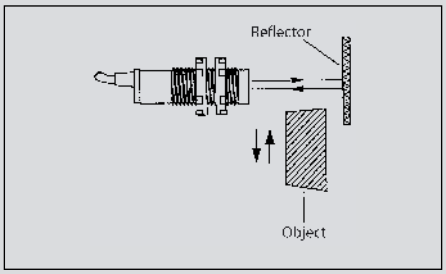
Advantages:

- Long sensing distance; the light beam needs only to travel in one direction from the transmitter to the receiver
- High operational reliability; interference reflections rarely trigger the receiver
- Detection of even the smallest objects by additionally mounting lenses or screens

Disadvantages:

- High installation cost with two devices having to be mounted, wired and adjusted

Retro-reflective sensors



The light transmitter and receiver in retro-reflective sensors are accommodated in one enclosure. The light beam emitted by the transmitter is reflected back to the receiver by a reflector (e.g. triple reflector or reflective film). An interruption in the light paths is evaluated and changes the output signal at the receiver.

The ranges of these types of sensor specified in the Technical Data section in this catalogue relate to an 83 mm diameter triple reflector. Different ranges by using other types or sizes of reflector are available on request.

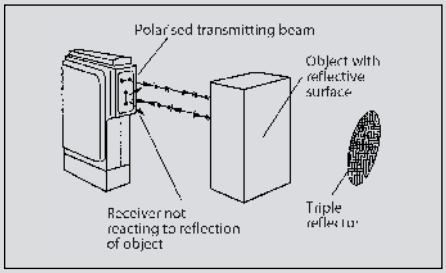
Advantages:

- Easy installation of light barrier and reflector
- The reflector can be used as a moving signal generator, e.g. in conveyor systems

Disadvantages:

- Shorter sensing range than a through-beam system since the light beam has to travel from the transmitter (light source) to the reflector and back to the receiver
- Highly polished objects can act as reflectors and may cause malfunctions

Retro-reflective sensors with polarisation filter



This is a special type of retro-reflective sensor. A special linear or circular polarised filter element (film) is placed between the transmit or receive elements and the glass light emitting face of the sensor.

Advantages:

- Reflections from specular or transparent objects are suppressed

Disadvantages:

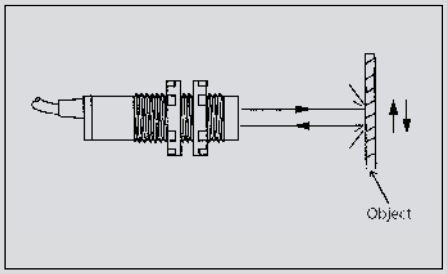
- The sensing range is reduced compared to standard sensors without polarisation filter

Special versions with autocollimation

Advantages:

- Transmit and receive channel use the same light source, i.e. no dead zone with reflectors in short distance range

Diffuse-reflection sensor



The light transmitter and receiver in a diffuse-reflection sensor are accommodated in one common enclosure. The light emitted from the transmitter is reflected diffused from the detected object. A part of this diffused reflection returns to the receiver and changes the switching status at the output when a certain intensity is exceeded. Accordingly, the texture and the colour of the object surface has a considerable influence on the object detection characteristics (presence – absence).

The sensing ranges specified in the Technical Data section of this catalogue are defined in accordance with DIN EN 60947-5-2: Sensing ranges up to 400 mm refer to a 100 x 100 m white Kodak paper test card. 200 x 200 mm test cards are used for sensing ranges ≥ 400 mm.

The reflectivity of the object surface to be sensed affects the sensing distance so that a correction or remission factor has to be specified. This value may vary from less than 10 % for matt-black plastic to 200 % for raw sheet aluminium (special values on request). An application-dependent test of the specific object is usually recommended to take ambient conditions such as dust and humidity into consideration for the selection of the optimum sensor.

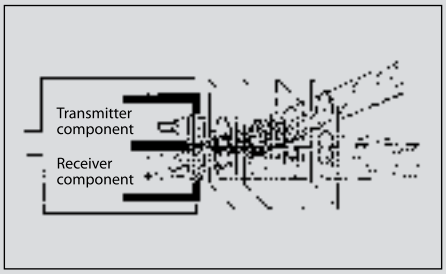
Advantages:

- Easy installation
- No reflector necessary

Disadvantages:

- Different sensing distances and sensitivity settings are required for different objects (surface, colour)

Diffuse-reflection sensor with background suppression



This is a special type of diffuse-reflection sensor. It is based on two receive modules or segmented receivers. Using the triangulation principle, reflections of objects beyond the target do not reach the active face of the receiver modules.

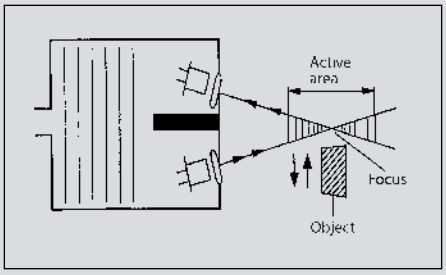
Advantages:

- No background effect on object detection (e.g. a faintly reflecting object may be detected in front of a high-gloss background)

Disadvantages:

- Short sensing distance
- Considerable technical expenditure

Convergent beam sensors, fixed focus



Convergent beam sensors, fixed focus
The transmit and receive modules of convergent beam sensors are arranged at a defined angle to each other. The light cone of the transmitter and receiver are joined at a fixed focal point. This results in the active zone for the detection of objects being defined around this focal point.

Advantages:

- Foreground/background suppression
- Defined active zone

Disadvantages:

- Short sensing distances (due to limited base width of sensor enclosure)

Angular optical system

The M18 series is available with a radial optical system (light outlet offset by 90°) for confined installation conditions. Compared to versions with an axial optical system, the sensing range of these sensors is slightly reduced due to optical displacement loss.

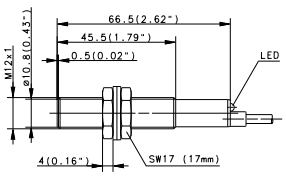
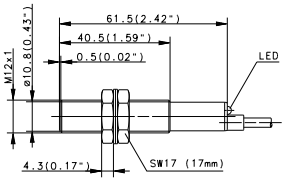
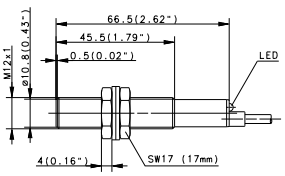
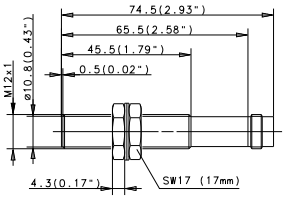
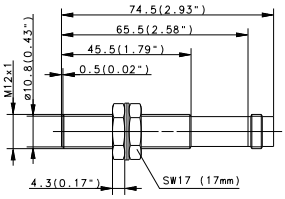
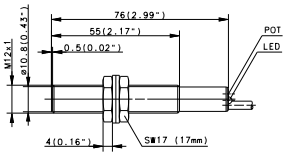
Reflectors

BERNSTEIN triple reflectors that consist of several triple mirrors arranged in a pyramid configuration are best suited for reflecting light in light barrier systems. The pyramid-like structure of these triple mirrors allows the reflector to be pivoted by up to 30° from the optical axis (e.g. caused by vibration or slight movement).

The specified sensing ranges of the retro-reflective sensors refer to the Ø 83 mm reflector (6572107003); the range is reduced accordingly with smaller reflectors.

Essentially, the size of the reflector should be selected according to the sensing range and the size of the object to be detected. The object should ideally be larger than the reflector so that it completely covers the reflector.

Optoelectronic Sensors (Type M12, M18)

Type			M12		M12		M12	
Operating mode			Retro-reflective sensor Type D	Retro-reflective sensor Type D	Retro-reflective sensor Type D	Retro-reflective sensor Type D	Retro-reflective sensor Type D	Retro-reflective sensor Type D
Sensing range			60 mm	60 mm	60 mm	60 mm	200 mm	200 mm
Type of connection			Cable 2 m	Connector M12	Cable 2 m	Connector M12	Cable 2 m	Cable 2 m
Special feature								
								
								
PNP		Light activated	**6557928002**	**6557927001**	**6557930002**	**6557929002**	**6557928004**	**6557928003**
		Dark activated	**6557728001**					
		Programmable						
NPN		Light activated						
		Dark activated						
		Programmable						
Transmitter								
Relay output								
NAMUR								
Analogue		Current output						
		Voltage output						
2-wire	DC							
	AC							
Technical data								
Rated operating voltage	U_B		10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC
Rated operating current	I_B		50 mA	50 mA	50 mA	50 mA	50 mA	50 mA
Switching frequency (max)	F		> 100 Hz	> 100 Hz	> 100 Hz	> 100 Hz	> 250 Hz	> 250 Hz
Short circuit protection			Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic
Function/operating voltage indicator			LED/-	-/-	LED/-	-/-	LED/-	LED/-
Sensitivity adjustable			-	-	-	-	-	Yes
Teachable								
Timer function								
Diagnostic function								
Type of light			IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm
Mechanical data								
Ambient temperature (min/max)			-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C
Protection class in accordance with IEC 529, EN 60529			IP67	IP67	IP67	IP67	IP67	IP65
Enclosure material			CuZn39Pb3	CuZn39Pb3	PA	PA	CuZn39Pb3	CuZn39Pb3
Connection			3 x 0.14 mm²	M12 x 1	3 x 0.14 mm²	M12 x 1	3 x 0.14 mm²	3 x 0.14 mm²

Please refer to Accessories for reflectors, mounting brackets, cable couplers and sensor tester.

HVS
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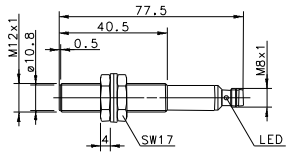
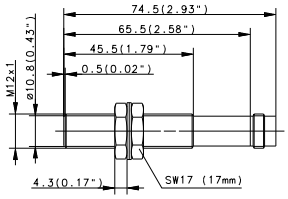
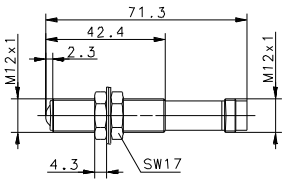
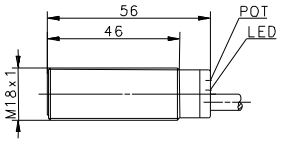
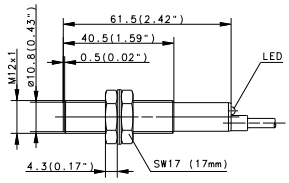
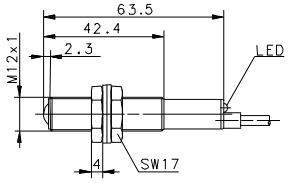
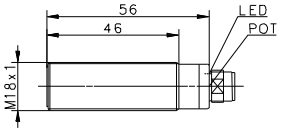
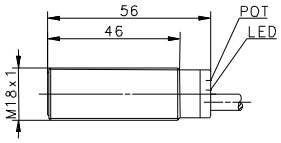
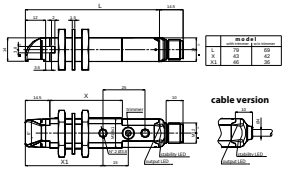
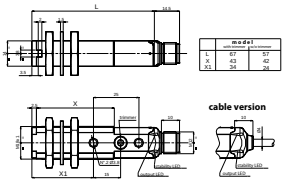
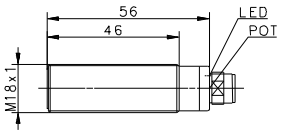
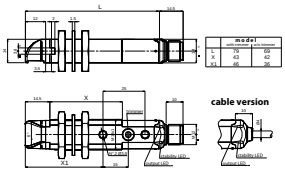
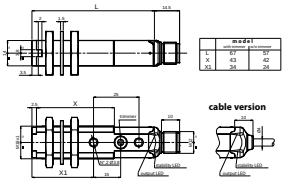
Site web : www.hvssystem.com

M12		M12		M12	M18		
Retro-reflective sensor Type D 200 mm Connector M12	Retro-reflective sensor Type D 200 mm Cable 2 m	Retro-reflective sensor Type D 200 mm Connector M12	Through-beam sensor Type D 6 m Cable 2 m	Through-beam sensor Type D 6 m Connector M12	Retro-reflective sensor Type D 40 mm Cable 2 m	Retro-reflective sensor Type D 40 mm Connector M12	
							
							
6557927004	**6557930001**	**6557929001**	**6551728001**	**6551729001**	**6558817001**	**6558816001**	
			6551028001	**6551029001**			
10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	
50 mA	50 mA	50 mA	50 mA	50 mA	50 mA	50 mA	
> 250 Hz	> 250 Hz	> 250 Hz	> 100 Hz	> 100 Hz	500 Hz	500 Hz	
Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	
LED/-	LED/-	-/-	LED/-	-/-	LED/-	LED/-	
-	-	-	-	-	-	-	
IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	
-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	
IP67	IP67	IP67	IP67	IP67	IP67	IP67	
CuZn39Pb3	PA 12	PA 12	CuZn39Pb3	PA. red	CuZn39Pb3	CuZn39Pb3	
M12 x 1	3 x 0.14 mm^2	M12 x 1	3 x 0.14 mm^2	M12 x 1	4 x 0.34 mm^2	M12 x 1	

You will find detailed data sheets to the products under www.bernstein.eu

Optoelectronic Sensors (Type M18)

Type			M18		M18		M18	
Operating mode			Retro-reflective sensor Type D	Retro-reflective sensor Type D	Retro-reflective sensor Type D	Retro-reflective sensor Type D	Retro-reflective sensor Type D	Retro-reflective sensor Type D
Sensing range			40 mm	40 mm	80 mm	80 mm	100 mm	100 mm
Type of connection			Cable 2 m	Connector M12	Cable 2 m	Connector M12	Cable 2 m	Connector M12
Special feature					Angle optic	Angle optic		
								
								
PNP		Light activated Dark activated Programmable	**6558819001**	**6558818002**	**6557819010**	**6557818010**	**6557819008**	**6557818008**
NPN		Light activated Dark activated Programmable						
Transmitter								
Relay output								
NAMUR								
Analogue		Current output Voltage output						
2-wire	DC AC							
Technical data								
Rated operating voltage	U_B		10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC
Rated operating current	I_B		50 mA	50 mA	200 mA	200 mA	200 mA	200 mA
Switching frequency (max)	F		500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz
Short circuit protection			Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic
Function/operating voltage indicator			LED/-	LED/-	LED/-	LED/-	LED/-	LED/-
Sensitivity adjustable			-	-	-	-	-	-
Teachable								
Timer function								
Diagnostic function								
Type of light			IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm
Mechanical data								
Ambient temperature (min/max)			-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C
Protection class in accordance with IEC 529, EN 60529			IP67	IP67	IP67	IP67	IP67	IP67
Enclosure material			PBT	PBT	PBT	PBT	PBT	PBT
Connection			4 x 0.34 mm²	M12 x 1	4 x 0.34 mm²	M12 x 1	4 x 0.34 mm²	M12 x 1

Please refer to Accessories for reflectors, mounting brackets, cable couplers and sensor tester.

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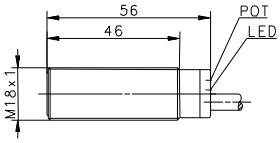
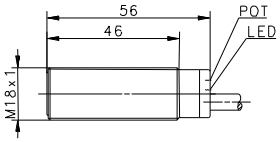
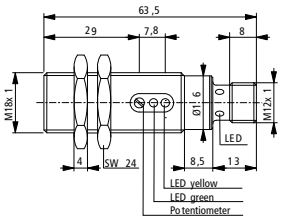
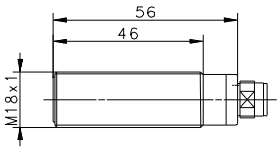
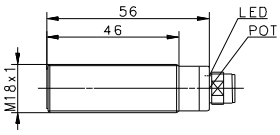
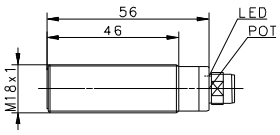
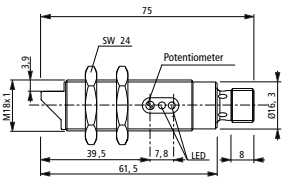
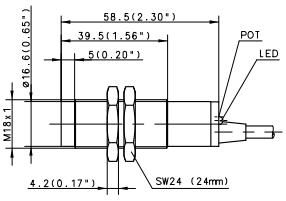
Site web : www.hvssystem.com

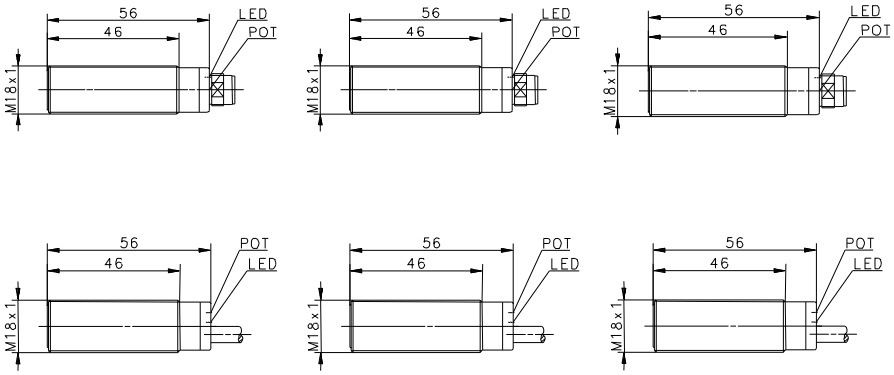
M18		M18		M18		M18		
Retro-reflective sensor Type D 100 mm Cable 2 m	Retro-reflective sensor Type D 100 mm Connector M12	Retro-reflective sensor Type D 100 mm Cable 2 m	Retro-reflective sensor Type D 100 mm Connector M12	Retro-reflective sensor Type D 120 mm Connector M12 ①	Retro-reflective sensor Type D 120 mm Connector M12 ①	Retro-reflective sensor Type D 200 mm Connector M12	Retro-reflective sensor Type D 200 mm Cable 2 m	
				
				
6557817002	**6557816001**	**6557819004**	**6557818002**	**6558916001**	**6558916002**	**6557016002**	**6557819001**	
6557219004	**6557216001**						**6557219002**	
10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-30 VDC	10-36 VDC	
200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	
500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	> 250 Hz	
Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	
LED/-	LED/-	LED/-	LED/-	LED/LED	LED/LED	LED/-	LED/-	
-	-	-	-	Yes	Yes	Yes	Yes	
IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	
-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+55°C	-20°C/+55°C	-5°C/+70°C	-20°C/+80°C	
IP67	IP67	IP67	IP67	IP67	IP67	IP67	IP65	
CuZn39Pb3	CuZn39Pb3	PBT	PBT, black	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	PA, red	
4 x 0.34 mm²	M12 x 1	4 x 0.34 mm²	M12 x 1	M12 x 1	M12 x 1	M12 x 1	4 x 0.25 mm²	

You will find detailed data sheets to the products under www.bernstein.eu

① Background suppression

Optoelectronic Sensors (Type M18)

Type			M18		M18		M18	
Operating mode			Retro-reflective sensor Type D	Retro-reflective sensor Type D	Retro-reflective sensor Type D	Retro-reflective sensor Type D	Retro-reflective sensor Type D	Retro-reflective sensor Type D
Sensing range			300 mm	300 mm	300 mm	300 mm	300 mm	500 mm
Type of connection			Connector M12	Cable 2 m	Connector M12	Cable 2 m	Connector M12	Cable 2 m
Special feature								



PNP		Light activated Dark activated Programmable	**6557821002**	**6557817003**	**6557816002**	**6557819005**	**6557818003**	
NPN		Light activated Dark activated Programmable			**6557216003**	**6557219005**	**6557218005**	**6557222003**
Transmitter								
Relay output								
NAMUR								
Analogue		Current output Voltage output						
2-wire	DC AC							

Technical data

Rated operating voltage	U_B	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC
Rated operating current	I_B	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA
Switching frequency (max)	F	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz
Short circuit protection		Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic
Function/operating voltage indicator		LED/-	LED/-	LED/-	LED/-	LED/-	LED/-
Sensitivity adjustable		Yes	Yes	Yes	Yes	Yes	Yes
Teachable							
Timer function							
Diagnostic function							
Type of light		IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm

Mechanical data

Ambient temperature (min/max)	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67	IP67	IP67
Enclosure material	Stainl. st. 1.4305	CuZn39Pb3	CuZn39Pb3	PBT	PBT	Stainl. st. 1.4305
Connection	M12 x 1	4 x 0.34 mm²	M12 x 1	4 x 0.34 mm²	M12 x 1	4 x 0.34 mm²

Please refer to Accessories for reflectors, mounting brackets, cable couplers and sensor tester.

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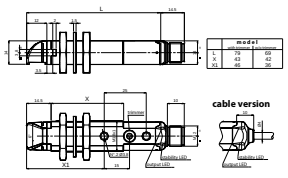
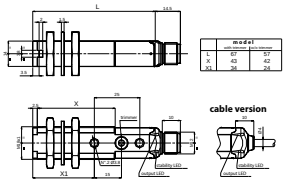
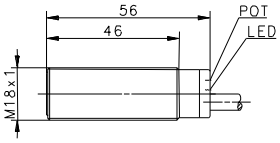
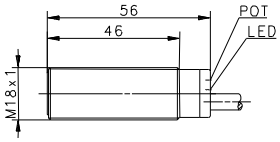
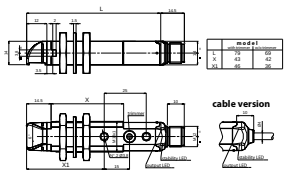
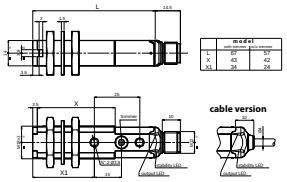
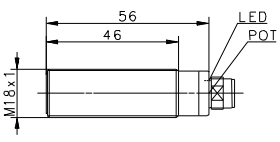
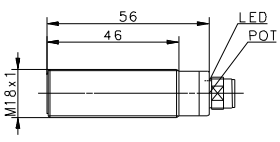
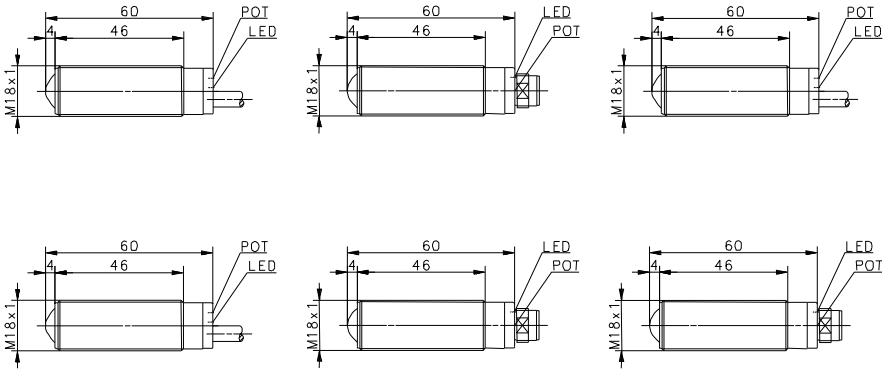
M18		M18		M18		M18		
Retro-reflective sensor Type D 300 mm Cable 2 m Angle optic	Retro-reflective sensor Type D 300 mm Connector M12 Angle optic	Retro-reflective sensor Type D 400 mm Cable 2 m	Retro-reflective sensor Type D 400 mm Connector M12	Retro-reflective sensor Type D 500 mm Cable 2 m	Retro-reflective sensor Type D 500 mm Connector M12	Retro-reflective sensor Type D 500 mm Cable 2 m	Retro-reflective sensor Type D 500 mm Connector M12	
								
								
6557819009	**6557818009**	**6557819007**	**6557818007**	**6557817004**	**6557816006**	**6557819006**	**6557818006**	
				6557217003	**6557216004**	**6557219006**	**6557218006**	
10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	
200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	
500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	
Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	
LED/-	LED/-	LED/-	LED/-	LED/-	LED/-	LED/-	LED/-	
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	
-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	
IP67	IP67	IP67	IP67	IP67	IP67	IP67	IP67	
PBT	PBT	PBT	PBT	CuZn39Pb3	CuZn39Pb3	PBT	PBT	
4 x 0.34 mm²	M12 x 1	4 x 0.34 mm²	M12 x 1	4 x 0.34 mm²	M12 x 1	4 x 0.34 mm²	M12 x 1	

You will find detailed data sheets to the products under www.bernstein.eu

Optoelectronic Sensors (Type M18)

Type			M18		M18		M18	
Operating mode			Retro-reflective sensor Type R	Retro-reflective sensor Type R	Retro-reflective sensor Type R	Retro-reflective sensor Type R	Retro-reflective sensor Type R	Retro-reflective sensor Type R
Sensing range			800 mm	800 mm	800 mm	2.5 m	2.5 m	2.5 m
Type of connection			Cable 2 m	Cable 2 m	Connector M12	Connector M12	Cable 2 m	Connector M12
Special feature			Glass lens	Glass lens	Glass lens	Glass lens	Glass lens	Glass lens



PNP		Light activated Dark activated Programmable	**6555817002**	**6555819004**	**6555818002**	**6555821001**	**6555817001**	**6555816001**
NPN		Light activated Dark activated Programmable			**6555218002**			**6555216001**
Transmitter								
Relay output								
NAMUR								
Analogue		Current output Voltage output						
2-wire	DC AC							

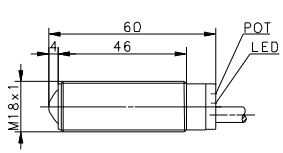
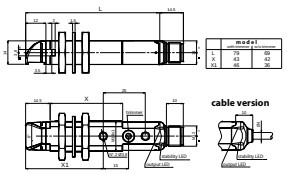
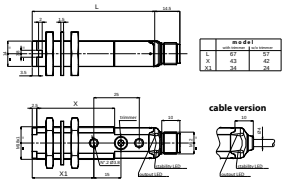
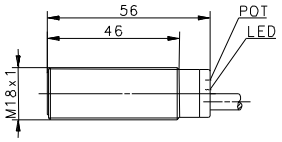
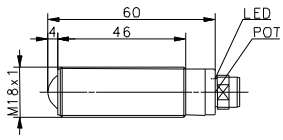
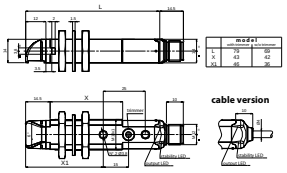
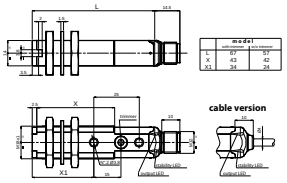
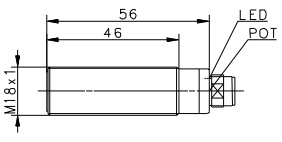
Technical data

Rated operating voltage	U_B	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC
Rated operating current	I_B	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA
Switching frequency (max)	F	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz
Short circuit protection		Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic
Function/operating voltage indicator		LED/-	LED/-	LED/-	LED/-	LED/-	LED/-
Sensitivity adjustable		Yes	Yes	Yes	Yes	Yes	Yes
Teachable							
Timer function							
Diagnostic function							
Type of light		red 660 nm	red 660 nm	red 660 nm	red 660 nm	red 660 nm	red 660 nm

Mechanical data

Ambient temperature (min/max)		-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C
Protection class in accordance with IEC 529, EN 60529		IP67	IP67	IP67	IP67	IP67	IP67
Enclosure material		CuZn39Pb3	PBT, black	PBT, black	Stainless steel 1.4305	CuZn39Pb3	CuZn39Pb3
Connection		4 x 0.34 mm²	4 x 0.34 mm²	M12 x 1	M12 x 1	4 x 0.34 mm²	M12 x 1

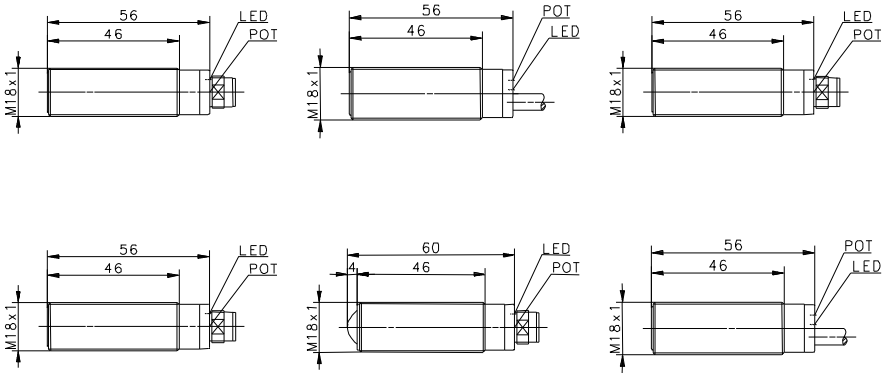
Please refer to Accessories for reflectors, mounting brackets, cable couplers and sensor tester.

M18		M18		M18		M18		
Retro-reflective sensor Type R 2.5 m Cable 2 m Glass lens	Retro-reflective sensor Type R 2.5 m Connector M12 Glass lens	Retro-reflective sensor Type R 2.5 m Cable 2 m Angle optic	Retro-reflective sensor Type R 2.5 m Connector M12 Angle optic	Retro-reflective sensor Type R 3 m Cable 2 m	Retro-reflective sensor Type R 3 m Connector M12	Retro-reflective sensor Type R 3 m Cable 2 m	Retro-reflective sensor Type R 3 m Connector M12	
								
								
6555819003	**6555818001**	**6555819006**	**6555818004**	**6555819005**	**6555818003**	**6554819003**	**6554818001**	
6555219001						**6554219002**	**6554218001**	
10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	
200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	
500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	
Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	
LED/-	LED/-	LED/-	LED/-	LED/-	LED/-	LED/-	LED/-	
Yes	Yes	Yes	Yes	Yes	Yes	-	-	
red 660 nm	red 660 nm	red 660 nm	red 660 nm	red 660 nm	red 660 nm	IR 880 nm	IR 880 nm	
-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	
IP67	IP67	IP67	IP67	IP67	IP67	IP67	IP67	
PBT, black	PBT, black	PBT	PBT	PBT	PBT	PBT, black	PBT, black	
4 x 0.34 mm²	M12 x 1	4 x 0.34 mm²	M12 x 1	4 x 0.34 mm²	M12 x 1	4 x 0.34 mm²	M12 x 1	

You will find detailed data sheets to the products under www.bernstein.eu

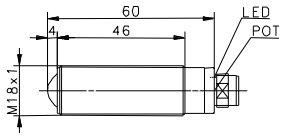
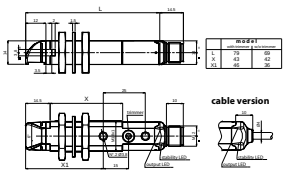
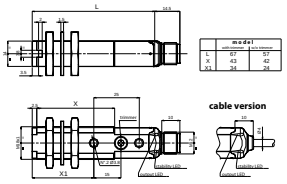
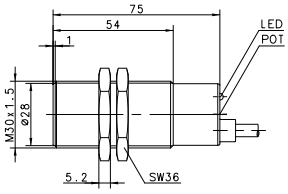
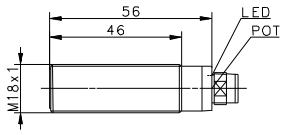
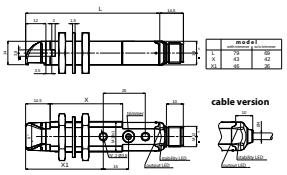
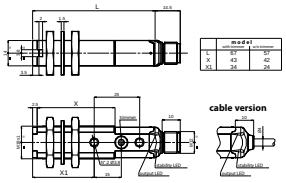
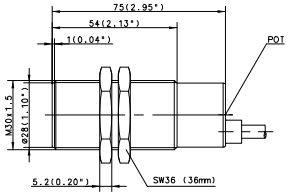
Optoelectronic Sensors (Type M18, M30)

Type			M18		M18		M18	
Operating mode			Retro-reflective sensor Type R	Through-beam sensor Type D	Through-beam sensor Type D	Through-beam sensor Type D	Through-beam sensor Type D	Through-beam sensor Type D
Sensing range			3 m	8 m	8 m	8 m	8 m	8 m
Type of connection			Connector M12	Connector M12	Cable 2 m	Connector M12	Connector M12	Cable 2 m
Special feature								



PNP		Light activated Dark activated Programmable	**6554816001**	**6551821001**	**6551817001**	**6551816101**	**6551816001**	**6551819001**
NPN		Light activated Dark activated Programmable						
Transmitter				**6551021001**				**6551019001**
Relay output								
NAMUR								
Analogue		Current output Voltage output						
2-wire	DC AC							
Technical data								
Rated operating voltage	U_B		10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC
Rated operating current	I_B		200 mA	200 mA	200 mA	200 mA	200 mA	200 mA
Switching frequency (max)	F		500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz
Short circuit protection			Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic
Function/operating voltage indicator			LED/-	LED/-	LED/-	LED/-	LED/-	LED/-
Sensitivity adjustable			-	-	-	-	-	-
Teachable								
Timer function								
Diagnostic function								
Type of light			IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm
Mechanical data								
Ambient temperature (min/max)			-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C
Protection class in accordance with IEC 529, EN 60529			IP67	IP67	IP67	IP67	IP67	IP67
Enclosure material			CuZn39Pb3	Stainless steel 1.4305	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	PBT, black
Connection			M12 x 1	M12 x 1	4 x 0.34 mm²	M12 x 1	M12 x 1	4 x 0.34 mm²

Please refer to Accessories for reflectors, mounting brackets, cable couplers and sensor tester.

M18		M18		M18		M30		
Through-beam sensor Type D 8 m Connector M12	Through-beam sensor Type D 8 m Connector M12	Through-beam sensor Type D 15 m Cable 2 m Angle optic	Through-beam sensor Type D 15 m Connector M12 Angle optic	Through-beam sensor Type D 18 m Cable 2 m	Through-beam sensor Type D 18 m Connector M12	Retro-reflective sensor Type D 200 mm Cable 6 m	Retro-reflective sensor Type D 500 mm Cable 2 m	
								
								
6551818101	**6551818001**	**6551819004**	**6551818003**	**6551819003**	**6551818002**	**6557905008**	**6557005006**	
6551018001		**6551019004**	**6551018003**	**6551019003**	**6551018002**			
10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-30 VDC	
200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	-	
500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	> 250 Hz	-	
Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Yes	Yes	
LED/-	LED/-	LED/-	LED/-	LED/-	LED/-	LED/-	-/-	
-	-	-	-	-	-	Yes	Yes	
IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	
-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+80°C	-20°C/+80°C	
IP67	IP67	IP67	IP67	IP67	IP67	IP65	IP65	
PBT, black	PBT, black	PBT	PBT	PBT	PBT	PA	PA	
M12 x 1	M12 x 1	4 x 0.34 mm^2	M12 x 1	4 x 0.34 mm^2	M12 x 1	3 x 0.5 mm^2	3 x 0.5 mm^2	

You will find detailed data sheets to the products under www.bernstein.eu

Optoelectronic Sensors (Type 12 x 12 mm, 30 x 30 mm)

Type			12x12x55mm		12x12x55mm		12x12x55mm
Operating mode			Through-beam sensor Type D	Through-beam sensor Type D	Through-beam sensor Type D	Through-beam sensor Type D	Through-beam sensor Type D
Sensing range			1 m	1 m	6 m	6 m	10 m
Type of connection			Connector M8	Connector M8	Connector M8	Connector M8	Connector M8
Special feature			Core beam				
PNP		Light activated	**6551955002**		**6551955001**		**6551955005**
		Dark activated	**6551755002**	**6551755004**	**6551755001**	**6551755003**	
		Programmable					
NPN		Light activated			**6551355001**		
		Dark activated			**6551155001**		
		Programmable					
Transmitter			**6551055003**		**6551055002**		
Relay output							
NAMUR							
Analogue		Current output					
		Voltage output					
2-wire	DC						
	AC						

Technical data

Rated operating voltage	U_B	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC
Rated operating current	I_B	200 mA	200 mA	200 mA	200 mA	200 mA
Switching frequency (max)	F	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
Short circuit protection		Cyclic	Cyclic	Cyclic	Cyclic	Cyclic
Function/operating voltage indicator		LED/-	LED/-	LED/-	LED/-	LED/-
Sensitivity adjustable		-	Yes	-	Yes	-
Teachable						
Timer function						
Diagnostic function		Yes		Yes		
Type of light		IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm

Mechanical data

Ambient temperature (min/max)	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP65	IP65	IP65	IP65	IP65
Enclosure material	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Connection	M8 x 1	M8 x 1	M8 x 1	M8 x 1	M8 x 1

Please refer to Accessories for reflectors, mounting brackets, cable couplers and sensor tester.

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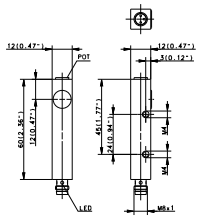
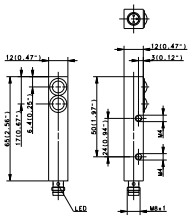
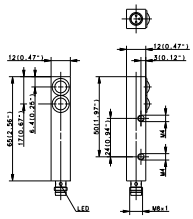
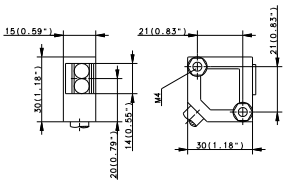
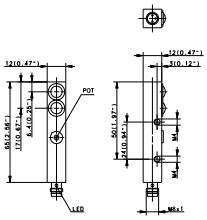
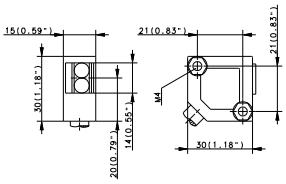
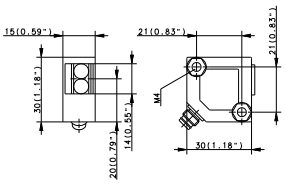
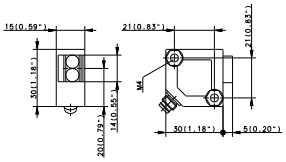
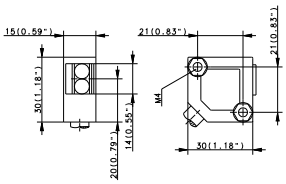
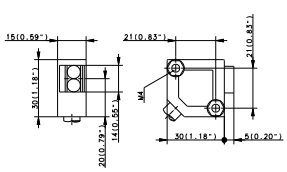
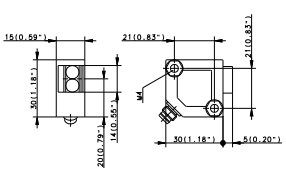
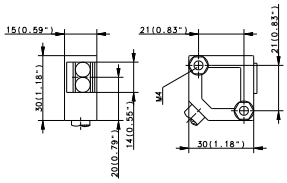
12x12x60mm	12x12x65mm		12x12x65mm	30x30x15mm		
Retro-reflective sensor Type D 200 mm Connector M8	Retro-reflective sensor Type D 50 mm Connector M8 Fixed focus/...	Retro-reflective sensor Type D 1.2 m Connector M8	Retro-reflective sensor Type R 4 m Connector M8	Retro-reflective sensor Type D 1.2 m Cable 3 m	Retro-reflective sensor Type D 1.2 m Cable 3 m Antivalent ②	
						
						
6557955001 6557755001	**6558955001**	**6557955002 6557755002**	**6554955001 6554755001**	**6557975004**	**6557875003** ②	
10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	
200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	
100 Hz	100 Hz	100 Hz	100 Hz	< 1000 Hz	< 1 kHz	
Cyclic	Cyclic	Cyclic	Cyclic	Yes	Yes	
LED/-	LED/-	LED/-	LED/-	LED/LED	LED/LED	
Yes	-	Yes	-	Yes	Yes	
IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	
-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-25°C/+70°C	-25°C/+70°C	
IP65	IP65	IP65	IP65	IP67	IP67	
CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	PBTB	PBTB	
M8 x 1	M8 x 1	M8 x 1	M8 x 1	4 x 0.14 mm^2	4 x 0.14 mm^2	

You will find detailed data sheets to the products under www.bernstein.eu

② Antivalent output

Optoelectronic Sensors (Type 30 x 30 mm, 40 x 26 mm, 50 x 50 mm)

Type			30x30x15mm		30x30x15mm		30x30x15mm	
Operating mode			Retro-reflective sensor Type D	Retro-reflective sensor Type R	Retro-reflective sensor Type R	Retro-reflective sensor Type R	Through-beam sensor Type D	Through-beam sensor Type D
Sensing range			1.2 m	4 m	4 m	4 m	12 m	12 m
Type of connection			Connec. M8/Ø 8	Cable 2 m	Cable 3 m	Connec. M8/Ø 8	Cable 3 m	Connec. M8/Ø 8
Special feature				polarised	polarised	polarised		
								
								
PNP		Light activated	**6557975003**	**6555975002**		**6555975001**		
		Dark activated						
		Programmable			**6555875001** ②		**6551875003** ②	**6551875004** ②
NPN		Light activated						
		Dark activated						
		Programmable						
Transmitter							**6551075003**	**6551075004**
Relay output								
NAMUR								
Analogue		Current output						
		Voltage output						
2-wire	DC							
	AC							
Technical data								
Rated operating voltage		U_B	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC	10-36 VDC
Rated operating current		I_B	200 mA	200 mA	200 mA	200 mA	-	200 mA
Switching frequency (max)		F	< 1000 Hz	< 1 kHz	< 1 kHz	< 1 kHz	-	> 1000 Hz
Short circuit protection			Yes	Yes	Yes	Yes	-	Yes
Function/operating voltage indicator			LED/LED	LED/LED	LED/LED	LED/LED	LED/LED	LED/LED
Sensitivity adjustable			Yes	Yes	Yes	Yes	Yes	Yes
Teachable								
Timer function								
Diagnostic function								
Type of light			IR 880 nm	red 660 nm	red 660 nm	red 660 nm	IR 880 nm	IR 880 nm
Mechanical data								
Ambient temperature (min/max)			-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC 529, EN 60529			IP67	IP67	IP67	IP67	IP67	IP67
Enclosure material			PBTB	PBTB	PBTB	PBTB	PBTB	PBTB
Connection			4-pin	4 x 0.14 mm²	4 x 0.14 mm²	4-pin	4 x 0.14 mm²	4-pin

Please refer to Accessories for reflectors, mounting brackets, cable couplers and sensor tester.

