

Magnetic Switches

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 magnetoresistive 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.

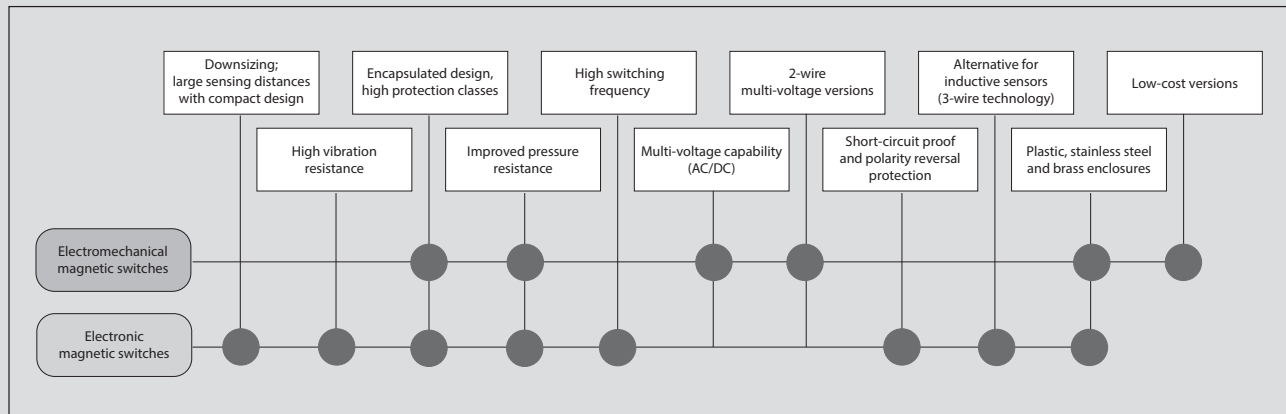
Thanks to the use of only one single "active" component (reed contact), "traditional" electromechanical magnetic switches are extremely reliable in operation. The universal current capability and low procurement costs allow these switches to be used in a wide range of applications.

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 electromechanical magnetic switches

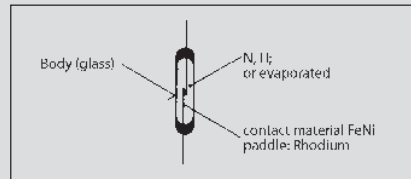
- Reliable under extreme ambient conditions such as dirt, humidity, gas, dust, etc.
- Protection class up to IP 67
- Stable switching point, reproducible switching point accuracy of approx. 0.1 mm
- Can be operated from several directions
- Can be mounted in any position
- High operational reliability 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 10^8 switching cycles if contacts are suitably protected
- Special versions available for extreme temperatures from $-40\text{ }^{\circ}\text{C}$ to $+150\text{ }^{\circ}\text{C}$
- 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.

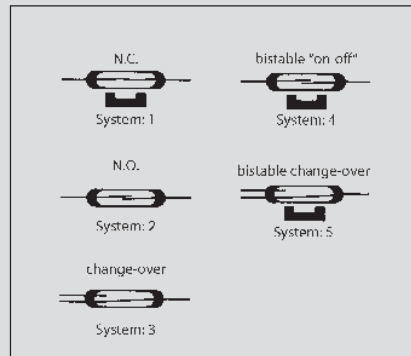
The magnetically influenced parts and their auxiliary components (resistor, diode, triac, output stage, etc.) are cast in high quality insulating material or casting compound to increase the vibration / impact strength and guarantee a protection class up to IP 67. Metal versions (stainless steel, aluminium 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.



