

Magnetic switch

Model MSA

WIKA data sheet SP 30.02

Applications

- Pulse generator for revolution, piston stroke and meter counting
- Running and standstill monitoring for machinery
- Amplitude of vibration monitoring for centrifuges
- Control of machine tools and also textile and printing machinery
- Filling scales, resonance conveyors and screens

Special features

- Magnetic switches work properly under extreme environmental influences, e.g. dirt, humidity, gases, dust, chips etc.
- Stable switch point, reproducible switch point accuracy 0.01 mm
- Reed contact can be actuated from several directions
- Can be mounted in any orientation
- Can be actuated in a voltage-free condition, bistable variants can save signals and are particularly suitable for extremely long stroke lengths

Description

The magnetic switch is made up of flat contact studs, which are hermetically sealed in a glass tube filled with inert gas (reed contact). By bringing a permanent magnet close, the overlapping contact stud ends attract each other and spring together into contact. Upon removal of the permanent magnet, the contact studs demagnetise immediately and return to their rest position.

The air gap between the contact stud ends is only 0.2 ... 0.3 mm and, for the contact studs, the mass to be moved and their spring force are very small. Thus the magnetic switch switches with almost no inertia and one can consider it as a "quasi-electronic component".



Fig. centre: MSA-GMSM 16

Fig. right: MSA-KRS 9

These cost-effective magnetic switches, which are particularly easy to install, are excellently suited for the automation of processes and as position indicators for sliders, flaps and valves.

The reliability of these compact switches is ensured through their long electrical service life. Since the magnetic switches mostly consist of just one component, they are particularly safe in operation.

Design, mode of operation and contact functions

Normally open

When a permanent magnet (red north pole or blue south pole) approaches the actuation zone of the magnetic switch, the contact studs of the integral inert gas contact (reed contact) are magnetised and attract each other. Since the magnetic field between the contact studs increases quadratically with decreasing air gap, the magnetic switch contact closes with a snap action.

Normally closed

The contact stud of a normally open contact has been magnetised using a polarising magnet with a south pole field such that the contact closes. When a blue south pole actuating magnet is brought close to the magnetic switch, both contact studs are magnetised with the same polarity. Like poles repel each other and the magnetic switch contact opens.

Change-over

The change-over contact has one movable and two fixed contact studs. When there is no magnetic field present, the moving contact stud is held against the fixed break (normally closed) contact by spring force. By bringing an actuating magnet close (red north pole or blue south pole) the moving contact stud is attracted by the working contact (normally open). The break contact opens and the working contact snaps closed.

Bistable normally open and change-over contact

Using a polarising magnet, one contact stud is magnetised with a south pole field so that when a red north pole permanent magnet approaches, the magnetic switch contact closes and when a blue south pole permanent magnet approaches it then opens again.

Mechanical lifetime

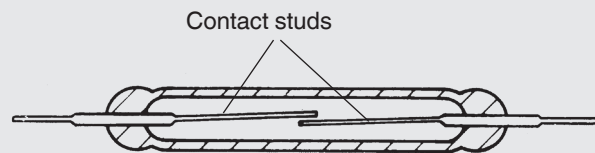
The actuation of the magnetic switch with permanent magnets (or electromagnets) is completely wear-free, since the magnetic field produces no wear. Since the contact studs are very pliant, even after 3×10^9 switching cycles (bends), no fatigue fractures occur. If a magnetic switch is actuated once every second, then one would need 100 years before 3×10^9 (3 billion) switching cycles were reached. The mechanical lifetime is therefore practically unlimited.

Electrical lifetime

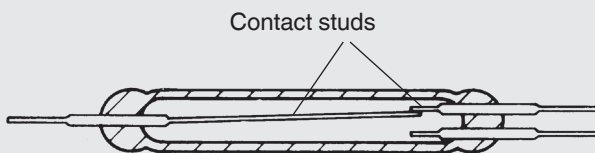
Magnetic switches are susceptible to excessive current loads. Since the spring forces of the pliant contact studs are only small, if there is a welding effect between only a few molecules of the contact material, it is sufficient to cause a sticking of the contact studs. Since magnetic switches open their contacts extremely quickly, with the switching off of inductive devices such as relays, solenoid valves and solenoids particularly high self-induction voltages exist.