② Antivalent output

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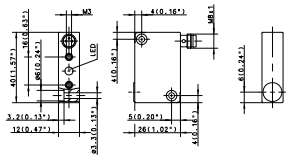
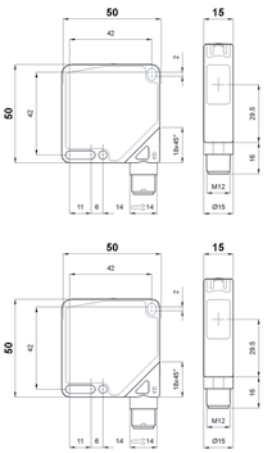
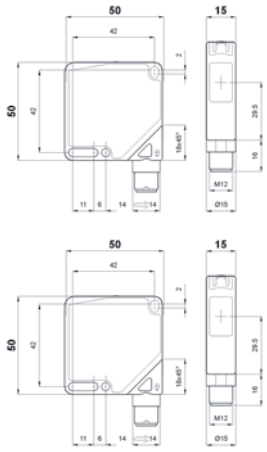
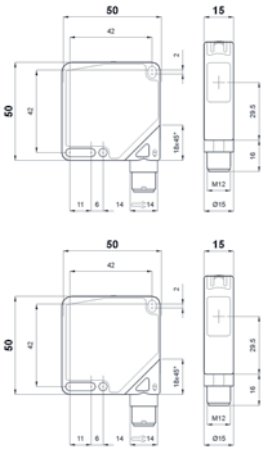
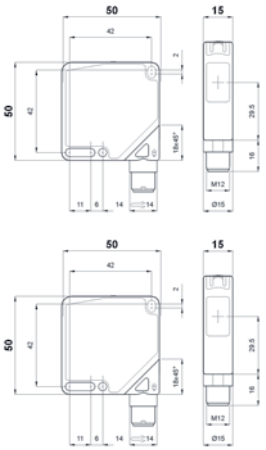
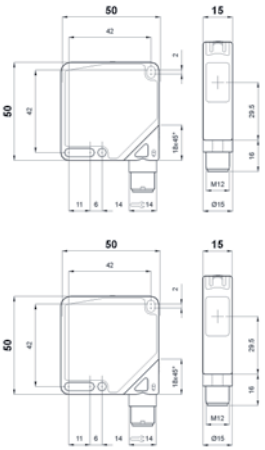
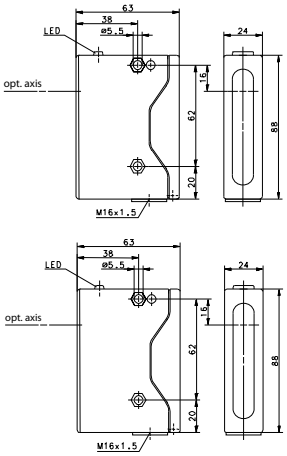
40x26x12mm	50x50x15mm		50x50x15mm		50x50x15mm		
Retro-reflective sensor Type D 40 mm Connector M8	Retro-reflective sensor Type D 200 mm Cable 2 m ①	Retro-reflective sensor Type D 200 mm Connector M12 ①	Retro-reflective sensor Type D 1 m Cable 2 m Antivalent	Retro-reflective sensor Type D 1 m Connector M12 Antivalent ②	Retro-reflective sensor Type D 2 m Cable 2 m Antivalent ②	Retro-reflective sensor Type D 2 m Connector M12 Antivalent ②	
							
6557950006	**6558866001**	**6558865001**	**6557866001** ②	**6557865001** ②	**6557866002**	**6557865002**	
10-36 VDC	10-30 VDC	10-30 VDC	10-30 VDC	10-30 VDC	10-30 VDC	10-30 VDC	
200 mA	50 mA	50 mA	35 mA	35 mA	35 mA	35 mA	
> 100 Hz	1 kHz	1 kHz	500 Hz	500 Hz	500 Hz	500 Hz	
Cyclic	Yes	Yes	Yes	Yes	Yes	Yes	
LED/-	LED/LED	LED/LED	LED/LED	LED/LED	LED/LED	LED/LED	
-	Yes	Yes	Yes	Yes	Yes	Yes	
IR 880 nm	red 670 nm	red 670 nm	red 660 nm	red 660 nm	IR 880 nm	IR 880 nm	
-5°C/+70°C	-20°C/+70°C	-20°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	
IP65	IP67	IP67	IP67	IP67	IP67	IP67	
PA	ABS	ABS	ABS	ABS	ABS	ABS	
M8 x 1	Ø 4 mm	M12 x 1	Ø 4 mm	M12 x 1	Ø 4 mm	M12 x 1	

You will find detailed data sheets to the products under www.bernstein.eu

① Background suppression
② Antivalent output

Optoelectronic Sensors (Type 50 x 50 mm, 88 x 63 mm)

Type			50x50x15mm		50x50x15mm		88x63x24mm	
Operating mode			Retro-reflective sensor Type R	Retro-reflective sensor Type R	Through-beam sensor Type D	Through-beam sensor Type D	Retro-reflective sensor Type D	Retro-reflective sensor Type D
Sensing range			8 m	8 m	20 m	20 m	400 mm	600 mm
Type of connection			Cable 2 m	Connector M12	Cable 2 m	Connector M12	Connect. space	Connect. space
Special feature			polarised	polarised	Antivalent ②	Antivalent ②	①	
								
PNP		Light activated Dark activated Programmable	**6555866001** ②	**6555865001** ②	**6551866001** ②	**6551865001** ②		**6557886001**
NPN		Light activated Dark activated Programmable						
Transmitter					**6551066001**	**6551065001**		
Relay output							**6558686002**	
NAMUR								
Analogue		Current output Voltage output						
2-wire	DC AC							
Technical data								
Rated operating voltage	U_B		10-30 VDC	10-30 VDC	10-30 VDC	10-30 VDC	12-265V AC/DC	10-36 VDC
Rated operating current	I_B		35 mA	35 mA	35	35 mA	3 A	200 mA
Switching frequency (max)	F		1 kHz	1 kHz	500 Hz	500 Hz	> 50 Hz	> 100 Hz
Short circuit protection			Yes	Yes	Yes	Yes	SCPD external	Cyclic
Function/operating voltage indicator			LED/LED	LED/LED	LED/LED	LED/LED	LED/-	LED/-
Sensitivity adjustable			Yes	Yes	Yes	Yes	Yes	Yes
Teachable								
Timer function							Yes	Yes
Diagnostic function								
Type of light			red 660 nm	red 660 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm
Mechanical data								
Ambient temperature (min/max)			-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-20°C/+70°C	-20°C/+70°C
Protection class in accordance with IEC 529, EN 60529			IP67	IP67	IP67	IP67	IP65	IP65
Enclosure material			ABS	ABS	ABS	ABS	PA	PA
Connection			Ø 4 mm	M12 x 1	Ø 4 mm	M12 x 1	Connect. space	Connect. space

Please refer to Accessories for reflectors, mounting brackets, cable couplers and sensor tester.

① Background suppression
② Antivalent output

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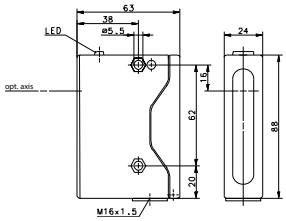
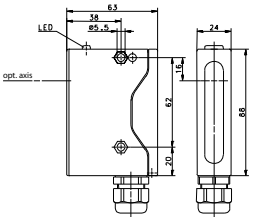
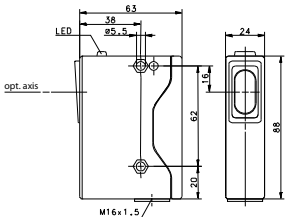
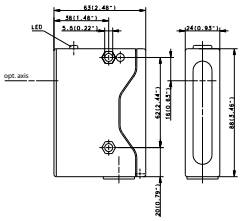
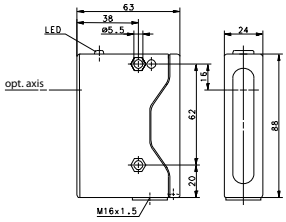
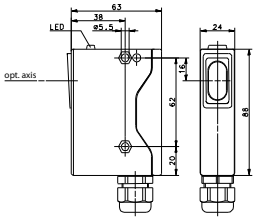
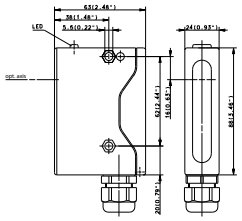
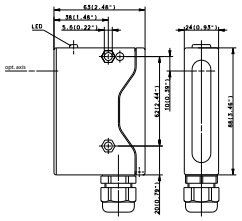
88x63x24mm		88x63x24mm	88x63x24mm		88x63x24mm	
Retro-reflective sensor Type D 600 mm Connect. space	Retro-reflective sensor Type D 1.5 m Connect. space	Retro-reflective sensor Type D 1.5 m Connect. space	Retro-reflective sensor Type R 6 m Connect. space polarised	Retro-reflective sensor Type R 6 m Connect. space polarised	Retro-reflective sensor Type R 8 m Connect. space	
						
						
6557886003			**6555886001**		**6554886001**	
6557686001		**6557686004**		**6555686002**		
12-265V AC/DC	10-36 VDC	12-265V AC/DC	10-36 VDC	12-265V AC/DC	10-36 VDC	
3 A	200 mA	3 A	200 mA	3 A	200 mA	
> 50 Hz	> 100 Hz	> 50 Hz	> 100 Hz	> 50 Hz	> 100 Hz	
SCPD external	Cyclic	SCPD external S	Cyclic	SCPD external	Cyclic	
LED/-	LED/-	LED/-	LED/-	LED/-	LED/-	
Yes	Yes	Yes	Yes	Yes	Yes	
Yes	Yes	Yes				
IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm	
-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	
IP65	IP65	IP65	IP65	IP65	IP65	
PA, red	PA	PA, red	PA, red	PA, red	PA, red	
Connect. space	Connect. space	Connect. space	Connect. space	Connect. space	Connect. space	

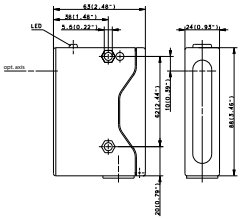
You will find detailed data sheets to the products under www.bernstein.eu

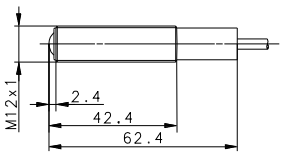
Optoelectronic Sensors (Type 88 x 63 mm, M12, Ø 20 mm)

Type			88x63x24mm	88x63x24mm		M12
Operating mode			Retro-reflective sensor Type R	Through-beam sensor Type D	Through-beam sensor Type D	Luminance sensor
Sensing range			8 m	20 m	20 m	
Type of connection			Connect. space	Connect. space	Connect. space	Cable 2 m
Special feature						Treshold 5 Lux









PNP		Light activated Dark activated Programmable		**6551886003**		**6550930001**
NPN		Light activated Dark activated Programmable				
Transmitter				**6551086003**	**6551086002**	
Relay output			**6554686002**		**6551686004**	
NAMUR						
Analogue		Current output Voltage output				
2-wire	DC AC					

Technical data

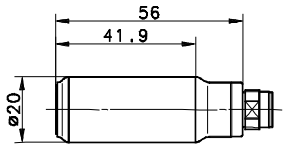
Rated operating voltage	U_B	12-265V AC/DC	10-36 VDC	12-265V AC/DC	12-39 VDC
Rated operating current	I_B	3 A	200 mA	-	-
Switching frequency (max)	F	> 50 Hz	> 100 Hz	-	1 Hz
Short circuit protection		SCPD external	Cyclic	SCPD external	-
Function/operating voltage indicator		LED/-	LED/-	-/LED	-/-
Sensitivity adjustable		Yes	Yes	-	-
Teachable					
Timer function		Yes	Yes	Yes	
Diagnostic function					
Type of light		IR 880 nm	IR 880 nm	IR 880 nm	IR 880 nm

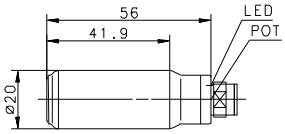
Mechanical data

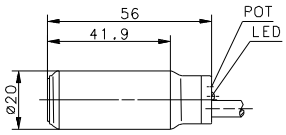
Ambient temperature (min/max)	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C	-20°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP65	IP65	IP65	IP67
Enclosure material	PA, red	PA, red	PA, red	PA, red
Connection	Connect. space	Connect. space	Connect. space	3 x 0.34 mm²

Please refer to Accessories for reflectors, mounting brackets, cable couplers and sensor tester.

Ø 20 mm		**Ø 20 mm**			
Retro-reflective sensor Type D 200 mm Connector M12	Retro-reflective sensor Type D 500 mm Cable 2 m	Retro-reflective sensor Type D 500 mm Connector M12			







	6557800005	**6557800006**			
6557000002 **6557000001**					
10-30 VDC	10-36 VDC	10-36 VDC			
200 mA	200 mA	200 mA			
-	500 Hz	500 Hz			
-	Cyclic	Cyclic			
-/-	LED/-	LED/-			
Yes	Yes	Yes			
IR 880 nm	IR 880 nm	IR 880 nm			
-5°C/+70°C	-20°C/+70°C	-20°C/+70°C			
IP67	IP67	IP67			
Stainless steel 1.4305	Stainless steel 1.4305	Stainless steel 1.4305			
M12 x 1	4 x 0.34 mm^2	M12 x 1			

You will find detailed data sheets to the products under www.bernstein.eu

General Information on BERNSTEIN Magnetic Switches

Electromechanical and electronic variants

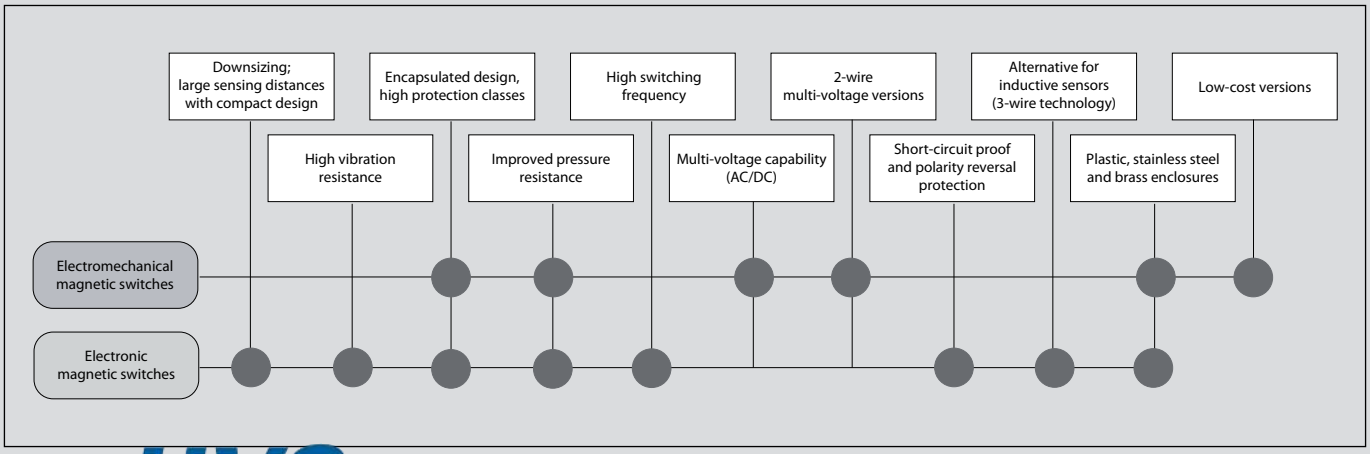
BERNSTEIN has extended its range of electromechanical magnetic switches with electronic versions which operate according to the Hall and magneto-resistive principle.

Electromechanical and electronic magnetic switches have special properties which ensure optimum use in their respective environments.

The electronic versions are characterised by their enhanced mechanical properties (extremely high resistance to vibration, shock or impact) and are not prone to wear in operation. Thanks to the use of only one single "active" component (reed contact), "traditional" electromechanical magnetic switches are extremely reliable in operation. The universal current capability and low procurement costs allow these switches to be used in a wide range of applications.
The matrix below highlights the main features of each functional principle and helps you to decide on which magnetic switch to use for your application.

Technical features and applications

More detailed information on the technical features and applications relating to the different functional principles are provided in the following sections.



Electromechanical Magnetic Switches

Special features of electro-mechanical magnetic switches

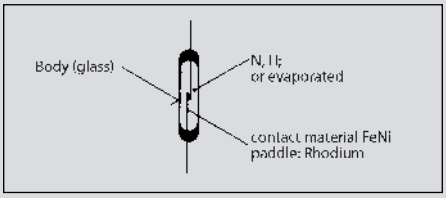
- Reliable under extreme ambient conditions such as dirt, humidity, gas, dust, etc.
- Protection class up to IP67
- Stable switching point, reproducible switching point accuracy of approx. 0.1 mm
- Can be operated from several directions
- Can be mounted in any position
- High operational reliability ensured by the use of only one single component
- Easy to install
- Long electrical service life (depending on the load to be switched) more than 108 switching cycles if contacts are suitably protected
- Special versions available for extreme temperatures from -40 °C to +150 °C
- Can be connected to direct and alternating voltage sources

Design, function and operating principle of an electromechanical magnetic switch

The basic elements of this type of switch are the components which change their electrical characteristics in response to the approach of an actuating magnet. The contact paddles assume opposing polarity (north and south pole) under the influence of a magnetic field.

The approach can be made by either permanent magnets or electromagnets; the sensitivity of the switch and the field strength of the magnet determine the distance between the switch and magnet. Opening and closing of the contact studs is determined by the magnet correspondingly approaching or moving away from the switch. Normally-closed, normally-open and changeover contacts as well as bistable versions are included in our range of products.

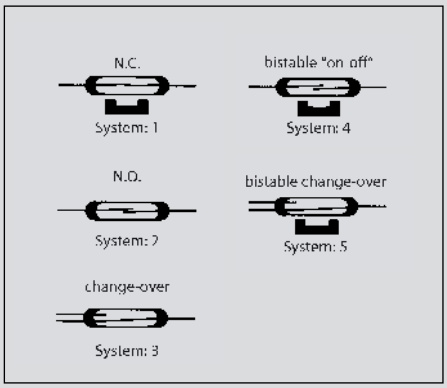
The magnetically influenced parts and their auxiliary components (resistor, diode, triac, output stage, etc.) are cast in high quality insulating material or casting compound to increase the vibration/impact strength and guarantee a protection class up to IP67. Metal versions (stainless steel, aluminium and brass) as well as standard plastic versions are available for use under extreme ambient conditions such as wider temperature ranges.



Design of a reed contact

Biasing (bistable)

Bias magnets energise or hold the contact closed. The contact of the bistable normally-open or normally-closed contact is held closed until a stronger magnet with opposite polarity neutralises the biasing.



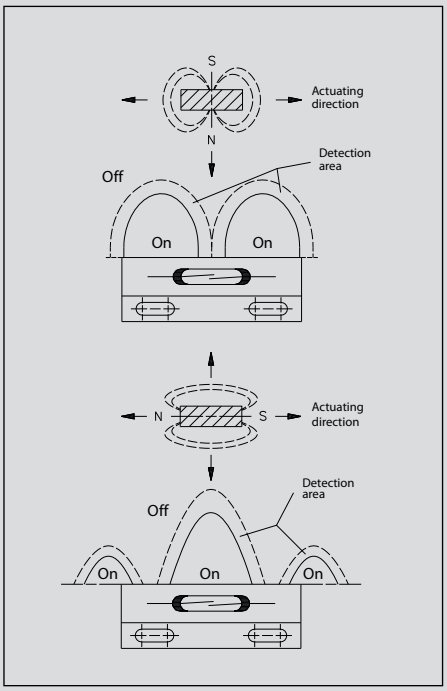
Types of reed contact switches

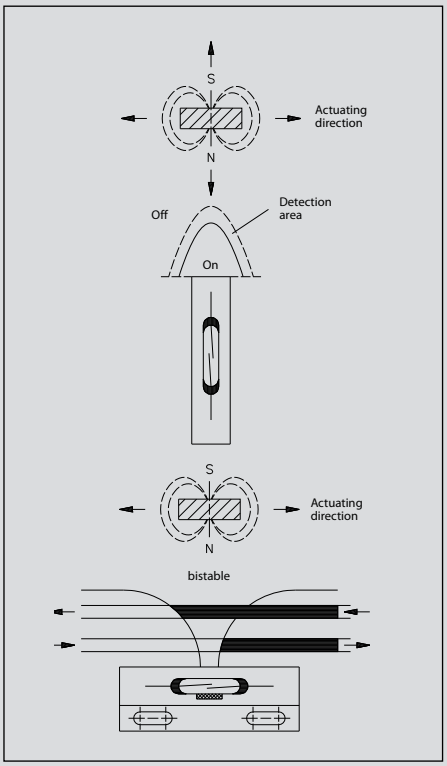
Actuation and switching characteristics

The switching characteristics are principally determined by the approach and polarity of the magnet. The following drawings show typical characteristics. Materials and external dimensions are specified in the product overview. Magnetic switches with reed contact output are identified by an "A" in the second position of the type code (MA...).

Switching frequency

Up to 200 Hz, depending on the size of load to be switched (considerably faster than relays, contactors etc.).





Switching distances

Refer to the tables in this catalogue to identify which switching magnets may be used as well as the minimum achievable switching distance.

Temperature ranges

The standard version may be used in a temperature range from -5 °C to +70 °C. Special types are also available offering an extended operating temperature range from -40 °C to +150 °C.

Electrical service life

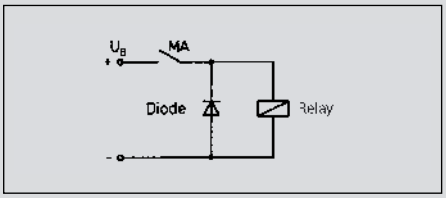
To maintain a long service life of the electrical contacts, it is important to ensure the maximum supply voltage and maximum switching current are not exceeded. Refer to the diagrams on Page 69 for the load values.

Guidelines for reed contact protection

The values for current, voltage and power specified in the catalogue apply only to purely resistive loads. Very often, however, these loads are exposed to inductive or capacitive components. In these cases it is advisable to protect the reed contacts against voltage and current peaks. Whilst it is not possible to recommend a safe contact protection concept that applies to all load ranges (each individual case will require its own evaluation), we would like to present general guidelines on how reed contacts may be connected to different loads in order to avoid premature failure.

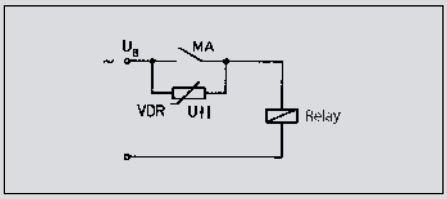
1. Inductive loads

In DC applications, contact protection is relatively easy to realise with the aid of a free-wheeling diode connected in parallel to the load. The diode polarity must be selected so that it blocks when normal operating voltage is applied but will short-circuit the voltage induced after the switch is opened (voltage peaks can significantly exceed the operating voltage).



Suppression of voltage peaks with a free-wheeling diode

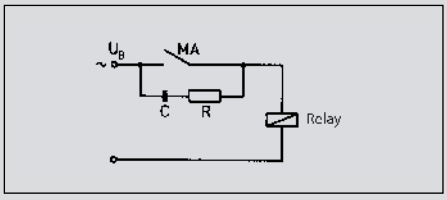
1) Voltage peaks induced by switching off inductive loads are suppressed by connecting a voltage-dependent resistor (VDR) in parallel to the reed contact.



Suppression of voltage peaks with a VDR

2) In AC voltage applications effective protection is achieved with a combination of a resistor and a capacitor (RC element).

Generally, the RC element is connected in parallel to the contact and therefore in series to the load (vice versa is also possible).



Suppression of voltage peaks with RC element

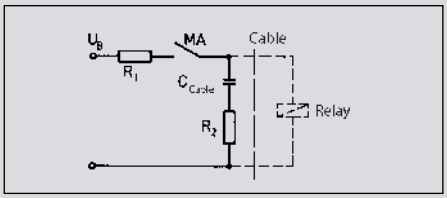
2. Capacitive loads

In contrast to inductive loads, increase making currents can occur in connection with capacitive loads and lamp loads that can damage and even weld contacts closed. When capacitors are switched (e.g. cable capacitance) a very high peak current occurs with its intensity depending on the capacitance and length of the cable leading to the switch.

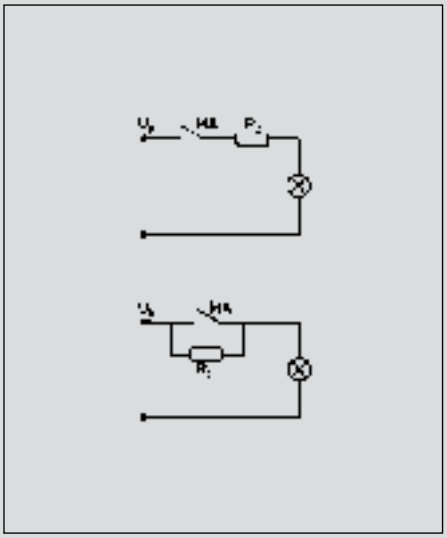
A resistor connected in series to the contact will reduce this current. The size of the resistor is determined by the characteristics of the corresponding electric circuit.

It should, however, be as large as possible to reduce the current to a permissible value, thus ensuring reliable contact protection.

Contact protection with resistors for limiting current:



Capacitive load



Lamp load

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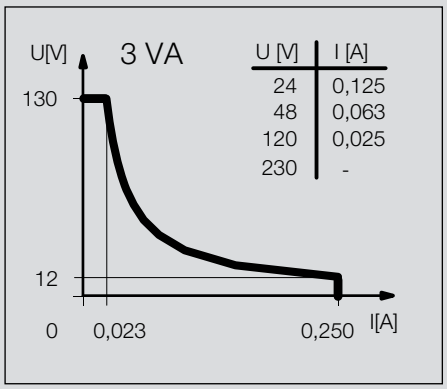
Site web : www.hvssystem.com

Performance diagrams for electromechanical magnetic switches



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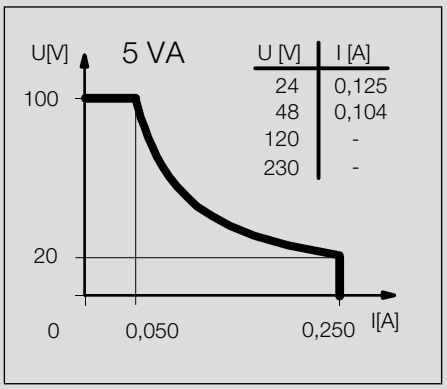

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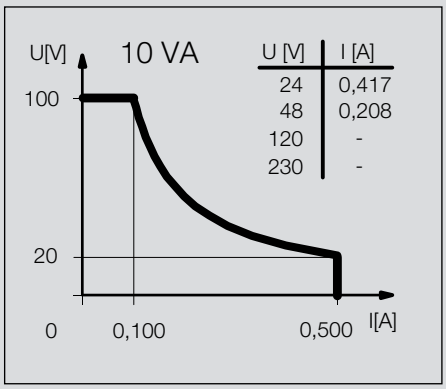

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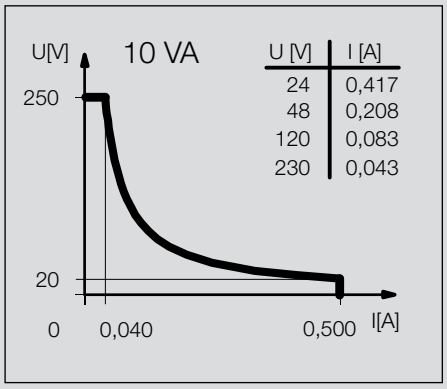

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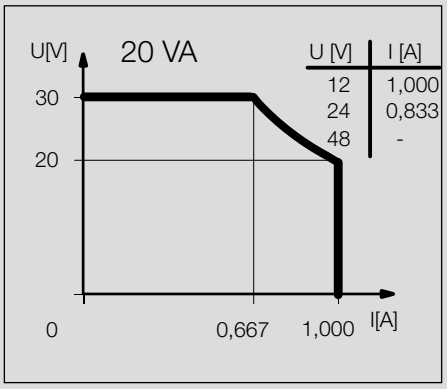

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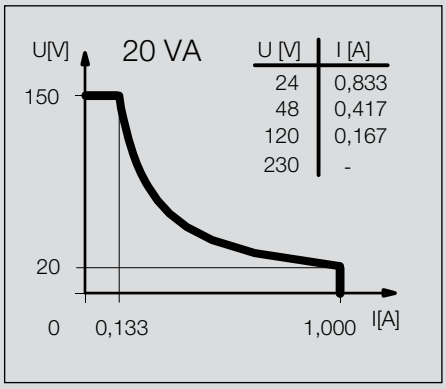

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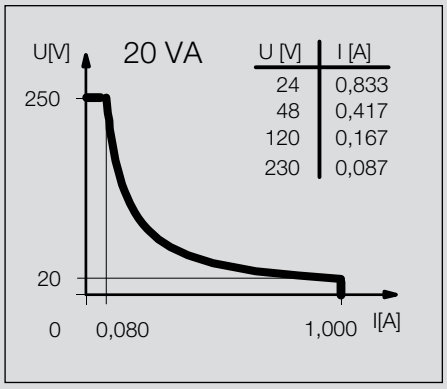

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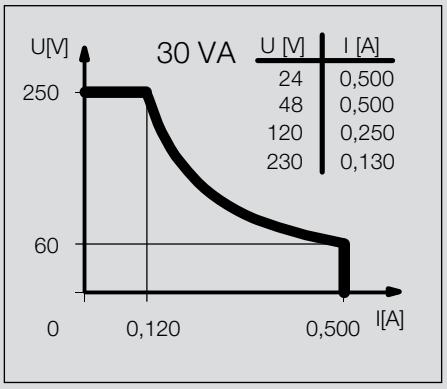

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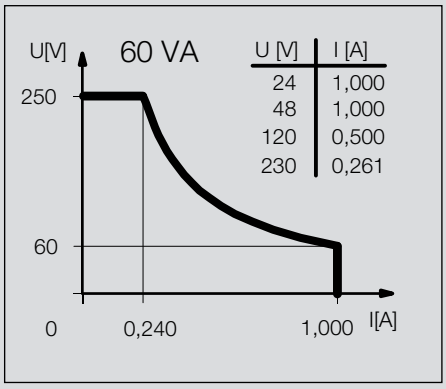

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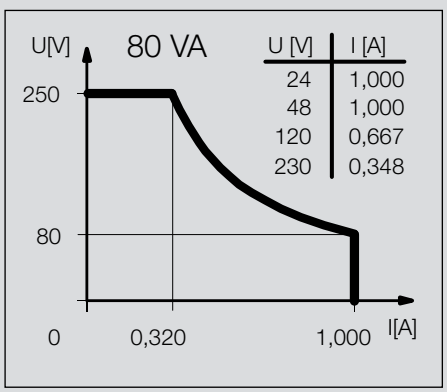

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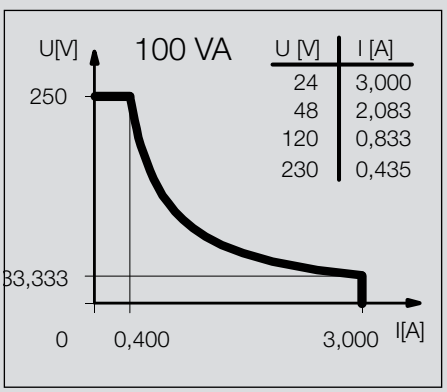

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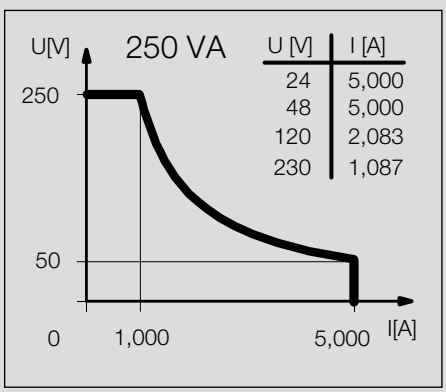

(12)

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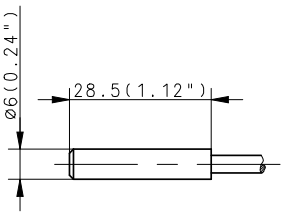
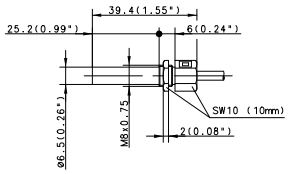
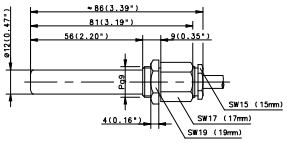
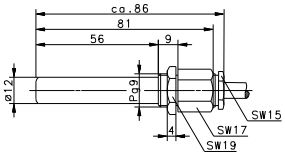
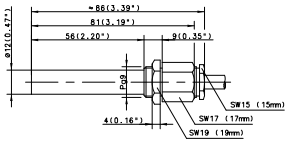
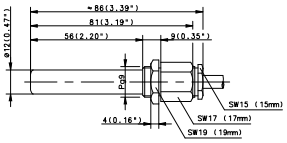
Magnetic Switches (Type Ø 6 mm, Ø 6.5 mm, Ø 12 mm, Ø 13 mm)

Type		Ø 6 mm		Ø 6.5 mm		Ø 12 mm	
Nominal switching distance (San)		19 mm	19 mm	18 mm		6 mm	7 mm
Type of connection		Cable 1 m	Cable 1 m	Cable 2 m		Cable 1 m	Cable 1 m
Reference magnet (Page)		T-62 N/S	T-62 N/S	T-62 N/S		T-62 N/S	T-62 N/S
Special feature							
							
Switching function	NO contact		**6311230571**	**6310246500**			**6314206246**
	NC contact						
	Changeover contact	**6310330572**				**6317306315**	
	Bistable						
Technical data							
Max. switching voltage		100 VDC	250 VDC	250 VDC		250 VDC	250 VDC
Switching current (max)		0.25 A	0.5 A	0.5 A		1 A	3 A
Performance class (diagram No.)		5 VA	10 VA	20 VA		80 VA	100 VA
Shock resistance			50 g (11 ms)				
Mechanical data							
Ambient temperature (min/max)		-5°C/+70°C	-5°C/+70°C	-5°C/+70°C		-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC529, EN60529		IP67	IP67	IP67		IP67	IP67
Enclosure material		PA	PA	PA		Aluminium	Al/CuZn39Pb3
Connection		3 x 0.14 mm²	2 x 0.14 mm	2 x 0.14 mm²		4 x 0.75 mm²	3 x 0.75 mm²

Please refer to Accessories for magnets, mounting brackets, cable couplers and sensor tester.

Type		Ø 12 mm		Ø 12 mm		Ø 12 mm	
Nominal switching distance (San)		7 mm	7 mm	7 mm	7 mm	8 mm	12 mm
Type of connection		Cable 1 m	Cable 3 m	Cable 8 m	Cable 2 m	Cable 1 m	Cable 1 m
Reference magnet (Page)		T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S
Special feature				Temperature			
							
Switching function	NO contact	**6312206321**	**6314216476**	**6314216585**	**6314226423**		
	NC contact						
	Changeover contact					**6315306314**	**6316316259**
	Bistable						
Technical data							
Max. switching voltage		250 VDC	250 VDC	250 VDC	250 VDC	250 VDC	250 VDC
Switching current (max)		0.5 A	3 A	3 A	3 A	0.5 A	1 A
Performance class (diagram No.)		30 VA	100 VA	100 VA	100 VA	30 VA	60 VA
Shock resistance		50 g (11 ms)					
Mechanical data							
Ambient temperature (min/max)		-5°C/+70°C	-5°C/+70°C	-40°C/+150°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC529, EN60529		IP67	IP67	IP67	IP67	IP67	IP67
Enclosure material		Aluminium	Stainless steel 1.4305	Stainless steel 1.4305	PA, red	Al/CuZn39Pb3	Stainless steel 1.4305
Connection		3 x 0.75 mm²	3 x 0.75 mm²	3 x 0.75 mm²	2 x 0.5 mm²	4 x 0.75 mm²	4 x 0.75 mm²

Please refer to Accessories for magnets, mounting brackets, cable couplers and sensor tester.

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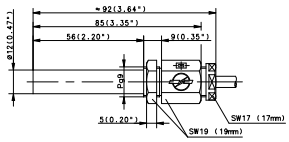
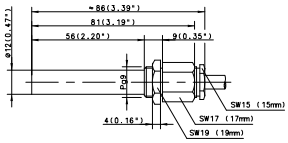
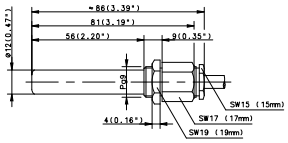
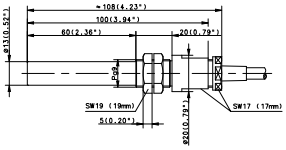
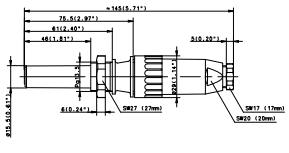
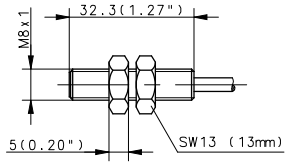
Ø 12 mm		Ø 12 mm		Ø 12 mm		Ø 13 mm		
12 mm	12 mm	16 mm	18 mm	19 mm	19 mm	9 mm	20 mm	
Cable 1 m	Cable 1 m	Cable 4 m	Cable 1m	Cable 1 m	Cable 4 m	Cable 1 m	Cable 1 m	
T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	T-69 N/S	T-69 N/S	T-62 N/S	T-62 N/S	
		Temperature			Temperature			
								
6316326426	**6315326425**	**6410206399**	**6310406554**	**6316306248**	**6316306004**	**6310136616**	**6310536617**	
250 VDC	250 VDC	250 VDC	250 VDC	250 VDC	250 VDC	250 VDC	250 VDC	
1 A	0.5 A	1.5 A	5 A	1 A	1 A	5 A	1 A	
60 VA	30 VA	50 VA	250 VA	60 VA	60 VA	250 VA	60 VA	
-5°C/+70°C	-5°C/+70°C	-40°C/+150°C	-5°C/+70°C	-5°C/+70°C	-40°C/+150°C	-5°C/+70°C	-5°C/+70°C	
IP67	IP67	IP67	IP67	IP67	IP67	IP67	IP67	
PA, red	PA, red	Al/CuZn39Pb3	Al/CuZn39Pb3	Al/CuZn39Pb3	Al/CuZn39Pb3	PA, black	PA, black	
3 x 0.5 mm^2	3 x 0.5 mm^2	3 x 0.75 mm^2	3 x 0.75 mm^2	4 x 0.75 mm^2	4 x 0.75 mm^2	2 x 0.75 mm^2	3 x 0.75 mm^2	

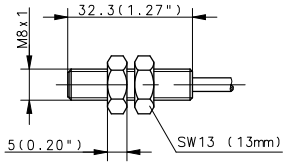
You will find detailed data sheets to the products under www.bernstein.eu

Magnetic Switches (Type Ø 15.5 mm, M8, M12, PG9, 28.6 x 18 mm)

Type		Ø 15.5 mm	M8		M8
Nominal switching distance (San)		6 mm	13 mm	13 mm	18 mm
Type of connection		Connector	Cable 1 m	Connector	Cable 1 m
Reference magnet (Page)		T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S
Special feature					



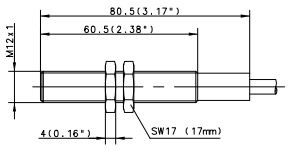


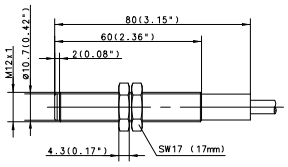


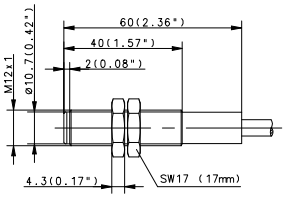
Switching function						
	NO contact					6311208596
	NC contact					
	Changeover contact	6317304313		6310308597	6310308595	
	Bistable					
Technical data						
Max. switching voltage		250 VDC		100 VDC	30 VDC	250 VDC
Switching current (max)		1 A		0.5 A	1 A	0.5 A
Performance class (diagram No.)		80 VA		10 VA	20 VA	10 VA
Shock resistance						
Mechanical data						
Ambient temperature (min/max)		-5°C/+70°C		-20°C/+70°C	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC529, EN60529		IP65		IP67	IP65	IP67
Enclosure material		PC, grey		Stainless steel 1.4305	Stainless steel 1.4305	Stainless steel 1.4305
Connection		Amphenol		3 x 0.14 mm²	Ø 6.5 mm	2 x 0.14 mm²

Please refer to Accessories for magnets, mounting brackets, cable couplers and sensor tester.