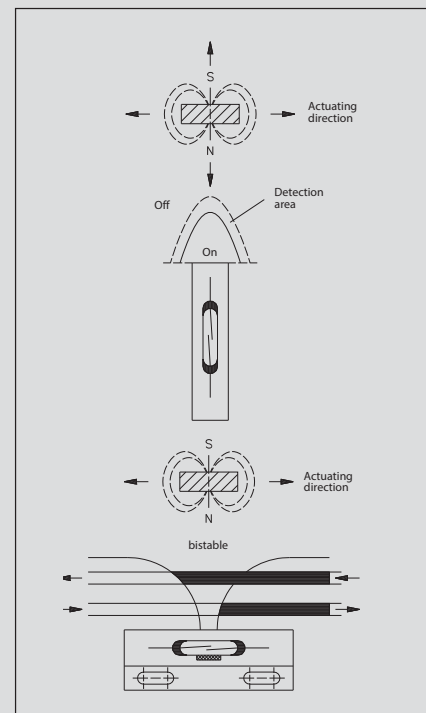
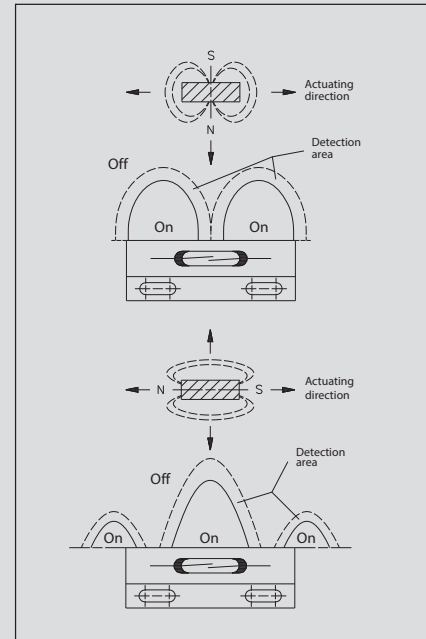
Types of reed contact switches

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.).



Magnetic Switches

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 $-5\text{ }^{\circ}\text{C}$ to $+70\text{ }^{\circ}\text{C}$. Special types are also available offering an extended operating temperature range from $-40\text{ }^{\circ}\text{C}$ to $+150\text{ }^{\circ}\text{C}$.

Electrical service life

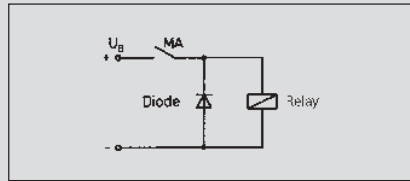
To maintain a long service life of the electrical contacts, it is important to ensure the maximum supply voltage and maximum switching current are not exceeded. Refer to the diagrams on Page 67 for the load values.

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.

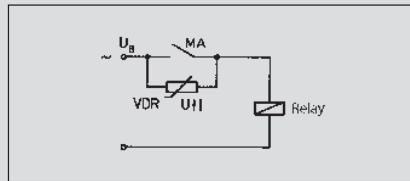
1. Inductive loads

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

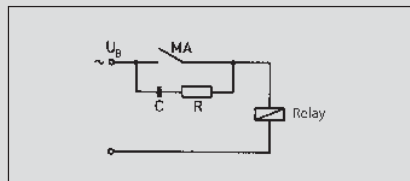
1) Voltage peaks induced by switching off inductive loads are suppressed by connecting a voltage-dependent resistor (VDR) in parallel to the reed contact.



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 parallel to the contact and therefore in series to the load (vice versa is also possible).



Suppression of voltage peaks with RC element

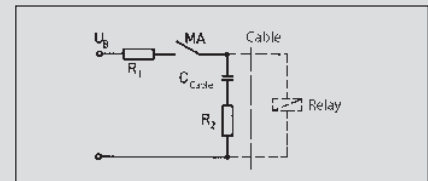
2. Capacitive loads

In contrast to inductive loads, an increase of making currents can occur in connection with capacitive loads and lamp loads that could 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.

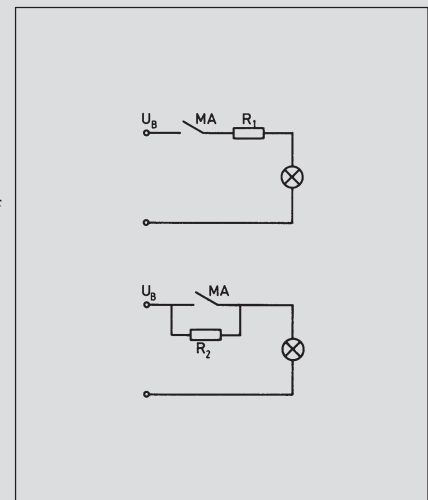
A resistor connected in series to the contact will reduce this current. The size of the resistor is determined by the characteristics of the corresponding electric circuit.