If contact protection measures are taken, then a high electrical lifetime can be achieved.

Reed contact for normally open or normally closed contact



Reed contact for change-over



Actuating distances

The largest actuation distance between magnetic switch and permanent magnet is achieved when one fixes the permanent magnet directly to iron with non-metal screws. As a result of an iron baseplate, the magnetic field is concentrated and thus has a greater range. If one attaches the permanent magnet with iron screws, then a part of the magnetic field in the holes is short-circuited and the range is thus smaller. When permanent magnets are arranged next to each other with smaller distances than 50 to 60 mm, the polarity must alternate (north-south-north-south and so on), so that the magnetic field between the permanent magnets is interrupted. Only then will the magnetic switches be actuated by each permanent magnet.

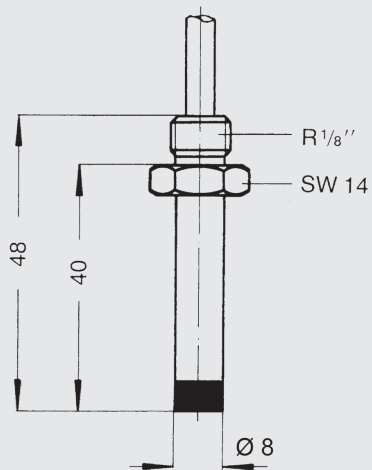
For permanent magnets with order code and also a table of actuating distances, see Accessories at the end of this data sheet.