Type		M12		M12		M12	
Nominal switching distance (San)		7 mm	7 mm	10 mm	12 mm	15 mm	18 mm
Type of connection		Cable 1 m	Cable 2 m	Cable 1 m	Cable 1 m	Cable 3 m	Cable 1 m
Reference magnet (Page)		T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	T-68
Special feature							







Switching function							
	NO contact					6416228260	6311218294
	NC contact						
	Changeover contact	6314223268	6314233002	6316333005	6316318002		
	Bistable						
Technical data							
Max. switching voltage		250 VDC	250 VDC	250 VDC	250 VDC	250 VDC	250 VDC
Switching current (max)		3 A	3 A	1 A	1 A	1 A	0.5 A
Performance class (diagram No.)		100 VA	100 VA	60 VA	60 VA	60 VA	10 VA
Shock resistance			50 g (11 ms)				50 g (11 ms)
Mechanical data							
Ambient temperature (min/max)		-5°C/+70°C	-25°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC529, EN60529		IP67	IP67	IP67	IP67	IP67	IP67
Enclosure material		CuZn39Pb3	PA, red	PA, red	CuZn39Pb3	PA, red	CuZn39Pb3
Connection		2 x 0.5 mm²	2 x 0.5 mm²	3 x 0.5 mm²	3 x 0.5 mm²	2 x 0.5 mm²	2 x 0.34mm²

Please refer to Accessories for magnets, mounting brackets, cable couplers and sensor tester.

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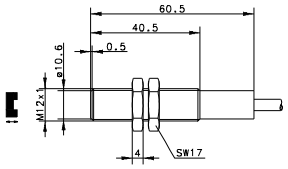
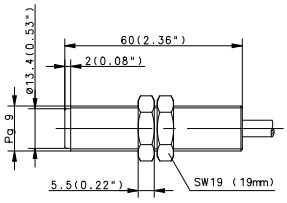
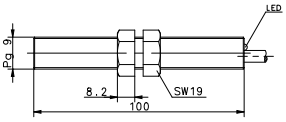
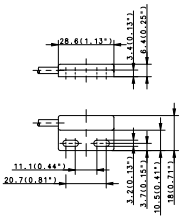
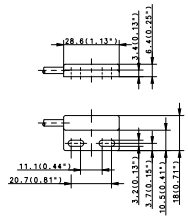
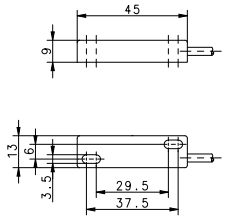
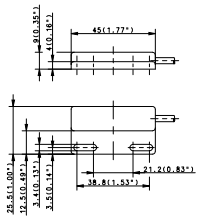
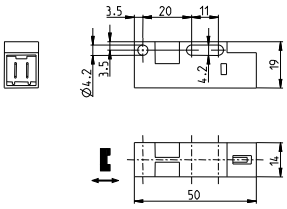
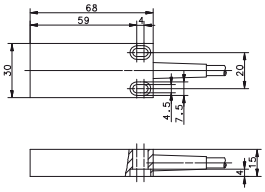
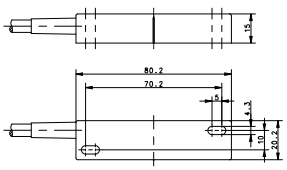
M12		PG9		PG9	28.6x18x6.4mm		
18 mm	22 mm	12 mm	17 mm	20 mm	8 mm	8 mm	
Cable 2 m	Cable 2 m	Cable 1 m	Cable 2 m	Cable 2 m	Cable 1 m	Cable 1.5 m	
T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	TK-11-11	TK-11-11	
				D			
							
6310118626	**6410433350**	**6315317001**	**6316343544**	**6310431569**	**6310311615**	**6410311368**	
175 VDC	250 VDC	250 VDC	250 VDC	250 VDC	130 VDC	130 VDC	
0.25 A	1.5 A	0.5 A	1 A	1 A	0.25 A	0.25 A	
5 VA	250 VA	30 VA	60 VA	120 VA	3 VA	3 VA	
50 g (11 ms)							
-5°C/+70°C	-25°C/+70°C	-5°C/+70°C	-5°C/+80°C	-5°C/+80°C	-5°C/+70°C	-20°C/+70°C	
IP67	IP67	IP67	IP65	IP65	IP67	IP67	
CuZn39Pb3	PA, red	PA, red	CuZn39Pb3	CuZn39Pb3	PA, black	PA	
2 x 0.34 mm²	2 x 0.5 mm²	3 x 0.5 mm²	3 x 0.5 mm²	2 x 0.5 mm²	3 x 0.14 mm²	3 x 0.14 mm²	

You will find detailed data sheets to the products under www.bernstein.eu

Magnetic Switches (Type 28.6 x 18, 45 x 13, 45 x 25.5, 50 x 19, 68 x 30, 80 x 20)

Type		28.6x18x6.4mm		45x13x9mm	45x13x9mm	
Nominal switching distance (San)		10 mm	25 mm	10 mm	5 mm	10 mm
Type of connection		Cable 1 m	Cable 5 m	Cable 2 m	Cable 1 m	Cable 1 m
Reference magnet (Page)		TK-11-11	T-67 N/S	TK-11-01	TK-45	TK-45
Special feature						
						
Switching function	NO contact	6311211541		6311201095		6311245539
	NC contact					
	Changeover contact				6316345540	
	Bistable		6311411603			
Technical data						
Max. switching voltage		250 VDC	250 VDC	250 VDC	250 VDC	250 VDC
Switching current (max)		0.5 A	0.5 A	0.5 A	1 A	0.5 A
Performance class (diagram No.)		10 VA	10 VA	10 VA	60 VA	10 VA
Shock resistance						50 g (11 ms)
Mechanical data						
Ambient temperature (min/max)		-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC529, EN60529		IP67	IP67	IP67	IP67	IP67
Enclosure material		PA, black	PA, black	PA, black	PA	PA
Connection		2 x 0.14 mm	2 x 0.14 mm	2 x 0.14 mm	2 x 0.34 mm²	2 x 0.14 mm²

Please refer to Accessories for magnets, mounting brackets, cable couplers and sensor tester.

Type		50x19x14mm	68x30x15mm	80x20x15mm	
Nominal switching distance (San)		20 mm	8 mm	18 mm	18 mm
Type of connection		Connector	Cable 1 m	Cable 1 m	Cable 1 m
Reference magnet (Page)		T-62 N/S	T-62 N/S	TK-21-02	TK-21-02
Special feature		Temperature			
					
Switching function	NO contact	6310299652			
	NC contact				
	Changeover contact		6316313004	6315302309	6315312196
	Bistable				
Technical data					
Max. switching voltage		100 VDC	250 VDC	250 VDC	250 VDC
Switching current (max)		0.5 A	1 A	0.5 A	0.5 A
Performance class (diagram No.)		10 VA	60 VA	30 VA	30 VA
Shock resistance		30 g (11 ms)			
Mechanical data					
Ambient temperature (min/max)		-30°C/+120°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC529, EN60529		IP67	IP67	IP67	IP67
Enclosure material		Nylon, black	PC, red	PA, black	PA, red
Connection		6.3 mm	3 x 0.5 mm²	3 x 0.75 mm²	3 x 0.75 mm²

Please refer to Accessories for magnets, mounting brackets, cable couplers and sensor tester.

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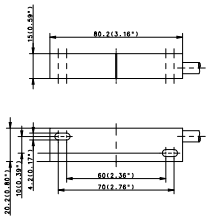
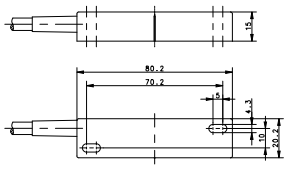
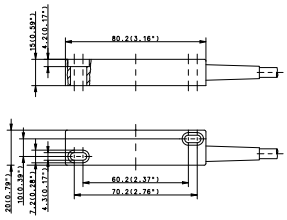
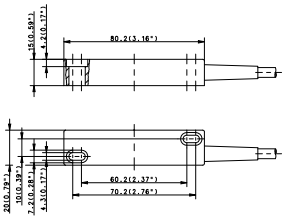
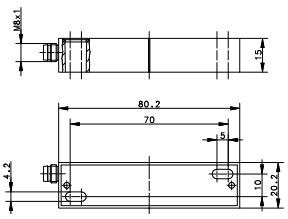
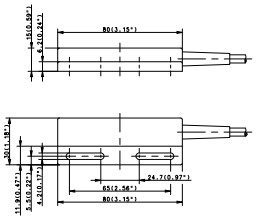
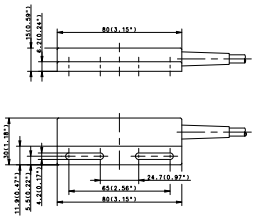
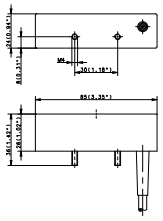
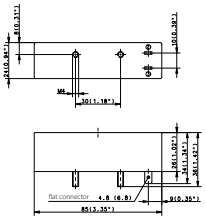
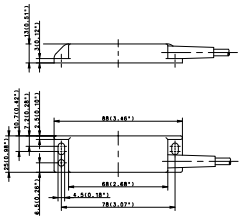
80x20x15mm		80x20x15mm		80x20x15mm		80x20x15mm		
20 mm	20 mm	21 mm	21 mm	21 mm	24 mm	24 mm	25 mm	
Cable 3 m	Cable 3 m	Cable 1 m	Cable 1 m	Cable 1 m	Cable 1 m	Cable 1 m	Cable 1 m	
T-62 N/S	T-62 N/S	TK-21-02	TK-21-02	TK-21-12	TA-21-02	TK-21-12	T-62 N/S	
Temperature								
								
6314402566	**6419402397**	**6312202316**	**6314202204**	**6314212217**	**6316302206**	**6316312220**	**6410412143**	
250 VDC	250 VDC	250 VDC	250 VDC	250 VDC	250 VDC	250 VDC	250 VDC	
3 A	5 A	0.5 A	3 A	3 A	1 A	1 A	1 A	
100 VA	250 VA	30 VA	100 VA	100 VA	60 VA	60 VA	60 VA	
	10 g (11 ms)							
-40°C/+150°C	-25°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	
IP67	IP67	IP67	IP67	IP67	IP67	IP67	IP67	
GDAlSi12, red	PA, black	PA, black	PA, black	PA, red	PA, black	PA, red	PA, red	
3 x 0.75 mm^2	2 x 0.5 mm^2	2 x 0.75 mm^2	2 x 0.75 mm^2	2 x 0.5 mm^2	3 x 0.75 mm^2	3 x 0.5 mm^2	2 x 0.5 mm^2	

You will find detailed data sheets to the products under www.bernstein.eu

Magnetic Switches (Type 80 x 20 mm, 80 x 30 mm, 85 x 24 mm, 88 x 25 mm, 100 x 58 mm)

Type		80x20x15mm		80x30x15mm		80x30x15mm	
Nominal switching distance (San)		25 mm	30 mm	8 mm	19 mm	20 mm	22 mm
Type of connection		Connector M8	Cable 1 m	Cable 1 m	Cable 1 m	Cable 1 m	Cable 1 m
Reference magnet (Page)		Ø 10 x 50 Neod	TA-21-02	TK-44	TK-44	T-62 N/S	TK-44
Special feature			Temperature				
							
Switching function	NO contact				**6314244536**		
	NC contact			**6314144542**			
	Changeover contact	**6310302636**	**6316302389**				**6317344538**
	Bistable					**6310444537**	
Technical data							
Max. switching voltage		60 VDC	250 VDC	250 VDC	250 VDC	250 VDC	250 VDC
Switching current (max)		1 A	1 A	3 A	3 A	5 A	1 A
Performance class (diagram No.)		3 VA	60 VA	100 VA	100 VA	250 VA	80 VA
Shock resistance			10 g (11 ms)				
Mechanical data							
Ambient temperature (min/max)		-30°C/+80°C	-40°C/+150°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC529, EN60529		IP65	IP67	IP67	IP67	IP67	IP67
Enclosure material		GDAlSi 12, red	GDAlSi12, red	PA, black	PA, black	PA, black	PA
Connection		M8 x 1	4 x 0.75 mm²	2 x 0.5 mm²	2 x 0.5 mm²	2 x 0.5 mm²	3 x 0.5 mm²

Please refer to Accessories for magnets, mounting brackets, cable couplers and sensor tester.

Type		85x24x26mm		85x24x26mm	88x25x13mm	
Nominal switching distance (San)		15 mm	24 mm	24 mm	22 mm	25 mm
Type of connection		Cable 3 m	Cable 1 m	Flat plug	Cable 1 m	Cable 1 m
Reference magnet (Page)		T-67 N/S	T-69 N/S	T-69 N/S	TK-42	TK-42
Special feature				K4.8		
						
Switching function	NO contact					**6314242533**
	NC contact					
	Changeover contact				**6317342535**	
	Bistable	**6314432609**	**6310432598**	**6310432590**		
Technical data						
Max. switching voltage		250 VDC	250 VDC	250 VDC	250 VDC	250 VDC
Switching current (max)		3 A	5 A	5 A	1 A	3 A
Performance class (diagram No.)		100 VA	250 VA	250 VA	80 VA	100 VA
Shock resistance						
Mechanical data						
Ambient temperature (min/max)		-25°C/+70°C	-5°C/+70°C	-20°C/+70°C	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC529, EN60529		IP67	IP67	IP67	IP67	IP67
Enclosure material		PBT	PA, black	PBT, black	PA, black	PA, black
Connection		2 x 0.5 mm²	2 x 0.75 mm²	4.8 mm	3 x 0.5 mm²	2 x 0.5 mm²

Please refer to Accessories for magnets, mounting brackets, cable couplers and sensor tester.

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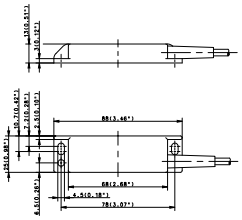
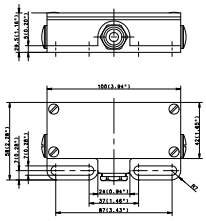
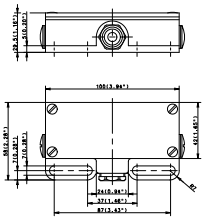
88x25x13mm		100x58x29.5		100x58x29.5		
25 mm	25 mm	10 mm	10 mm	15 mm		
Cable 1 m	Cable 3 m	Screw terminal	Screw terminal	Screw terminal		
T-69 N/S	T-69 N/S	TA-31	TA-31	T-62 N/S		
						
			6314203232			
		6317303312				
6310442534	**6310442622**			**6319403532**		

250 VDC	250 VDC	250 VDC	250 VDC	250 VDC		
5 A	5 A	1 A	3 A	5 A		
250 VA	250 VA	80 VA	100 VA	250 VA		

-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-25°C/+70°C	-25°C/+70°C		
IP67	IP67	IP67	IP65	IP65		
PA, black	PA, black	Aluminium	Aluminium	Aluminium		
2 x 0.5 mm^2	2 x 0.5 mm^2	max. 1.5 mm^2	max. 1.5 mm^2	max. 1.5 mm^2		

You will find detailed data sheets to the products under www.bernstein.eu

Electronic Magnetic Sensors

Thanks to their special properties, electronic magnetic switches with magnetoresistive or Hall elements are ideal for use in many different applications. They are used to detect position, angle and/or speed and are immune to shock, impact, vibration and wear. High switching frequencies, long switching distances, a broad temperature range and excellent reproducibility are other advantageous features of this technology which in many cases make them the technically superior alternative to electromechanical reed contacts.

The fact that many non-magnetic metals allow magnetic fields to pass unhindered also extends the fields of application for magnetic sensors. This makes it possible to encapsulate sensors in a sturdy pressure-proof metal enclosure. Sensors can, however, also be mounted in tubing or concealed behind non-magnetic metal surfaces.

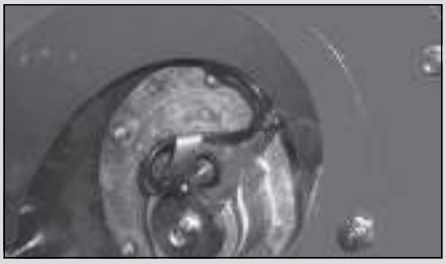
Advantages of electronic magnetic sensors over electromechanical reed contacts

- Reliable and immune to vibration
- Bounce-free switching
- Unlimited service life
- High repeat accuracy
- Short response times
- High sensitivity
- Thermal stability

Select the sensor and the technical principle that best meet your requirements from the comprehensive BERNSTEIN range of magnetic sensors: Hall sensors with minimum circuitry, standard Hall sensors with integrated sensor electronics or magnetoresistive sensors. Round, square or metric bodies in plastic, brass, brass/plastic or stainless enclosures.

Fundamentals of Hall sensor technology

The BERNSTEIN range of magnetic sensors is based on a modular system comprising an encapsulated Hall element with the EMC protective circuitry. These sensors therefore conform to the requirements of EN-60947-5-2 for non-mechanical magnetic proximity switches. Sensors of various designs are available for a wide variety of applications.



- Output circuitry NPN, NO contact or bistable
- Voltage range 4.5 – 24 V DC
- Polarity reversal protected
- Switching frequencies up to 20 kHz
- Size ranging from 6 mm diameter to 50 x 25 x 10 mm
- Unipolar version

Standard range of Hall sensors

In contrast to the more basic BERNSTEIN Hall sensors, the functionality and modularity have been enhanced in these Hall sensors by integrating comprehensive sensor electronics. In this segment BERNSTEIN also offers a complete modular system that can be adapted to suit your specific needs.

- Output circuitry PNP, NC or NO contact or bistable
- Voltage range 10 – 39 V DC
- Output current 400 mA, short-circuit proof
- Polarity reversal protected
- Switching frequencies up to 10 kHz
- Size ranging from M10 diameter to 50 x 25 x 10 mm
- Unipolar version

Single-channel speed sensors with high frequency range

BERNSTEIN offers a high performance series of gearwheel sensors designed as electronic magnetic sensors with Hall elements that detect the rotation of near-engine ferromagnetic gearwheels with sensing distances of up to 2 mm. A specific feature of these single-channel speed sensors is their high switching frequency. Based on the BERNSTEIN modular range of magnetic sensors, switching frequencies of up to 20 kHz can be realised. Switching frequencies up to 10 kHz can be achieved in the standard range. The sensors are available in M12 and M18 versions. The characteristic versatility of Hall sensors is fully utilised in these applications:

Outstanding immunity to shock, impact, vibration, non-wearing and silent, high switching frequencies, broad temperature range, exceptional repeat accuracy.

Technical data

- Output circuitry PNP or NPN
- Voltage range 10 – 36 V DC
- Switching frequencies up to 20 kHz
- Sensing distance 0 – 2 mm on ferromagnetic material

Standard range of magnetoresistive sensors

Magnetoresistive sensors are more sensitive than Hall-effect sensors by a factor of 10. Not only can they be very small but they can also detect especially low field strengths.

In addition to their high measuring accuracy even at high ambient temperatures, these sensors are also characterised by a high degree of reliability and by the fact that they occupy little space. Since they are designed to be independent of polarity, the countermagnet does not need to be mounted with pole orientation. With corresponding encapsulation, BERNSTEIN magnetoresistive sensors have proven effective even in demanding environments such as lift construction or agricultural technology.

- Output circuitry PNP, NC or NO contact
- High sensitivity (up to sensing distance of 60 mm)
- Voltage range 10 – 39 V DC/10 – 30 V DC
- Output current 400 mA/200 mA, short-circuit proof
- Polarity reversal protected
- Polarity independent
- Size 6 mm diameter to M18

Microsensors

Ever more complex and above all more compact measuring and control configurations require components that occupy even less space. In line with this trend, BERNSTEIN has expanded its comprehensive range of sensors for determining position, angle and/or speed in industrial applications in two branches of development: Compared to the previous smallest model (RD = 6 mm), the diameter in this series of magnetoresistive sensors has been further reduced by 30 % yet the smallest model RD = 4 mm or 5 x 5 mm still achieves the parameters of the larger sensors. As part of the second development stage, the basic and standard range of electronic magnetic sensors has been expanded to include the latch functionality (bistable switching characteristic) which utilises the magnetic field only for the corresponding switching operation. As a result, this functionality has been added to a wide range of enclosure variants in the current modular range.

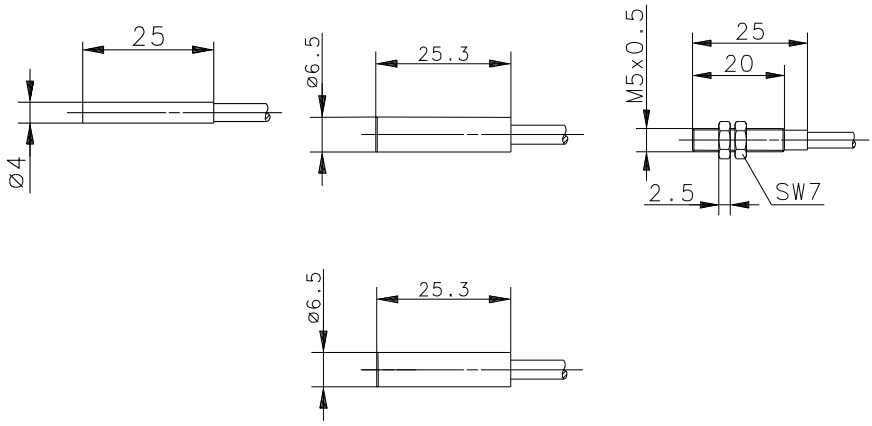
Sensing distances of electronic magnetic sensors

Since the sensing distances of magnetic sensors are influenced by the combination of sensor and magnet, it is appropriate to consider them as a complete system. The overview below shows the expected sensing distances (Sn) when using different magnets from the BERNSTEIN range.

Magnet	Size	Article number	Sn of Hall sensors	Sn of magneto-resistive sensors
T 75	Ø 5 mm	**6301175057**	5 mm	10 mm
T 06	Ø 6 mm	**6301106065**	5 mm	15 mm
T 61	Ø 20 mm	**6301261035**	10 mm	35 mm
T 62	Ø 23 mm	**6301262039**	17 mm	45 mm
T 67	Ø 20 mm	**6301167054**	15 mm	40 mm
T 69	Ø 31 mm	**6301269031**	20 mm	60 mm

Electronic Magnetic Sensors (Type D04, D06, M05, M08, M10, M12)

Type	D04	D06		M05
Operating mode	MR	Hall	MR	MR
Magnetic sensitivity (mT)	3 mT	10 mT	2 mT	3 mT
Sensing distance (Sn)	30 mm	17 mm	45 mm	30 mm
Reference magnet (Page)	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S
Type of connection	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m
Special feature				



PNP	NO contact	**6373299132**		**6373270105**	**6373299133**
	NC contact				
	Bistable				
NPN	NO contact		**6362670001**		
	NC contact				
	Bistable		**6363870032**		
Analogue	Current output				
	Voltage output				

Technical data

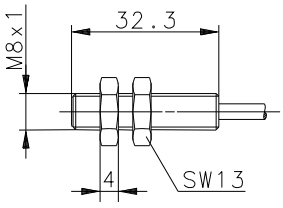
Rated operating voltage	U_B	4.5-30 VDC	4.5-24 VDC	10-30 VDC	4.5-30 VDC
Rated operating current	I_B	200 mA	25 mA	200 mA	200 mA
Max. switching voltage	F	10 kHz	20 kHz	1500 Hz	10 kHz
Function/operating voltage indicator		-/-	-/-	-/-	-/-
Sensitivity adjustable					
Short circuit-protection		Current limiter	Current limiter	Cyclic	Current limiter
Teachable					

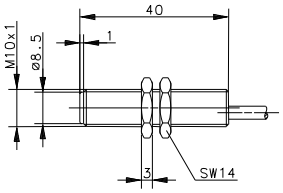
Mechanical data

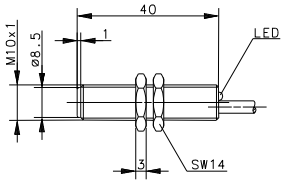
Ambient temperature (min/max)	-20°C/+70°C	-25°C/+70°C	-25°C/+70°C	-20°C/+70°C
Protection class in accordance with IEC529, EN60529	IP67	IP67	IP67	IP67
Enclosure material	Stainless steel 1.4401	Stainless steel 1.4401	Stainless steel 1.4401	CuZn39Pb3
Connection	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²

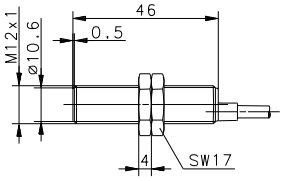
Please refer to Accessories for magnets, mounting brackets, cable couplers and sensor tester.

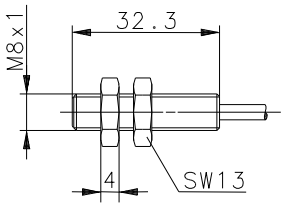
M08		M10		M10	M12		
Hall	MR	Hall	Hall	MR	Hall	Hall	
10 mT	2 mT	10 mT	10 mT	1 mT	10 mT	10 mT	
17 mm	45 mm	17 mm	17 mm	45 mm	17 mm	17 mm	
T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	
Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m	
			All-metal	All-metal			

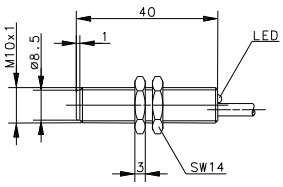


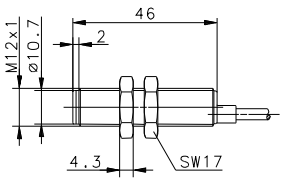










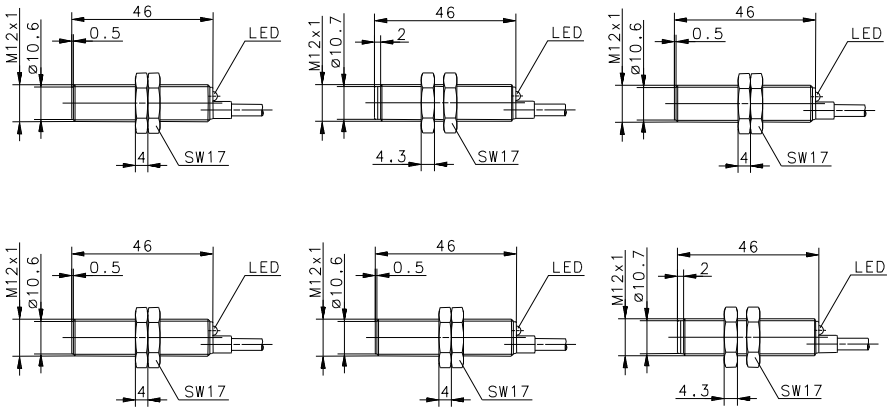


	6373260107		6372261085 6372161086 6373461124	6373261087 6373161088		
6362660002 6363860033		6362661003 6363861034			6362662004 6363862035	6362662005 6363862036
4.5-24 VDC	10-30 VDC	4.5-24 VDC	10-39 VDC	10-39 VDC	4.5-24 VDC	4.5-24 VDC
25 mA	200 mA	25 mA	400 mA	400 mA	25 mA	25 mA
20 kHz	1500 Hz	20 kHz	10 kHz	10 kHz	20 kHz	20 kHz
-/-	-/-	-/-	LED/-	LED/-	-/-	-/-
Current limiter	Cyclic	Current limiter	Cyclic	Cyclic	Current limiter	Current limiter
-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
IP67	IP67	IP67	IP67	IP67	IP67	IP67
CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	PA
3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²

You will find detailed data sheets to the products under www.bernstein.eu

Electronic Magnetic Sensors (Type M12, M18)

Type		M12		M12		M12	
Operating mode		Hall	Hall	Hall	MR	MR	MR
Magnetic sensitivity (mT)		10 mT	10 mT	10 mT	1 mT	1 mT	1 mT
Sensing distance (Sn)		17 mm	17 mm	17 mm	45 mm	45 mm	45 mm
Reference magnet (Page)		T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S
Type of connection		Cable 2 m	Cable 10 m	Cable 2 m	Cable 2 m	Cable 5 m	Cable 2 m
Special feature							



PNP	NO contact	**6372262090**	**6472262077**	**6372262089**	**6373262094**	**6373262123**	**6373262093**
	NC contact	**6372162092**		**6372162091**	**6373162096**		**6373162095**
	Bistable	**6373462126**		**6373462125**			
NPN	NO contact						
	NC contact						
	Bistable						
Analogue	Current output						
	Voltage output						

Technical data

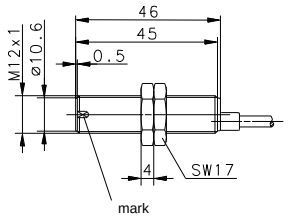
Rated operating voltage	U_B	10-39 VDC	10-39 VDC	10-39 VDC	10-39 VDC	10-39 VDC	10-39 VDC
Rated operating current	I_B	400 mA	400 mA	400 mA	400 mA	400 mA	400 mA
Max. switching voltage	F	10 kHz	10 kHz	10 kHz	10 kHz	1500 Hz	10 kHz
Function/operating voltage indicator		LED/-	LED/-	LED/-	LED/-	LED/-	LED/-
Sensitivity adjustable							
Short circuit-protection		Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic
Teachable							

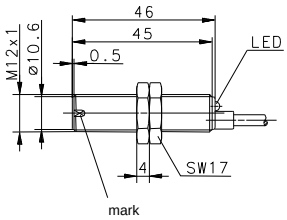
Mechanical data

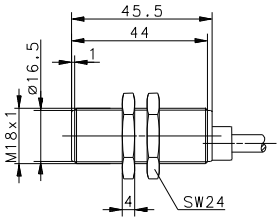
Ambient temperature (min/max)		-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C
Protection class in accordance with IEC529, EN60529		IP67	IP67	IP67	IP67	IP67	IP67
Enclosure material		CuZn39Pb3	CuZn39Pb3	PA	CuZn39Pb3	CuZn39Pb3	PA
Connection		3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²

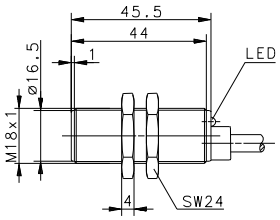
Please refer to Accessories for magnets, mounting brackets, cable couplers and sensor tester.

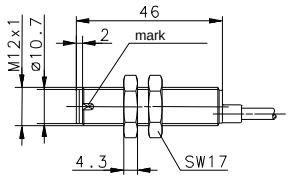
M12		M12		M18		M18		
Hall	Hall	Hall	Hall	Hall	Hall	Hall	Hall	
-	-	-	-	10 mT	10 mT	10 mT	10 mT	
0-2 mm	0-2 mm	0-2 mm	0-2 mm	17 mm	17 mm	17 mm	17 mm	
-	-	-	-	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	
Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m	
Speed	Speed	Speed	Speed					

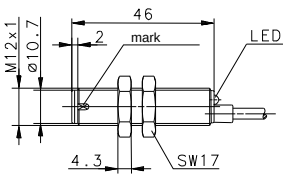


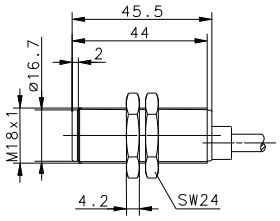


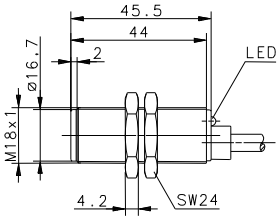










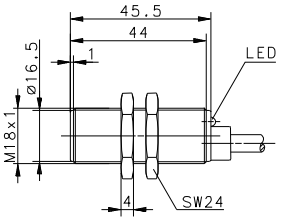


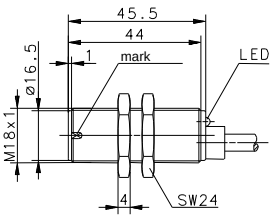
		6379262120	**6379262119**			**6372263098** **6372163100** **6373463128**	**6372263097** **6372163099** **6373463127**	
6369662028	**6369662027**			**6362663006** **6363863037**	**6362663007** **6363863038**			
10-36 VDC	10-36 VDC	10-39 VDC	10-39 VDC	4.5-24 VDC	4.5-24 VDC	10-39 VDC	10-39 VDC	
< 20 mA	< 20 mA	400 mA	400 mA	25 mA	25 mA	400 mA	400 mA	
20 kHz	20 kHz	10 kHz	10 kHz	20 kHz	20 kHz	10 kHz	10 kHz	
-/-	-/-	LED/-	LED/-	-/-	-/-	LED/-	LED/-	
Cyclic	Cyclic	Cyclic	Cyclic	Current limiter	Current limiter	Cyclic	Cyclic	
-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	
IP67	IP67	IP67	IP67	IP67	IP67	IP67	IP67	
CuZn39Pb3	PA, red	CuZn39Pb3	PA, red	CuZn39Pb3	PBT	CuZn39Pb3	PBT	
3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	

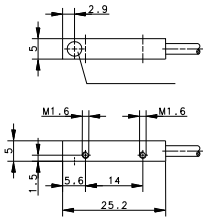
You will find detailed data sheets to the products under www.bernstein.eu

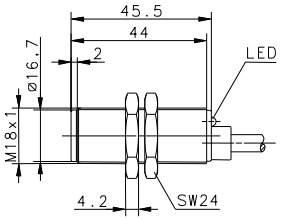
Electronic Magnetic Sensors (Type M18, Q05, Q08, Q12, E27, E29)

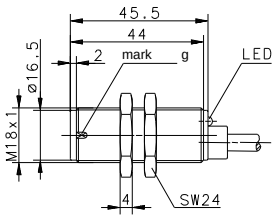
Type		M18		M18		Q05
Operating mode		MR	MR	Hall	Hall	MR
Magnetic sensitivity (mT)		1 mT	1 mT	-	-	3 mT
Sensing distance (Sn)		45 mm	45 mm	0 - 2 mm	0 - 2 mm	10 mm
Reference magnet (Page)		T-62 N/S	T-62 N/S	-	-	T-62 N/S
Type of connection		Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m
Special feature				Speed	Speed	











PNP	NO contact	**6373263102**	**6373263101**	**6379263122**	**6379263121**	**6373299134**
	NC contact	**6373163104**	**6373163103**			
	Bistable					
NPN	NO contact					
	NC contact					
	Bistable					
Analogue	Current output					
	Voltage output					

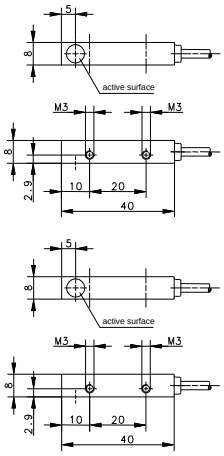
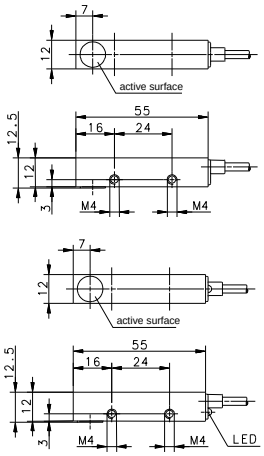
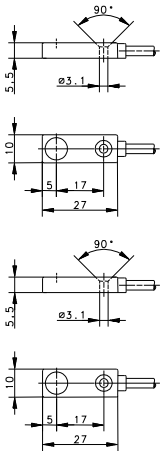
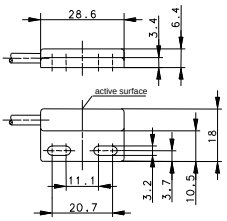
Technical data

Rated operating voltage	U_B	10-39 VDC	10-39 VDC	10-39 VDC	10-39 VDC	4.5-30 VDC
Rated operating current	I_B	400 mA	400 mA	400 mA	400 mA	200 mA
Max. switching voltage	F	10 kHz	10 kHz	10 kHz	10 kHz	10 kHz
Function/operating voltage indicator		LED/-	LED/-	LED/-	LED/-	-/-
Sensitivity adjustable						
Short circuit-protection		Cyclic	Cyclic	Cyclic	Cyclic	Current limiter
Teachable						

Mechanical data

Ambient temperature (min/max)	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-20°C/+70°C
Protection class in accordance with IEC529, EN60529	IP67	IP67	IP67	IP67	IP67
Enclosure material	CuZn39Pb3	PBT	CuZn39Pb3	PBT, black	CuZn39Pb3
Connection	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.05 mm²

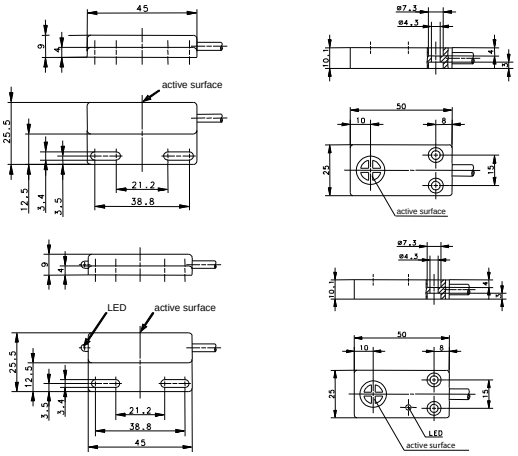
Please refer to Accessories for magnets, mounting brackets, cable couplers and sensor tester.

Q08		Q12		E27		E29	
Hall	MR	Hall	Hall	Hall	Hall	Hall	
10 mT	2 mT	10 mT	10 mT	10 mT	2 mT	10 mT	
17 mm	45 mm	17 mm	17 mm	17 mm	30 mm	17 mm	
T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	
Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m	
							
	6373280106		**6372255083** **6372155084** **6373455131**				
6362680012 **6363880043**		**6362655013** **6363855044**		**6362693010** **6363893041**	**6363893031**	**6362611008** **6363811039**	
4.5-24 VDC	10-30 VDC	4.5-24 VDC	10-39 VDC	4.5-24 VDC	4.5-24 VDC	4.5-24 VDC	
25 mA	200 mA	25 mA	400 mA	25 mA	25 mA	25 mA	
20 kHz	1500 Hz	20 kHz	10 kHz	20 kHz	20 kHz	20 kHz	
-/-	-/-	-/-	LED/-	-/-	-/-	-/-	
Current limiter	Cyclic	Current limiter	Cyclic	Current limiter	Current limiter	Current limiter	
-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	
IP67	IP67	IP67	IP67	IP67	IP67	IP67	
CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	PA	PA	PA	
3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	3 x 0.14 mm²	

You will find detailed data sheets to the products under www.bernstein.eu

Electronic Magnetic Sensors (Type E45, E50)

Type		E45		E50		
Operating mode		Hall	Hall	Hall	Hall	
Magnetic sensitivity (mT)		10 mT	10 mT	10 mT	10 mT	
Sensing distance (Sn)		17 mm	17 mm	17 mm	17 mm	
Reference magnet (Page)		T-62 N/S	T-62 N/S	T-62 N/S	T-62 N/S	
Type of connection		Cable 2 m	Cable 2 m	Cable 2 m	Cable 2 m	
Special feature						



PNP	NO contact		**6372245079**		**6372290081**	
	NC contact		**6372145080**		**6372190082**	
	Bistable		**6373445129**		**6373490130**	
NPN	NO contact	**6362645009**		**6362690011**		
	NC contact					
	Bistable	**6363845040**		**6363890042**		
Analogue	Current output					
	Voltage output					

Technical data

Rated operating voltage	U_B	4.5-24 VDC	10-39 VDC	4.5-24 VDC	10-39 VDC	
Rated operating current	I_B	25 mA	400 mA	25 mA	400 mA	
Max. switching voltage	F	20 kHz	10 kHz	20 kHz	10 kHz	
Function/operating voltage indicator		-/-	LED/-	-/-	LED/-	
Sensitivity adjustable						
Short circuit-protection		Current limiter	Cyclic	Current limiter	Cyclic	
Teachable						

Mechanical data

Ambient temperature (min/max)	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	-25°C/+70°C	
Protection class in accordance with IEC529, EN60529	IP67	IP67	IP67	IP67	
Enclosure material	PA	PA	PBT	PBT	
Connection	3 x 0.14 mm^2	3 x 0.14 mm^2	3 x 0.50 mm^2	3 x 0.50 mm^2	

Please refer to Accessories for magnets, mounting brackets, cable couplers and sensor tester.