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:

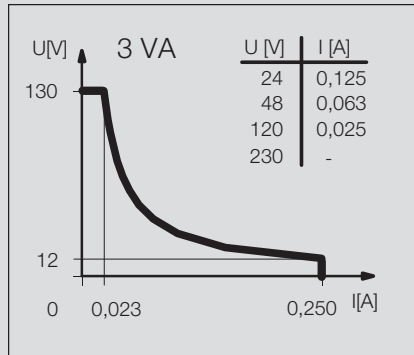


Capacitive load

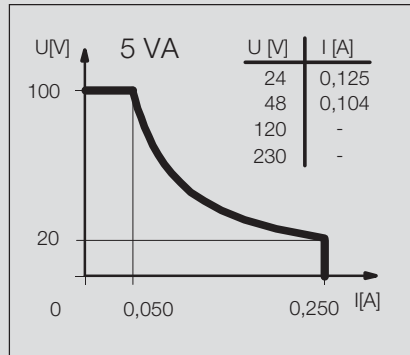


Lamp load

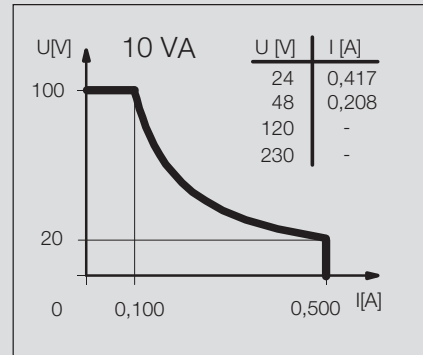
Performance diagrams for electromechanical magnetic switches



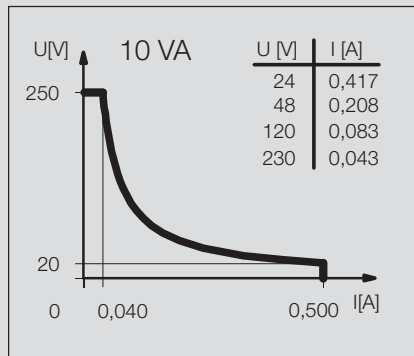
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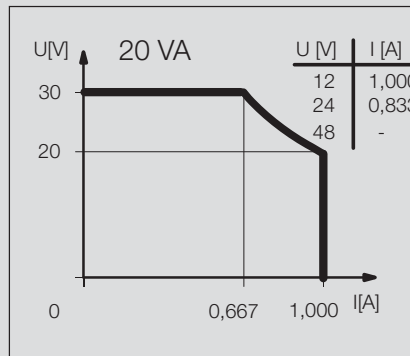
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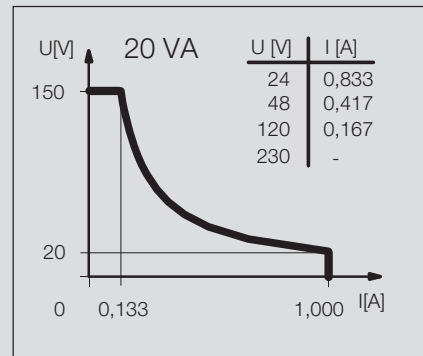
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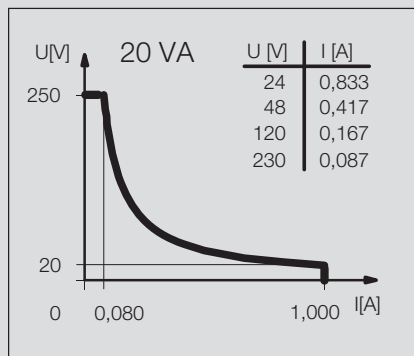
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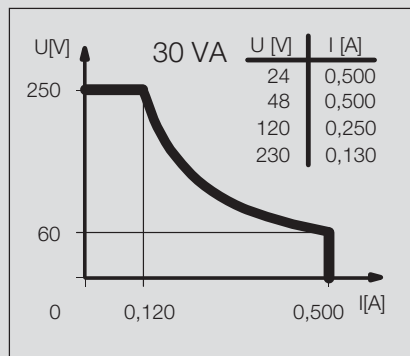
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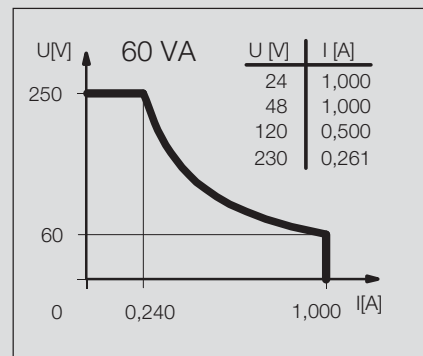
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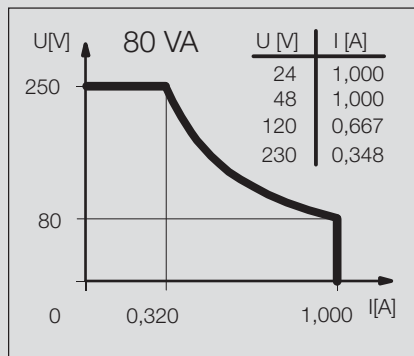
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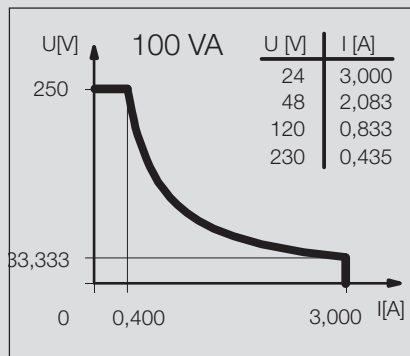
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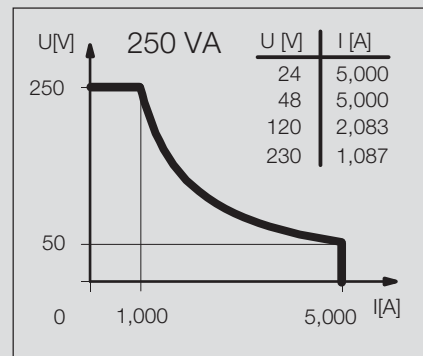
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(10)