Model overview

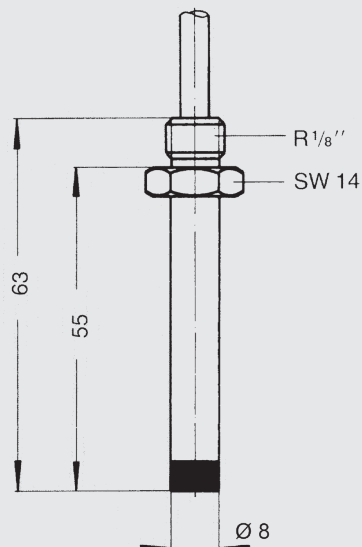
Magnetic switches, case forms and materials	Dimensions	Switch behaviour	Max. switching power AC/DC	Max. switching voltage	Max. switching current AC/DC
Mini magnetic switch in round stainless steel case					
Model MSA-VS-Lx	L = 40 or 55	Monostable	10 VA / 5 W	230 V	0.5 A / 0.25 A
Magnetic switch in round polyamide case, glass-fibre reinforced					
Model MSA-MRS 9	L = 50	Monostable	10 VA / 5 W	230 V	0.5 A / 0.25 A
Model MSA-KRS 9	L = 60	Monostable	60 VA / 30 W	230 V	1 A / 0.5 A
Model MSA-KRU 9	L = 60	Monostable	30 VA / 20 W	230 V	0.5 A / 0.35 A
Model MSA-KWU 9	L = 60	Monostable	50 VA / 30 W	230 V	1 A / 0.5 A
Model MSA-GMS 9	L = 80	Monostable	100 VA / 50 W	230 V	1 A / 0.5 A
Model MSA-GMU 9	L = 80	Monostable	30 VA / 20 W	230 V	0.5 A / 0.35 A
Model MSA-GMSM 16	L = 75	Bistable	100 VA / 50 W	230 V	1 A / 0.5 A
Model MSA-GMOM 16	L = 75	Bistable	100 VA / 50 W	230 V	1 A / 0.5 A
Model MSA-GMUM 16	L = 75	Bistable	30 VA / 20 W	230 V	0.5 A / 0.35 A
Magnetic switch in round brass case					
Model MSA-MRS 10	M10 x 1 thread	Monostable	10 VA / 5 W	230 V	0.5 A / 0.25 A
Model MSA-MRS 12	M12 x 1 thread	Monostable	60 VA / 30 W	230 V	1 A / 0.5 A
Model MSA-MRU 12	M12 x 1 thread	Monostable	30 VA / 20 W	230 V	0.5 A / 0.35 A
Model MSA-MRS 20	M20 x 1 thread	Monostable	60 VA / 30 W	230 V	1 A / 0.5 A
Model MSA-MRU 20	M20 x 1 thread	Monostable	30 VA / 20 W	230 V	0.5 A / 0.35 A
Magnetic switch in round polyamide case					
Model MSA-GMS 18	M18 x 1.5 thread	Monostable	60 VA / 30 W	230 V	1 A / 0.5 A
Model MSA-GMU 18	M18 x 1.5 thread	Monostable	30 VA / 20 W	230 V	0.5 A / 0.35 A
Model MSA-GMUM 18	M18 x 1.5 thread	Bistable	100 VA / 50 W	230 V	1 A / 0.5 A
Magnetic switch in flat polyamide case, glass-fibre reinforced					
Model MSA-DRS	L = 80	Monostable	60 VA / 30 W	230 V	1 A / 0.5 A
Model MSA-DRU	L = 80	Monostable	30 VA / 20 W	230 V	0.5 A / 0.35 A
Model MSA-DRSM	L = 80	Bistable	100 VA / 50 W	230 V	1 A / 0.5 A
Model MSA-DRUM	L = 80	Bistable	30 VA / 20 W	230 V	0.5 A / 0.35 A
Model MSA-DWU	L = 80	Monostable	50 VA / 30 W	230 V	1 A / 0.5 A
Model MSA-DGS	L = 80	Monostable	100 VA / 50 W	230 V	1 A / 0.5 A
Magnetic switch in aluminium case					
Model MSA-FKS-AL	L = 50	Monostable	10 VA / 5 W	230 V	0.5 A / 0.25 A
Model MSA-FKOM-AL	L = 50	Bistable	10 VA / 5 W	230 V	0.5 A / 0.25 A
Model MSA-FKSM-AL	L = 50	Bistable	10 VA / 5 W	230 V	0.5 A / 0.25 A
Model MSA-FLS-AL	L = 80	Monostable	60 VA / 30 W	230 V	1 A / 0.5 A
Model MSA-FLU-AL	L = 80	Monostable	30 VA / 20 W	230 V	0.5 A / 0.35 A
Model MSA-FLSM-AL	L = 80	Bistable	100 VA / 50 W	230 V	1 A / 0.5 A
Model MSA-FLUM-AL	L = 80	Bistable	30 VA / 20 W	230 V	0.5 A / 0.35 A
Model MSA-FWU-AL	L = 80	Monostable	50 VA / 30 W	230 V	1 A / 0.5 A
Model MSA-FGMS-AL	L = 80	Monostable	100 VA / 50 W	230 V	1 A / 0.5 A
Magnetic switch in round stainless steel case					
Model MSA-EVS-L70 (KRS)	L = 70	Monostable	60 VA / 30 W	230 V	1 A / 0.5 A
Model MSA-EVU-L70 (KRU)	L = 70	Monostable	30 VA / 20 W	230 V	0.5 A / 0.35 A
Model MSA-EVS-L100 (GMS)	L = 100	Monostable	100 VA / 50 W	230 V	1 A / 0.5 A
Model MSA-EVSM-L100 (GMSM)	L = 100	Bistable	100 VA / 50 W	230 V	1 A / 0.5 A
Model MSA-EVOM-L1004 (GMOM)	L = 100	Bistable	100 VA / 50 W	230 V	1 A / 0.5 A
Model MSA-EVUM-L100 (GMUM)	L = 100	Bistable	30 VA / 20 W	230 V	0.5 A / 0.35 A
Slot magnetic switch for non-contact actuation using a sheet iron flag in polyamide case					
Model MSA-SRO	-	Monostable	100 VA / 50 W	230 V	1 A / 0.5 A
Model MSA-SRU	-	Monostable	30 VA / 20 W	230 V	0.5 A / 0.35 A
Model MSA-SWO	-	Monostable	50 VA / 30 W	230 V	1 A / 0.5 A
Model MSA-SWU	-	Monostable	50 VA / 30 W	230 V	1 A / 0.5 A