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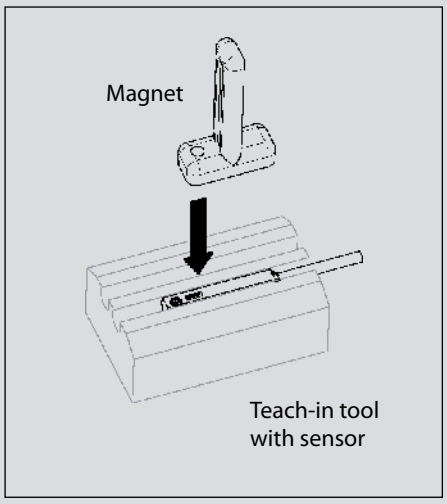
Notes

Programmable Miniature Position Sensors with Fully Integrated Electronics

The product family of teachable magnetic sensors is characterised by two freely programmable, independent switching points. Despite this high degree of functionality, BERNSTEIN has succeeded in integrating the entire electronics in the compact sensor enclosure with the smallest possible dimensions. This design feature renders additional protection, e.g. for the cable electronics, or high-cost safeguards unnecessary.

The compact design is suitable for installation in all standard T- and C-slots (e.g. FESTO or SMC). In installed position, the two freely programmable switching points can be quickly and easily set with the aid of the easy-to-use teach-in tool.



- The installed sensor assumes programming mode when the teach-in tool is placed over it
- The positions of the magnet are assigned to the respective outputs by correspondingly aligning the tool
- The programmable switching points are stored in the sensor
- The switching points can be changed by repeating the teach-in procedure

This configuration largely avoids unintentional changes to the settings, substantially increases the resistance to environmental influences while retaining the protection class rating.

Manually searching for the switching points has been replaced by rapid electronic balancing with the sensor installed in position. Two LEDs at the top of the sensor serve as the function indicator, provide information on the programming status and also signal faults. In addition to featuring effective polarity reversal protection as standard, the sensors also have an internal EEPROM that stores the switching points in the event of power failure.

Advantages

- Completely integrated electronic solution
- Permanent protection rating
- No need for additional electronics
- Fully immersed and therefore protected installation in the slot
- Suitable for standard C- and T-slots
- Available as cable or plug version
- Occupies only one slot
- Two freely programmable switching points
- Straightforward teach-in procedure
- Reduced installation and wiring requirements
- Can be fitted from above
- High switching accuracy

Technical data

- PNP/NO contact
- Magnetic sensitivity ±1.5 mT to ±13.5 mT
- Sensing distance up to 50 mm (depending on magnet/air gap)
- Repeat accuracy ≤ 0.1 mT
- Hysteresis 1 mT ≤ H ≤ 1.35 mT
- Operating voltage range 10 – 30 V DC
- Output current Ie ≤ 50 mA (one output switched) ≤ 25 mA per output (both outputs switched)
- Ambient temperature -20 °C to +80 °C
- Protection class IP67

Other slot sensors

Sensors with only one output can also be used for applications that require only one switching point. For this purpose BERNSTEIN offers a range of Hall sensors with set sensitivity or reed contact versions that do not require auxiliary energy.

All sensors come with the following accessories:

- 1x setscrew M2 x 3 (E22), M3 x 6 (E30), DIN 913
- 1x Offset screwdriver (E22)
- 1x Teach-in tool
- 1x Operating and installation instructions

Standards and approvals

MEK E-22/MEA E30
EN 60947-5-2

CE

① **MEK-E22 Ex**

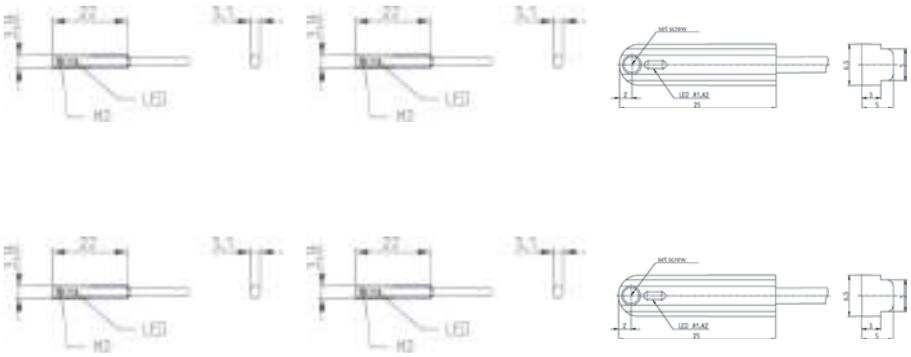
II 2 G Ex mb II T6
II 2 D Ex tD A21 IP67
T 85 °C

KEMA 08ATEX0130 X

Teachable Electronic Slot Sensors

BERNSTEIN

Type	E22		E22		E30	
Operating mode	Hall	Hall	Hall	Hall	Hall	Hall
Magnetic sensitivity (mT)	1.5 – 13.5 mT	1.5 – 13.5 mT	1.5 – 13.5 mT	1.5 – 13.5 mT	1.5 – 13.5 mT	1.5 – 13.5 mT
Switching function	2 x PNP NO	2 x PNP NO	2 x PNP NO	2 x PNP NO	2 x PNP NO	2 x PNP NO
Reference magnet (Page)						
Type of connection	Cable 2 m	Connector M8	Cable 2 m	Connector M8	Cable 2 m	Connector M8
Special feature	Teachable	Teachable	Teachable – Ex ①	Teachable – Ex ①	Teachable	Teachable



Type	C-slot SMC C-slot Festo T-slot	**6370281109** **6370281144**	**6370281110** **6370281145**	**6370281152**	**6370281153**	**6370299136**	**6370299143**

Technical data

Rated operating voltage	U_B	10-30 VDC	10-30 VDC	10-30 VDC	10-30 VDC	10-30 VDC	10-30 VDC
Rated operating current	I_B	≤ 50 mA	≤ 50 mA	≤ 50 mA	≤ 50 mA	≤ 50 mA	≤ 50 mA
Max. switching voltage	F						
Function/operating voltage indicator		2 x LED/-	2 x LED/-	2 x LED/-	2 x LED/-	2 x LED/-	2 x LED/-
Sensitivity adjustable		Yes	Yes	Yes	Yes	Yes	Yes
Short circuit-protection		Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic
Teachable		Yes	Yes	Yes	Yes	Yes	Yes

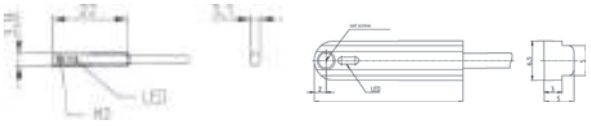
Mechanical data

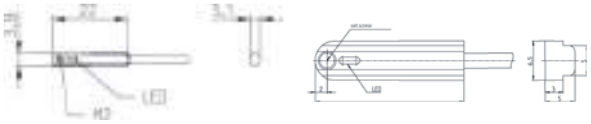
Ambient temperature (min/max)		-20°C/+80°C	-20°C/+80°C	-20°C/+80°C	-20°C/+80°C	-20°C/+80°C	-20°C/+80°C
Protection class in accordance with IEC529, EN60529		IP67	IP67	IP67	IP67	IP67	IP67
Enclosure material		PA, black	PA, black	PA, black	PA, black	Aluminium	Aluminium
Connection		4 x 0.05 mm²	M8 x 1	4 x 0.05 mm²	M8 x 1	4 x 0.05 mm²	M8 x 1

Please refer to Accessories for magnets, mounting brackets, cable couplers and sensor tester.

Electronic Slot Sensors

Type	E22		E30		
Operating mode	Hall	Hall	Hall	Hall	
Magnetic sensitivity (mT)	3 mT	3 mT	3 mT	3 mT	
Switching function	PNP NO	PNP NO	PNP NO	PNP NO	
Reference magnet (Page)					
Type of connection	Cable 2 m	Connector M8	Cable 2 m	Connector M8	
Special feature					





Type						
	C-slot SMC	**6372281146**	**6372281147**			
	C-slot Festo	**6372281148**	**6372281149**			
	T-slot			**6372299150**	**6372299151**	

Technical data

Rated operating voltage	U_B	10-30 VDC	10-30 VDC	10-30 VDC	10-30 VDC	
Rated operating current	I_B	≤ 50 mA	≤ 50 mA	≤ 50 mA	≤ 50 mA	
Max. switching voltage	F					
Function/operating voltage indicator		LED/-	LED/-	LED/-	LED/-	
Sensitivity adjustable		Yes	Yes	Yes	Yes	
Short circuit-protection		Cyclic	Cyclic	Cyclic	Cyclic	
Teachable		-	-	-	-	

Mechanical data

Ambient temperature (min/max)	-20°C/+80°C	-20°C/+80°C	-20°C/+80°C	-20°C/+80°C	
Protection class in accordance with IEC529, EN60529	IP67	IP67	IP67	IP67	
Enclosure material	PA, black	PA, black	Aluminium	Aluminium	
Connection	3 x 0.05 mm²	M8 x 1	3 x 0.05 mm²	M8 x 1	

Please refer to Accessories for magnets, mounting brackets, cable couplers and sensor tester.

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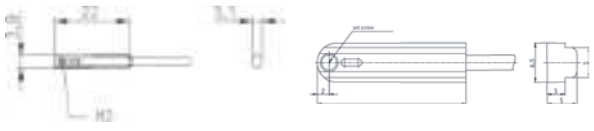
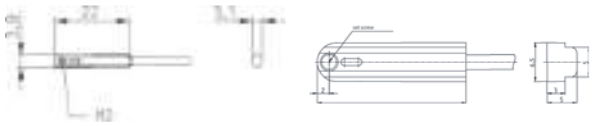
Slot Sensors with Reed Contact

BERNSTEIN

Type	E22		E30		
Operating mode	Reed	Reed	Reed	Reed	
Magnetic sensitivity (mT)	3 mT	3 mT	3 mT	3 mT	
Switching function	NO	NO	NO	NO	
Switching power	10 VA	10 VA	10 VA	10 VA	
Type of connection	Cable 2 m	Connector M8	Cable 2 m	Connector M8	
Special feature					





Type					
	C-slot SMC	**6310281656**	**6310281657**		
	C-slot Festo	**6310281658**	**6310281659**		
	T-slot			**6310299660**	**6310299661**

Technical data

Rated operating voltage	U_B	120 VDC	120 VDC	120 VDC	120 VDC
Performance class (diagram No.)		10 VA	10 VA	10 VA	10 VA
Shock resistance		30 g (11 ms)	30 g (11 ms)	30 g (11 ms)	30 g (11 ms)
Reproducibility		+/- 1 mm	+/- 1 mm	+/- 1 mm	+/- 1 mm
Mechanical service life (switching operations)		3×10^8	3×10^8	3×10^8	3×10^8

Mechanical data

Ambient temperature (min/max)	-25°C/+80°C	-25°C/+80°C	-25°C/+80°C	-25°C/+80°C
Protection class in accordance with IEC529, EN60529	IP67	IP67	IP67	IP67
Enclosure material	PA, black	PA, black	Aluminium	Aluminium
Connection	3 x 0.05 mm^2	M8 x 1	3 x 0.05 mm^2	M8 x 1

You will find detailed data sheets to the products under www.bernstein.eu

Safety Magnetic Controllers

Magnetic controllers for safety functions

In accordance with the Machinery Directive (98/37/EC and 2006/42/EU) all manufactures are obligated to construct machines conforming to health and safety standards. This requirement ensures that machines correspond to the stipulated safety standard, thus avoiding any danger for the operator during operation. When considering machine safety, all machine manufacturers or operators will be confronted with terms such as hazard analysis and hazard assessment. The new Machinery Directive (2006/42/EU) now additionally stipulates the need for risk analysis. It is therefore fitting to take a closer look at these terms: While hazard assessment takes into consideration all hazards that can occur at the machine workplace, hazard analysis performed by the machine manufacturer considers the possible hazards that may emanate from the machine. Against this backdrop, ever increasing significance is being attached to safety technology.

Despite all the safety regulations that are taken into account during the design phase, in accordance with EN 414 (types of hazard) a risk of injury posed by moving parts still exists during operation or maintenance of machines.

The aim is to identify all potential hazards and take appropriate precautions, e.g. by installing suitable safety facilities with the corresponding performance level as defined by EN 13849-1 or EN 61508 or with the corresponding SIL category in accordance with EN 62061.

BERNSTEIN offers safety magnetic controllers certified in accordance with EN ISO 13849-1 and conforming to performance level d for safety applications.

A safety system consists of the safety magnetic controllers and a coded transducer unit. Depending on the type of device, one or two coded transducer units (magnetic switch with corresponding magnet) of type

- MAK-4236-x with TK-42-CD
- MAK-5236-x with TK-52-CD / 2
- MAK-5336-x with TK-43-CD

can be connected to and monitored by the safety magnetic controllers.

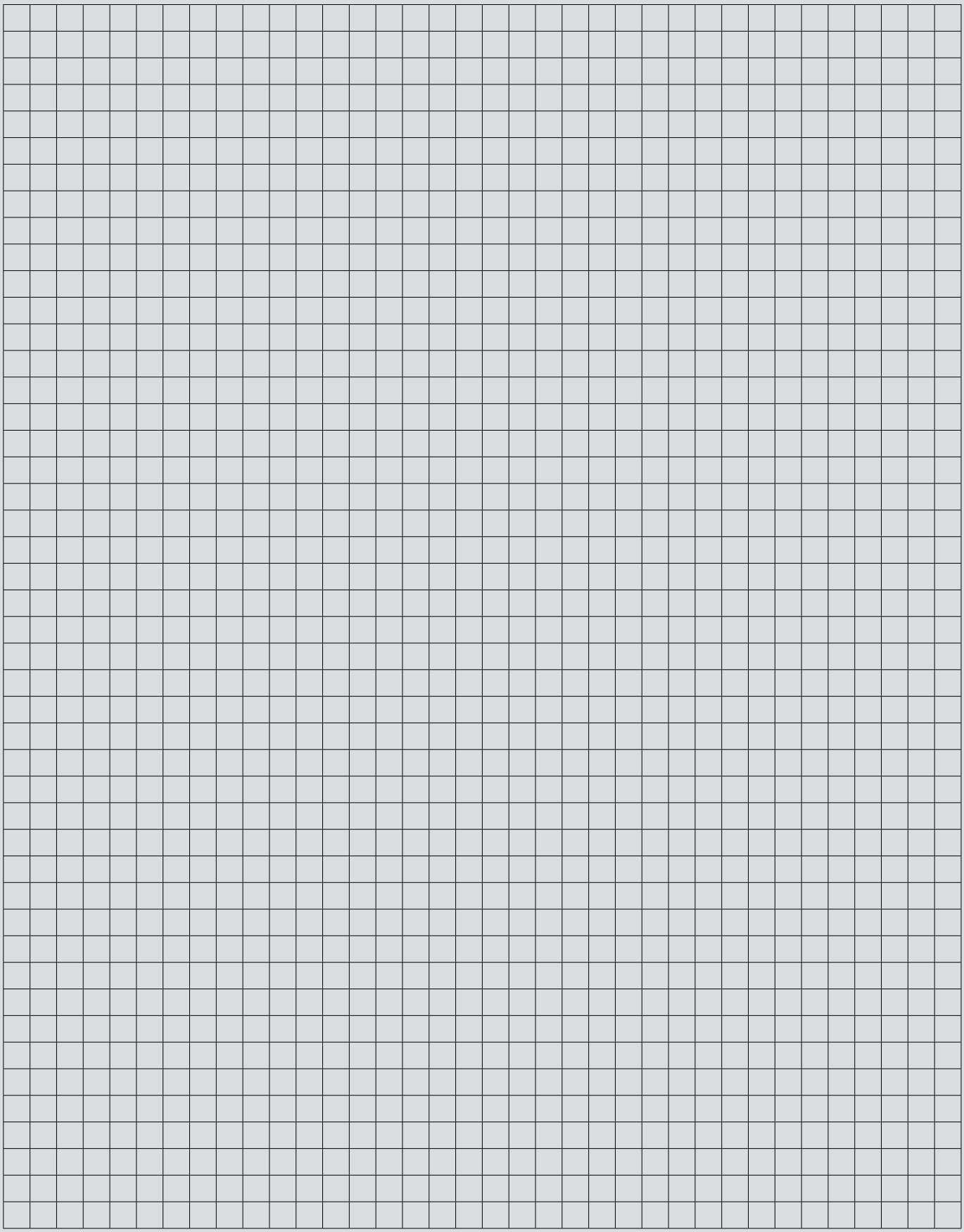
The safety magnetic controllers process the NC or NO contact signals coming from the coded magnetic switch separately, thus achieving a redundant evaluation system. The individual NO contact signals are internally processed in serial while the corresponding NC contact signals are processed in parallel. A switching delay of approx. 0.5 seconds must be taken into account during operation. This delay is the time difference between the NC contact signal and the NO contact signal. On exceeding the delay, the safety magnetic controller signals an error and switches to the "safe state". An LED indicates that the safety magnetic controller is in the "safe state".

When the locking device is closed and the transducer actuated correctly, the output relays pick up, allowing the machine that poses no danger in the form of moving parts to start up via the PLC. The system additionally features a galvanically isolated data output for signalling purposes. This signal can be transferred to a control facility such a PLC or processed for use by an acoustic or visual indicator.

When using positive-action motor circuit breakers, the risk of the contacts welding together can be included in the safety circuit. The safety magnetic controller features a corresponding feedback circuit for this purpose. The feedback circuit must be bypassed if it is not used in the application. The system is reset immediately by opening the locking device or the transducer unit.

The use of positive-action relays and the mutual monitoring of individual control circuits allows safety magnetic controllers to be used in applications that must conform to the safety requirements defined by performance level d in accordance with EN ISO 13849-1.

Notes



Magnetic controllers for safety functions

TÜV certified

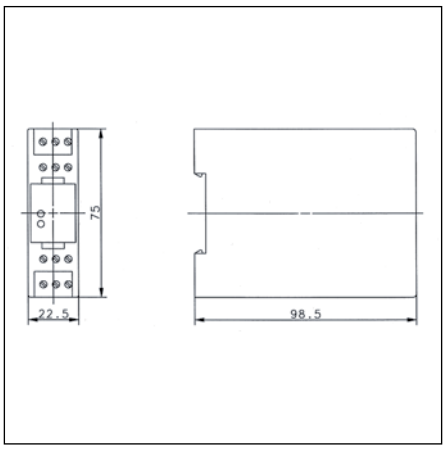
- EN ISO 13849-1 performance level “d“
- EN 61508 and EN 62061 “SIL 3“
- EN 60947-5-2 Single fault security “S“

Coded transducer units

Magnetic switches

Type designation	MÜZ-102/D24-FL-DA	MÜZ-202/D24-FL
Article number	**6392701306**	**6392702307**
Max. number of connectable transducer units	1	2
Safety output, NO contact	●	●
Feedback circuit	●	–
Data output (NC contact)	●	–
Operating voltage		
AC 230 V	–*	–*
AC 24 V	–	–
DC 24 V	●	●
Operating current	60 mA	
Switching capacity, safety output		
Switching voltage max	AC 250 V	AC 250 V
Switching current max	8 A	8 A
Switching power max	1700 VA	1700 VA
LED: Hazard status/switching status	●/–	●/–
LED: Supply voltage/ON	●	–
Relay: Positive-action/standard	●/–	●/–
Ambient conditions		
Temperature range min/max	0 °C/+55 °C	0 °C/+55 °C
	32 °F/+131 °F	32 °F/+131 °F
Protection class (to IEC 529, EN 60529)	IP20	IP20
Enclosure material	PC	PC
Mounting system (DIN 50022)	TS 35	TS 35
Type of connection: Terminal block	max. 2.5 mm²	max. 2.5 mm²
Wiring diagram (Page/Item)	260/7	260/8

All dimensions in mm



3 m PVC cable
Type designation
Article number
6 m PVC cable
Type designation
Article number
9 m PVC cable
Type designation
Article number
Connector (M12/4-pin)
Type designation
Article number
Ambient conditions
Temperature range min/max
Protection class (to IEC 529, EN 60529)
Enclosure material
Sensing distance S on min
S on max
Actuating magnet
Type designation
Article number
Use: safety magnetic controller
Article number

All dimensions in mm

Other types available on request.

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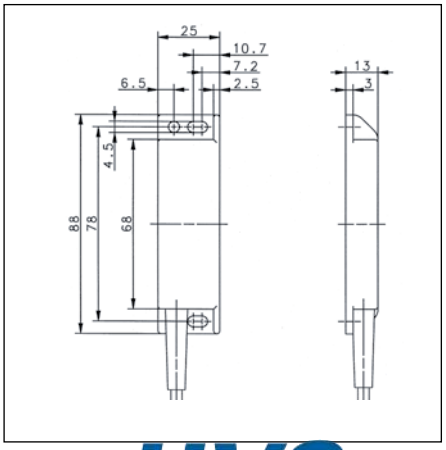
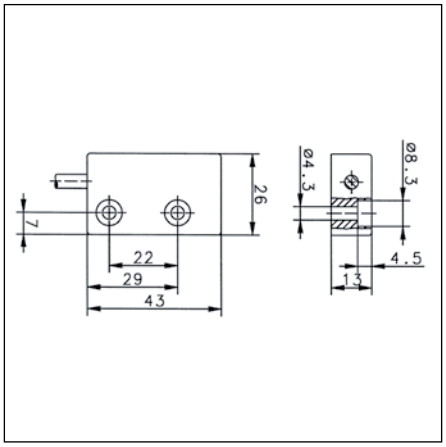
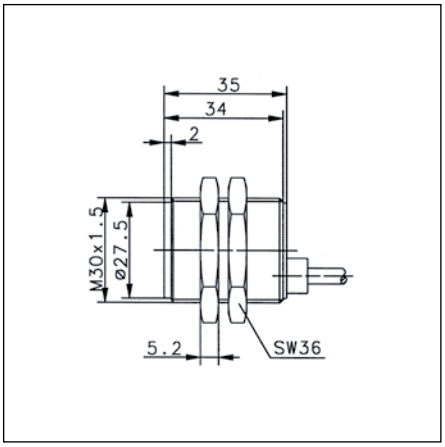
MAK-4236-3	MAK-5236-3	MAK-5336-3
6490642315	**6490652316**	**6490653317**
MAK-4236-6	MAK-5236-6	MAK-5336-6
6490642302	**6490652307**	**6490653311**
MAK-4236-9	MAK-5236-9	MAK-5336-9
6490642303	**6490652308**	**6490653312**
MAK-4236-STK	MAK-5236-STK	MAK-5336-STK
6490642305	**6490652309**	**6490653313**
-5 °C/+70 °C	-5 °C/+70 °C	-5 °C/+70 °C
+23 °F/+158 °F	+23 °F/+158 °F	+23 °F/+158 °F
IP67	IP67	IP67
PA 6.6	PBT	PA 6.6
4 mm	3 mm	3 mm
14 mm	14 mm	14 mm
TK-42-CD	TK-52-CD/2	TK-43-CD
6402042310	**6402052311**	**6402043312**
6392701306	**6392701306**	**6392701306**
6392702307	**6392702307**	**6392702307**







Ultrasonic Sensors

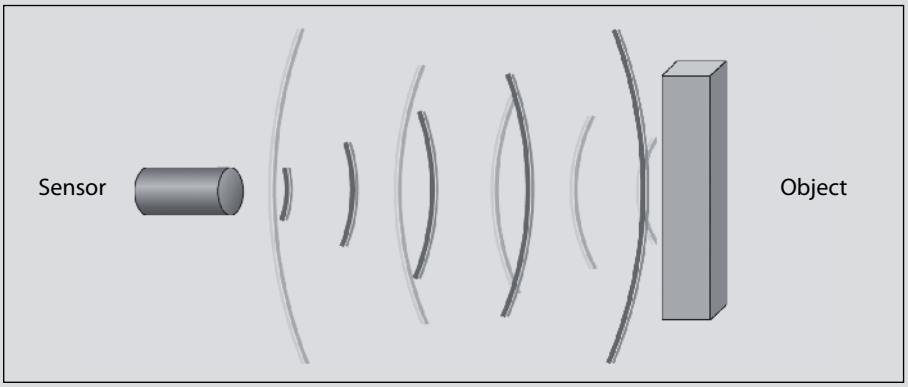
Ultrasonic sensors are used to precisely detect the position of objects of any material and colour, irrespective of external light levels even in harsh industrial environments. The sensors are characterised by high sound intensity that makes it possible to detect even the smallest of objects.

In addition to their high precision, outstanding repeatability and high degree of linearity their strengths also include their suitability for use in universal applications, irrespective of light conditions, as well as colour and material of the objects and substances to be detected.

Ultrasonic sensors produce accurate results even in connection with highly transparent objects such as film or glass surfaces and are completely unaffected by normal levels of soiling on the sensor surface. High performance under the most difficult operating conditions, even in suspended particle or water vapour environments, is a characteristic feature as is their ruggedness under harsh operating conditions.

Thanks to their outstanding properties ultrasonic sensors are used in a diverse range of applications and sectors of industry.

Measuring principle



The sensor emits a sound pulse that is reflected from the object to be detected. The sensor reads in the reflected pulse and the distance to the object is determined by means of a runtime measurement routine.

Advantages

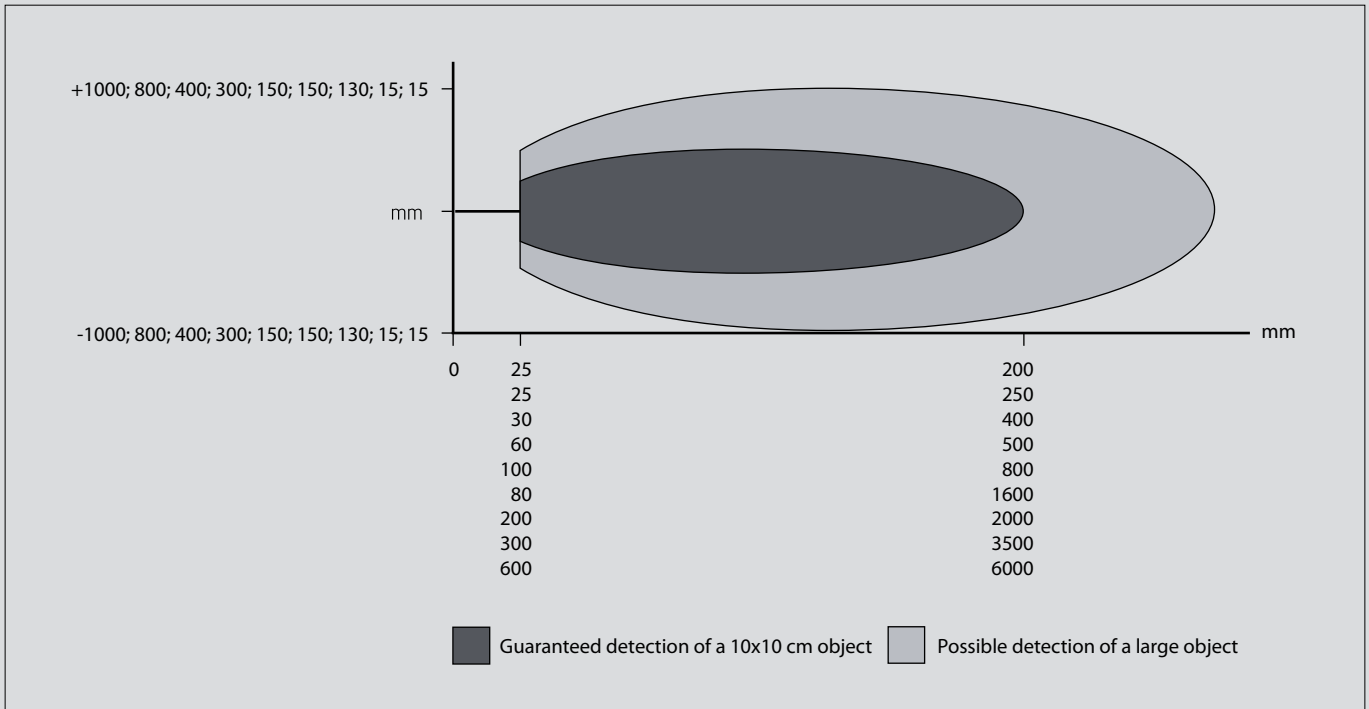
- Protection class IP67
- Large detection range of up to 6000 mm (depending on type)
- High linearity
- High repeat accuracy
- Narrow sound beam of 8°
- Adaptive 0-10 V voltage or 4-20 mA current output (analogue sensors)
- Two adaptive switching outputs, can be used individually or combined in connection with switching sensors (depending on type)

Technical data*

- One analogue 0 ...10 V/4 ... 20 mA output or two switching outputs.
- Rated operating voltage range 12 V – 30 V DC
- Enclosure: PBT/ GF30
- Ambient temperature -15 °C…70 °C
- Repeat accuracy ±0.2 % ±2 mm
- Hysteresis 1 %

* Please refer to the following catalogue pages and the corresponding datasheets for technical information on the individual products

Detection range:



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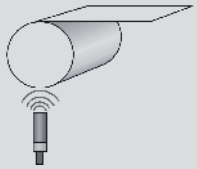
Application examples:

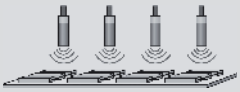


Wind-on and wind-off control
Detection of the diameter of coils in the paper, plastics and textile as well as metal working industries.

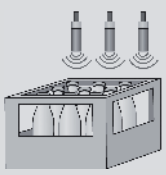
Sag control
Detection of sag loop for controlling material tension or controlling quantity of material for the downstream production process.

Level measurement
Level measurement of liquids of bulk materials in containers and silos.

Thickness measurement
Thickness measurement of objects.



Completeness check
For checking completeness of objects in containers.

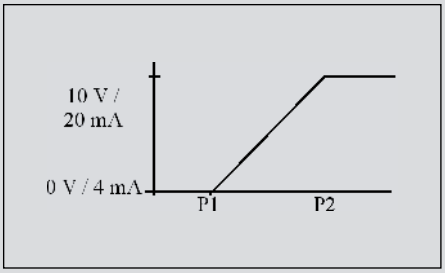


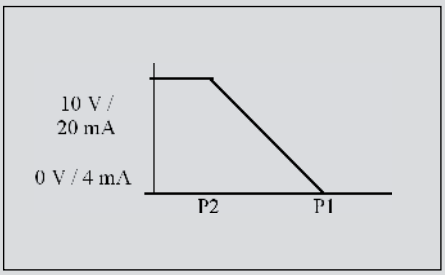
Completeness check of bottles in crates
For checking the presence and height of bottles in crates.

Teach-in procedure

Analogue sensors

Any interval within the measuring range can be selected for the analogue output by means of TeleTeach. The slope of the characteristic curve – positive or negative – can, of course, be set to any value.





The points P1 and P2 determine the position of the analogue characteristic curve: P1 defines the point at which the characteristic curve assumes the value 0 V/4 mA, P2 defines the 10 V/20 mA point. In the case of a "positive characteristic curve", the sensor is programmed in such a way that the sensor-P1 distance is smaller than the sensor-P2 distance. Correspondingly, sensor-P2 distance is smaller than sensor-P1 distance for a "negative characteristic curve".

Switching sensors

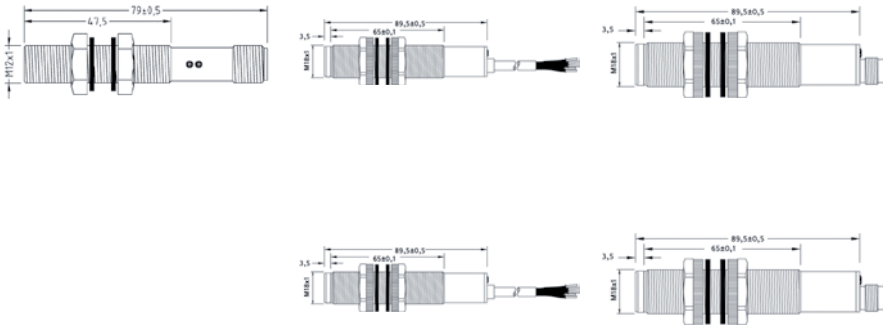
The two switching outputs are taught-in accurate to the millimetre via a teach-in input. Independent of each other, they can be optionally adapted with 1 % hysteresis as complementary windows (NO/NC) or as complementary switching outputs (NO/NC) with hysteresis adjustable to any value. P1 and P2 define the position of the switching points. The switching point has NO characteristic if the corresponding LED is on while teaching in the switching point and conversely, it has NC characteristic when the LED is off. Two LEDs indicate the switching status of the sensor.

Standards and approvals:

EN 60947-5-2

Ultrasonic Sensors (Type M12, M18)

Type			M12	M18		M18	
Detection range			25-200 mm	30-400 mm	30-400 mm	30-400 mm	30-400 mm
Output			1 x NO/NC	2 x NO/NC	Analogue	2 x NO/NC	Analogue
Type of connection			Connector M12	Cable 2 m	Cable 2 m	Connector M12	Connector M12
Special feature							



PNP	DC	NO/NC	**6712101001**	**6711102005**		**6712102005**	
NPN	DC	NO/NC	**6712201001**	**6711202005**		**6712202005**	
Analogue	DC	0-10 V			**6711402005**		**6712402005**
		4-20 mA			**6711302005**		**6712302005**

Technical data

Rated operating voltage	U_B	12-30 VDC	12-30 VDC	15-30 VDC	12-30 VDC	15-30 VDC
Rated operating current	I_B	100 mA	500 mA	-	500 mA	-
Switching frequency (max)	F	20 Hz	15 Hz	-	15 Hz	-
Resolution		-	-	0.125 mm	-	0.125 mm
Linearity error		-	-	< 0.5 %	-	< 0.5 %
Response times		-	-	60 ms	-	60 ms
Repeatability		±0.3 %	±0.2 % ±1 mm	±0.2 % ±1 mm	±0.2 % ±1 mm	±0.2 % ±1 mm
Sound beam		12°	8°	8°	8°	8°
Short circuit-protection		Cyclic	Cyclic	Cyclic	Cyclic	Cyclic
Function/operating voltage indicator		LED/LED	LED/LED	LED/LED	LED/LED	LED/LED

Mechanical data

Ambient temperature (min/max)		-20°C/+70°C	-15°C/+70°C	-15°C/+70°C	-15°C/+70°C	-15°C/+70°C
Protection class in accordance with IEC529, EN60529		IP67	IP67	IP67	IP67	IP67
Enclosure material		Stainless steel	PBT/GF30	PBT/GF30	PBT/GF30	PBT/GF30
Connection		M12 x 1	5 x 0.14 mm²	4 x 0.14 mm²	M12 x 1	M12 x 1

Please refer to Accessories for cable couplers and sensor tester.

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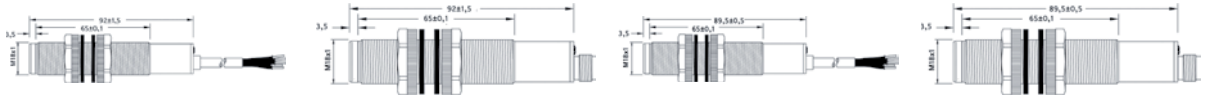
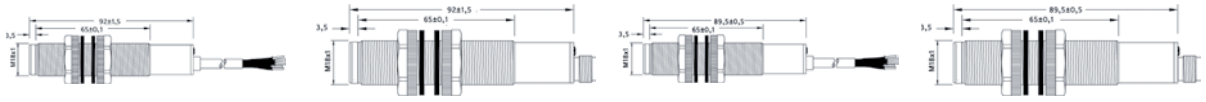
M18		M18		M18		M18		
60-500 mm	60-500 mm	60-500 mm	60-500 mm	80-1600 mm	80-1600 mm	80-1600 mm	80-1600 mm	
2 x NO/NC	Analogue	2 x NO/NC	Analogue	2 x NO/NC	Analogue	2 x NO/NC	Analogue	
Cable 2 m	Cable 2 m	Connector M12	Connector M12	Cable 2 m	Cable 2 m	Connector M12	Connector M12	





6711102004		6712102004		6711102002		6712102002		
6711202004		6712202004		6711202002		6712202002		
	6711402004		6712402004		6711402002		6712402002	
	6711302004		6712302004		6711302002		6712302002	

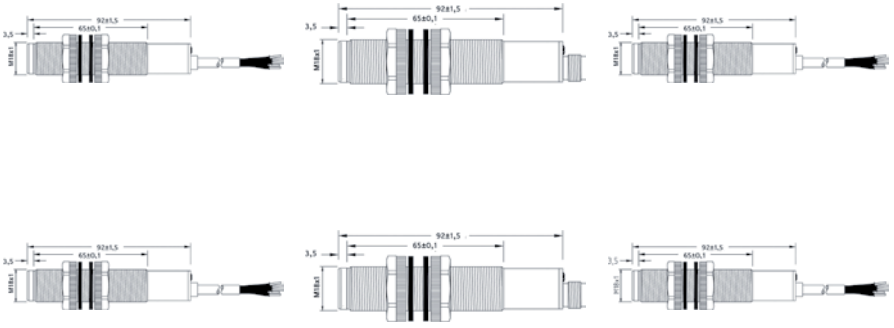
12-30 VDC	15-30 VDC	12-30 VDC	15-30 VDC	12-30 VDC	15-30 VDC	12-30 VDC	15-30 VDC	
500 mA	-	500 mA	-	500 mA	-	500 mA	-	
10 Hz	-	10 Hz	-	6 Hz	-	6 Hz	-	
-	0.25 mm	-	0.25 mm	-	1 mm	-	1 mm	
-	< 0.5 %	-	< 0.5 %	-	< 0.5 %	-	< 0.5 %	
-	100 ms	-	100 ms	-	140 ms	-	140 ms	
±0.2 % ±1 mm	±0.2 % ±1 mm	±0.2 % ±1 mm	±0.2 % ±1 mm	±0.2 % ±2 mm	±0.2 % ±2 mm	±0.2 % ±2 mm	±0.2 % ±2 mm	
8°	8°	8°	8°	8°	8°	8°	8°	
Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	
LED/LED	LED/LED	LED/LED	LED/LED	LED/LED	LED/LED	LED/LED	LED/LED	

-15°C/+70°C	-15°C/+70°C	-15°C/+70°C	-15°C/+70°C	-15°C/+70°C	-15°C/+70°C	-15°C/+70°C	-15°C/+70°C	
IP67	IP67	IP67	IP67	IP67	IP67	IP67	IP67	
PBT/GF30	PBT/GF30	PBT/GF30	PBT/GF30	PBT/GF30	PBT/GF30	PBT/GF30	PBT/GF30	
5 x 0.14 mm^2	4 x 0.14 mm^2	M12 x 1	M12 x 1	5 x 0.14 mm^2	4 x 0.14 mm^2	M12 x 1	M12 x 1	

You will find detailed data sheets to the products under www.bernstein.eu

Ultrasonic Sensors (Type M18, M30)

Type			M18		M18		M18	
Detection range			100-800 mm	100-800 mm	100-800 mm	100-800 mm	200-2000 mm	200-2000 mm
Output			2 x NO/NC	Analogue	2 x NO/NC	Analogue	2 x NO/NC	Analogue
Type of connection			Cable 2 m	Cable 2 m	Connector M12	Connector M12	Cable 2 m	Cable 2 m
Special feature								



PNP	DC	NO/NC	**6711102003**		**6712102003**		**6711102001**	
NPN	DC	NO/NC	**6711202003**		**6712202003**		**6711202001**	
Analogue	DC	0-10 V		**6711402003**		**6712402003**		**6711402001**
		4-20 mA		**6711302003**		**6712302003**		**6711302001**

Technical data

Rated operating voltage	U_B	12-30 VDC	15-30 VDC	12-30 VDC	15-30 VDC	12-30 VDC	15-30 VDC
Rated operating current	I_B	500 mA	-	500 mA	-	500 mA	-
Switching frequency (max)	F	10 Hz	-	10 Hz	-	5 Hz	-
Resolution		-	0.25 mm	-	0.25 mm	-	1 mm
Linearity error		-	< 0.5 %	-	< 0.5 %	-	< 0.5 %
Response times		-	100 ms	-	100 ms	-	200 ms
Repeatability		±0.2 % ±1 mm	±0.2 % ±1 mm	±0.2 % ±1 mm	±0.2 % ±1 mm	±0.2 % ±2 mm	±0.2 % ±2 mm
Sound beam		8°	8°	8°	8°	8°	8°
Short circuit-protection		Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic
Function/operating voltage indicator		LED/LED	LED/LED	LED/LED	LED/LED	LED/LED	LED/LED

Mechanical data

Ambient temperature (min/max)	-15°C/+70°C	-15°C/+70°C	-15°C/+70°C	-15°C/+70°C	-15°C/+70°C	-15°C/+70°C
Protection class in accordance with IEC529, EN60529	IP67	IP67	IP67	IP67	IP67	IP67
Enclosure material	PBT/GF30	PBT/GF30	PBT/GF30	PBT/GF30	PBT/GF30	PBT/GF30
Connection	5 x 0.14 mm^2	4 x 0.14 mm^2	M12 x 1	M12 x 1	5 x 0.14 mm^2	4 x 0.14 mm^2

Please refer to Accessories for cable couplers and sensor tester.