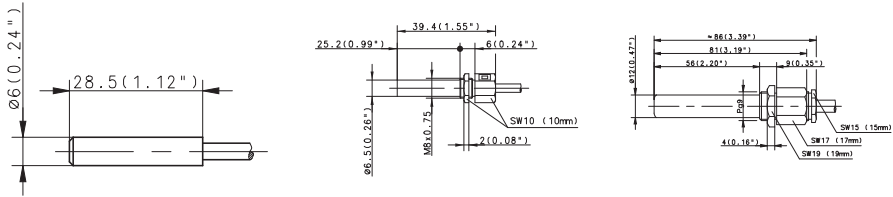
(11)



(12)

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	18 mm	6 mm	7 mm
Type of connection	Cable 1 m	Cable 1 m	Cable 2 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						



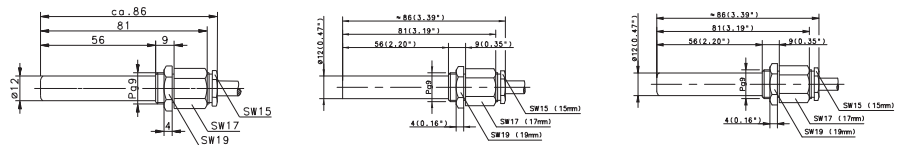
Switching function	NO contact Type NC contact Type Changeover contact Type Bistable Type	6311230571 MAK-3012-B-1	6310246500 MAK-4612-A-2	6314206246 MAA-0612-F-1
		6310330572 MAK-3013-X-1		6317306315 MAA-0613-M-1

Technical data					
Max. switching voltage	100 V	250 V	250 V	250 V	250 V
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 IEC 529, EN 60529	IP67	IP67	IP67	IP67	IP67
Enclosure material	PA	PA	PA	Aluminium	Al/CuZn39Pb3
Connection	3 x 0.14 mm ²	2 x 0.14 mm	2 x 0.14 mm ²	4 x 0.75 mm ²	3 x 0.75 mm ²