Mini magnetic switch in stainless steel Model MSA-VS-Lx

Model MSA-VS-L40



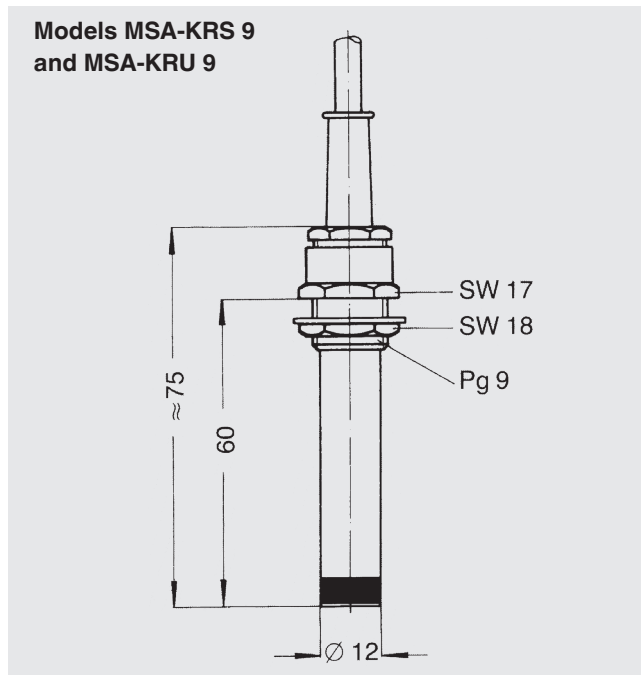
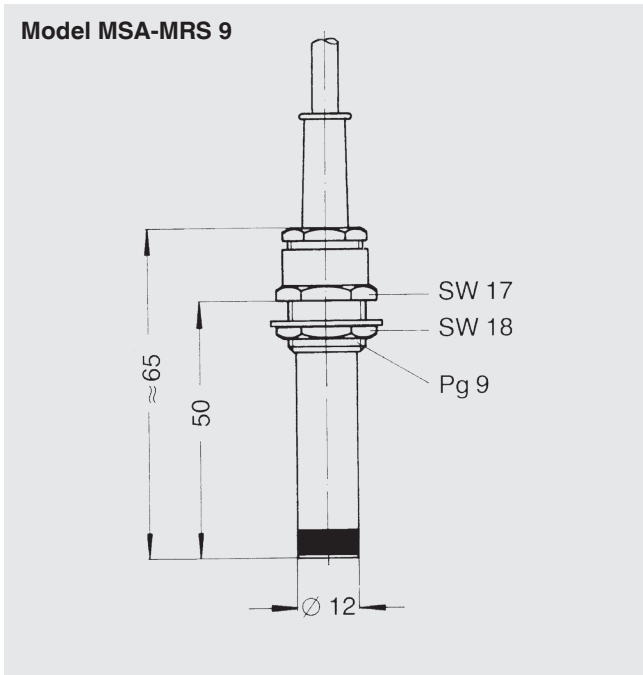
Model MSA-VS-L55



Specifications	
Switching function	Normally open
Switch behaviour	Monostable
Contact material	Rhodium
Switching power	AC 10 VA DC 5 W
Switching voltage	AC/DC 230 V
Switching current	AC 0.5 A DC 0.25 A
Switching frequency	1,000 1/sec
Switch hysteresis	approx. 5 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP54
Connection cable	2-wire PVC (specify length when ordering)
Case	Stainless steel

Specifications	
Switching function	Normally open
Switch behaviour	Monostable
Contact material	Rhodium
Switching power	AC 10 VA DC 5 W
Switching voltage	AC/DC 230 V
Switching current	AC 0.5 A DC 0.25 A
Switching frequency	1,000 1/sec
Switch hysteresis	approx. 5 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP54
Connection cable	2-wire PVC (specify length when ordering)
Case	Stainless steel