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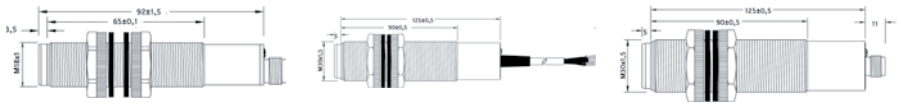
M18		M30		M30			
200-2000 mm	200-2000 mm	300-3500 mm	300-3500 mm	300-3500 mm	300-3500 mm		
2 x NO/NC	Analogue	2 x NO/NC	Analogue	2 x NO/NC	Analogue		
Connector M12	Connector M12	Cable 2 m	Cable 2 m	Connector M12	Connector M12		



6712102001		**6711103001**		**6712103001**			
6712202001		**6711203001**		**6712203001**			
	6712402001		**6711403001**		**6712401001**		
	6712302001		**6711303001**		**6712303001**		

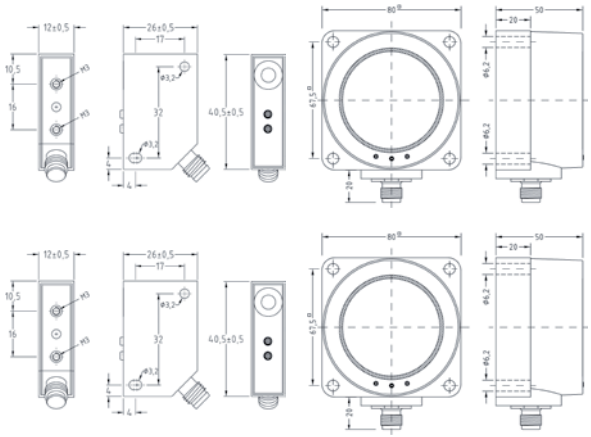
12-30 VDC	15-30 VDC	12-30 VDC	15-30 VDC	12-30 VDC	15-30 VDC		
500 mA	-	500 mA	-	500 mA	-		
5 Hz	-	2.5 Hz	-	2.5 Hz	-		
-	1 mm	-	1 mm	-	1 mm		
-	< 0.5 %	-	< 0.5 %	-	< 0.5 %		
-	200 ms	-	400 ms	-	400 ms		
±0.2 % ±2 mm	±0.2 % ±2 mm	±0.2 % ±2 mm	±0.2 % ±2 mm	±0.2 % ±2 mm	±0.2 % ±2 mm		
8°	8°	8°	8°	8°	8°		
Cyclic	Cyclic	Cyclic	Cyclic	Cyclic	Cyclic		
LED/LED	LED/LED	LED/LED	LED/LED	LED/LED	LED/LED		

-15°C/+70°C	-15°C/+70°C	-15°C/+70°C	-15°C/+70°C	-15°C/+70°C	-15°C/+70°C		
IP67	IP67	IP67	IP67	IP67	IP67		
PBT/GF30	PBT/GF30	PBT/GF30	PBT/GF30	PBT/GF30	PBT/GF30		
M12 x 1	M12 x 1	5 x 0.14 mm^2	4 x 0.14 mm^2	M12 x 1	M12 x 1		

You will find detailed data sheets to the products under www.bernstein.eu

Ultrasonic Sensors (Type 40 x 26 mm, 80 x 80 mm)

Type			40.5x26x12mm		80x80x50mm		
Detection range			25-250 mm	25-250 mm	600-6000 mm	600-6000 mm	
Output			1 x NO/NC	Analogue	2 x NO/NC	Analogue	
Type of connection			Connector M8	Connector M8	Connector M12	Connector M12	
Special feature							



PNP	DC	NO/NC	**6713111001**		**6712112001**		
NPN	DC	NO/NC	**6713211001**		**6712212001**		
Analogue	DC	0-10 V		**6713411001**		**6712412001**	
		4-20 mA				**6712312001**	

Technical data

Rated operating voltage	U_B	10-30 VDC	12-30 VDC	12-30 VDC	15-30 VDC	
Rated operating current	I_B	100 mA	-	500 mA	-	
Switching frequency (max)	F	20 Hz	-	1 Hz	-	
Resolution		-	0.125 mm	-	1.5 mm	
Linearity error		-	< 0.3 %	-	< 0.5 %	
Response times		-	40 ms	-	700 ms	
Repeatability		±0.2 % ±0.2 mm	±0.2 % ±0.2 mm	±0.2 % ±2 mm	±0.2 % ±2 mm	
Sound beam		8°	8°	8°	8°	
Short circuit-protection		Cyclic	Cyclic	Cyclic	Cyclic	
Function/operating voltage indicator		LED/LED	LED/LED	LED/LED	LED/LED	

Mechanical data

Ambient temperature (min/max)	-10°C/+70°C	-10°C/+70°C	-15°C/+70°C	-15°C/+70°C	
Protection class in accordance with IEC529, EN60529	IP67	IP67	IP65	IP65	
Enclosure material	PBT/GF30	PBT/GF30	PBT/GF30	PBT/GF30	
Connection	M8 x 1 ①	M8 x 1 ①	M12 x 1	M12 x 1	

Please refer to Accessories for cable couplers and sensor tester.

① Cable coupler included in delivery specification

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Notes

Design and Function

BERNSTEIN float switches are designed as contactless magnetic switches. They are used to control level in containers/tanks with non-flowing and/or flowing liquids such as water, oils, caustic solutions etc.

Float switches consist of a connection head, immersion tube with one to four magnetic sensor elements and a float. Versions with straight or elbow immersion tube are available.

Rising or falling liquid levels carry the float equipped with a ring magnet into the detection zone of a magnetic sensor element, where the magnetic field of the float is evaluated and a switching pulse generated.

The range of BERNSTEIN float switches extends from miniature float switches through to heavy-duty, pressure-proof versions.

The combination options between various enclosure materials, floats and connection heads make it possible to create the optimum configuration for virtually any application.

Based on a comprehensive modular system of adjustable float switches, the product range offers an enormous problem solution potential. It allows the user to adjust the required switching points to individual applications, thus creating a customised product ideally adapted to his specific operating conditions.

BERNSTEIN additionally offers many other specific solutions that cannot all be illustrated in one catalogue. For more demanding applications it is therefore recommended to contact BERNSTEIN using the fax Enquire/ Order form at the end of this section.

BERNSTEIN miniature float switches

To ensure smooth running operating processes, in many devices and industrial systems it is necessary to monitor product level in the most confined spaces.

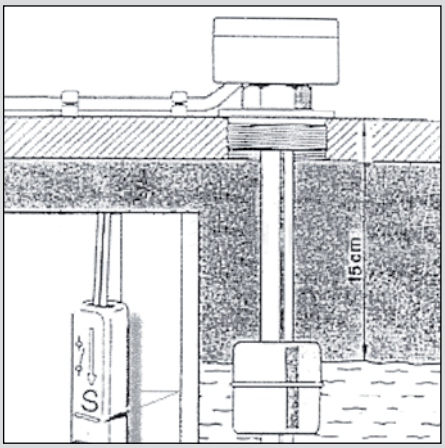
These miniature float switches have been specially developed for small tanks/reservoirs as used in the automotive industry, drinks vending machines, air conditioning systems etc.

The NC/NO contact switching function in many miniature switches can be selected by simply turning the float by 180°.

This type of miniature float switch is also available with individual lengths of immersion tube.

BERNSTEIN adjustable float switches

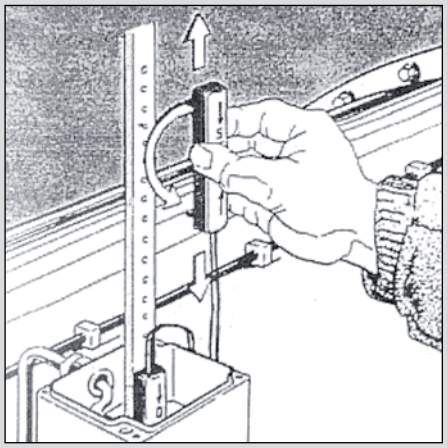
Up to four encapsulated magnetic sensor elements can be placed in any position at 10 mm intervals in the immersion tube of BERNSTEIN adjustable float switches.



Thanks to their extremely user-friendly design, each of these universally used devices can replace several conventional switches.

Instead of keeping a large assortment of different switches in stock, the user requires only one single device.

The NC or NO contact switching function can be easily adapted to given operating conditions.



All versions are available as standard in four lengths (250, 500, 750 and 1000 mm). Other lengths are possible on request.

BERNSTEIN standard float switches

For over 25 years it has been hard to imagine fluid level regulation, control and monitoring systems without BERNSTEIN standard float switches. In addition to being used to simply provide a signal when a liquid level drops below or exceeds a defined value, they also ideally serve as signal generators in automatically operating filling systems.

With a wide range of different floats, enclosure materials and connection heads to choose from, the optimum float switch can be configured for virtually any application. Lengths of up to 2 m are possible. Versions are available with an elbow immersion tube in the connection head or even with a specially developed switching device.

Terminology and Basic Theory

Connection cable
Temperature resistant up to +70 °C, special versions up to +150 °C also available. Switches with cables come in the standard length of 1 m, other lengths are also possible on request.

Radian (y)
The radian is the length measured from the contact surface of the connection head to the neutral phase of the vertical immersion tube.

Chemical resistance
See "Chemical Resistance" table (Page 133).

Pressure
Up to 25 bar depending on type of float.

Disruptive breakdown voltage
Each float switch undergoes a high voltage test in accordance with DIN VDE 0160.

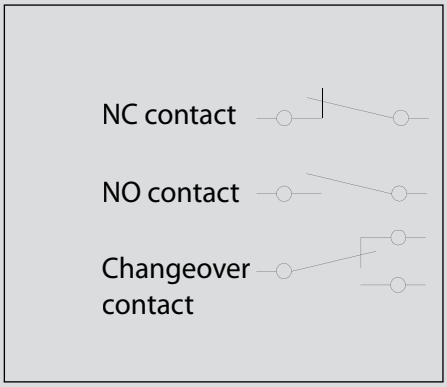
Maximum making current
From 0.5 A – 5 A depending on type of sensor used.

Immersion depth (h1)
Designates how far the float is immersed in the medium. This parameter is dependent on the density of the liquid as well as the size and weight of the float. The values listed in the catalogue refer to a density of 1.

End length (e)
From 36 mm to 50 mm depending on the type of float.

Electrical service life
To maintain a long service life of the float switches, it is important to ensure the maximum supply voltages and switching currents are not exceeded.

Spark quenching
On request, all BERNSTEIN float switches can be equipped with protection circuitry which prevents wear caused by switching sparks when switching inductive or capacitive loads (please refer to protective circuitry for reed contacts).



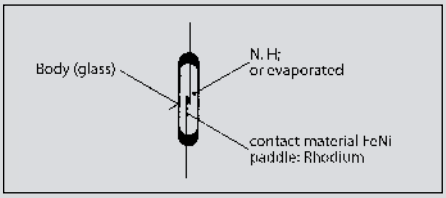
Contact function

Performance diagram
The performance diagram shows the switching capacity as a function of the switching current (please refer to Page 71).

Miniature float switches
Favourable design and compact dimensions allow these float switches to be used in smallest containers.

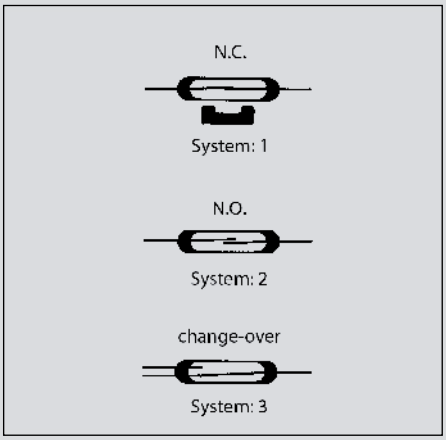
Mechanical wear
Thanks to the contactless operating principle, mechanical wear is not an issue.

Reed contact
A reed contact is a magnetically or electromagnetically operated switch. The pair of ferromagnetic contact studs are housed in a hermetically sealed glass tube filled with inert gas. Under the influence of a magnetic field, the contact paddles assume opposing polarity (north and south pole) and close when a sufficient force is applied. This procedure can be repeated millions of times even at extremely short time intervals.



Design of a reed contact

BERNSTEIN float switches are equipped with barium ferrite magnets that are located in the float. Opening and closing of the contact studs is determined by the magnet in the float correspondingly approaching or moving away. The delivery range includes normally-closed contacts, normally-open contacts and changeover contacts.



Versions of reed contacts

Switching distances (o/m/u)
The switching distances are defined with

- **o** = Top
- **m** = Middle
- **u** = Bottom

(please refer to Float Switch Enquiry and Order form on Page 134).

Switch length (x)
This is the length from the connection head up to the lower end of the tube.
x (max.) = 2000 mm

Maximum switching power
3 VA – 250 VA depending on type of reed contact (please refer to Page 130).

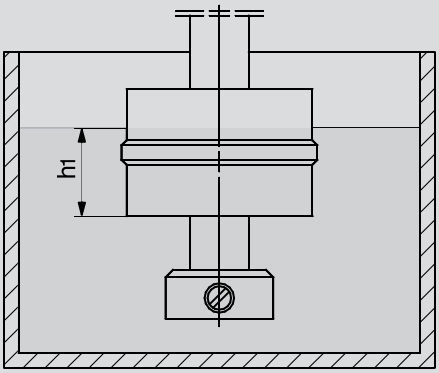
Immersion tube
Available in PVC, MS63, stainless 1.4571.

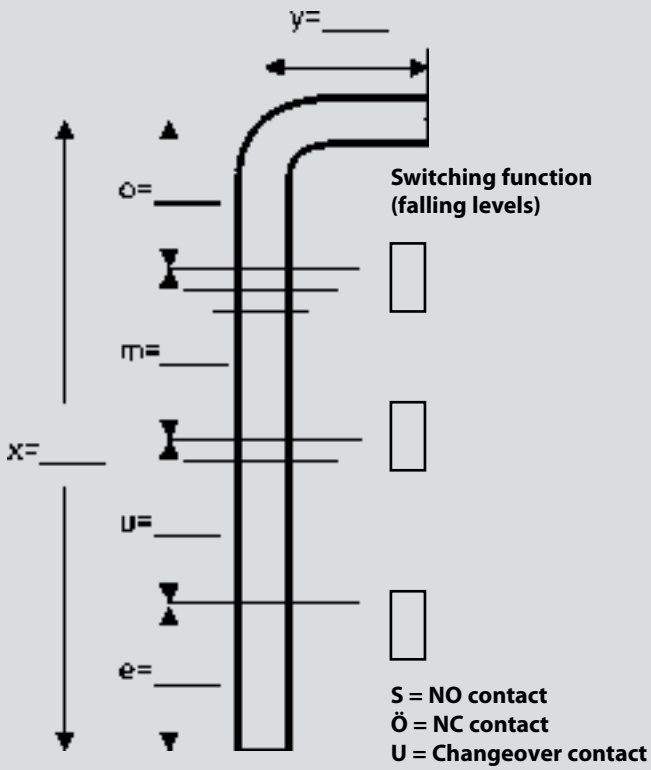
Maximum switching voltage
100 V – 250 V depending on type of reed contact (please refer to Page 130).

Switching point
The float magnet initiates a switching signal by magnetising the contact studs of the reed contact. Three switching points per switch are possible (more on request).

Switching path
This corresponds to the path, on which the contact remains active while the float is moving in the same direction.

Protection classes
Corresponding to their ID code, the switches are dustproof and water-proof in accordance with IP65 or IP67 (EN 60529, IEC 529).





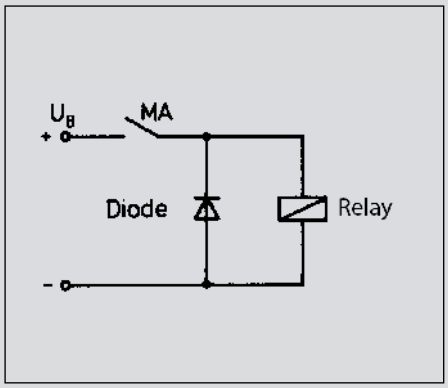
Guidelines for reed contact protection

The values for current, voltage and power specified in the catalogue apply only to purely resistive loads. Very often, however, these loads are exposed to inductive or capacitive components. In these cases it is advisable to protect the reed contacts against voltage and current peaks. Whilst it is not possible to recommend a safe contact protection concept that applies to all load ranges (each individual case will require its own evaluation), we would like to present general guidelines on how reed contacts may be connected to different loads in order to avoid premature failure.

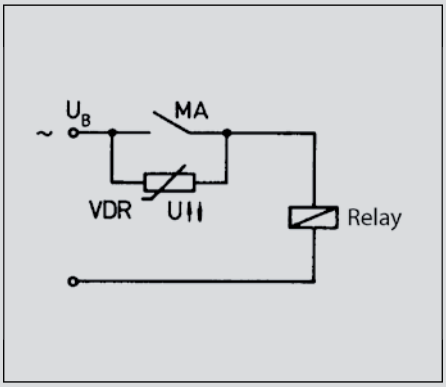
1. Inductive loads

In DC applications, contact protection is relatively easy to realise with the aid of a free-wheeling diode connected in parallel to the load. The diode polarity must be selected so that it blocks when normal operating voltage is applied but will short-circuit the voltage induced after the switch is opened (voltage peaks can significantly exceed the operating voltage).

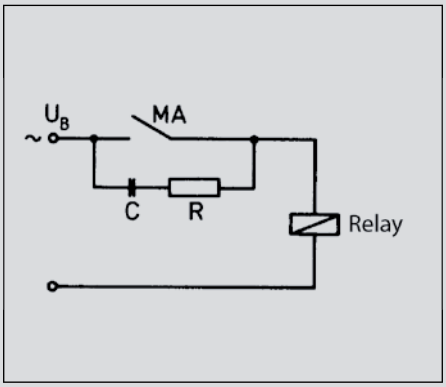
This can amount to a multiple of the operating voltage and initially cause a switching spark between the opening contact studs.



Suppression of voltage peaks with a free-wheeling diode



1) Voltage peaks induced by switching off inductive loads are suppressed by connecting a voltage-dependent resistor (VDR) in parallel to the reed contact.



2) In AC voltage applications effective protection is achieved with a combination of a resistor and a capacitor (RC element).

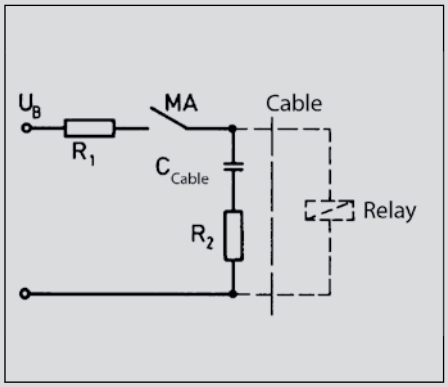
Generally, the RC element is connected in parallel to the contact and therefore in series to the load (vice versa is also possible).

2. Capacitive loads

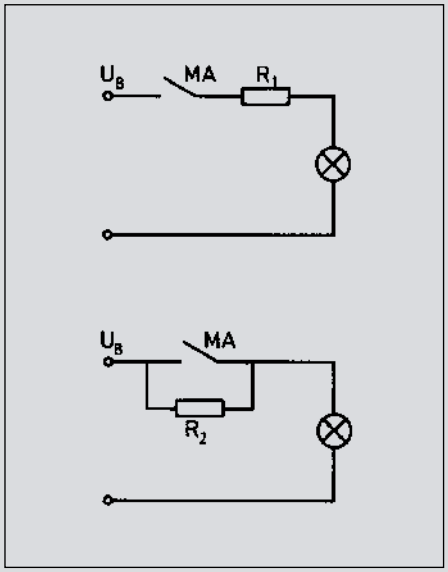
In contrast to inductive loads, increase making currents can occur in connection with capacitive loads and lamp loads that can damage and even weld contacts closed. When capacitors are switched (e.g. cable capacitance) a very high peak current occurs with its intensity depending on the capacitance and length of the cable leading to the switch.

A resistor connected in series to the contact will reduce this current. The size of the resistor is determined by the characteristics of the corresponding electric circuit.
It should, however, be as large as possible to reduce the current to a permissible value, thus ensuring reliable contact protection.

Contact protection with resistors for limiting current:



1) Capacitive load



2) Lam load

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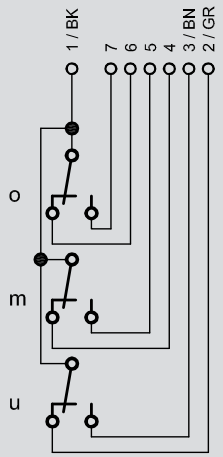
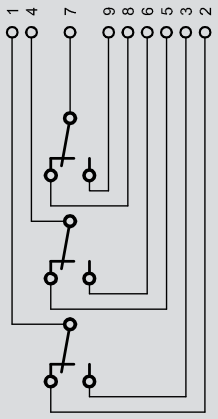
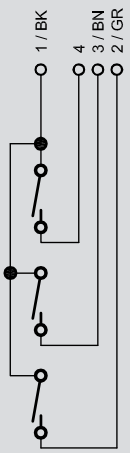
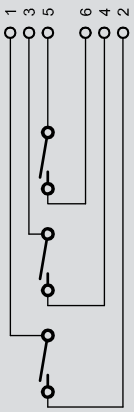
Wiring diagram

Switching points	Changeover contact		NC or NO contact	
	Up to 3 switching points	Separate contacts	Up to 3 switching points	Separate contacts
3				
2				
1				

The letters o, m and u identify the position of the contact.
o = top, m = middle, u = bottom

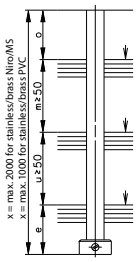
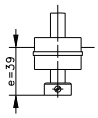
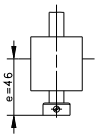
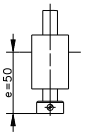
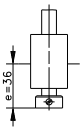
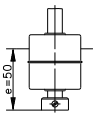
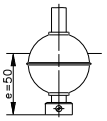
Standard float switches

Ordering example:
See Page 118

Position	1	2	3	4
Version	Magnetic float switch	Output type reed contact	Float switch – float combination	
Type	**M**	**A**	☐	**-**

Min./max. dimensions

Float switch – float combination

Switching distance for falling levels	Float material: Connection head material	Float material: Float switch material	POM ø 40 x 27	PVC ø 42 x 44	PP ø 30 x 44	NBR ø 30 x 44	1.4571 ø 45 x 47	1.4571 ø 52
								
Half cable gland R3/8" 	**1.4571**	**1.4571**	**A**	**V**	**T**	**R**	**N**	**E**
	MS 59	**MS63**	**M**	**L**	**C**	**S**	**P**	**F**
	PVC	**PVC**	**K**	**D**	**I**	**U**	**—**	**—**
Cable gland PG9 	**1.4571**	**1.4571**	**A**	**V**	**T**	**R**	**N**	**E**
	MS 58	**MS63**	**M**	**L**	**C**	**S**	**P**	**F**
	PVC	**PVC**	**K**	**D**	**I**	**U**	**—**	**—**
ø 75 flange with connector 	**PC**	**1.4571**	**A**	**V**	**T**	**R**	**N**	**E**
	PC	**MS63**	**M**	**L**	**C**	**S**	**P**	**F**
	PC	**PVC**	**K**	**D**	**I**	**U**	**—**	**—**

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5	6	7	8	9	10	11	12	13
General design	Number of switching points	Switching function		Switching power	Connection head	Standard range		Special features (see Page 119)
7	□	□		□	□	S		□

		Number of switching points	Switching function	Switching power		Connection head	
1.4571 ø 62	1.4571 ø 84	1 Switching point 2 Switching points 3 Switching points	1 NC contact 2 NO contact 3 Changeover contact 4 Mixed version (CO, NC, NO)	max. 0.5 A - 30 VA - 250 V	max. 1 A - 60 VA - 250 V min. switching power = 3 VA	ID letter for connection head	**Straight type** Type in illustration in 1.4571 material. Slight dimensional variations may occur in PVC and brass versions.
B	G	1/2/3	1/2/3/4	K	L	A	
O	H	1/2/3	1/2/3/4	K	L	A	
—	—	1/2/3	1/2/3/4	K	L	A	

ID letter for connection head	**Elbow version** Type in illustration in 1.4571 material. Slight dimensional variations may occur in PVC versions.
C	
—	
C	

B	G	1/2/3	1/2/3/4	K	L	V	
O	H	1/2/3	1/2/3/4	K	L	V	
—	—	1/2/3	1/2/3/4	K	L	V	

H	
—	
H	

B	G	1/2/—	1/2/3/4	K	L	T	
O	H	1/2/—	1/2/3/4	K	L	T	
—	—	1/2/—	1/2/3/4	K	L	T	

W	
—	
W	

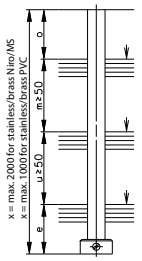
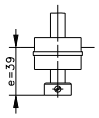
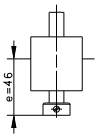
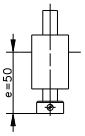
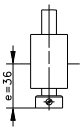
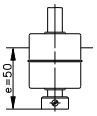
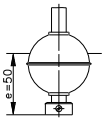
Standard float switches

Ordering example:
See Page 118

Position	1	2	3	4
Version	Magnetic float switch	Output type reed contact	Float switch – float combination	
Type	**M**	**A**	☐	**-**

Min./max. dimensions

Float switch – float combination

Switching distance for falling levels	Float material: Connection head material	Float material: Float switch material	POM ø 40 x 27	PVC ø 42 x 44	PP ø 30 x 44	NBR ø 30 x 44	1.4571 ø 45 x 47	1.4571 ø 52
								
Oval flange with connector 	**PC**	**1.4571**	**A**	**V**	**T**	**R**	**N**	**E**
	PC	**MS63**	**M**	**L**	**C**	**S**	**P**	**F**
	PC	**PVC**	**K**	**D**	**I**	**U**	**—**	**—**
Flange enclosure ø 78 	**G-Al Si 12**	**1.4571**	**A**	**V**	**T**	**R**	**N**	**E**
	G-Al Si 12	**MS63**	**M**	**L**	**C**	**S**	**P**	**F**
	G-Al Si 12	**PVC**	**K**	**D**	**I**	**U**	**—**	**—**
Flange enclosure ø 120 	**G-Al Si 12**	**1.4571**	**A**	**V**	**T**	**R**	**N**	**E**
	G-Al Si 12	**MS63**	**M**	**L**	**C**	**S**	**P**	**F**
	G-Al Si 12	**PVC**	**K**	**D**	**I**	**U**	**—**	**—**

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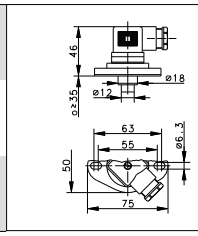
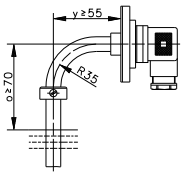
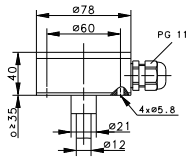
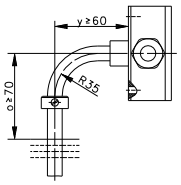
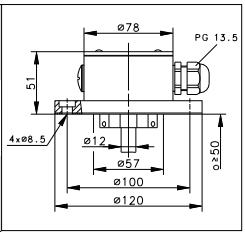
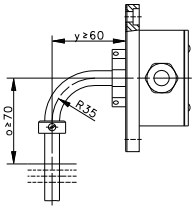
5	6	7	8	9	10	11	12	13
General design	Number of switching points	Switching function		Switching power	Connection head	Standard range		Special features (see Page 119)
7	☐	☐		☐	☐	**S**		☐

		Number of switching points	Switching function	Switching power		Connection head			
1.4571 ø 62	**1.4571 ø 84**	**1 Switching point 2 Switching points 3 Switching points**	**1 NC contact 2 NO contact 3 Changeover contact 4 Mixed version (CO, NC, NO)**	**max. 0.5 A - 30 VA - 250 V**	**max. 1 A - 60 VA - 250 V min. switching power = 3 VA**	**ID letter for connection head**	**Straight type** Type in illustration in 1.4571 material. Slight dimensional variations may occur in PVC and brass versions.	**ID letter for connection head**	**Elbow version** Type in illustration in 1.4571 material. Slight dimensional variations may occur in PVC versions.
B	**G**	**1/2**	**1/2/3/4**	**K**	**L**	**TO**		**TW**	
O	**H**	**1/2**	**1/2/3/4**	**K**	**L**	**TO**		**—**	
—	**—**	**1/2**	**1/2/3/4**	**K**	**L**	**TO**		**TW**	
B	**G**	**1/2/3**	**1/2/3/4**	**K**	**L**	**S**		**B**	
O	**H**	**1/2/3**	**1/2/3/4**	**K**	**L**	**S**		**—**	
—	**—**	**1/2/3**	**1/2/3/4**	**K**	**L**	**S**		**B**	
B	**G**	**1/2/3**	**1/2/3/4**	**K**	**L**	**FL 120**		**WFL 120**	
O	**H**	**1/2/3**	**1/2/3/4**	**K**	**L**	**FL 120**		**—**	
—	**—**	**1/2/3**	**1/2/3/4**	**K**	**L**	**FL 120**		**WFL 120**	

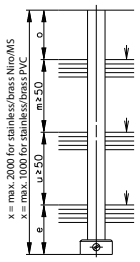
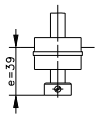
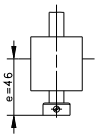
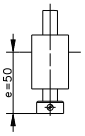
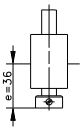
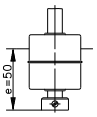
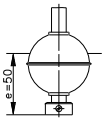
Standard float switches

Ordering example:
See Page 118

Position	1	2	3	4
Version	Magnetic float switch	Output type reed contact	Float switch – float combination	
Type	**M**	**A**	☐	**-**

Min./max. dimensions

Float switch – float combination

Switching distance for falling levels	Float material: Connection head material	Float material: Float switch material	POM ø 40 x 27	PVC ø 42 x 44	PP ø 30 x 44	NBR ø 30 x 44	1.4571 ø 45 x 47	1.4571 ø 52
								
Flange enclosure DN50 ø 165 	**1.4571/ G-Al Si 12**	**1.4571**	**A**	**V**	**T**	**R**	**N**	**E**
	PVC/ G-Al Si 12	**PVC**	**K**	**D**	**I**	**U**	**—**	**—**
Flange enclosure DN65 ø 185 	**1.4571/ G-Al Si 12**	**1.4571**	**A**	**V**	**T**	**R**	**N**	**E**
	PVC/ G-Al Si 12	**PVC**	**K**	**D**	**I**	**U**	**—**	**—**
Tank cable gland R1,5" 	**G-Al Si 12**	**1.4571**	**A**	**V**	**T**	**R**	**N**	**E**
	PVC/ Polyester	**PVC**	**K**	**D**	**I**	**U**	**—**	**—**

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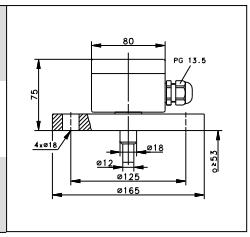
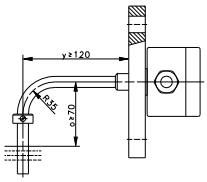
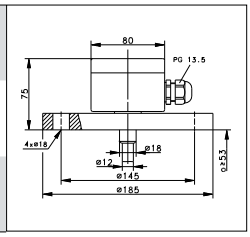
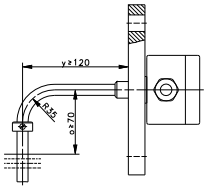
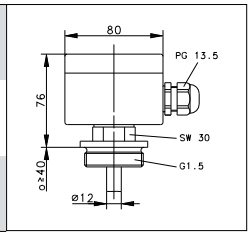
5	6	7	8	9	10	11	12	13
General design	Number of switching points	Switching function		Switching power	Connection head	Standard range		Special features (see Page 119)
7	☐	☐		☐	☐	S		☐

		Number of switching points	Switching function	Switching power		Connection head	
1.4571 ø 62	1.4571 ø 84	1 Switching point 2 Switching points 3 Switching points	1 NC contact 2 NO contact 3 Changeover contact 4 Mixed version (CO, NC, NO)	max. 0.5 A - 30 VA - 250 V	max. 1 A - 60 VA - 250 V min. switching power = 3 VA	ID letter for connection head	**Straight type** Type in illustration in 1.4571 material. Slight dimensional variations may occur in PVC and brass versions.

								ID letter for connection head	**Elbow version** Type in illustration in 1.4571 material. Slight dimensional variations may occur in PVC versions.
B	G	1/2/3	1/2/3/4	K	L	DN 50		WDN 50	
—	—	1/2/3	1/2/3/4	K	L	DN 50		—	
								WDN 50	
B	G	1/2/3	1/2/3/4	K	L	DN 65		WDN 65	
—	—	1/2/3	1/2/3/4	K	L	DN 65		—	
								WDN 65	
B	G	1/2/3	1/2/3/4	K	L	R 1,5			
—	—	1/2/3	1/2/3/4	K	L	R 1,5			

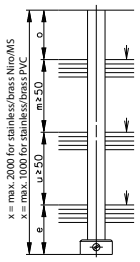
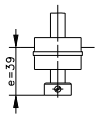
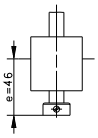
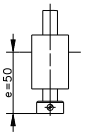
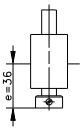
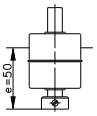
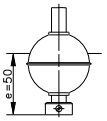
Standard float switches

Ordering example: ◯
MAK-721 KR2S

Position	1	2	3	4
Version	Magnetic float switch	Output type reed contact	Float switch – float combination	
Type	**M**	**A**	**Ⓚ**	**-**

Min./max. dimensions

Float switch – float combination

Switching distance for falling levels	Float material: Connection head material	Float material: Float switch material	POM ø 40 x 27	PVC ø 42 x 44	PP ø 30 x 44	NBR ø 30 x 44	1.4571 ø 45 x 47	1.4571 ø 52
								
Tank cable gland R2” 	1.4571/ G-Al Si 12	1.4571	A	V	T	R	N	E
	PVC/ Polyester	PVC	Ⓚ	D	I	U	—	—

With specification o = _____ ; u = _____ (see Order form on Page 134)

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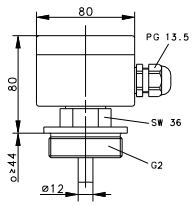
5	6	7	8	9	10	11	12	13
General design	Number of switching points	Switching function		Switching power	Connection head	Standard range		Special features (see below)
7	②	①		Ⓚ	R2	S		

		Number of switching points	Switching function	Switching power		Connection head	
1.4571 ø 62	1.4571 ø 84	1 Switching point 2 Switching points 3 Switching points	1 NC contact 2 NO contact 3 Changeover contact 4 Mixed version (CO, NC, NO)	max. 0.5 A - 30 VA - 250 V	max. 1 A - 60 VA - 250 V min. switching power = 3 VA	ID letter for connection head	**Straight type** Type in illustration in 1.4571 material. Slight dimensional variations may occur in PVC and brass versions.
B	G	1 /②/ 3	①/ 2 / 3 / 4	Ⓚ	L	R2	
—	—	1/2/3	1/2/3/4	K	L	R2	

Special features

- Temperature monitoring PT100 (P1)/ PT1000 (P10)
- Bi-metal switch

We can produce tailor-made designs for specific applications to suit individual customer requirements.

Miniature float switches

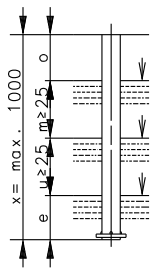
Ordering example:
See Page 118

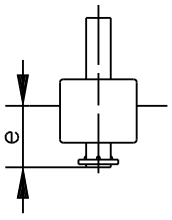
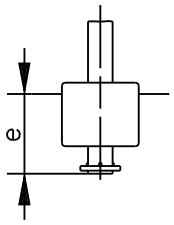
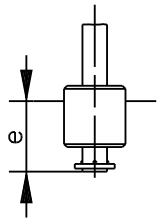
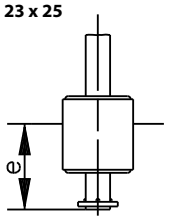
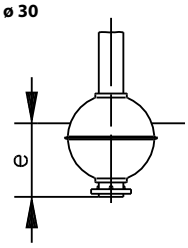
Position	1	2	3
Version	Miniature float switches	Float	
Type	**MS**	▯	-

Min./max. dimensions

Float

Switching distance for falling levels



PP ø 25 x 21	PVC ø 25 x 21	NBR ø 20 x 20	NBR ø 23 x 25	1.4571 ø 30
				
e = 20 (NC contact) e = 17 (NO contact)	e = 26 (NC contact) e = 23 (NO contact)	e = 23 (NC contact) e = 23 (NO contact)	e = 28 (NC contact) e = 22 (NO contact)	e = 24 (NC contact) e = 23 (NO contact)

Connection thread R1/8"

K1	K2	K3	K4	N1
K1	K2	K3	K4	N1
K1	—	K3	K4	—
—	K2	K3	K4	—

Connection thread R3/8"

K1	K2	K3	K4	N1
K1	K2	K3	K4	N1
K1	—	K3	K4	—
—	K2	K3	K4	—

Connection thread R3/8" with connector

K1	K2	K3	K4	N1
K1	K2	K3	K4	N1
K1	—	K3	K4	—
—	K2	K3	K4	—

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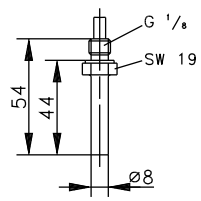
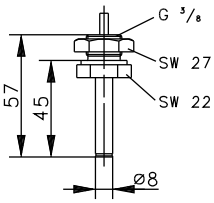
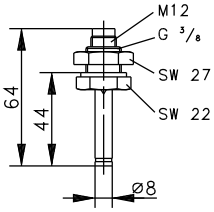
4	5	6	7	8	9	10
Enclosure material		Connection head		Switching function		Special features (see Page 119)
□	-	□	-	□		□

Enclosure material ⬇ | **Connection head** ⬇ | **Switching function** ⬇

Ni (stainless) = 1.4571 MS (brass) = MS63 PP = Polypropylene PVC = Polyvinyl chloride	Version	S = NO contact (250 V– 0.5 A– 10 VA) max. = 10 VA	O = NC contact (100 V; 0.3 A; 3 VA)	U = Changeover contact (100 V; 0.3 A; 3 VA)	X = max. overall length (mm)	Max. number of switching points	Cable length (m)
Ni	**R 1/8** 	S	O	U	1000	3	1
MS		S	O	U	1000	3	1
PP		S	O	U	40,5	1	1
PVC		S	O	U	500	3	1
Ni	**R 3/8** 	S	O	U	1000	3	1
MS		S	O	U	1000	3	1
PP		S	O	U	40,5	1	1
PVC		S	O	U	500	3	1
Ni	**R 3/8ST** 	S	O	U	1000	3	—
MS		S	O	U	1000	3	—
PP		PP			40,5	1	—
PVC		PVC			500	3	—

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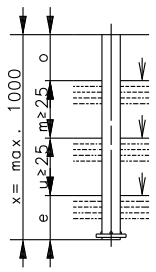
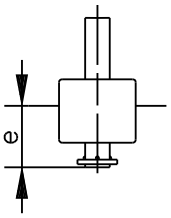
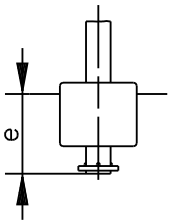
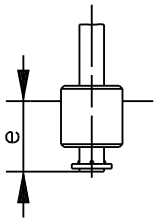
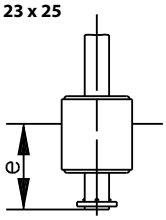
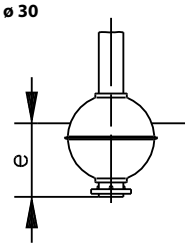
Miniature float switches

Ordering example: See Page 118	Position	1	2	3
	Version	Miniature float switches	Float	
	Type	**MS**	☐	-

Min./max. dimensions

Float

Switching distance for falling levels	PP ø 25 x 21	PVC ø 25 x 21	NBR ø 20 x 20	NBR ø 23 x 25	1.4571 ø 30
					
	e = 20 (NC contact) e = 17 (NO contact)	e = 26 (NC contact) e = 23 (NO contact)	e = 23 (NC contact) e = 23 (NO contact)	e = 28 (NC contact) e = 22 (NO contact)	e = 24 (NC contact) e = 23 (NO contact)
Connection thread PG7 	K1	K2	K3	K4	N1
	K1	K2	K3	K4	N1
	K1	—	K3	K4	—
	—	K2	K3	K4	—
MSKS-PA-FL36-OS 	–	–	–	–	–

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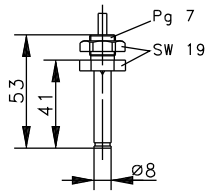
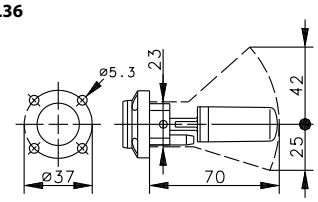
4	5	6	7	8	9	10
Enclosure material		Connection head		Switching function		Special features (see Page 119)
□	-	□	-	□		□

Enclosure material ⬇ | **Connection head** ⬇ | **Switching function** ⬇

Ni (stainless) = 1.4571 MS (brass) = MS63 PP = Polypropylene PVC = Polyvinyl chloride	Version	S = NO contact (250 V– 0.5 A– 10 VA) max. = 10 VA	O = NC contact (100 V; 0.3 A; 3 VA)	U = Changeover contact (100 V; 0.3 A; 3 VA)	X = max. overall length (mm)	Max. number of switching points	Cable length (m)
Ni	PG7 	S	O	U	1000	3	1
MS		S	O	U	1000	3	1
PP		S	O	U	40,5	1	1
PVC		S	O	U	500	3	1
PA12 (Enclosure & float)	FL36 	S (with 1 m cable)	O	—	For lateral mounting		

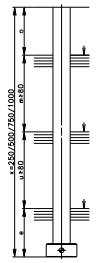
Adjustable float switches

Ordering example: See Page 118	Position	1	2	3	4
	Version	Magnetic float switch	Output type reed contact	Float switch – float combination	
	Type	**M**	**A**	☐	**-**

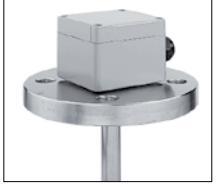
Min./max. dimensions

Float switch – float combination

Switching distance for falling levels



Float material

Connection head material	Float switch material	1.4571 ø 52 x 55	PVC ø 52 x 55
Flange enclosure DN50 ø 165 			
1.4571/ G-Al Si 12	1.4571	N	V
PVC/ Polyester	PVC	—	D
Flange enclosure DN65 ø 185 			
1.4571/ G-Al Si 12	1.4571	N	V
PVC/ Polyester	PVC	—	D
Tank cable gland R1,5" 			
G-Al Si 12	1.4571	N	V
PVC/ Polyester	PVC	—	D

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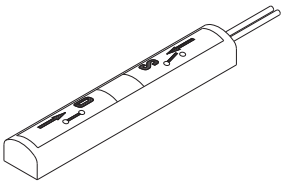
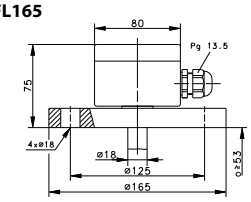
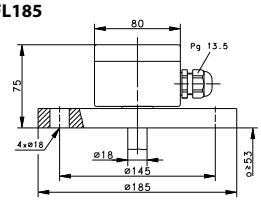
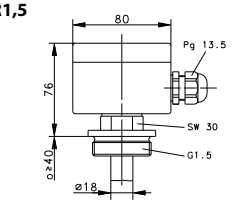
5	6	7	8
Adjustable	Connection head		Length
VST	□	/	□

Important! Please order switching devices without switching modules separately!