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			



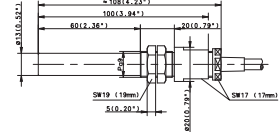
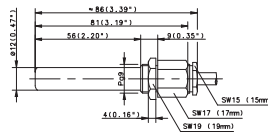
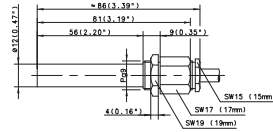
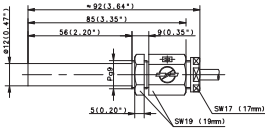
Switching function	NO contact Type NC contact Changeover contact Type Bistable	6312206321 MAA-0612-D-1	6314216476 MAN-1612-F-3	6314216585 MAN-1612-FT-8	6314226423 MAK-2612-F-1	6315306314 MAA-0613-K-1	6316316259 MAN-1613-L-1
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Technical data						
Max. switching voltage	250 V	250 V	250 V	250 V	250 V	250 V
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 IEC 529, EN 60529	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 mm ²	3 x 0.75 mm ²	3 x 0.75 mm ²	2 x 0.5 mm ²	4 x 0.75 mm ²	4 x 0.75 mm ²

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

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 1 m	Cable 1 m	Cable 1 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 MAK-2613-L-1	6315326425 MAK-2613-K-1	6410206399 MAA-0612-NT-4	6310406554 MAA-0614-P-1	6316306248 MAA-0613-L-1	6316306004 MAA-0613-LT-1	6310136616 MAK-3611-P-1	6310536617 MAK-3615-L-1
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250 V	250 V	250 V	250 V	250 V	250 V	250 V	250 V
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

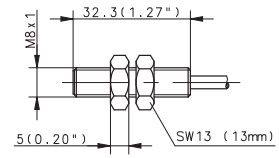
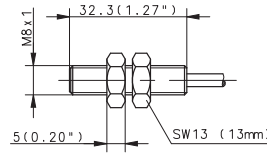
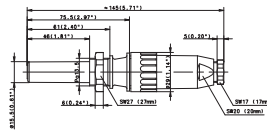
-5°C/+70°C	-5°C/+70°C	-40°C/+150°C	-5°C/+70°C	-5°C/+70°C	-40°C/+150°C	-5°C/+70°C	-5°C/+70°C
IP67	IP67	IP67	IP67	IP67	IP67	IP67	IP67
PA, red	PA, red	Al/CuZn39Pb3	Al/CuZn39Pb3	Al/CuZn39Pb3	Al/CuZn39Pb3	PA, black	PA, black
3 x 0.5 mm ²	3 x 0.5 mm ²	3 x 0.75 mm ²	3 x 0.75 mm ²	4 x 0.75 mm ²	4 x 0.75 mm ²	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				



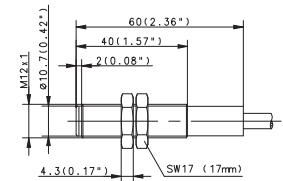
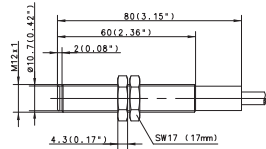
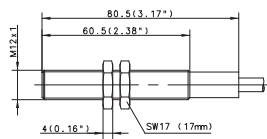
Switching function	NO contact		NC contact		Changeover contact		Bistable	
	Type	Type	Type	Type	Type	Type	Type	Type
	6317304313	MAK-0413-M-S	6310308597	MAN-0813-Y-1	6310308595	MAN-0813-STK	6311208596	MAN-0812-B-1

Technical data	Ø 15.5 mm	M8		M8
Max. switching voltage	250 V	100 V	30 V	250 V
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	Ø 15.5 mm	M8		M8
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 IEC 529, EN 60529	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 mm ²	Ø 6.5 mm	2 x 0.14 mm ²

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
Type of connection	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
Special feature				