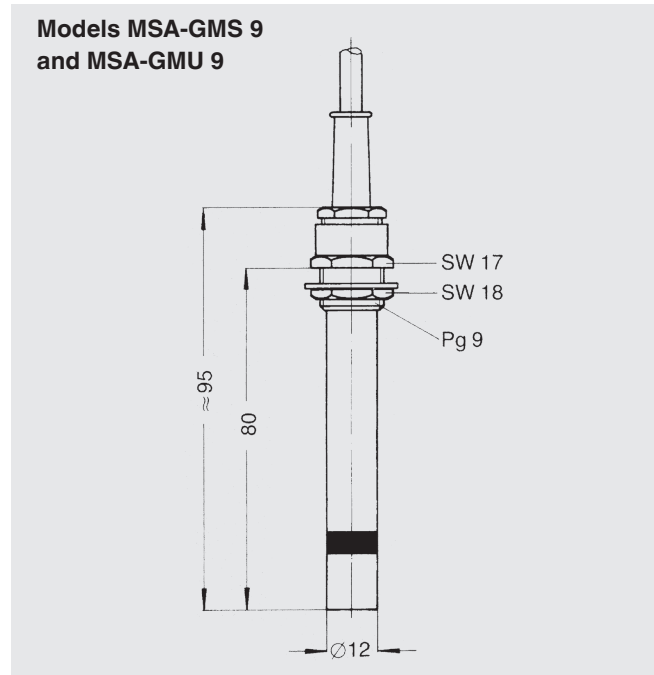
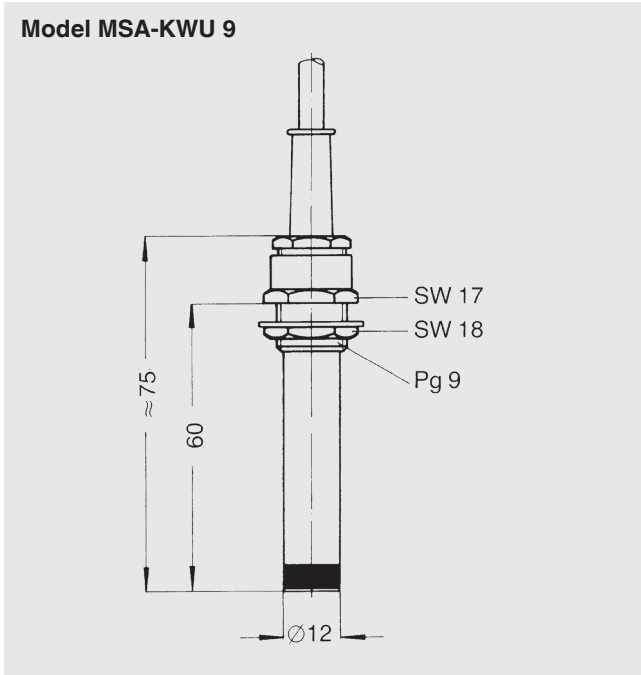
Magnetic switch in round polyamide case, glass-fibre reinforced Models MSA-MRS 9 and MSA-KRx 9



Specifications	
Switching function	Normally open
Switch behaviour	Monostable
Contact material	Rhodium
Switching power	AC 10 VA DC 5 W
Switching voltage	AC/DC 230 V
Switching current	AC 0.5 A DC 0.25 A
Switching frequency	1,000 1/sec
Switch hysteresis	approx. 5 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	2-wire PVC (specify length when ordering)
Case	Polyamide, glass-fibre reinforced

Specifications	
Switching function	
Model MSA-KRS 9	Normally open
Model MSA-KRU 9	Change-over
Switch behaviour	Monostable
Contact material	Rhodium
Switching power	
Model MSA-KRS 9	AC 60 VA DC 30 W
Model MSA-KRU 9	AC 30 VA DC 20 W
Switching voltage	AC/DC 230 V
Switching current	
Model MSA-KRS 9	AC 1 A DC 0.5 A
Model MSA-KRU 9	AC 0.5 A DC 0.35 A
Switching frequency	300 1/sec
Switch hysteresis	approx. 5 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	(specify length when ordering)
Model MSA-KRS 9	2-wire PVC
Model MSA-KRU 9	3-wire PVC
Case	Polyamide, glass-fibre reinforced