Connection head	Length	Switching module	Max. number of switching modules/switching devices

Version	Other lengths (mm) on request	 NC/NO contact Bistable	Changeover contact	NC/NO contact Lengths 250 mm	500 mm	750 mm	1000 mm	Changeover contact Lengths 250 mm	500 mm	750 mm	1000 mm
FL165 	250 / 500 / 750 / 1000	4910007069	4916007075	2	3	4	4	2	3	3	3
	250 / 500 / 750 / 1000	4910007069	4916007075	2	3	4	4	2	3	3	3
	250 / 500 / 750 / 1000	4910007069	4916007075	2	3	4	4	2	3	3	3
FL185 	250 / 500 / 750 / 1000	4910007069	4916007075	2	3	4	4	2	3	3	3
	250 / 500 / 750 / 1000	4910007069	4916007075	2	3	4	4	2	3	3	3
	250 / 500 / 750 / 1000	4910007069	4916007075	2	3	4	4	2	3	3	3
R1,5 	250 / 500 / 750 / 1000	4910007069	4916007075	2	3	4	4	2	3	3	3
	250 / 500 / 750 / 1000	4910007069	4916007075	2	3	4	4	2	3	3	3
	250 / 500 / 750 / 1000	4910007069	4916007075	2	3	4	4	2	3	3	3

Adjustable float switches

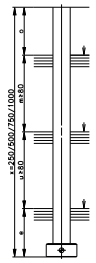
Ordering example:
See Page 118

Position	1	2	3	4
Version	Magnetic float switch	Output type reed contact	Float switch – float combination	
Type	**M**	**A**	☐	**-**

Min./max. dimensions

Float switch – float combination

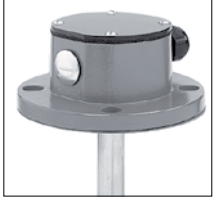
Switching distance for falling levels



Float material		1.4571 ø 52 x 55	PVC ø 52 x 55
Connection head material	Float switch material		
1.4571/ G-Al Si 12	1.4571	N	V
PVC/ Polyester	PVC	—	D

Tank cable gland R2"

Flange enclosure ø 120



G-Al Si 12	1.4571	N	V
G-Al Si 12	PVC	—	D

Flange enclosure ø 120 with gush water protection

G-Al Si 12	1.4571	—	—
G-Al Si 12	PVC	—	—

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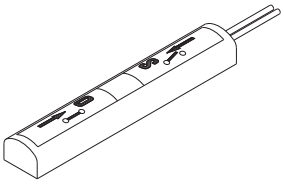
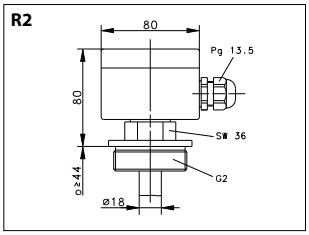
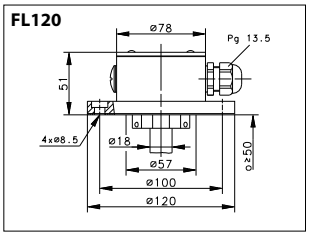
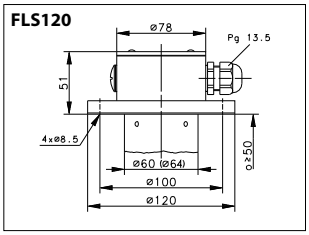
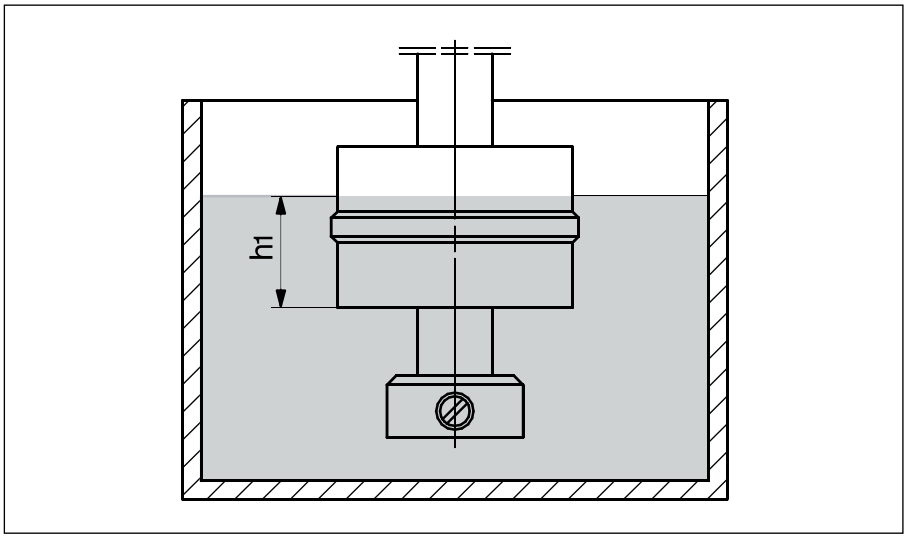
5	6	7	8
Adjustable	Connection head		Length
VST	□	/	□

Important! Please order switching devices without switching modules separately!

Connection head	Length	Switching module	Max. number of switching modules/switching devices

Version	Other lengths (mm) on request	 NC/NO contact Bistable	Changeover contact	NC/NO contact Lengths 250 mm	500 mm	750 mm	1000 mm	Changeover contact Lengths 250 mm	500 mm	750 mm	1000 mm
R2 	250 / 500 / 750 / 1000	4910007069	4916007075	2	3	4	4	2	3	3	3
	250 / 500 / 750 / 1000	4910007069	4916007075	2	3	4	4	2	3	3	3
	250 / 500 / 750 / 1000	4910007069	4916007075	2	3	4	4	2	3	3	3
FL120 	250 / 500 / 750 / 1000	4910007069	4916007075	2	3	4	4	2	3	3	3
	250 / 500 / 750 / 1000	4910007069	4916007075	2	3	4	4	2	3	3	3
	250 / 500 / 750 / 1000	4910007069	4916007075	2	3	4	4	2	3	3	3
FLS120 	250 / 500 / 750 / 1000	4910007069	4916007075	2	3	4	4	2	3	3	3
	250 / 500 / 750 / 1000	4910007069	4916007075	2	3	4	4	2	3	3	3
	250 / 500 / 750 / 1000	4910007069	4916007075	2	3	4	4	2	3	3	3

Floats
Standard Float Switches



ID letter	A/M/K
Dimensions (mm)	Ø 40 x 27
Material	POM

Immersion depth h1 (mm)	Density y (g/cm³)
18	1
20	0.9
22,5	0.8
26	0.7

Art. No.: 4945206009

ID letter	T/C/I
Dimensions (mm)	Ø 30 x 44
Material	PP

Immersion depth h1 (mm)	Density y (g/cm³)
27,5	1
30,5	0.9
34,5	0.8
39,5	0.7

Art. No.: 4945203019

ID letter	R/S/U
Dimensions (mm)	Ø 30 x 44
Material	NBR

Immersion depth h1 (mm)	Density y (g/cm³)
19,5	1
22	0.9
24,5	0.8
28	0.7

Art. No.: 4945203031

ID letter	V/L/D
Dimensions (mm)	Ø 42 x 44
Material	PVC

Immersion depth h1 (mm)	Density y (g/cm³)
25	1
27,5	0.9
30,5	0.8
35	0.7

Art. No.: 4945215029

ID letter	N/P
Dimensions (mm)	Ø 44 x 45
Material	1.4571

Immersion depth h1 (mm)	Density y (g/cm³)
32	1
35	0.9
39	0.8
45	0.7

Art. No.: 4942104002

ID letter	E/F
Dimensions (mm)	Ø 52
Material	1.4571

Immersion depth h1 (mm)	Density y (g/cm³)
32	1
34	0.9
37	0.8
43	0.7

Art. No.: 4942105003

ID letter	B/O
Dimensions (mm)	Ø 62
Material	1.4571

Immersion depth h1 (mm)	Density y (g/cm³)
33	1
35	0.9
38	0.8
42	0.7

Art. No.: 4942102001

ID letter	G/H
Dimensions (mm)	Ø 84
Material	1.4571

Immersion depth h1 (mm)	Density y (g/cm³)
33	1
35	0.9
38	0.8
42	0.7

Art. No.: 4942101004

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Floats
Adjustable Float Switches

ID letter	V/L/D
Dimensions (mm)	Ø 52 x 55
Material	PVC

Immersion depth h1 (mm)	Density y (g/cm³)
29	1
32	0.9
36	0.8
42	0.7

Art. No.: 4945216032

ID letter	N/P
Dimensions (mm)	Ø 52 x 55
Material	1.4571

Immersion depth h1 (mm)	Density y (g/cm³)
33	1
36	0.9
40,5	0.8
46	0.7

Art. No.: 4942299023

Floats
Miniature Float Switches

ID letter	K1
Dimensions (mm)	Ø 25 x 21
Material	PP

Immersion depth h1 (mm)	Density y (g/cm³)
12	1
13	0.9
14,5	0.8
16,5	0.7

Art. No.: 4945207021

ID letter	K2
Dimensions (mm)	Ø 25 x 21
Material	PVC

Immersion depth h1 (mm)	Density y (g/cm³)
15	1
16	0.9
18,5	0.8
–	0.7

Art. No.: 4945207022

ID letter	K4
Dimensions (mm)	Ø 23 x 25
Material	NBR

Immersion depth h1 (mm)	Density y (g/cm³)
16	1
17,5	0.9
19,5	0.8
22	0.7

Art. No.: 4945211024

ID letter	K3
Dimensions (mm)	Ø 20 x 20
Material	NBR

Immersion depth h1 (mm)	Density y (g/cm³)
15	1
17	0.9
–	0.8
–	0.7

Art. No.: 4945210020

ID letter	N1
Dimensions (mm)	Ø 30
Material	1.4571

Immersion depth h1 (mm)	Density y (g/cm³)
18	1
19	0.9
21	0.8
24	0.7

Art. No.: 4942109018

Standard
Float switches

Electrical data							
Switching function	**Changeover**/NC/NO contacts			**Changeover**/NC/NO contacts			
Contact ID letter	**K**			**L (min. Switching power 3 VA)**			
Switching voltage (max)	250 V AC/DC			250 V AC/DC			
Switching current (max)	0.5 A			1 A			
Switching power (max)	30 VA			60 VA			
Mechanical data							
Container connection options	Flange enclosure RD 120 mm			Flange enclosure RD 120 mm			
	Flange enclosure RD 77 mm			Flange enclosure RD 77 mm			
	Flange enclosure RD 165 mm			Flange enclosure RD 165 mm			
	Flange enclosure RD 185 mm			Flange enclosure RD 185 mm			
	Cable gland PG9			Cable gland PG9			
	Cable gland R3/8"			Cable gland R3/8"			
	Cable gland R1/5" with connector DIN 43650			Cable gland R1/5" with connector DIN 43650			
	Oval flange 75 x 50 mm with connector DIN 43650			Oval flange 75 x 50 mm with connector DIN 43650			
Float switch material	Stainless steel 1.4571			Stainless steel 1.4571			
	Brass MS63			Brass MS63			
	PVC			PVC			
Float variants	A/M/K	Cylinder float	RD 40 x 27 mm (POM)	A/M/K	Cylinder float	RD 40 x 27 mm (POM)	
	T/C/I	Cylinder float	RD 30 x 44 mm (PP)	T/C/I	Cylinder float	RD 30 x 44 mm (PP)	
	V/D	Cylinder float	RD 42 x 44 mm (NBR)	V/D	Cylinder float	RD 42 x 44 mm (NBR)	
	R/S	Cylinder float	RD 30 x 44 mm (NBR)	R/S	Cylinder float	RD 30 x 44 mm (NBR)	
	N/P	Cylinder float	RD 44 x 45 mm (stainless steel)	N/P	Cylinder float	RD 44 x 45 mm (stainless steel)	
	E/F	Ball float	RD 52 mm (stainless steel)	E/F	Ball float	RD 52 mm (stainless steel)	
	B/O	Ball float	RD 62 mm (stainless steel)	B/O	Ball float	RD 62 mm (stainless steel)	
	G/H	Ball float	RD 84 mm (stainless steel)	G/H	Ball float	RD 84 mm (stainless steel)	
Ambient conditions							
Protection class (DIN 40050)	IP65 (up to IP68 on request)			IP65 (up to IP68 on request)			
Temperature range	-5 °C to +70 °C (from -30 °C to +150 °C on request)			-5 °C to +70 °C (from -30 °C to +150 °C on request)			
Pressure	5 bar (up to 25 bar on request)			5 bar (up to 25 bar on request)			

Miniature Float Switches

Electrical data						
Switching function	**Changeover**/NC contacts			**Changeover**/NC/NO contacts		
Contact ID letter	**B**			**X**		
Switching voltage (max)	250 V AC/DC			100 V AC/DC		
Switching current (max)	0.5 A			0.3 A		
Switching power (max)	10 VA			3 VA		
Mechanical data						
Container connection options	Cable gland PG7			Cable gland PG7		
	Cable gland R1/8"			Cable gland R1/8"		
	Cable gland R3/8"			Cable gland R3/8"		
	Cable gland R3/8" with connector			Cable gland R3/8" with connector		
Float switch material	Stainless steel 1.4571			Stainless steel 1.4571		
	PP			PP		
	PVC			PVC		
	Brass MS63			Brass MS63		
Float variants	K1	Cylinder float	RD 25 x 20 mm (PP)	K1	Cylinder float	RD 25 x 20 mm (PP)
	K2	Cylinder float	RD 25 x 20 mm (PVC)	K2	Cylinder float	RD 25 x 20 mm (PVC)
	K3	Cylinder float	RD 20 x 20 mm (NBR)	K3	Cylinder float	RD 20 x 20 mm (NBR)
	K4	Cylinder float	RD 23 x 25 mm (NBR)	K4	Cylinder float	RD 23 x 25 mm (NBR)
	N1	Ball float	RD 30 mm (stainless steel)	N1	Ball float	RD 30 mm (stainless steel)
Ambient conditions						
Protection class (DIN 40050)	IP65 (up to IP68 on request)			IP65 (up to IP68 on request)		
Temperature range	-5 °C to +70 °C (from -30 °C to +150 °C on request)			-5 °C to +70 °C (from -30 °C to +150 °C on request)		
Pressure	5 bar (up to 15 bar on request)			5 bar (up to 15 bar on request)		

Adjustable Float Switches

Electrical data		
Contact ID letter	**P**	**L**
Switching module, type designation	REEDK. KPL. F. MA	REEDK. KPL. F. MA
Article number	**4910007069**	**4910007075**
Switching function	NC/NO contact (bi)	Changeover contact (bi)
Switching voltage (max)	250 V AC/DC	250 V AC/DC
Switching current (max)	5 A	1 A
Switching power (max)	250 VA	60 VA
Mechanical data		
Container connection options	Flange DN 50 (PVC/stainless steel)	Flange DN 50 (PVC/stainless steel)
	Flange DN 65 (PVC/stainless steel)	Flange DN 65 (PVC/stainless steel)
	Cable gland R1.5" (PVC/stainless steel)	Cable gland R1.5" (PVC/stainless steel)
	Cable gland R2" (PVC/stainless steel)	Cable gland R2" (PVC/stainless steel)
	Flange enclosure RD 120 mm	Flange enclosure RD 120 mm
	(also available with gush water tube)	(also available with gush water tube)
Float switch material	Stainless steel 1.4571	Stainless steel 1.4571
	Brass MS63	Brass MS63
	PVC	PVC
Float variants	N/P Cylinder float RD 52 x 55 mm (stainless steel)	N/P Cylinder float RD 52 x 55 mm (stainless steel)
	V/D/L Cylinder float RD 52 x 55 mm (PVC)	V/D/L Cylinder float RD 52 x 55 mm (PVC)
Ambient conditions		
Protection class (DIN 40050)	IP65 (up to IP68 on request)	IP65 (up to IP68 on request)
Temperature range	-5 °C to +70 °C (from -30 °C to +150 °C on request)	-5 °C to +70 °C (from -30 °C to +150 °C on request)
Pressure	5 bar (up to 15 bar on request)	5 bar (up to 15 bar on request)

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Chemical Resistance
Float switch materials at +20 °C

Chemical substance	Conc. in %	POM	PP	NBR	PVC	Brass MS63	1.4571
Acetone	100	+	+	U	U	+	+
Aluminium sulphate	10	/	+	+	+	U	+
Aluminium chloride	10	/	+	+	+	U	+
Formic acid	85	+	+	U	+	U	+
Ammonia	10	+	+	U	O	U	+
Aniline	100	/	+	U	U	O	+
Ethyl acetate	100	O	O	U	U	+	+
Ethyl ether	100	+	+	U	/	+	+
Ethylene chloride	100	/	U	U	U	/	+
Benzine	100	+	U	+	+	+	+
Benzene	100	+	U	O	U	+	+
Boric acid	10	/	+	+	+	+	+
Butyl acetate	100	+	O	U	U	/	+
Calcium chloride	10	+	+	+	+	U	+
Chlorobenzene	100	+	+	U	U	/	+
Chlorine water	–	/	+	U	O	U	+
Chloroform	100	/	U	U	U	+	+
Chromic acid	10	O	+	U	+	U	+
Ferrous chloride	10	O	+	+	+	U	U
Acetic acid	10	+	+	U	+	U	+
Acetic acid	80	O	+	U	+	U	+
Formaldehyde	20	+	+	+	+	O	+
Glycerine	90	+	+	+	+	+	+
Urea	10	/	+	+	+	/	+
Iodine	–	/	+	+	U	/	+
Potassium bichromate	5	/	+	O	+	U	+
Potassium nitrate	10	/	+	+	+	/	+
Potassium permanganate	1	+	+	O	+	/	+
Copper sulphate	10	/	/	+	+	U	+
Magnesium chloride	10	/	+	+	+	U	+
Methylene chloride	100	U	U	U	O	/	+
Lactic acid	10	+	+	O	+	O	+
Mineral oil	100	+	+	+	+	+	+
Sodium bisulphite	10	/	+	U	O	U	+
Sodium carbonate	10	+	+	+	+	O	+
Sodium chloride	10	+	+	+	+	O	+
Sodium sulphate	10	/	+	+	+	+	+
Oxalic acid	40	/	O	U	+	O	O
Phenol, aqueous	10	U	+	U	+	/	+
Phosphoric acid	10	+	+	O	+	U	+
Mercury	100	/	+	+	+	U	+
Mercuric chloride	5	/	+	+	O	U	+
Nitric acid	65	U	U	U	+	U	+
Nitric acid	10	U	O	U	+	U	+
Hydrochloric acid	10	U	+	U	+	U	U
Hydrochloric acid	2	U	+	U	+	U	U
Carbon disulphide	100	+	U	U	U	+	+
Sulphuric acid	10	+	+	+	+	U	+
Sulphuric acid	98	U	O	U	O	U	+
Hydrogen sulphide	2	/	+	+	+	O	+
Soap solution	1	+	+	+	+	+	+
Carbon tetrachloride	100	+	U	U	O	+	+
Trichloroethylene	100	O	O	U	U	O	+
Wine	–	/	+	+	+	O	+
Zinc chloride	10	/	+	+	+	U	+

+ = Resistant

The material remains fully resistant to the medium or is minimally affected. The effect of pressure and temperature changes on the materials must be taken into account.

O = Conditionally resistant

The material is affected by the medium; sealing materials swell. Application may be possible if concentration, pressure, temperature, service life or other influencing factors are restricted.

U = Non-resistant

The material may not be used in the specified medium or at the given temperature unless under very clearly defined preconditions.

/ = No data available

Enquiry and Order Form
Float Switches

❑ **Enquiry**

❑ **Order**

Date: _____

Receiver

BERNSTEIN AG
Tieloser Weg 6
D-32457 Porta Westfalica

Telephone: +49-(0)571/793-0
Fax: +49-(0)571/793-555
info@de.bernstein.eu

Sender

Company:

Customer No.:

Contact:

Department:

Street:

Town:

Telephone:

Fax:

E-mail:

Operational environment

Medium: _____ Temperature: from _____ °C to _____ °C

Pressure: min. _____ bar max. _____ bar

❑ One-off ❑ Batch order ❑ Sample

Batch size: _____ pcs.

Annual quantity: _____ pcs.

Electrical data

Voltage: _____ V ❑ AC ❑ DC Current: _____ A

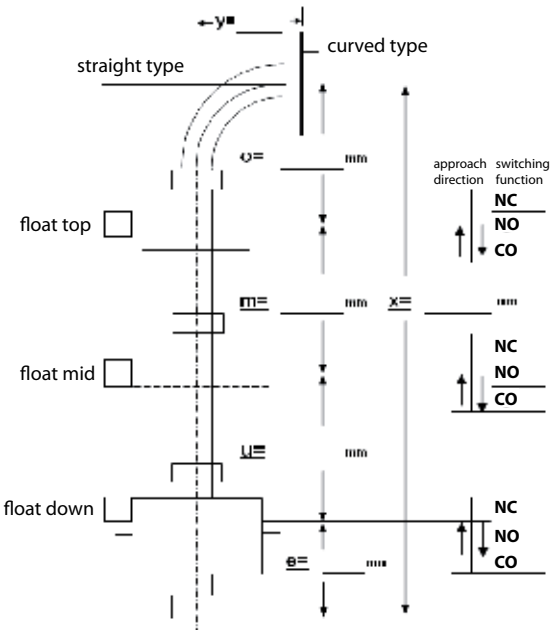
Power: min. _____ VA max. _____ VA

Technical data

Cable length*: _____ m ❑ Separate contacts

Mounting: ❑ From top ❑ From bottom ❑ From side

*Standard 1 m



Type

1	2	3	4	5	6	7	8	9	10	11	12	13

Special features

Remarks

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E-mail:hvssystem@hvssystem.com
Site web : www.hvssystem.com

Notes

Magnets

1. Hard ferrite magnets

Barium and strontium hard ferrites are economically priced, reliable components that are also widely used in automation, control and measurement applications. When operated in high temperature ranges, the specified switching distance will decrease by a factor of 0.2 % per 1 °C.

Chemical properties:

Ferrite magnets are oxide ceramics. They are made of approx. 80 % iron oxide and 20 % barium oxide or strontium oxide. The magnets are resistant to a large number of chemicals, including solvents, caustic solutions and weak acids. If strong organic and inorganic acids, e.g. hydrochloric, sulphuric and hydrofluoric acid, are used, their resistance will basically be determined by the temperature, concentration and reaction time of the medium. In general, the resistance should first be determine by means of long-term tests.

Mechanical properties:

Due to their ceramic characteristic, ferrites are brittle and sensitive to shock and bending loads.

2. Rare-earth magnets

Permanent magnets made from samarium cobalt and neodymium iron boron are high performance and high quality components that are widely used in drive and control engineering. When operated in high temperature ranges, the specified switching distance will decrease by a factor of 0.02 % per 1 °C.

Chemical properties:

All rare-earth magnets are metallic materials and show the corresponding characteristics associated with these materials, e.g. the polished shine immediately after being machined. The magnets are surface-treated (e.g. nickel coating) to protect them from environmental influences.

Mechanical properties:

Minor chips may occur if rare-earth magnets are subjected to impact stress. They respond very sensitively to vibrations and may become demagnetised.

3. Plastic-bound magnets

Plastic-bound permanent magnets have an attractive price-performance ratio and thanks to the way they are formed they can be produced with complex geometries.

Injection-moulded magnets are typical composite materials. The magnetic powder is embedded in thermoplastic materials (polyamides). One of the main advantages of plastic-bound magnets is that they can be formed into a diverse range of shapes.

Chemical properties:

Surface corrosion can rarely be found on plastic bound magnets. For this reason, they can be used in most fields of application without additional coating.

Mechanical properties:

Plastic-bound magnets can be subjected to buckling and bending without breaking or chipping.

Use in potentially explosive atmospheres

Magnets must not be used in potentially explosive atmospheres as they can cause sparks. Grinding dust and chips from rare-earth magnets are self-igniting and burn off at high temperatures. They should therefore only be machined using ample water and never in dry conditions since even dried grinding dust can ignite.

Strong magnetic fields

Strong magnetic fields can interfere with or even damage electronic or mechanical equipment. This includes cardiac pacemakers. Appropriate safety distances are specified in the corresponding manuals or may be requested from the manufacturers.

Radioactive radiation

Permanent magnets must not be exposed to long-term radioactive radiation otherwise they may lose their magnetism.

Effects on persons

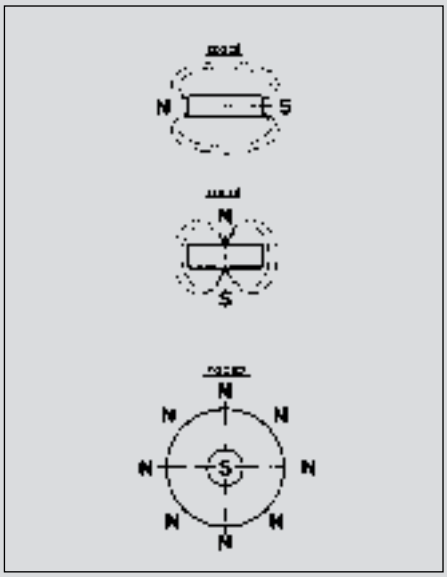
There are no known side-effects caused by touching magnet materials.

Magnet shapes

Rectangular, circular and cylindrical mag-nets are the most common shapes of permanent magnets manufactured in a press-shaping process. In addition to these standard geometries, permanent magnets may be manufactured in many other shapes. The shape should preferably be defined during the pressing process since subsequent shaping can only be performed using complex diamond tools. Holes and openings can only be made in the pressing direction.

Directions of magnetisation

The term preferred direction refers to the alignment of the magnetic crystals in a certain direction. The magnet achieves its highest magnetic values in this preferred direction and must therefore be magne-tised in this direction.



The preferred direction is achieved by subjecting the magnetic powder to a strong external magnetic field (coil) during the pressing process. As magnets have no preferred direction, the magnetisation direction and type can be freely selected.

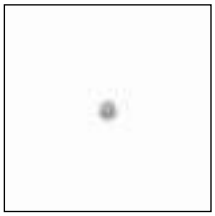
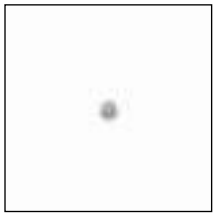
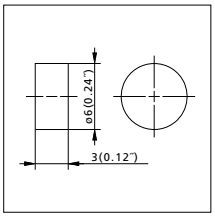
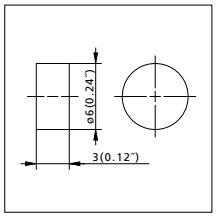
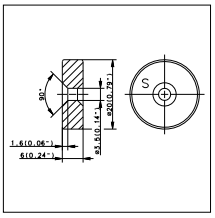
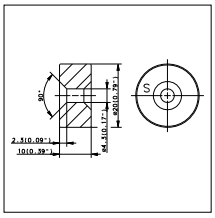
Mounting a magnetic switch system on ferromagnetic materials

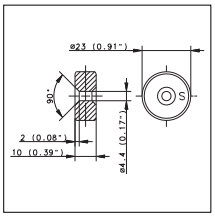
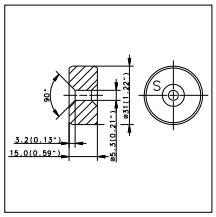
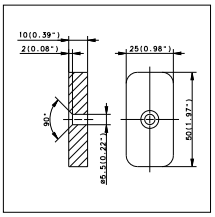
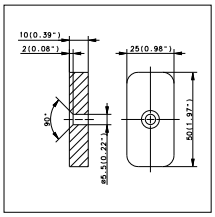
The nominal distance may be reduced when magnetic limit switches and their actuating magnets are mounted on mag-netisable material (Fe, etc.). To ensure trouble-free operation, a minimum gap of 15 mm between the magnetic switch and any material that can be magnetised should be maintained as a reference value. The same applies to the actuating magnets.

Applications

- Counting
- Position indication in lifts
- End position switches in pneumatic and hydraulic installations
- Position indication on butterfly valves, slide valves and valves in general
- Conveyors in high-bay shelving
- Position detection in textile, packaging and meat cutting machines
- Machine runtime and downtime monitoring
- Control of machine tools
- Level monitoring of liquids (see Float Switches)

Actuating Magnets without Encapsulation

Actuating magnets without encapsulation	T-75	T-06N/S	T-61N/S	T-67N/S
				
Magnet material	Rare-earth	Neodymium iron boron (NdFeB)	Barium ferrite	Barium ferrite
Temperature range (magnetic switch operation)	-40 °C ... +150 °C -40 °F ... +302 °F	-40 °C ... +150 °C -40 °F ... +302 °F	-40 °C ... +150 °C -40 °F ... +302 °F	-40 °C ... +150 °C -40 °F ... +302 °F
Temperature coefficient	0.2 %/K	0.2 %/K	0.2 %/K	0.2 %/K
Enclosure material	-	-	-	-
Article number	**6301175057**	**6301106065**	**6301261035**	**6301167054**
Dimensioned drawing				
		Marking slots on north pole side		

Actuating magnets without encapsulation	T-62N/S	T-69N/S	T-68N	T-68S
				
Magnet material	Barium ferrite	Barium ferrite	Barium ferrite	Barium ferrite
Temperature range (magnetic switch operation)	-40 °C ... +150 °C -40 °F ... +302 °F	-40 °C ... +150 °C -40 °F ... +302 °F	-40 °C ... +150 °C -40 °F ... +302 °F	-40 °C ... +150 °C -40 °F ... +302 °F
Temperature coefficient	0.2 %/K	0.2 %/K	0.2 %/K	0.2 %/K
Enclosure material	-	-	-	-
Article number	**6301262039**	**6301269031**	**6301268028**	**6301368033**
Dimensioned drawing				
			90° countersink on north pole side	90° countersink on south pole side

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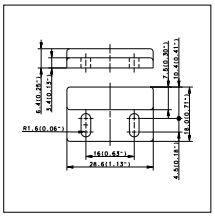
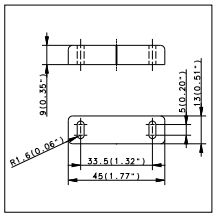
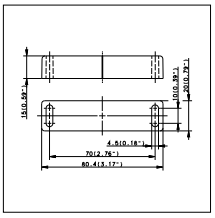
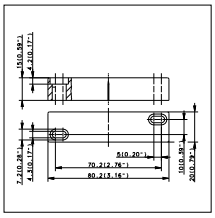
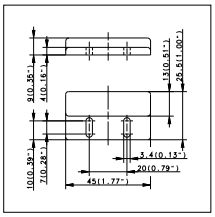
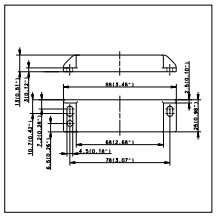
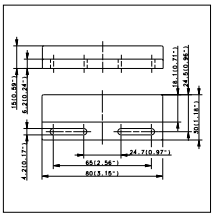
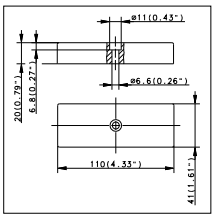
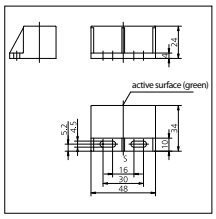
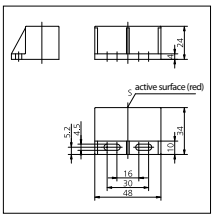
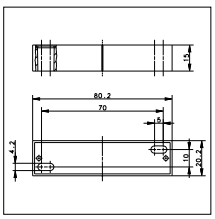
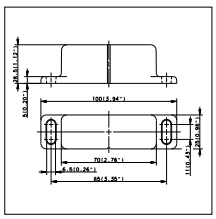
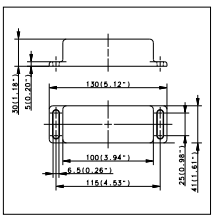
Actuating Magnets in Plastic Enclosure

Actuating magnets in plastic enclosure	TK-11-11	TK-11-01	TK-21-02	TK-21-12
				
Magnet material	AlNiCo-500	AlNiCo-500	AlNiCo-500	AlNiCo-500
Temperature range (magnetic switch operation)	-20 °C ... +80 °C -4 °F ... +176 °F	-20 °C ... +80 °C -4 °F ... +176 °F	-20 °C ... +80 °C -4 °F ... +176 °F	-20 °C ... +80 °C -4 °F ... +176 °F
Temperature coefficient	0.2 %/K	0.2 %/K	0.2 %/K	0.2 %/K
Enclosure material	PA 6.6	PA 6.6	PA 6.6	PA 6.6
Article number	**6302111047**	**6303111001**	**6303121002**	**6302121030**
Dimensioned drawing				

Actuating magnets in plastic enclosure	TK-45	TK-42	TK-44
			
Magnet material	AlNiCo-500	AlNiCo-500	AlNiCo-500
Temperature range (magnetic switch operation)	-20 °C ... +80 °C -4 °F ... +176 °F	-20 °C ... +80 °C -4 °F ... +176 °F	-20 °C ... +80 °C -4 °F ... +176 °F
Temperature coefficient	0.2 %/K	0.2 %/K	0.2 %/K
Enclosure material	PA 6.6	PA 6.6	PA 6.6
Article number	**6302145048**	**6302142049**	**6302144050**
Dimensioned drawing			

Actuating Magnets

Actuating magnets in plastic enclosure	TK-50	TK-57N	TK-57S
			
Magnet material	Barium ferrite	Barium ferrite	Barium ferrite
Temperature range (magnetic switch operation)	-20 °C ... +80 °C -4 °F ... +176 °F	-20 °C ... +80 °C -4 °F ... +176 °F	-20 °C ... +80 °C -4 °F ... +176 °F
Temperature coefficient	0.2 %/K	0.2 %/K	0.2 %/K
Enclosure material	PA 6.6	PBT	PBT
Article number	**6302100053**	**6302257060**	**6302357061**
Dimensioned drawing			

Actuating magnets in metal enclosure	TA-21-02	TA-31	TA-33
			
Magnet material	AlNiCo-500	AlNiCo-500	Barium ferrite
Temperature range (magnetic switch operation)	-40 °C ... +150 °C -40 °F ... +302 °F	-20 °C ... +80 °C -4 °F ... +176 °F	-20 °C ... +80 °C -4 °F ... +176 °F
Temperature coefficient	0.2 %/K	0.2 %/K	0.2 %/K
Enclosure material	Al	Al	Al
Article number	**6305121064**	**6303131005**	**6303133034**
Dimensioned drawing			

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Mounting Brackets

Mounting brackets	BWN-M06NI/40 x 47	BWN-M06NI/27 x 38	BWN-M36NI
			
Material	Niro 1.4301	Niro 1.4301	Niro 1.4301
For series	MA-06, MA-16, MA-26, MA-15	MA-06, MA-16, MA-26, MA-15	MA-06, MA-16, MA-26, MA-15
Article number	**4102802001**	**4102802002**	**4904700035**
Dimensioned drawing			

Miniature Snap-In Connectors

Miniature snap-in connectors		Ø 6.5 mm	Ø 6.5 mm
Contact assignments **1 = Brown** **2 = Black** **3 = Blue**			
Cable material		PUR	PUR
Coupler material		PA 12	PA 12
Coupling ring material		POM	POM
Temperature range		-25 °C … +90 °C -13 °F … +194 °F	-25 °C … +90 °C -13 °F … +194 °F
Switching function		Universal	Universal
Cable structure		3 x 0.25 mm^2	3 x 0.25 mm^2
Protection class		IP67/NEMA 4	IP67/NEMA 4
Article number	**2,5 m**	**4139100219**	**4139100221**
	5 m	**4139100220**	**4139100222**
	10 m		

Connectors

Cable connector M8 x 1		M8	M8	M8
Contact assignments **1 = Brown** **2 = Black** **3 = Blue**				
Cable material		PVC	PVC	PVC
Coupler material		TPU	PUR	PUR
Coupling ring material		CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Temperature range		-25/+90 °C	-25/+90 °C	-25/+90 °C
Switching function		PNP/LED	Universal	Universal
Cable structure		3 x 0.25 mm²	3 x 0.25 mm²	3 x 0.25 mm²
Protection class		IP67	IP68	IP68
Article number	**2.5 m**	**4139100213**	**4139100795**	**4139100798**
	5 m	**4139100216**	**4139100796**	**4139100799**
	10 m		**4139100797**	**4139100800**

Cable connector M12 x 1		M12 3-wire	M12 3-wire	M12 4-wire	M12 4-wire
Contact assignments **1 = Brown** **2 = White** **3 = Blue** **4 = Black**					
Cable material		PVC	PVC	PVC	PUR
Coupler material		PUR	PUR	PA	PUR
Coupling ring material		CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Temperature range		-25/+90 °C	-25/+90 °C	-25/+90 °C	-25/+90 °C
Switching function		Universal	Universal	Universal	PNP/LED
Cable structure		3 x 0.34 mm²	3 x 0.34 mm²	4 x 0.25 mm²	4 x 0.25 mm²
Protection class		IP68	IP68	IP68	IP67
Article number	**2.5 m**	**4139100801**	**4139100804**		**4139100244**
	5 m	**4139100802**	**4139100468**	**4139100903**	**4139100245**
	10 m	**4139100803**	**4139100805**	**4139100467**	**4139100254**

Cable connector M12 x 1		M12 Ultralock	M12 Ultralock	M12	M12
Contact assignments **1 = Brown** **2 = White** **3 = Blue** **4 = Black**					
Cable material		PVC	PVC	–	–
Coupler material		PUR	PUR	PA	PA
Coupling ring material		CuZn39Pb3	CuZn39Pb3	CuZn39Pb3	CuZn39Pb3
Temperature range		-25/+90 °C	-25/+90 °C	-25/+90 °C	-25/+90 °C
Switching function		Universal	Universal	Universal	Universal
Cable structure		3 x 0.34 mm²	3 x 0.34 mm²	–	–
Protection class		IP68	IP68	IP67	IP67
Article number	**2.5 m**	**4139100899**	**4139100906**	**4139100102**	**4139100101**
	5 m				
	10 m				

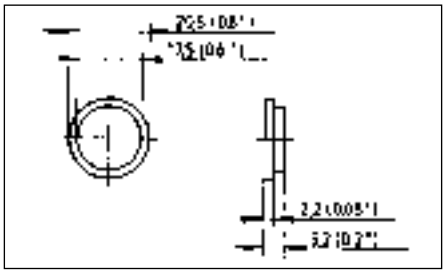
Cable connector M12 x 1		M12 3-wire	M12 5-wire
Contact assignments **1 = Brown** **2 = White** **3 = Blue** **4 = Black**			
Cable material		PVC	PUR
Coupler material		TPU	PUR
Coupling ring material		CuZn39Pb3	CuZn39Pb3
Temperature range		-25/+90 °C	-25/+90 °C
Switching function		PNP/LED	Universal
Cable structure		3 x 0.4 mm²	5 x 0.34 mm²
Protection class		IP68	IP68
Article number	**2.5 m**	**4139100553**	**4139100956**
	5 m	**4139100554**	
	10 m		

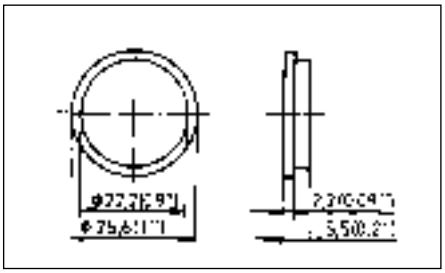
Reflectors

Triple reflectors are best suited for the purpose of reflecting light in light barrier systems. Reflective films are only used as a second choice alternative. Triple reflectors are designed as small, pyramid-shaped triple mirrors, joined to provide a reflection surface. Three pyramid-shaped mirror surfaces joined at 90° reflect the incident light three times on one mirror surface. They reflect the light beam by 180° back in the source direction. Vibration, slight movement and displacement up to 30° with respect to the optical axis of the triple reflector do not interrupt the light beam.