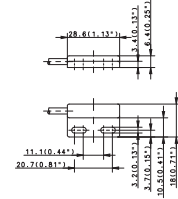
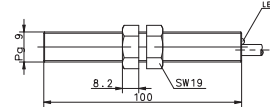
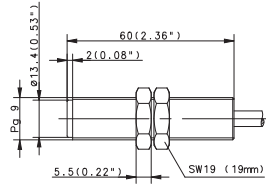
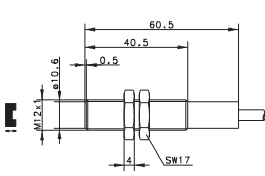
Switching function	NO contact		NC contact		Changeover contact		Bistable	
	Type	Type	Type	Type	Type	Type	Type	Type
	6314223268	MAM-2312-F-1	6314233002	MAK-3312-F-2	6316333005	MAK-3313-L-1	6316318002	MAM-1813-L-1
							6416228260	MAK-2812-L-3
								6311218294
								MAM-1812-B-1

Technical data	Ø 15.5 mm	M12		M12
Max. switching voltage	250 V	250 V	250 V	250 V
Switching current (max)	3 A	3 A	1 A	1 A
Performance class (diagram No.)	100 VA	100 VA	60 VA	60 VA
Shock resistance		50 g (11 ms)		50 g (11 ms)

Mechanical data	Ø 15.5 mm	M12		M12
Ambient temperature (min/max)	-5°C/+70°C	-25°C/+70°C	-5°C/+70°C	-5°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67	IP67	IP67	IP67
Enclosure material	CuZn39Pb3	PA, red	PA, red	CuZn39Pb3
Connection	2 x 0.5 mm ²	2 x 0.5 mm ²	3 x 0.5 mm ²	3 x 0.5 mm ²

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

M12		PG9		PG9		28.6x18x6.4mm	
18 mm	22 mm	17 mm		20 mm		8 mm	8 mm
Cable 2 m	Cable 2 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		TK-11-11	TK-11-11
				D			



6310118626 MAM-1811-2	6410433350 MAK-3314-P-2	6316343544 MAM-4313-L-2	6310431569 MAM-3114-2-LED	6310311615 MAK-1113-1	6410311368 MAK-1113-1,5
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175 V	250 V	250 V	250 V	130 V	130 V
0.25 A	1.5 A	1 A	1 A	0.25 A	0.25 A
5 VA	250 VA	60 VA	120 VA	3 VA	3 VA
50 g (11 ms)					

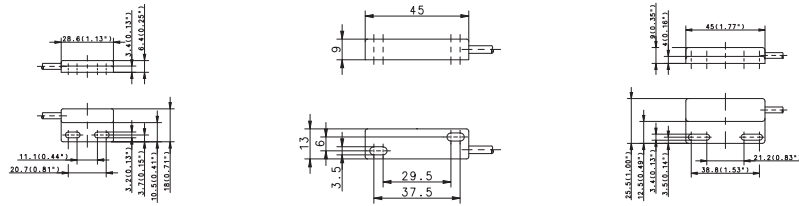
-5°C/+70°C	-25°C/+70°C	-5°C/+80°C	-5°C/+80°C	-5°C/+70°C	-20°C/+70°C
IP67	IP67	IP65	IP65	IP67	IP67
CuZn39Pb3	PA, red	CuZn39Pb3	CuZn39Pb3	PA, black	PA
2 x 0.34 mm ²	2 x 0.5 mm ²	3 x 0.5 mm ²	2 x 0.5 mm ²	3 x 0.14 mm ²	3 x 0.14 mm ²

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, 68 x 30, 80 x 20)

Type	28.6x18x6.4mm		45x13x9mm		45x25.5x9mm	
Nominal switching distance (San)	10 mm	25 mm	10 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						



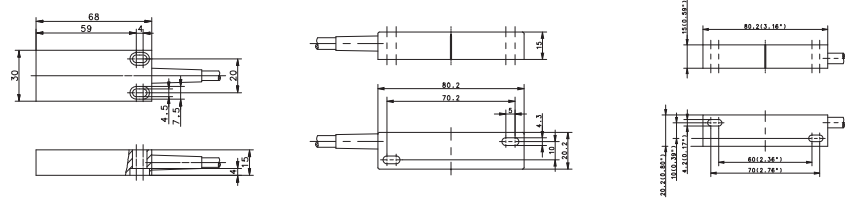
Switching function	NO contact	6311211541	6311201095	6311245539
	Type	MAK-1112-B-1	MAK-0112-B-2	MAK-4512-B-1
NC contact	Type			
	Changeover contact			6316345540
Type				MAK-4513-L-1
	Bistable	6311411603		
Type		MAK-1114-B-5		