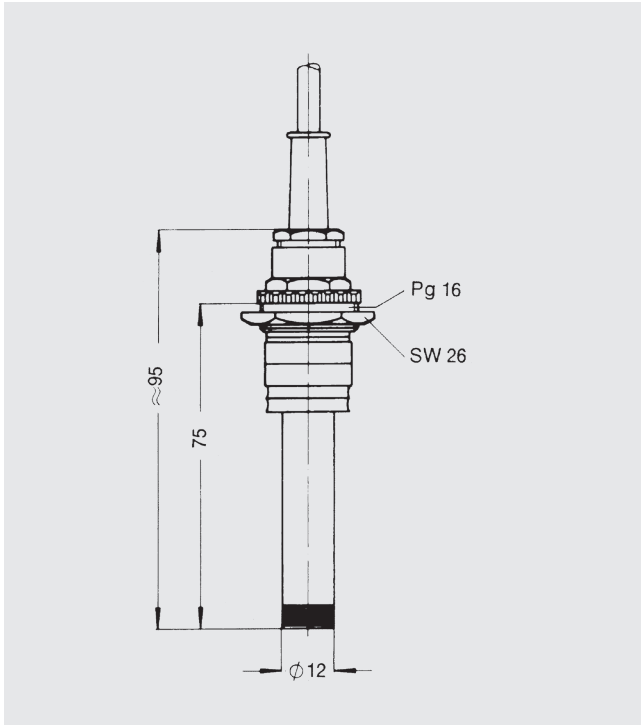
Magnetic switch in round polyamide case, glass-fibre reinforced Models MSA-KWU 9 and MSA-GMx 9



Specifications	
Switching function	Change-over
Switch behaviour	Monostable
Contact material	Rhodium
Switching power	AC 50 VA DC 30 W
Switching voltage	AC/DC 230 V
Switching current	AC 1 A DC 0.5 A
Switching frequency	100 1/sec
Switch hysteresis	approx. 2 ... 3 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	2-wire PVC (specify length when ordering)
Case	Polyamide, glass-fibre reinforced

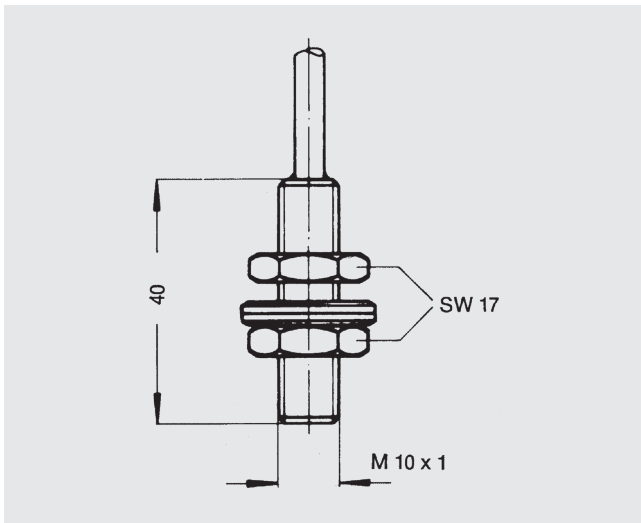
Specifications	
Switching function	
Model MSA-GMS 9	Normally open
Model MSA-GMU 9	Change-over
Switch behaviour	Monostable
Contact material	Rhodium
Switching power	
Model MSA-GMS 9	AC 100 VA DC 50 W
Model MSA-GMU 9	AC 30 VA DC 20 W
Switching voltage	AC/DC 230 V
Switching current	
Model MSA-GMS 9	AC 1 A DC 0.5 A
Model MSA-GMU 9	AC 0.5 A DC 0.35 A
Switching frequency	300 1/sec
Switch hysteresis	
Model MSA-GMS 9	approx. 3 ... 4 mm
Model MSA-GMU 9	approx. 5 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	(specify length when ordering)
Model MSA-GMS 9	2-wire PVC
Model MSA-GMU 9	3-wire PVC
Case	Polyamide, glass-fibre reinforced

Magnetic switch in round polyamide case, glass-fibre reinforced
Models MSA-GMSM 16, MSA-GMOM 16 and MSA-GMUM 16