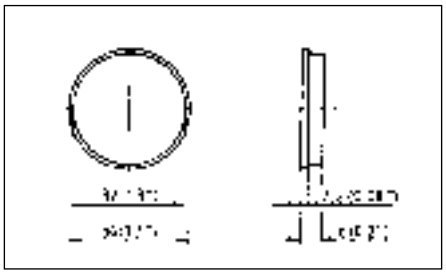
A reflective film can also be tilted or displaced. In this case, in contrast to the triple reflector, the degree of reflection diminishes considerably as such films use small mirrors together with micro glass pearls to reflect light. An advantage of reflective film, however, is its flexibility in installation. Although its reflection quality can be improved by means of a triple structure in the film, it still does not match the degree of reflection achieved by a triple reflector. In general, a plane mirror must not be displaced. The angle of incidence of the light beam directed at such mirrors must precisely correspond to the angle of reflection about the optical axis to ensure effective reflection in the light barrier receiver (optoelectric sensor).

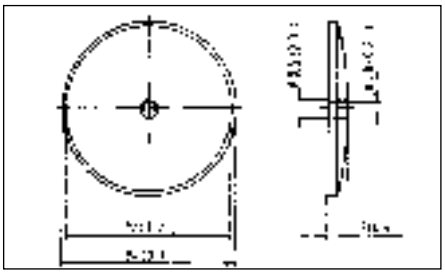
The specified ranges of the reflection light barriers refer to the RTS-083 KK and RTS-060 KK reflector. Essentially, the size of the reflector should be selected according to the sensing range and the size of the object to be detected. The object should ideally be larger than the reflector so that it completely covers the reflector.



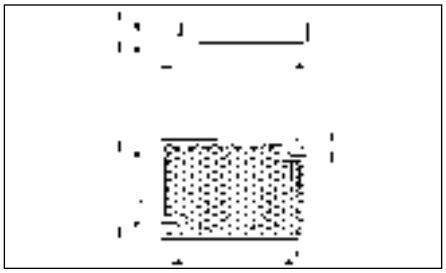


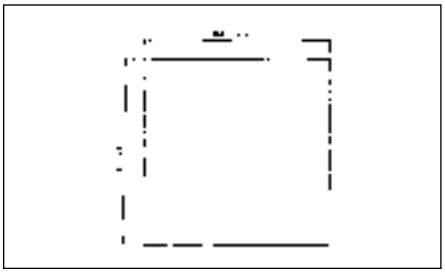
Type designation	RTS-D17 KK	RTS-D22 KK
Article number	**6572108008**	**6572109009**
Diameter	17.5 mm	22 mm





Type designation	RTS-D32 KK	RTS-D83 KK
Article number	**6572110010**	**6572107003**
Diameter	32 mm	83 mm



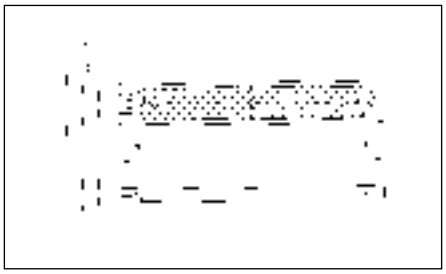


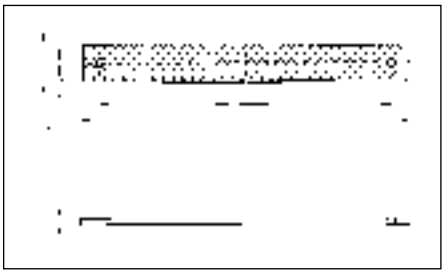
Type designation	RTS-60 KK	RFS-100 KK
Article number	**6572100007**	**6572300001**
Structure	60 x 41 mm	100 x 100 mm Self-adhesive film

Example: OR20RS

Reflector	Range
RTS-D17 KK	3.2 m
RTS-D22 KK	3.5 m
RTS-D32 KK	4.0 m
RTS-D83 KK	8.0 m
RTS-60 KK	8.0 m
RFS-100 KK	6.0 m
RTS-120 KK	3.5 m
RTS-500 KK	7.0 m

Ranges of other reflection light barriers available on request.





Type designation	RTS-120 KK	RTS-500 KK
Article number	**6572100006**	**6572100002**
Structure	120 x 18 mm	500 x 35 mm Plastic

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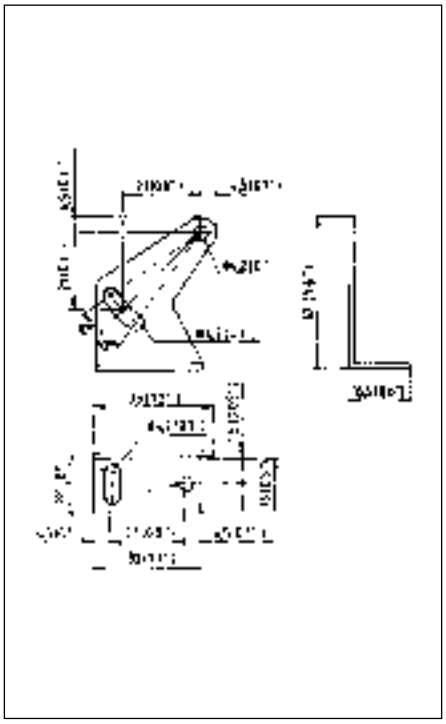
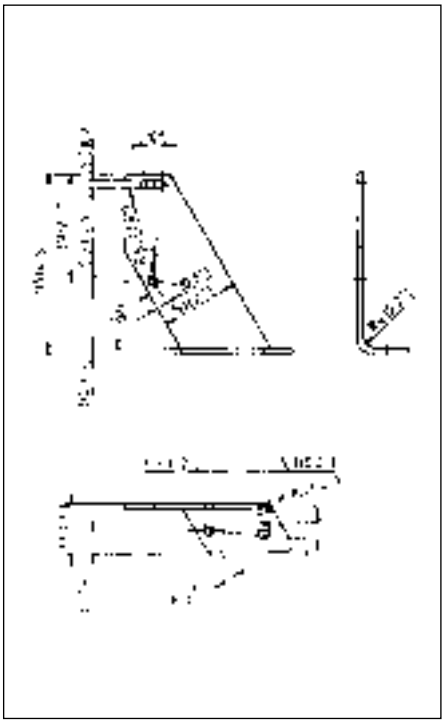
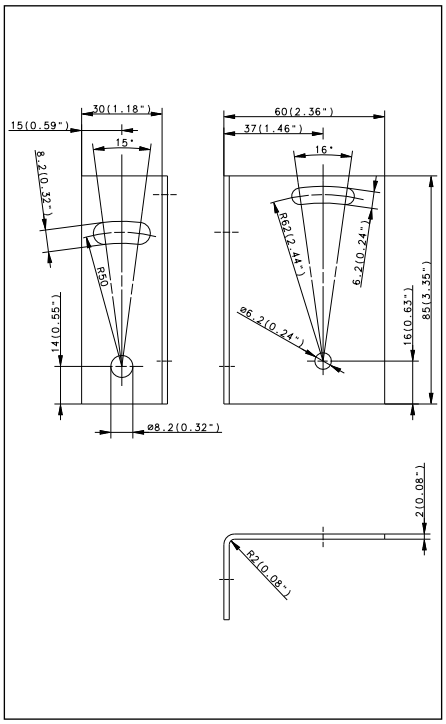
Mounting Material

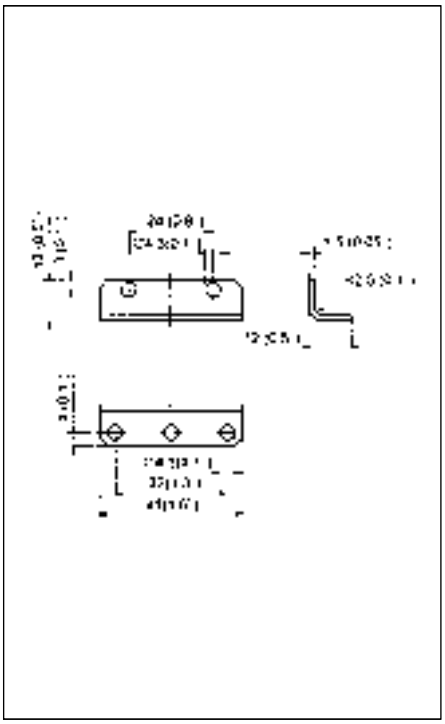
Other mounting brackets available on request.





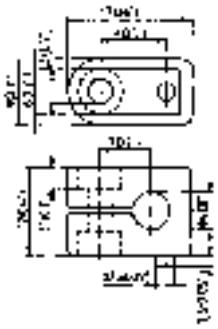
Type designation	BWN-L05ST KPL	BWN-L20NI KPL
Article number	**6571300003**	**6571200002**



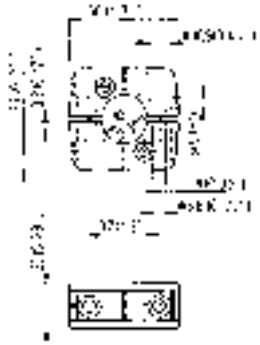


Type designation	BWN-L20NI KPL	BWN-L12AL KPL
Article number	**6571200007**	**6571500006**

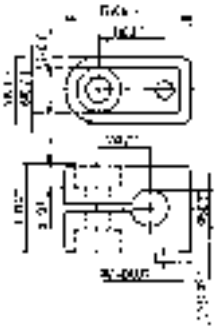
Mounting Brackets



Type BKB-D04PA
Art. No. 5960223069

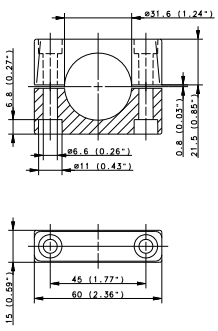


Type BKS-D20PA
Art. No. 5960223085

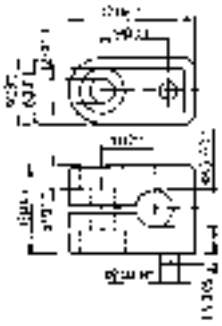


Type BKB-D05PA
Art. No. 5960223070

Type BKS-D22PA
Art. No. 5960223040



Type BKS D32 PA
Art. No. 5960223002
Including 2 screws M 6 x 45 mm, DIN 912



Type BKB-D06PA
Art. No. 5960223071

Type BKS-D34PA
Art. No. 5960223041

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Sensor Tester

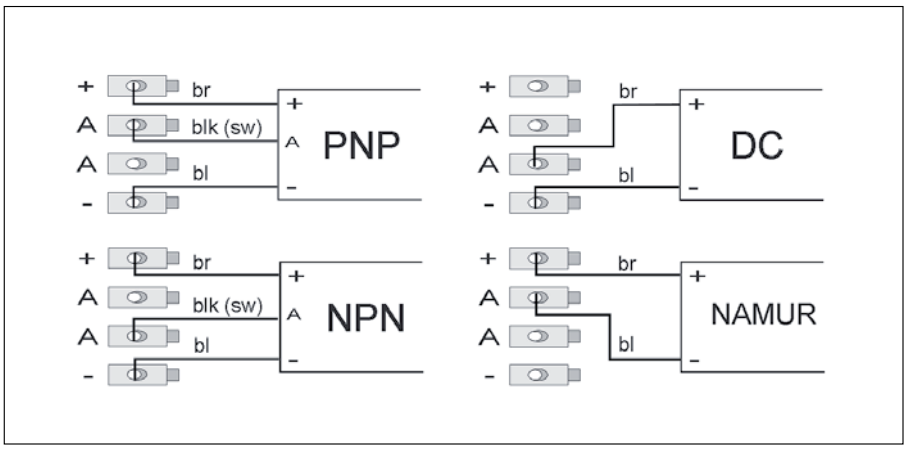
Technical data		
Type designation		Sensor Tester
Article number		**6510000048**
Function		Sensor tester for DC 2-wire and 3-wire
		proximity switches
		Test function: Checking and indicating the
		switching status of a sensor with
		visual and acoustic signal
Power supply		9 V block battery (6LR61)
Output voltage		15 VDC, 20 mA stabilised
Enclosure		Modified enclosure of Series OR20
Temperature range	min/max	–25 °C/+70 °C
Input signals		NPN/PNP 3-wire, DC 2-wire, NAMUR

The sensor tester is used for checking 2-wire and 3-wire DC proximity switches. Coloured LEDs and an acoustic signal are used to indicate the switching statuses.

Green LED:	Operating voltage
Red LED:	Low battery
Yellow LED:	Sensor switching status

When not in use, the sensor tester switches off automatically after approx. 30 s.

Connection assignments



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Type Code

Inductive Sensors

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	+
K	I	N	-	T	1	2	N	S	/	0	0	4	-	K	L	2			
Product group				Type of enclosure			Output			Sensing distance				Options					

Product group		
1	K	Non-contact proximity switch
2	I	Inductive
3	B	Flush mount
	N	Non-flush mount
	R	Ring sensor
4	-	Dash (fixed)
Type of enclosure		
5	M	Metric thread (metal enclosure)
	T	Metric thread (plastic enclosure)
	D	Round enclosure (metal)
	R	Round enclosure (plastic)
	Q	Cuboid enclosure (metal)
	P	PG thread (metal)
	E	Rectangular enclosure (plastic)
	S	Slot proximity switch (plastic)
	N	Standard mounting (to DIN 50025/50037)
	C	Compact enclosure
6 – 7		Two-digit number for:
		Round types = Ø as specified
		Threaded types = standard designation
		Rectangular types = consecutive type numbers

Design examples		
	D08	Ø 8 mm (metal)
	R22	Ø 22 mm (plastic)
	M12	Threaded barrel M12 x 1
Rectangular and other types		
	E16	16 x 5 x 5 mm
	E27	27 x 10 x 5.5 mm
	E28	28 x 16 x 11 mm
	E40	40 x 26 x 12 mm
	E50	50 x 25 x 10 mm
	E68	68 x 30 x 15 mm
	G00	Tube thread, general
	N44	41.5 x 41.5 x 120 mm
	Q05	5 x 5 x 25 mm
	Q08	8 x 8 x 40 mm, Side active
	Q12	12 x 12 x 55 mm

Output		
8	P	PNP
	N	NPN
	A	AC 2-wire
	E	NAMUR
	Z	DC 2-wire
	R	Relay
	G	Push-pull
	D	Dual output stage (NPN/PNP selectable)
9	S	NO contact
	Ö	NC contact
	P	Programmable
	A	Analogue
	U	Antivalent (selectable)
10	/	Slash (fixed)
Sensing distance		
11 – 13	z. B. 1.5	1.5 mm
	z. B. 002	2.0 mm
	z. B. 040	40 mm
14	-	Dash (fixed)
Options		
15 – 17		See type code "OPTIONS"

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Inductive Sensors (sort by type designation)

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KIB-D03PÖ/0,6-KL2PU	**6502799007**	14
KIB-D03PS/0,6-KL2PU	**6502999019**	14
KIB-D04NS/0,8-KL2PU	**6502399004**	14
KIB-D04PÖ/0,8-KL2PU	**6502799002**	14
KIB-D04PS/0,8-KL2PU	**6502999004**	14
KIB-D06NS/1,5-KL2	**6502399009**	14
KIB-D06PÖ/1,5-KL2	**6502799011**	14
KIB-D06PS/1,5-K2VPU	**6502999034**	15
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KIB-D06PS/1,5-KL5V	**6602999460**	15
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KIB-E27NS/1,5-KL2PU	**6502393001**	33
KIB-E27PS/1,5-KL2PU	**6502993001**	33
KIB-E28PÖ/002-KL2	**6502773002**	33
KIB-E28PÖ/002-KLSM8	**6502773001**	33
KIB-E28PS/002-KL2	**6502973001**	33
KIB-E28PS/002-KLSM8	**6502973002**	33
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KIB-E40PÖ/002-KL2	**6502784006**	34
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Capacitive Sensors

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	+
K	C	N	-	T	1	2	N	S	/	0	0	4	-	K	L	P	2		
Product group				Type of enclosure			Output			Sensing distance				Options					

Product group		
1	K	Non-contact proximity switch
2	C	Capacitive
3	B	Flush mount
	N	Non-flush mount
4	-	Dash (fixed)
Type of enclosure		
5	M	Metric thread (metal enclosure)
	T	Metric thread (plastic enclosure)
	D	Round enclosure (metal)
	R	Round enclosure (plastic)
	Q	Cuboid enclosure (metal)
	P	PG thread (metal)
	E	Rectangular enclosure (plastic)
	N	Standard mounting (to DIN 50025/50037)
6 – 7		Two-digit number for:
		Round types = Ø as specified
		Threaded types = standard designation
		Rectangular types = consecutive type numbers

Design examples		
	12	12 Thread M12 x 1
	18	34 Ø 34 mm (metal/plastic)
	30	20 Ø 20 mm (plastic)
	32	(Euro standard enclosure)
	34	Ø 34 mm (metal/plastic)
	20	Ø 20 mm (plastic)
	22	Ø 22 mm (plastic)
	50	50 x 25 x 10 mm
	68	68 x 30 x 15 mm
	44	41.5 x 41.5 x 120 mm (Euro standard enclosure)
Output		
8	p	PNP
	N	NPN
	A	AC 2-wire
	E	NAMUR
	Z	DC 2-wire
	R	Relay
	G	Push-pull
	D	Dual output stage (NPN/PNP selectable)

Output		
9	S	NO contact
	Ö	NC contact
	P	Programmable
	A	Analogue
	U	Antivalent (selectable)
10	/	Slash (fixed)
Sensing distance		
11 – 13	e.g. 1.5	1.5 mm
	e.g. 002	2.0 mm
	e.g. 040	40 mm
14	-	Dash (fixed)
Options		
15 – 19		See type code "OPTIONS" (0850174076)

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Type Code

Optoelectronic Sensors

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O	M	1	2	R	T	-	D	H	T	P	-	0	2	0	0	-	C	L	
Product group		Enclosure size		Operating principle			Type of voltage	Output				Sensing range					Type of connec-tion	Op-tions	

Product group		
1	O	Optoelectronic sensor
2	M	Metric brass enclosure
	N	Metric stainless steel enclosure
	T	Metric thermoplastic enclosure
	R	Rectangular type
	Z	Cylindrical type
Enclosure size details		
3 – 4	e.g. 12	M12
	e.g. 18	M18
	e.g. 20	Type 20
Operating principle		
5 – 6	ES	Through-beam sensor assy (set)
	EE	Receiver, through-beam sensor
	SE	Transmitter, through-beam sensor
	LC	Fibre optic switching amplifier (light barrier with fibre optic cable connection)
	RH	Diffuse-reflection sensor with background suppression
	RS	Retro-reflective sensor
	RT	Diffuse –reflection sensor
	FF	Convergent beam sensor, fixed focus
	PS	Retro-reflective sensor, polarised
7	-	Dash (fixed)
Type of voltage		
8	A	AC
	D	DC
	M	Multi-voltage
	P	Programmable (AC or DC)

Output function		
9	A	Antivalent (light and dark activated)
	D	Dark activated
	H	Light activated
	O	No output (transmitter for through-beam sensors)
	P	Programmable (light and dark activated)
	X	Customer-specific output
Type of output		
10	A	Analogue output
	N	NAMUR
	O	No output
	Q	Triac
	R	Relay
	S	Other
	T	Transistor
	Y	Thyristor
11	N	NPN transistor output
	P	PNP transistor output
	G	Push-pull output stage
	S	Transmitter, through-beam sensor
	U	PNP/NPN selectable
	X	Customer-specific output
	2	2-wire output
	3	Dash (fixed)
	4	4-Leiter-Ausgang
12	-	Trennstrich (festgelegt)

Sensing range		
13 – 16	The range and sensing distance are always a 4-digit specification - Millimetre values with no decimal point - Metre values with decimal point	
	e.g. 06.0	6 m
	e.g. 15.0	15 m
	e.g. 0500	500 mm
17	-	Dash (fixed)
Type of connection		
18	A	Connection space
	B	Self-configured cable connector
	C	Cable type (standard C = 2 m or length in m)
	S	Plug connector
Options		
19	C	Control input
	D	LED for switching status and operating reserve
	E	Adjustable sensitivity
	I	Electrically programmable
	F	Operating reserve output and LED
	G	LED for switching status, operating voltage indicator and light path monitoring
	H	LED for indicating operating voltage and switching status
	L	LED for switching status
	T	Adjustable time stage
	V	LED for indicating operating voltage
	W	Radial optical system
	X	Customer-specific option
	Z	Inbuilt time stage

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Magnetic Switches

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
M	A	K	-	0	1	1	2	-	D	-	1	-	S	O	K			
Product group				Type		Contact specifications					Cable length		Special features					

Product group		
1	M	Magnetic switch
2	Type of output	
	A	Reed contact
	R	Relay
3	Enclosure material	
	A	Aluminium
	N	Stainless steel
	M	Brass, nickel-plated
	K	Plastic, general
	O	Other materials
4	-	Dash (fixed)
Type		
5 – 6	01 – 99	Cylindrical and rectangular types (see next page for details)
Contact specifications		
7	Number of contacts	
	e.g. 1	1 Reed contact
	e.g. 2	2 Reed contacts
	...	etc.

8	Contact function	
	1	NC contact
	2	NO contact
	3	Changeover contact
	4	Bistable (ON/OFF)
	5	Bistable (changeover contact)
	6	NC, NO contact; separate contacts
	7	Coded, BG
	8	Currently not used
	9	Currently not used
	0	Other outputs
9	-	Dash (fixed)
10	Contact type/power of reed contacts	
	A	250 VDC ; 0.5 A; 20 VA
	B	250 VDC ; 0.5 A; 10 VA
	C	250 VDC ; 0.5 A; 30 VA
	D	250 VDC ; 0.5 A; 30 VA
	E	250 VDC ; 1.5 A; 30 VA
	F	250 VDC ; 3.0 A; 100 VA
	G	250 VDC ; 5.0 A; 250 VA
	H	250 VDC ; 1.0 A; 60 VA
	K	250 VDC ; 0.5 A; 30 VA
	L	250 VDC ; 1.0 A; 60 VA
	M	250 VDC ; 1.0 A; 80 VA
	N	250 VDC ; 1.0 A; 60 VA
	O	120 VDC ; 0.5 A; 10 VA
	P	250 VDC ; 5.0 A; 250 VA
	R	28 VDC ; 0.25 A; 3 VA
	W	250 VDC ; 1.0 A; 60 VA
	X	100 VDC ; 0.25 A; 5 VA
	Y	100 VDC ; 0.5 A; 10 VA

	TRIAC	
	K	24 - 250 VDC ; 1.5 A a. 300 VA b. 330 VA
	Hall	
11	-	Dash (fixed)
Cable length in metres		
12	e.g. 1	1 m cable
	e.g. 2	2 m cable
	...	etc.
13	-	Dash (fixed)
Special features		
14 – 17	T	Temperature resistant from -40 °C to +150 °C
	SI	With miniature fuse
	VDR	With VDR
	WID	With resistor
	LED	With LED
	SPK	Spiral cable
	SK	Special cable
	SOK	Connector type without head (without device socket)
	SMK	Connector type with head (with device socket)
	PG11	Type of thread
	RZ	Time delay with relay
	220 V	220 Volt version
	24 V	24 Volt version

Type Code

Magnetic Switches

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
M	A	K	-	0	1	1	2	-	D	-	1	-	S	O	K			
Product group				Type		Contact specifications					Cable length		Special features					

Type		
5 – 6	01 – 99	Cylindrical and rectangular types
	01	45 x 13 x 9 mm [MA-01] PA
	02	80 x 20 x 15 mm [MA-02] PA/AL
	03	110 x 58 x 29 mm [MA-03] AL
	04	Ø 15.5 x 87 mm [MA-04] PC
	05	Currently not used
	06	Ø 12 x 81 mm [MA-06] AL
	07 – 10	Currently not used
	11	28.6 x 18 x 6.4 mm [MA-11] PA
	12	80 x 20 x 15 mm [MA-12] PA
	13	68 x 30 x 15 mm [MA-13] PC
	14	Currently not used
	15	Ø 12 x 81 mm [MA-15] PA
	16	Ø 12 x 81 mm [MA-13] VA
	17	PG9 x 60 mm [MA-17] PA
	18	M12 x 1 x 60 mm [MA-18] Ms
	19	M18 x 1 x 80 mm [MA-19] Ms
	20	Currently not used
	21	PG9 x 80 mm [MA-21] PA
	22	Currently not used
	23	M12 x 1 x 80 mm [MA-23] Ms
	24/25	Currently not used
	26	Ø 12 x 81 mm [MA-26] PA
	27	Currently not used
	28	M12 x 1 x 60 mm [MA-28] PA
	29	M18 x 1 x 80 mm [MA-29] PA
	30	Ø 6 x 30 mm [MA-30] PA
	31	Currently not used
	32	85 x 26 x 26 mm [MA-32] PBT
	33	M12 x 1 x 80 mm [MA-33] PA
	34/35	Currently not used
	36	Ø 13 x 96 mm [MA-36] PA
	37-39	Currently not used
	40	M10 x 1 x 40 mm [MA-40] PPE
	41	50 x 31 x 11 mm [MA-41] PA
	42	88 x 25 x 13 mm [MA-42] PA
	43	PG9 x 80 mm [MA-43] Ms
	44	80 x 30 x 15 mm [MA-44] PA
	45	45 x 25.5 x 9 mm [MA-45] PA
	46	Ø 6.5 x 39.34 mm [MA-46] PA
	47	Currently not used
	48	80 x 30 x 15 mm [MA-48] PA
	49-51	Currently not used
	52	43 x 26 x 13 mm [MA-52] PBT
	53	M30 x 1.5 mm [MA-53] PA
	54	Currently not used
	55	12 x 12 x 55 mm [MA-55] S
	56-59	Currently not used
	60	M8 x 1 mm [MA-60] S
	61	M10 x 1 mm [MA-61] S
	62	M12 x 1 mm [MA-62] S
	63	M18 x 1 mm [MA-63] S
	64	M30 x 1.5 mm [MA-64] S
	65-69	Currently not used
	70	Ø 6.5 mm [MA-70] S
	71/72	Currently not used
	73	68 x 30 x 15 mm [MA-73] S
	74-79	Currently not used
	80	8 x 8 x 40 mm [MA-80] S
	81-98	Currently not used
	99	other [MA-99] S

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Magnetic Switch Monitoring Devices

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
M	Ü	Z	-	1	0	2	/	U	2	4	-	F	L	-	2	S	-	E	2	0	-	H	G
Product group				Numb. of magnetic switches	Number of relays			Voltage				Special features											

Product group		
1	M	Magnetic limit switch, general
2	Ü	Monitoring
	C	Controller
3	Z	Control station
	S	Interface
	N	Power supply unit
4	-	Dash (fixed)
Number of connectable magnetic switches		
5	1	1 unit
	2	2 units
	...	etc.
Number of relays		
6 – 7	01	1 unit
	02	2 units
	03	Constant current source
	04	4 units
	...	etc.
8	/	Slash (fixed)

Voltage		
9	A	AC
	D	DC
	U	UC
	1	Mains voltage
	2	Mains voltage
10 – 11	24	24 Volt
	The following applies when there is a "1" in the 9th position:	
	10	110 Volt
	20	120 Volt
	30	130 Volt
	The following applies when there is a "2" in the 9th position:	
	10	210 Volt
	20	220 Volt
	30	230 Volt

Special features		
13 – 24	FL	Flat design
	2S	NO contact signal (to outside)
	E20	20 transducer units, externally
	HG	Hall sensor
	VC	Voltage control
	PRT	Print version
	DA	Data output
	Special features are separated by a dash with no specific position assignment.	

Magnetic Switches/Slot sensors with reed contact (sort by type designation)

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Magnetic Switches/Slot sensors with reed contact (sort by article number)

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6311208596	MAN-0812-B-1	74
6311211541	MAK-1112-B-1	76
6311218294	MAM-1812-B-1	74
6311230571	MAK-3012-B-1	72
6311245539	MAK-4512-B-1	76
6311411603	MAK-1114-B-5	76
6312202316	MAK-0212-D-1	77
6312206321	MAA-0612-D-1	72
6314144542	MAK-4411-F-1	78
6314202204	MAK-0212-F-1	77
6314203232	MAA-0312-F	79
6314206246	MAA-0612-F-1	72
6314212217	MAK-1212-F-1	77
6314216476	MAN-1612-F-3	72
6314216585	MAN-1612-FT-8	72
6314223268	MAM-2312-F-1	74
6314226423	MAK-2612-F-1	72
6314233002	MAK-3312-F-2	74
6314242533	MAK-4212-F-1	78
6314244536	MAK-4412-F-1	78
6314402566	MAA-0214-FT-3	77
6314432609	MAK-3214-F-3	78
6315302309	MAK-0213-K-1	76
6315306314	MAA-0613-K-1	72
6315312196	MAK-1213-K-1	76
6315317001	MAK-1713-K-1	75
6315326425	MAK-2613-K-1	73
6316302206	MAK-0213-L-1	77
6316302389	MAA-0213-LT-1	78
6316306004	MAA-0613-LT-1	73
6316306248	MAA-0613-L-1	73
6316312220	MAK-1213-L-1	77
6316313004	MAK-1313-L-1	76
6316316259	MAN-1613-L-1	72
6316318002	MAM-1813-L-1	74
6316326426	MAK-2613-L-1	73
6316333005	MAK-3313-L-1	74
6316343544	MAM-4313-L-2	75
6316345540	MAK-4513-L-1	76

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6317303312	MAA-0313-M	79
6317304313	MAK-0413-M-S	74
6317306315	MAA-0613-M-1	72
6317342535	MAK-4213-M-1	78
6317344538	MAK-4413-M-1	78
6319403532	MAA-0314-P	79
6410206399	MAA-0612-NT-4	73
6410311368	MAK-1113-1,5	75
6410412143	MAK-1214-L-2	77
6410433350	MAK-3314-P-2	75
6416228260	MAK-2812-L-3	74
6419402397	MAK-0214-P-3	77

Type Code

Magnetic Switches/Slot sensors with reed contact

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15					
M	E	K	-	M	1	2	P	S	/	H	1	0	-	K	L	2			
Product group				Type of enclosure			Output			Sensitivity				Options					

Product group		
1	M	Magnetic sensor
2	E	Electronic
3	K	Plastic
	M	Brass
	N	Stainless steel
4	-	Dash (fixed)
Type of enclosure		
5	M	Metric thread
	D	Round enclosure
	E	Rectangular enclosure
	Q	Cuboid enclosure
6 – 7		Two-digit number for:
		Metric enclosure = standard designation
		Round enclosure = Ø as specified
		Rectangular enclosure = enclosure width
		Cuboid enclosure = edge length

Output		
8	P	PNP
	N	NPN
9	S	NO contact
	Ö	NC contact
	B	Bistable
	A	Analogue
	D	Speed
10	/	Slash (fixed)
Sensitivity		
11	H	Hall
	M	Magnetoresistive
12 – 13		Sensitivity in mT
	z. B. 10	10 mT
	z. B. 01	1 mT
14	-	Dash (fixed)
Options		
15		See type code "OPTIONS" (0850174076)

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Magnetic Switches/Slot sensors with reed contact (sort by type designation)

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MEA-E30PS/HP-KL0,3S	**6370299143**	91
MEA-E30PS/HP-KL2	**6370299136**	91
MEK-E22PS/HP-KL0,3S	**6370281110**	91
MEK-E22PS/HP-KL0,3S	**6370281145**	91
MEK-E22PS/HP-KL0,3S	**6372281147**	92
MEK-E22PS/HP-KL0,3S	**6372281149**	92
MEK-E22PS/HP-KL0,3S	**6372299151**	92
MEK-E22PS/HP-KL0,3S-EX	**6370281153**	91
MEK-E22PS/HP-KL2	**6370281109**	91
MEK-E22PS/HP-KL2	**6370281144**	91
MEK-E22PS/HP-KL2	**6372281146**	92
MEK-E22PS/HP-KL2	**6372281148**	92
MEK-E22PS/HP-KL2	**6372299150**	92
MEK-E22PS/HP-KL2-EX	**6370281152**	91
MEK-E27NB/H02-K2	**6363893031**	87
MEK-E27NB/H11-K2	**6363893041**	87
MEK-E27NS/H10-K2	**6362693010**	87
MEK-E29NB/H11-K2	**6363811039**	87
MEK-E29NS/H10-K2	**6362611008**	87
MEK-E45NB/H11-K2	**6363845040**	88
MEK-E45NS/H10-K2	**6362645009**	88
MEK-E45PB/H11-KL2	**6373445129**	88
MEK-E45PÖ/H10-KL2	**6372145080**	88
MEK-E45PS/H10-KL2	**6372245079**	88
MEK-E50NB/H11-K2	**6363890042**	88
MEK-E50NS/H10-K2	**6362690011**	88
MEK-E50PB/H11-KL2	**6373490130**	88
MEK-E50PÖ/H10-KL2	**6372190082**	88
MEK-E50PS/H10-KL2	**6372290081**	88
MEK-M12NB/H11-K2	**6363862036**	83
MEK-M12ND/H-K2	**6369662027**	85
MEK-M12NS/H10-K2	**6362662005**	83
MEK-M12PB/H11-KL2	**6373462125**	84
MEK-M12PD/H-KL2	**6379262119**	85
MEK-M12PÖ/H10-KL2	**6372162091**	84
MEK-M12PÖ/M01-KL2	**6373162095**	84
MEK-M12PS/H10-KL2	**6372262089**	84
MEK-M12PS/M01-KL2	**6373262093**	84
MEK-M18NB/H11-K2	**6363863038**	85
MEK-M18NS/H10-K2	**6362663007**	85
MEK-M18PB/H11-KL2	**6373463127**	85
MEK-M18PD/H-KL2	**6379263121**	86
MEK-M18PÖ/H10-KL2	**6372163099**	85
MEK-M18PÖ/M01-KL2	**6373163103**	86
MEK-M18PS/H10-KL2	**6372263097**	85
MEK-M18PS/M01-KL2	**6373263101**	86
MEM-M05PS/M03-K2	**6373299133**	82
MEM-M08NB/H11-K2	**6363860033**	83
MEM-M08NS/H10-K2	**6362660002**	83
MEM-M08PS/M02-K2	**6373260107**	83
MEM-M10NB/H11-K2	**6363861034**	83
MEM-M10NS/H10-K2	**6362661003**	83
MEM-M10PB/H11-KL2	**6373461124**	83
MEM-M10PÖ/H10-KL2	**6372161086**	83
MEM-M10PÖ/M01-KL2	**6373161088**	83
MEM-M10PS/H10-KL2	**6372261085**	83
MEM-M10PS/M01-KL2	**6373261087**	83
MEM-M12NB/H11-K2	**6363862035**	83
MEM-M12ND/H-K2	**6369662028**	85
MEM-M12NS/H10-K2	**6362662004**	83
MEM-M12PB/H11-KL2	**6373462126**	84
MEM-M12PD/H-KL2	**6379262120**	85
MEM-M12PÖ/H10-KL2	**6372162092**	84
MEM-M12PÖ/M01-KL2	**6373162096**	84
MEM-M12PS/H10-KL10	**6472262077**	84
MEM-M12PS/H10-KL2	**6372262090**	84
MEM-M12PS/M01-KL2	**6373262094**	84
MEM-M12PS/M01-KL5	**6373262123**	84
MEM-M18NB/H11-K2	**6363863037**	85
MEM-M18NS/H10-K2	**6362663006**	85
MEM-M18PB/H11-KL2	**6373463128**	85
MEM-M18PD/H-KL2	**6379263122**	86
MEM-M18PÖ/H10-KL2	**6372163100**	85
MEM-M18PÖ/M01-KL2	**6373163104**	86
MEM-M18PS/H10-KL2	**6372263098**	85
MEM-M18PS/M01-KL2	**6373263102**	86
MEM-Q05PS/M03-K2	**6373299134**	86
MEM-Q08NB/H11-K2	**6363880043**	87
MEM-Q08NS/H10-K2	**6362680012**	87
MEM-Q08PS/M02-K2	**6373280106**	87
MEM-Q12NB/H11-K2	**6363855044**	87
MEM-Q12NS/H10-K2	**6362655013**	87
MEM-Q12PB/H11-KL2	**6373455131**	87
MEM-Q12PÖ/H10-KL2	**6372155084**	87
MEM-Q12PS/H10-KL2	**6372255083**	87
MEN-D04PS/M03-K2	**6373299132**	82
MEN-D06NB/H11-K2	**6363870032**	82
MEN-D06NS/H10-K2	**6362670001**	82
MEN-D06PS/M02-K2	**6373270105**	82

Magnetic Switches/Slot sensors with reed contact (sort by article number)

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6362645009	MEK-E45NS/H10-K2	88
6362655013	MEM-Q12NS/H10-K2	87
6362660002	MEM-M08NS/H10-K2	83
6362661003	MEM-M10NS/H10-K2	83
6362662004	MEM-M12NS/H10-K2	83
6362662005	MEK-M12NS/H10-K2	83
6362663006	MEM-M18NS/H10-K2	85
6362663007	MEK-M18NS/H10-K2	85
6362670001	MEN-D06NS/H10-K2	82
6362680012	MEM-Q08NS/H10-K2	87
6362690011	MEK-E50NS/H10-K2	88
6362693010	MEK-E27NS/H10-K2	87
6363811039	MEK-E29NB/H11-K2	87
6363845040	MEK-E45NB/H11-K2	88
6363855044	MEM-Q12NB/H11-K2	87
6363860033	MEM-M08NB/H11-K2	83
6363861034	MEM-M10NB/H11-K2	83
6363862035	MEM-M12NB/H11-K2	83
6363862036	MEK-M12NB/H11-K2	83
6363863037	MEM-M18NB/H11-K2	85
6363863038	MEK-M18NB/H11-K2	85
6363870032	MEN-D06NB/H11-K2	82
6363880043	MEM-Q08NB/H11-K2	87
6363890042	MEK-E50NB/H11-K2	88
6363893031	MEK-E27NB/H02-K2	87
6363893041	MEK-E27NB/H11-K2	87
6369662027	MEK-M12ND/H-K2	85
6369662028	MEM-M12ND/H-K2	85
6370281109	MEK-E22PS/HP-KL2	91
6370281110	MEK-E22PS/HP-KL0,3S	91
6370281144	MEK-E22PS/HP-KL2	91
6370281145	MEK-E22PS/HP-KL0,3S	91
6370281152	MEK-E22PS/HP-KL2-EX	91
6370281153	MEK-E22PS/HP-KL0,3S-EX	91
6370299136	MEA-E30PS/HP-KL2	91
6370299143	MEA-E30PS/HP-KL0,3S	91
6372145080	MEK-E45PÖ/H10-KL2	88
6372155084	MEM-Q12PÖ/H10-KL2	87
6372161086	MEM-M10PÖ/H10-KL2	83
6372162091	MEK-M12PÖ/H10-KL2	84
6372162092	MEM-M12PÖ/H10-KL2	84
6372163099	MEK-M18PÖ/H10-KL2	85
6372163100	MEM-M18PÖ/H10-KL2	85
6372190082	MEK-E50PÖ/H10-KL2	88
6372245079	MEK-E45PS/H10-KL2	88
6372255083	MEM-Q12PS/H10-KL2	87
6372261085	MEM-M10PS/H10-KL2	83
6372262089	MEK-M12PS/H10-KL2	84
6372262090	MEM-M12PS/H10-KL2	84
6372263097	MEK-M18PS/H10-KL2	85
6372263098	MEM-M18PS/H10-KL2	85
6372281146	MEK-E22PS/HP-KL2	92
6372281147	MEK-E22PS/HP-KL0,3S	92
6372281148	MEK-E22PS/HP-KL2	92
6372281149	MEK-E22PS/HP-KL0,3S	92
6372290081	MEK-E50PS/H10-KL2	88
6372299150	MEK-E22PS/HP-KL2	92
6372299151	MEK-E22PS/HP-KL0,3S	92
6373161088	MEM-M10PÖ/M01-KL2	83
6373162095	MEK-M12PÖ/M01-KL2	84
6373162096	MEM-M12PÖ/M01-KL2	84
6373163103	MEK-M18PÖ/M01-KL2	86

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6373260107	MEM-M08PS/M02-K2	83
6373261087	MEM-M10PS/M01-KL2	83
6373262093	MEK-M12PS/M01-KL2	84
6373262094	MEM-M12PS/M01-KL2	84
6373262123	MEM-M12PS/M01-KL5	84
6373263101	MEK-M18PS/M01-KL2	86
6373263102	MEM-M18PS/M01-KL2	86
6373270105	MEN-D06PS/M02-K2	82
6373280106	MEM-Q08PS/M02-K2	87
6373299132	MEN-D04PS/M03-K2	82
6373299133	MEM-M05PS/M03-K2	82
6373299134	MEM-Q05PS/M03-K2	86
6373445129	MEK-E45PB/H11-KL2	88
6373455131	MEM-Q12PB/H11-KL2	87
6373461124	MEM-M10PB/H11-KL2	83
6373462125	MEK-M12PB/H11-KL2	84
6373462126	MEM-M12PB/H11-KL2	84
6373463127	MEK-M18PB/H11-KL2	85
6373463128	MEM-M18PB/H11-KL2	85
6373490130	MEK-E50PB/H11-KL2	88
6379262119	MEK-M12PD/H-KL2	85
6379262120	MEM-M12PD/H-KL2	85
6379263121	MEK-M18PD/H-KL2	86
6379263122	MEM-M18PD/H-KL2	86
6472262077	MEM-M12PS/H10-KL10	84

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Ultrasonic Sensors

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
U	T	1	8	I	-	D	P	E	0	-	0	6	.	0	-	C	3	I	
Product group		Enclosure size		Instal-lation/ use		Type of voltage	Output				Range					Type of connec-tion	Teach-in	Inter-face	Options

Product group		
1		Ultrasonic sensor
2	T	Thermoplastic enclosure
	N	Stainless steel enclosure
Enclosure size details		
3 – 4	e.g. 12	M12 (stainless steel)
	e.g. 15	M30 (stainless steel)
	e.g. 18	M18 (stainless steel)
	e.g. 30	M30 (plastic)
	e.g. 25	30 x 25 x 11 (plastic)
	e.g. 80	80 x 80 x 43 (plastic)
	e.g. 36	101 x 36 x 22 (plastic)
Installation/use		
5	I	Internal transductor
	S	True scan transmitter and receiver
6	-	Dash (fixed)
Type of voltage		
7	A	AC
	D	DC 12-30 V

Digital output		
8	0	None
	P	PNP
	N	NPN
9	0	None
	E	Electrically programmable NC/NO
	...	etc.
Analogue output		
10	0	None
	I	Current – analogue
	U	Voltage – analogue
11	-	Dash (fixed)
Range		
12 – 15	The range and sensing distance are always a 4-digit specification	
	- Millimetre values with no decimal point - Metre values with decimal point	
	e.g. 06.0	6 m
	e.g. 15.0	15 m
	e.g. 0500	500 mm
16	-	Dash (fixed)

Type of connection		
17	C	Cable type (standard C = 2 m or length in m)
	S	Connector (M12, 5-pin)
	V	Connector (M8, 4-pin)
	B	Connector (M16, 8-pin)
Teach-in method		
18	0	None
	1	Button
	2	Serial interface
	3	Contact
	...	etc.
Serial interface		
19	0	None
	1	RS232
	2	RS485
	3	I/O link
	4	CANopen
	...	etc.
Options		
20 on-wards	e.g.	Preset switching points
	...	etc.