Technical data	
Max. switching voltage	250 V 250 V 250 V 250 V 250 V
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 IEC 529, EN 60529	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 mm ² 2 x 0.14 mm ²

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

Type	68x30x15 mm		80x20x15 mm		80x20x15 mm	
Nominal switching distance (San)	8 mm	18 mm	18 mm	20 mm	10 mm	10 mm
Type of connection	Cable 1 m	Cable 1 m	Cable 1 m	Cable 3 m	Cable 3 m	Cable 3 m
Reference magnet (Page)	T-62 N/S	TK-21-02	TK-21-02	T-62 N/S	T-67	T-67
Special feature				Temperature		



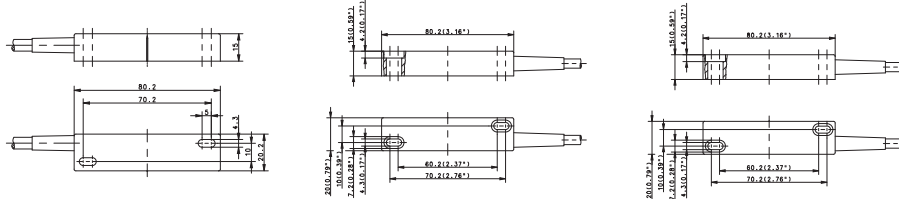
Switching function	NO contact	6316313004	6315302309	6315312196	6314402566	6419402397
	Type	MAK-1313-L-1	MAK-0213-K-1	MAK-1213-K-1	MAA-0214-FT-3	MAK-0214-P-3
NC contact	Type					
	Changeover contact					
Type						
	Bistable					

Technical data	
Max. switching voltage	250 V 250 V 250 V 250 V 250 V
Switching current (max)	1 A 0.5 A 0.5 A 3 A 5 A
Performance class (diagram No.)	60 VA 30 VA 30 VA 100 VA 250 VA
Shock resistance	10 g (11 ms)

Mechanical data	
Ambient temperature (min/max)	-5°C/+70°C -5°C/+70°C -5°C/+70°C -40°C/+150°C -25°C/+70°C
Protection class in accordance with IEC 529, EN 60529	IP67 IP67 IP67 IP67 IP67
Enclosure material	PC, red PA, black PA, red GDAIS12, red PA, black
Connection	3 x 0.5 mm ² 3 x 0.75 mm ² 3 x 0.75 mm ² 3 x 0.75 mm ² 2 x 0.5 mm ²

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

80x20x15 mm		80x20x15 mm		80x20x15 mm	
21 mm	21 mm	21 mm	24 mm	24 mm	25 mm
Cable 1 m	Cable 1 m	Cable 1 m	Cable 1 m	Cable 1 m	Cable 1 m
TK-21-02	TK-21-02	TK-21-12	TA-21-02	TK-21-12	T-62 N/S



6312202316 MAK-0212-L-1	6314202204 MAK-0212-F-1	6314212217 MAK-1212-F-1	6316302206 MAK-0213-L-1	6316312220 MAK-1213-L-1	6410412143 MAK-1214-L-2
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250 V	250 V	250 V	250 V	250 V	250 V
0.5 A	3 A	3 A	1 A	1 A	1 A
30 VA	100 VA	100 VA	60 VA	60 VA	60 VA