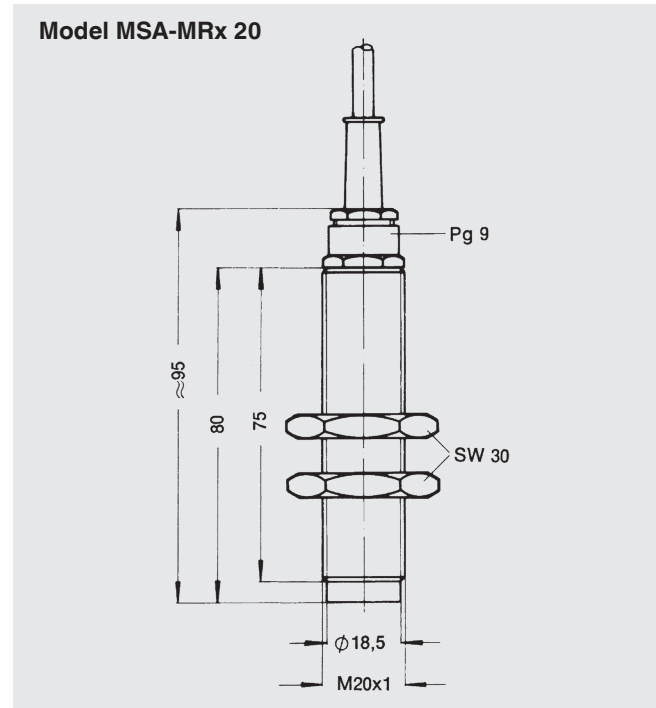
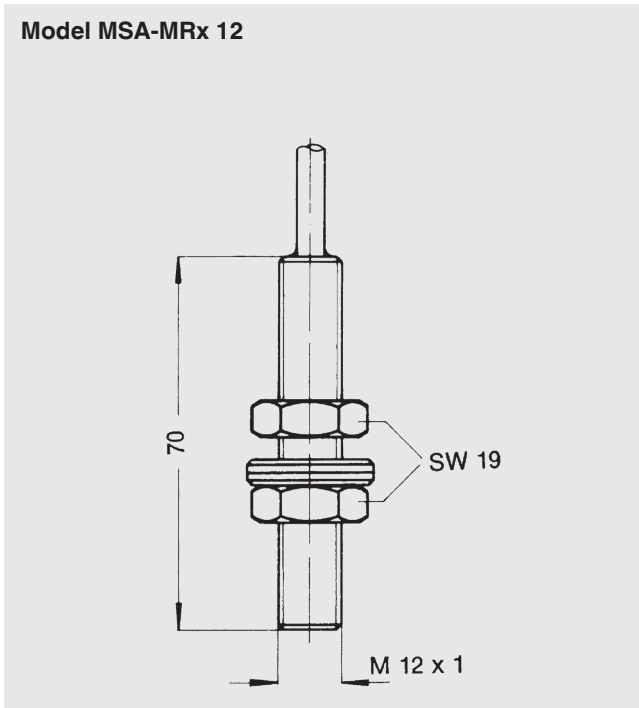
Specifications	
Switching function	
Model MSA-GMSM 16	Normally open
Model MSA-GMOM 16	Normally closed
Model MSA-GMUM 16	Change-over
Switch behaviour	Bistable
Contact material	Rhodium
Switching power	
Models MSA-GMSM 16 and MSA-GMOM 16	AC 100 VA DC 50 W
Model MSA-GMUM 16	AC 30 VA DC 20 W
Switching voltage	AC/DC 230 V
Switching current	
Models MSA-GMSM 16 and MSA-GMOM 16	AC 1 A DC 0.5 A
Model MSA-GMUM 16	AC 0.5 A DC 0.35 A
Switching frequency	300 1/sec
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	(specify length when ordering)
Model MSA-GMSM 16	2-wire PVC
Model MSA-GMOM 16	2-wire PVC
Model MSA-GMUM 16	3-wire PVC
Case	Polyamide, glass-fibre reinforced

Magnetic switch in round brass case, M10 x 1 male thread
Model MSA-MRS 10



Specifications	
Switching function	Normally open
Switch behaviour	Monostable
Contact material	Rhodium
Switching power	AC 10 VA DC 5 W
Switching voltage	AC/DC 230 V
Switching current	AC 0.5 A DC 0.25 A
Switching frequency	1,000 1/sec
Switch hysteresis	approx. 5 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP54
Connection cable	2-wire PVC (specify length when ordering)
Case	Brass

Magnetic switch in round brass case, M12 x 1 male thread Models MSA-MRx 12 and MSA-MRx 20