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UN12I-DNE0-0200-S30	**6712201001**	100
UN12I-DPE0-0200-S30	**6712101001**	100
UT18I-D00I-01.6-C30	**6711302002**	101
UT18I-D00I-01.6-S30	**6712302002**	101
UT18I-D00I-02.0-C30	**6711302001**	102
UT18I-D00I-02.0-S30	**6712302001**	103
UT18I-D00I-0400-C30	**6711302005**	100
UT18I-D00I-0400-S30	**6712302005**	100
UT18I-D00I-0500-C30	**6711302004**	101
UT18I-D00I-0500-S30	**6712302004**	101
UT18I-D00I-0800-C30	**6711302003**	102
UT18I-D00I-0800-S30	**6712302003**	102
UT18I-D00U-01.6-C30	**6711402002**	101
UT18I-D00U-01.6-S30	**6712402002**	101
UT18I-D00U-02.0-C30	**6711402001**	102
UT18I-D00U-02.0-S30	**6712402001**	103
UT18I-D00U-0400-C30	**6711402005**	100
UT18I-D00U-0400-S30	**6712402005**	100
UT18I-D00U-0500-C30	**6711402004**	101
UT18I-D00U-0500-S30	**6712402004**	101
UT18I-D00U-0800-C30	**6711402003**	102
UT18I-D00U-0800-S30	**6712402003**	102
UT18I-DNE0-01.6-C30	**6711202002**	101
UT18I-DNE0-01.6-S30	**6712202002**	101
UT18I-DNE0-02.0-C30	**6711202001**	102
UT18I-DNE0-02.0-S30	**6712202001**	103
UT18I-DNE0-0400-C30	**6711202005**	100
UT18I-DNE0-0400-S30	**6712202005**	100
UT18I-DNE0-0500-C30	**6711202004**	101
UT18I-DNE0-0500-S30	**6712202004**	101
UT18I-DNE0-0800-C30	**6711202003**	102
UT18I-DNE0-0800-S30	**6712202003**	102
UT18I-DPE0-01.6-C30	**6711102002**	101
UT18I-DPE0-01.6-S30	**6712102002**	101
UT18I-DPE0-02.0-C30	**6711102001**	102
UT18I-DPE0-02.0-S30	**6712102001**	103
UT18I-DPE0-0400-C30	**6711102005**	100
UT18I-DPE0-0400-S30	**6712102005**	100
UT18I-DPE0-0500-C30	**6711102004**	101
UT18I-DPE0-0500-S30	**6712102004**	101
UT18I-DPE0-0800-C30	**6711102003**	102
UT18I-DPE0-0800-S30	**6712102003**	102
UT25I-D00U-0250-V30	**6713411001**	104
UT25I-DNE0-0250-V30	**6713211001**	104
UT25I-DPE0-0250-V30	**6713111001**	104
UT30I-D00I-03.5-C30	**6711303001**	103
UT30I-D00I-03.5-S30	**6712303001**	103
UT30I-D00U-03.5-C30	**6711403001**	103
UT30I-D00U-03.5-S30	**6712403001**	103
UT30I-DNE0-03.5-C30	**6711203001**	103
UT30I-DNE0-03.5-S30	**6712203001**	103
UT30I-DPE0-03.5-C30	**6711103001**	103
UT30I-DPE0-03.5-S30	**6712103001**	103
UT80I-D00I-06.0-S30	**6712312001**	104
UT80I-D00U-06.0-S30	**6712412001**	104
UT80I-DNE0-06.0-S30	**6712212001**	104
UT80I-DPE0-06.0-S30	**6712112001**	104

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6711102001	UT18I-DPE0-02.0-C30	102
6711102002	UT18I-DPE0-01.6-C30	101
6711102003	UT18I-DPE0-0800-C30	102
6711102004	UT18I-DPE0-0500-C30	101
6711102005	UT18I-DPE0-0400-C30	100
6711103001	UT30I-DPE0-03.5-C30	103
6711202001	UT18I-DNE0-02.0-C30	102
6711202002	UT18I-DNE0-01.6-C30	101
6711202003	UT18I-DNE0-0800-C30	102
6711202004	UT18I-DNE0-0500-C30	101
6711202005	UT18I-DNE0-0400-C30	100
6711203001	UT30I-DNE0-03.5-C30	103
6711302001	UT18I-D00I-02.0-C30	102
6711302002	UT18I-D00I-01.6-C30	101
6711302003	UT18I-D00I-0800-C30	102
6711302004	UT18I-D00I-0500-C30	101
6711302005	UT18I-D00I-0400-C30	100
6711303001	UT30I-D00I-03.5-C30	103
6711402001	UT18I-D00U-02.0-C30	102
6711402002	UT18I-D00U-01.6-C30	101
6711402003	UT18I-D00U-0800-C30	102
6711402004	UT18I-D00U-0500-C30	101
6711402005	UT18I-D00U-0400-C30	100
6711403001	UT30I-D00U-03.5-C30	103
6712101001	UN12I-DPE0-0200-S30	100
6712102001	UT18I-DPE0-02.0-S30	103
6712102002	UT18I-DPE0-01.6-S30	101
6712102003	UT18I-DPE0-0800-S30	102
6712102004	UT18I-DPE0-0500-S30	101
6712102005	UT18I-DPE0-0400-S30	100
6712103001	UT30I-DPE0-03.5-S30	103
6712112001	UT80I-DPE0-06.0-S30	104
6712201001	UN12I-DNE0-0200-S30	100
6712202001	UT18I-DNE0-02.0-S30	103
6712202002	UT18I-DNE0-01.6-S30	101
6712202003	UT18I-DNE0-0800-S30	102
6712202004	UT18I-DNE0-0500-S30	101
6712202005	UT18I-DNE0-0400-S30	100
6712203001	UT30I-DNE0-03.5-S30	103
6712212001	UT80I-DNE0-06.0-S30	104
6712302001	UT18I-D00I-02.0-S30	103
6712302002	UT18I-D00I-01.6-S30	101
6712302003	UT18I-D00I-0800-S30	102
6712302004	UT18I-D00I-0500-S30	101
6712302005	UT18I-D00I-0400-S30	100
6712303001	UT30I-D00I-03.5-S30	103
6712312001	UT80I-D00I-06.0-S30	104
6712402001	UT18I-D00U-02.0-S30	103
6712402002	UT18I-D00U-01.6-S30	101
6712402003	UT18I-D00U-0800-S30	102
6712402004	UT18I-D00U-0500-S30	101
6712402005	UT18I-D00U-0400-S30	100
6712403001	UT30I-D00U-03.5-S30	103
6712412001	UT80I-D00U-06.0-S30	104
6713111001	UT25I-DPE0-0250-V30	104
6713211001	UT25I-DNE0-0250-V30	104
6713411001	UT25I-D00U-0250-V30	104

Type Code

Float Switches, Standard Range

1	2	3	4	5	6	7	8	9	10	11	12	13					
M	**A**	**A**	**-**	**7**	**1**	**3**		**K**	**S**	**S**		**1**	**0**	**0**	**0**		
Product group		Immersion tube/float combination		General design	Number of switching points	Contact function		Switching power	Connection head	Range		Switch length in mm					

Product group		
1	M	Magnetic switch
2	Type of output	
	A	Reed contact
	I	Triac
Immersion tube/float combination		
3	Immersion tube material 1.4571	
	A	Cylindrical float rd. 40 x 27 POM
	V	Cylindrical float rd. 42 x 44 PVC
	T	Cylindrical float rd. 30 x 44 PP
	R	Cylindrical float rd. 30 x 44 NBR
	N	Cylindrical float rd. 45 x 47 1.4571
	E	Ball float rd. 52 1.4571
	B	Ball float rd. 62 1.4571
	G	Ball float rd. 84 1.4571
	Immersion tube material brass MS63	
	M	Cylindrical float rd. 40 x 27 POM
	L	Cylindrical float rd. 42 x 44 PVC
	C	Cylindrical float rd. 30 x 44 PP
	S	Cylindrical float rd. 30 x 44 NBR
	P	Cylindrical float rd. 45 x 47 1.4571
	F	Ball float rd. 52 1.4571
	O	Ball float rd. 62 1.4571
	H	Ball float rd. 84 1.4571
	Immersion tube material PVC	
	K	Cylindrical float rd. 40 x 27 POM
	D	Cylindrical float rd. 42 x 44 PVC
	I	Cylindrical float rd. 30 x 44 PP
	U	Cylindrical float rd. 30 x 44 NBR
4	-	Dash (fixed)

General design		
5	7	Float switch
Number of switching points		
6	1	1 switching point
	2	2 switching points
	...	etc.
Contact function		
7	1	NC contact
	2	NO contact
	3	Changeover contact
	4	Mixed configuration (NC, NO, CO)
8		Space (fixed)
Switching power		
9	B	250 V; 0.5 A; 10 VA
	F	250 V; 3.0 A; 100 VA
	K	250 V; 0.5 A; 30 VA
	L	250 V; 1.0 A; 60 VA
	P	250 V; 5.0 A; 250 VA
	X	100 V; 0.25 A; 5 VA
Connection head		
10	Straight immersion tube	
	A	Half cable gland G3/8"
	V	Cable gland PG9
	D	Degussa plastic enclosure
	F	Aluminium enclosure DIN 43729
	K	PVC screw connection R2" connector DIN 43650
	N	PVC screw connection R1.5" connector Amphenol
	O	PVC screw connection R2" connector Amphenol
	R	PVC screw connection R1,5" connector DIN 43650

	S	Flange enclosure rd. 78
	T	PC flange rd. 75 connector DIN 43650
	TO	PC oval flange connector DIN 43650
	FL120	Flange enclosure rd. 120
	DN50	Flange DN65 with enclosure 80 x 80
	DN65	Flange DN65 with enclosure 80 x 80
	R1,5	Tank cable gland R1.5" with enclosure 80 x 80
	R2	Tank cable gland R2" with enclosure 80 x 80
	Elbow immersion tube	
	C	Half cable gland G3/8"
	H	Cable gland PG9
	E	Degussa plastic enclosure
	G	Aluminium enclosure DIN 43729
	L	PVC screw connection R2" connector DIN 43650
	M	PVC screw connection R1.5" connector Amphenol
	P	PVC screw connection R2" connector Amphenol
	I	PVC screw connection R1.5" connector DIN 43650
	B	Flange enclosure rd. 78
	W	PC flange rd. 75 connector DIN 43650
	TW	PC oval flange connector DIN 43650
	WFL120	Flange enclosure rd. 120
	WDN50	Flange DN50 with enclosure 80 x 80
	WDN65	Flange DN65 with enclosure 80 x 80
Range		
11	S	Standard range
12		Space (fixed)
Switch length in mm		
13		Switch length – X

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Adjustable Float Switches

1	2	3	4	5	6	7	8	9	10	11	12	13						
M	A	N	-	V	S	T	-	R	2,	0	/	0	2	5	0			
Product group		Immersion tube/float combination		Type				Connection head				Switch length in mm						

Product group		
1 – 2	MA	Magnetic switch, reed contact
Immersion tube/float combination		
3	Immersion tube material 1.4571	
	N	Cylindrical float rd. 52 x 55 1.4571
	V	Cylindrical float rd. 52 x 55 PVC
	Immersion tube material brass MS63	
	P	Cylindrical float rd. 52 x 55 1.4571
	L	Cylindrical float rd. 52 x 55 PVC
	Immersion tube material brass MS63	
	D	Cylindrical float rd. 52 x 55 PVC
4	-	Dash (fixed)

Type		
5 – 7	VST	Adjustable
8	-	Dash (fixed)
Connection head		
9 – 11	R2,0	Tank cable gland R2" with enclosure 80 x 80
	R1,5	Tank cable gland R1.5" with enclosure 80 x 80
	FL165	Flange DN50 with enclosure 80 x 80
	FL185	Flange DN65 with enclosure 80 x 80
	FL120	Flange enclosure rd. 120
	FLS120	Flange enclosure rd. 120 with protective tube
12	/	Slash (fixed)
Switch length in mm		
13		Switch length – X

Type Code

Miniature Float Switches

1	2	3	4	5	6	7	8	9	10				
MS	**K1**	**-**	**PVC**	**-**	**R1/8**	**-**	**OSO**		**0**	**3**	**5**	**0**	
Range	Float		Immersion tube material		Connection head		Position and number of switching points, with switching function		Switch length in mm				

Range		
1	MS	Miniature float switches
Float		
2	K1	rd. 25 x 20, PP
	K2	rd. 25 x 20, PVC
	K3	rd. 20 x 20, NBR
	K4	rd. 23 x 25, NBR
	K5	rd. 23 x 32, NBR
	K6	rd. 17,5 x 25, NBR
	K7	rd. 25 x 20, PVDF
	K8	rd. 25 x 20, PTFE
	N1	rd. 30, 1.4571
	KS	Pivoted float
3	-	Dash (fixed)
Immersion tube material		
4	NI	Stainless steel 1.4571
	MS	Brass MS63
	PVC	Polyvinyl chloride
	PP	Polypropylene
	POM	Polyacetal

Immersion tube material		
	PVDF	Polyvinyl idenfluoride
	PTFE	Polytetrafluoroethylene
	PA	Polyamide
5	-	Dash (fixed)
Connection head		
6	R1/8	Screw connection R1/8"
	R1/4	Screw connection R1/4"
	R3/8	Screw connection R3/8"
	R1	Screw connection R1"
	R1,5	Screw connection R1,5"
	PG7	Screw connection PG7
	PG9	Screw connection PG9
	M12X1	Screw connection M12x1
	M24X1	Screw connection M24x1
	F40	Flange, rd. 40
	FL75	Flange, rd. 75
	FL36	Flange, 36 x 36 with cable
	FL36ST	Flange, 36 x 36 with connector
	TO	Oval flange
	OV	No connection head

7	-	Dash (fixed)
Position and number of switching points, with switching function		
8	Switching function	
	O	NC contact
	S	NO contact
	U	Changeover contact
	Position and number	
	3 switching points	e.g. NC/NO/NC = top/middle/bottom
	2 switching points	e.g. CO/NO = top/bottom
	1 switching point	e.g. NC = bottom
9		Space
Switch length in mm		
10		Switch length – X

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Options

1	2	3	4	5	6	7	8	9	10	11	12	13	14				
K	L	2	E	V	P	S	N	T	F	Z	I	D	G				

1	K	Short circuit-proof
2	L	LED
3	2	Cable length in m
4	E	Extended sensing distance (sn large)
5	V	Shortened type
6	P	Potentiometer
7	S	Device connector (terminals)
	PU	PUR cable
	SD	Connector to DIN 43650 (including socket)
	SM	Mini snap-in device connector
	S8	M8 device connector with union nut
	S12	Mini snap-in/M8 screw-on device connector
	SM8	M12 device connector with union nut, AC version
	S12A	M16 device connector with union nut and dust cap
	S16S	M12 Ultra-Lock device connector
	S12U	M5 x 0.5 device connector
	S5	Screw connection with cable

8	N	Stainless steel enclosure
9	T	Extended temperature range
10	F	Extended switching frequency
11	Z	Time-delayed
12	I	Programmable (intelligent)
13	D	ATEX products, dust Ex
14	G	ATEX products, gas Ex

Type Code

Cable Connectors

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17			
W	**D**	**K**	**-**	**M**	**1**	**2**	**P**	**S**	**/**	**L**	**L**	**2**	**-**	**2**	**P**	**U**			
Device specifications				Type of connection			Classification				LEDs			Cable length	Options				

Device specifications		
1		Cable output
	W	Elbow
	G	Straight
2		Product group
	D	Socket
	S	Connector (the sensor connections should always be used as the basis for connecting lines with different outputs)
	A	Adapter (socket and connector)
3		Preassembly
	K	Fixed cable
	A	Connection space, self-configurable
	V	Connecting line (extension)
4	-	Dash (fixed)
Type of connection		
5 – 7		(Immer auf Dose/Stecker bezogen)
	M12	Union nut M12 x 1
	M08	Union nut M8 x 1
	R06	Round snap-in connection Ø 6.5 mm
	R12	Round snap-in connection, Ultra-Lock M12
	M05	M5 x 0.5 screw-on connection

Classification		
8		Configuration for switch output
	P	PNP (LED to negative)
	N	N = NPN (LED to positive)
	U	Universal (no LED)
	A	AC (M12 special coding Pin 1 + 2)
9		Pin assignments of cable sockets for switch output
	S	NO contact 1 - 3 - 4 for M12 1 - 3 - 2 for Mini 1 - 2 for M12 AC
	Ö	NC contact 1 - 3 - 2 for M12
	A	Antivalent 1 - 3 - 4 - 2 for M12
	N	NAMUR 1 - 3 for M12
	U	More than 4 connections
	T	Teach-in function
10	/	Slash (fixed)
Manufacturer		
11		Internal information

LEDs		
12	L	Integrated LED
	O	Without LED
13		Number of LEDs
	0	No LED
	1	1 LED
	2	2 LEDs etc.
14	-	Dash (fixed)
Cable length		
15		In m (moulded cable)
Options		
16 – 17	PU	Polyurethane cable
	HF	Highly flexible cable
	SD	Connector/socket
	BD	Socket both ends
	R	Vibration safeguard
	Without	PVC cable

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Cable Connectors (sort by type designation)

Type	Art. No.	Page
GDA-M12UA/LO	**4139100102**	143
GDK-M08US/WO0-10	**4139100797**	142
GDK-M08US/WO0-2	**4139100795**	142
GDK-M08US/WO0-5	**4139100796**	142
GDK-M12US/WO0-10	**4139100803**	142
GDK-M12US/WO0-2	**4139100801**	142
GDK-M12US/WO0-5	**4139100802**	142
GDK-M12UU/HO-2PU	**4139100956**	143
GDK-R06US/SO0-2,5PU	**4139100219**	141
GDK-R06US/SO0-5PU	**4139100220**	141
GDK-R12US/WO0-2	**4139100899**	143
WDA-M12UA/LO	**4139100101**	143
WDK-M08PS/LL2-2	**4139100213**	142
WDK-M08PS/LL2-5	**4139100216**	142
WDK-M08US/WO0-10	**4139100800**	142
WDK-M08US/WO0-2	**4139100798**	142
WDK-M08US/WO0-5	**4139100799**	142
WDK-M12PA/SL2-10PU	**4139100254**	142
WDK-M12PA/SL2-2PU	**4139100244**	142
WDK-M12PA/SL2-5PU	**4139100245**	142
WDK-M12PS/LL2-2	**4139100553**	143
WDK-M12PS/LL2-6	**4139100554**	143
WDK-M12UA/WO0-10	**4139100467**	142
WDK-M12UA/WO0-5	**4139100903**	142
WDK-M12US/WO0-10	**4139100805**	142
WDK-M12US/WO0-2	**4139100804**	142
WDK-M12US/WO0-5	**4139100468**	142
WDK-R06US/SO0-2,5PU	**4139100221**	141
WDK-R06US/SO0-5PU	**4139100222**	141
WDK-R12US/WO0-2	**4139100906**	143

Cable Connectors (sort by article number)

Art. No.	Type	Page
4139100101	WDA-M12UA/LO	143
4139100102	GDA-M12UA/LO	143
4139100213	WDK-M08PS/LL2-2	142
4139100216	WDK-M08PS/LL2-5	142
4139100219	GDK-R06US/SO0-2,5PU	141
4139100220	GDK-R06US/SO0-5PU	141
4139100221	WDK-R06US/SO0-2,5PU	141
4139100222	WDK-R06US/SO0-5PU	141
4139100244	WDK-M12PA/SL2-2PU	142
4139100245	WDK-M12PA/SL2-5PU	142
4139100254	WDK-M12PA/SL2-10PU	142
4139100467	WDK-M12UA/WO0-10	142
4139100468	WDK-M12US/WO0-5	142
4139100553	WDK-M12PS/LL2-2	143
4139100554	WDK-M12PS/LL2-6	143
4139100795	GDK-M08US/WO0-2	142
4139100796	GDK-M08US/WO0-5	142
4139100797	GDK-M08US/WO0-10	142
4139100798	WDK-M08US/WO0-2	142
4139100799	WDK-M08US/WO0-5	142
4139100800	WDK-M08US/WO0-10	142
4139100801	GDK-M12US/WO0-2	142
4139100802	GDK-M12US/WO0-5	142
4139100803	GDK-M12US/WO0-0	142
4139100804	WDK-M12US/WO0-2	142
4139100805	WDK-M12US/WO0-10	142
4139100899	GDK-R12US/WO0-2	143
4139100903	WDK-M12UA/WO0-5	142
4139100906	WDK-R12US/WO0-2	143
4139100956	GDK-M12UU/HO-2PU	143

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Mounting Material

1	2	3	4	5	6	7	8	9											
B	K	S	-	D	2	0	P	A											
Product group				Type group			Material												

Product group		
1	B	Mounting material
2		Type of product
	K	Retaining bracket
	W	Mounting bracket
	H	Retaining plate
3		Specification
	S	Bracket, 2-piece
	B	Block, 1-piece
	R	Reducer
	N	90° elbow
4	-	Dash (fixed)

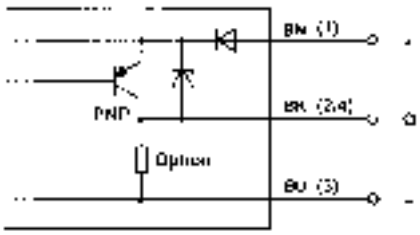
Type group		
5 – 7		**For clips:**
		Diameter in mm corresponding to matching sensor
		For elbows: Type group
	e.g. L05	Light barrier OR05
	e.g. M06	Magnetic switch M06
Material		
8 – 9		Material
	ST	Steel
	NI	Stainless steel
	AL	Aluminium
	PA	Polyamide
	PP	Polypropylene

Ausgangsarten DC 1

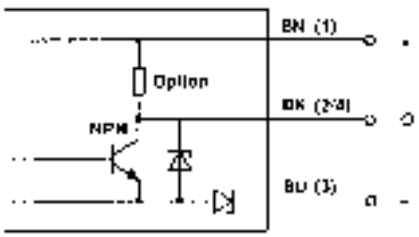
Cable colour abbreviations

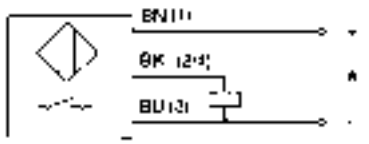
BN = Brown
BU = Blue
BK = Black (switch output)

PNP output
(circuit schematic)

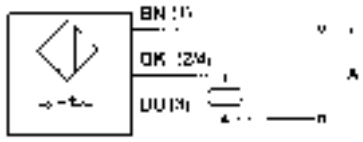


NPN output
(circuit schematic)

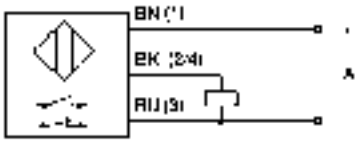




1) PNP normally-open contact
When actuated, a PNP transistor applies the output to positive.

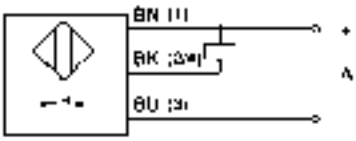


2) PNP normally-closed contact
When actuated, a PNP transistor disconnects the output from positive.

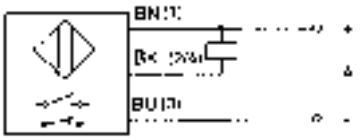


3) PNP programmable
The PNP NO contact 1) or PNP NC contact 2) function can be selected by means of a built-in changeover switch.

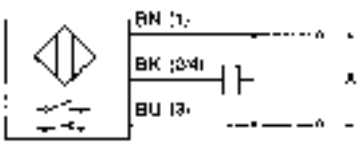
4) NPN normally-open contact
When actuated, a NPN transistor applies the output to negative.



5) NPN normally-closed contact
When actuated, an NPN transistor disconnects the output from negative.

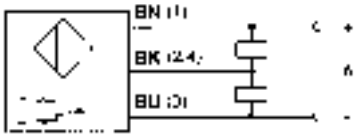


6) NPN programmable
The NPN NO contact 4) or NPN NC contact 5) function can be selected by means of a built-in changeover switch.



7) PNP/NPN programmable
Two built-in changeover switches are used to select between PNP or NPN switching and between NC or NO function.

8) NAMUR
Current change to DIN EN 60947-5-6



9) Push-pull programmable
When actuated, the output changes from negative to positive or, selectable with a built-in changeover switch, from positive to negative.

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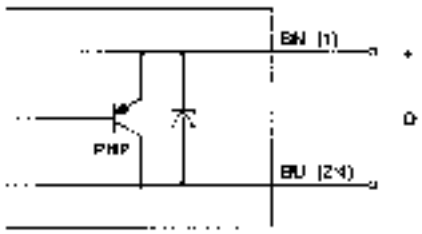
Types of Output DC 2

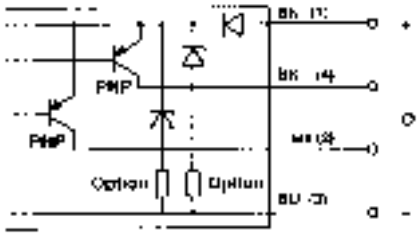
Cable colour abbreviations

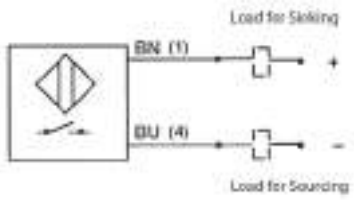
BN = Brown
BU = Blue
BK = Black (switch output)
WH = White (switch output)

DC 2-wire
(circuit schematic)

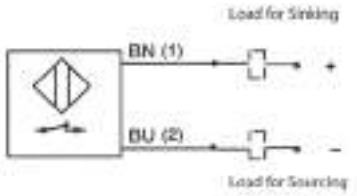


DC 4-wire
(circuit schematic)

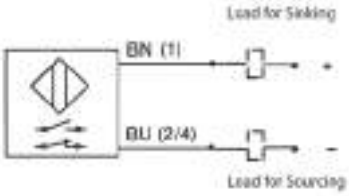




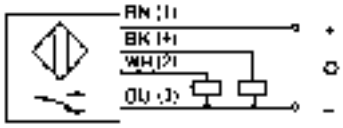
1) NO contact DC 2-wire
When actuated, the contacts are bridged.



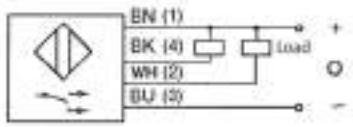
2) NC contact DC 2-wire
When actuated, the contacts are disconnected.



3) NC/NO contact programmable DC 2-wire
The NO contact 1) or NC contact 2) function can be selected by means of a built-in changeover switch.



4) Changeover output DC (antivalent) PNP 4-wire
When actuated, the positive operating voltage is alternatively applied to one of the two outputs.



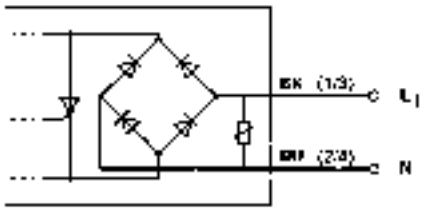
5) Changeover output DC (antivalent) NPN 4-wire
When actuated, the negative operating voltage is alternatively applied to one of the two outputs.

Types of Output AC 1

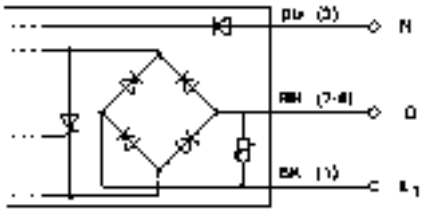
Cable colour abbreviations

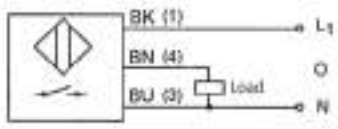
BN = Brown
BU = Blue
BK = Black

AC 2-wire
(circuit schematic)

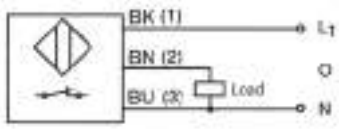


AC 3-wire
(circuit schematic)

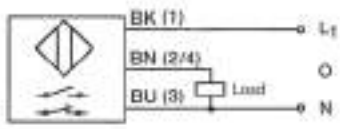




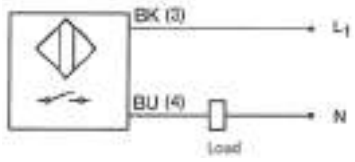
1) NO contact AC 3-wire
When actuated, a thyristor connected across a rectifier bridge applies the operating voltage to the output.



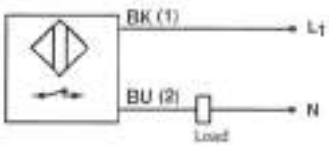
2) NC contact AC 3-wire
When actuated, a thyristor connected across a rectifier bridge disconnects the operating oltage from the output.



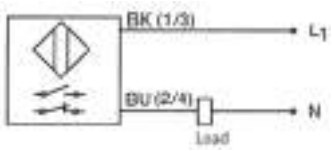
3) NC/NO contact programmable AC 3-wire
The AC NO contact 1) or AC NC contact 2) function can be selected by means of a built-in changeover switch.



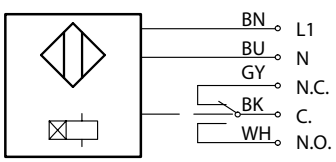
4) NO contact AC 2-wire
When actuated, a thyristor connected across a rectifier bridge applies the load to the operating voltage.



5) NC contact AC 2-wire
When actuated, a thyristor connected across a rectifier bridge disconnects the load from the operating voltage.



6) NC/NO contact programmable AC 2-wire
The AC NO contact 4) or AC NC contact 5) function can be selected by means of a built-in changeover switch.



7) AC relay output
With adjustable pickup delay

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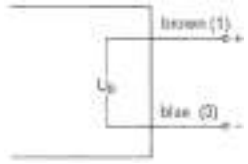
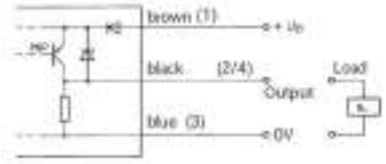
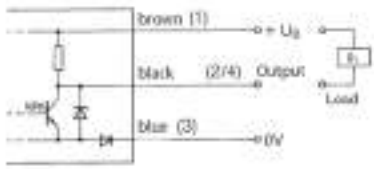
Optoelectronic Sensors 1



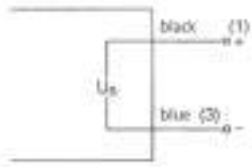
① **Transmitter**



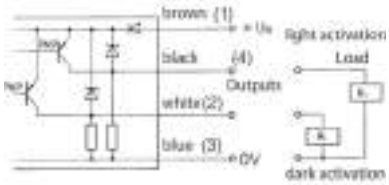
④ **PNP**
Light activated or dark activated



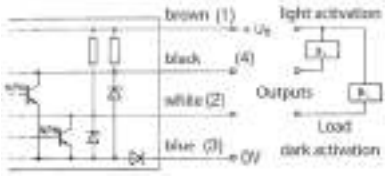
⑦ **NPN**
Light activated or dark activated



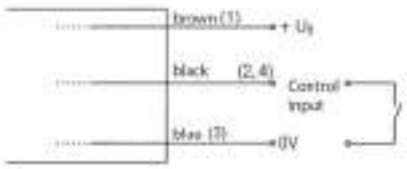
② **Transmitter**



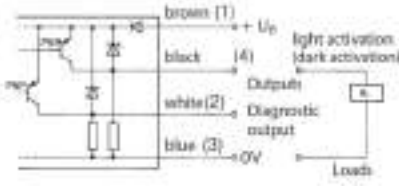
⑤ **PNP antivalent**
Light activated and dark activated



⑧ **NPN antivalent**
Light activated and dark activated

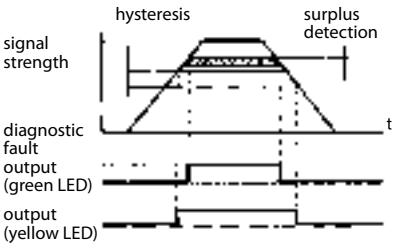


③ **Transmitter**

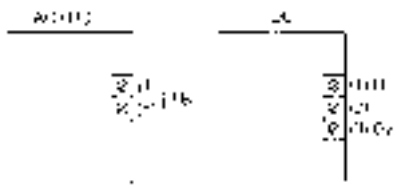


⑥ **PNP**
Light activated and operating reserve output

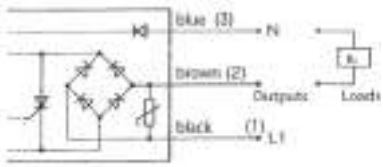
Funktionsreserve



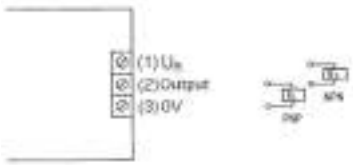
Optoelectronic Sensors 2



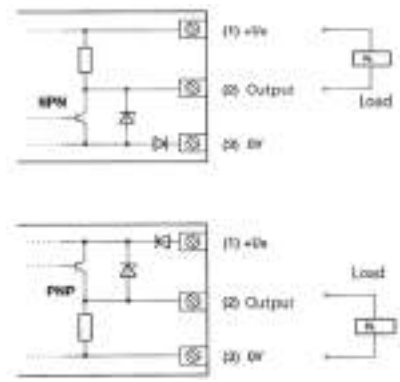
Transmitter



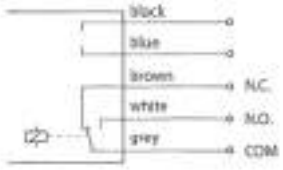
AC 3-wire



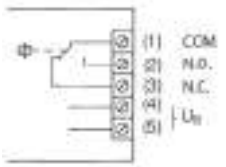
NPN or PNP



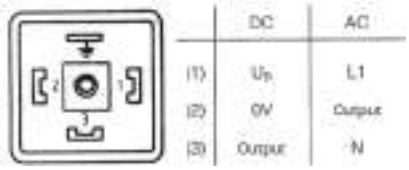
NPN or PNP



Relay output



Relay output



DIN connector

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E-mail:hvssystem@hvssystem.com
Site web : www.hvssystem.com

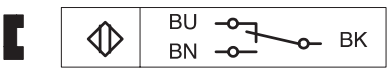
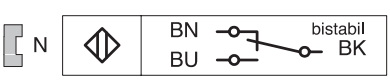
Type of Contact

Electric Loading Capacity of Reed Contacts AC/DC

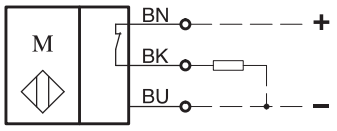
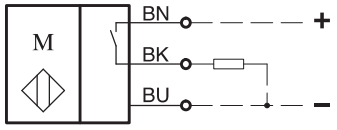
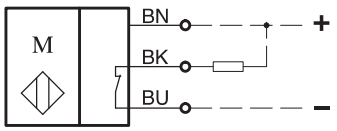
Contact type ID	Power	Voltage	Current
R	3 VA	28 V	0.25 A
X	5 VA	100 V	0.25 A
B	10 VA	250 V	0.5 A
Y	10 VA	100 V	0.5 A
A	20 VA	250 V	0.5 A
K	30 VA	250 V	0.5 A
H	60 VA	250 V	1.0 A
L	60 VA	250 V	1.0 A
M	80 VA	250 V	1.0 A
F	100 VA	250 V	3.0 A
G	250 VA*	250 V	5.0 A*
P	250 VA*	250 V	5.0 A*

* Maximum make current for the duration of 2 ms
2.5 A; 100 W/VA in continuous operation

Wiring Diagrams Electromechanical Magnetic Switches

contact	
NO contact	
Changeover contact	
Bistable ON-OFF	
Bistable Changeover contact	

Wiring Diagrams Electronic Magnetic Switches

NC contact, PNP	
NO contact, PNP/PNP, bistable	
NC contact, NPN	
NO contact, NPN