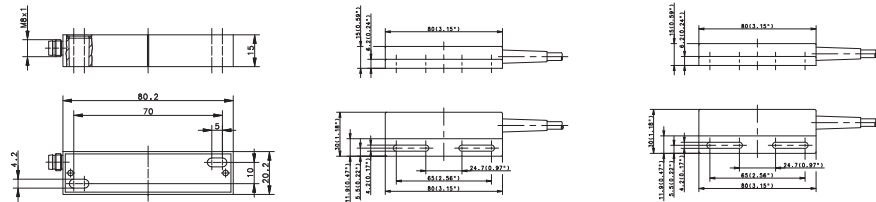
-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C	-5°C/+70°C
IP67	IP67	IP67	IP67	IP67	IP67
PA, black	PA, black	PA, red	PA, black	PA, red	PA, red
2 x 0.75 mm ²	2 x 0.75 mm ²	2 x 0.5 mm ²	3 x 0.5 mm ²	3 x 0.5 mm ²	2 x 0.5 mm ²

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	80 x 20 x 15 mm		80 x 30 x 15 mm		80 x 30 x 15 mm	
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				



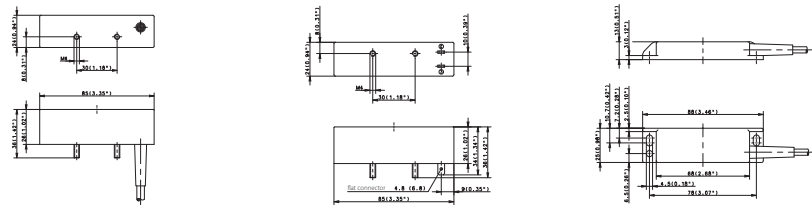
Switching function	NO contact		NC contact		Changeover contact	
	Type	Type	Type	Type	Type	Type
	MAA-0213-STK	MAA-0213-LT-1	MAK-4411-F-1	MAK-4412-F-1	MAK-4413-M-1	MAK-4414-P-1
	6310302636	6316302389	6314144542	6314244536	6317344538	6310444537

Technical data	80 x 20 x 15 mm		80 x 30 x 15 mm		80 x 30 x 15 mm	
Max. switching voltage	60 V	250 V	250 V	250 V	250 V	250 V
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	80 x 20 x 15 mm		80 x 30 x 15 mm		80 x 30 x 15 mm	
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 IEC 529, EN 60529	IP65	IP67	IP67	IP67	IP67	IP67
Enclosure material	GDAISi 12, red	GDAISi12, red	PA, black	PA, black	PA, black	PA
Connection	M8 x 1	4 x 0.75 mm ²	2 x 0.5 mm ²	2 x 0.5 mm ²	2 x 0.5 mm ²	3 x 0.5 mm ²

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

Type	85 x 24 x 26 mm		85 x 24 x 26 mm		88 x 25 x 13 mm	
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			



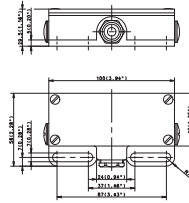
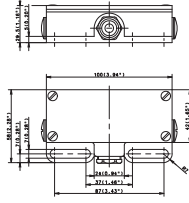
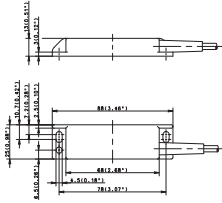
Switching function	NO contact		NC contact		Changeover contact	
	Type	Type	Type	Type	Type	Type
	MAK-3214-F-3	MAK-3214-P-1	MAK-3214-P-STK4.8		MAK-4213-M-1	MAK-4212-F-1
	6314432609	6310432598	6310432590		6317342535	

Technical data	85 x 24 x 26 mm		85 x 24 x 26 mm		88 x 25 x 13 mm	
Max. switching voltage	250 V	250 V	250 V		250 V	250 V
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	85 x 24 x 26 mm		85 x 24 x 26 mm		88 x 25 x 13 mm	
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 IEC 529, EN 60529	IP67	IP67	IP67		IP67	IP67
Enclosure material	PBT	PA, black	PBT, black		PA, black	PA, black
Connection	2 x 0.5 mm ²	2 x 0.75 mm ²	4.8 mm		3 x 0.5 mm ²	2 x 0.5 mm ²

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

88x25x13 mm		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 MAA-0312-F		
		6317303312 MAA-0313-M			
6310442534 MAK-4214-P-1	6310442622 MAK-4214-P-3			6319403532 MAA-0314-P	

250 V	250 V	250 V	250 V	250 V
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

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