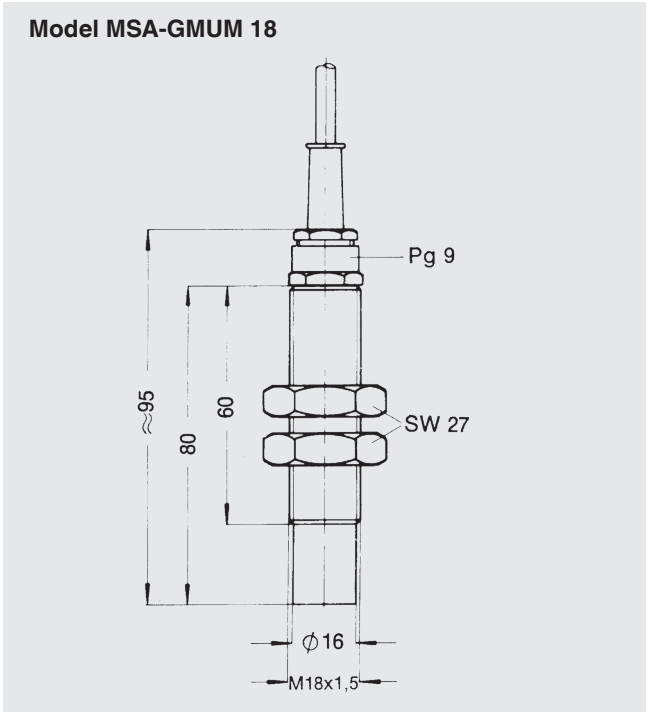
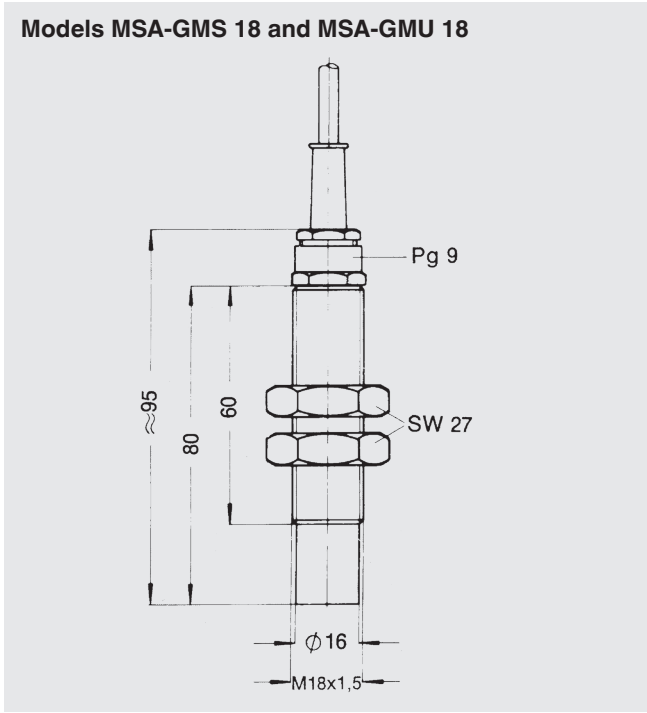


Specifications	
Switching function	
Model MSA-MRS 12	Normally open
Model MSA-MRU 12	Change-over
Switch behaviour	Monostable
Contact material	Rhodium
Switching power	
Model MSA-MRS 12	AC 60 VA DC 30 W
Model MSA-MRU 12	AC 30 VA DC 20 W
Switching voltage	AC/DC 230 V
Switching current	
Model MSA-MRS 12	AC 1 A DC 0.5 A
Model MSA-MRU 12	AC 0.5 A DC 0.35 A
Switching frequency	300 1/sec
Switch hysteresis	approx. 5 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP54
Connection cable	(specify length when ordering)
Model MSA-MRS 12	2-wire PVC
Model MSA-MRU 12	3-wire PVC
Case	Brass

Specifications	
Switching function	
Model MSA-MRS 20	Normally open
Model MSA-MRU 20	Change-over
Switch behaviour	Monostable
Contact material	Rhodium
Switching power	
Model MSA-MRS 20	AC 60 VA DC 30 W
Model MSA-MRU 20	AC 30 VA DC 20 W
Switching voltage	AC/DC 230 V
Switching current	
Model MSA-MRS 20	AC 1 A DC 0.5 A
Model MSA-MRU 20	AC 0.5 A DC 0.35 A
Switching frequency	300 1/sec
Switch hysteresis	
Model MSA-MRS 20	approx. 3 ... 4 mm
Model MSA-MRU 20	approx. 5 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	(specify length when ordering)
Model MSA-MRS 20	2-wire PVC
Model MSA-MRU 20	3-wire PVC
Case	Brass

Magnetic switch in round polyamide case

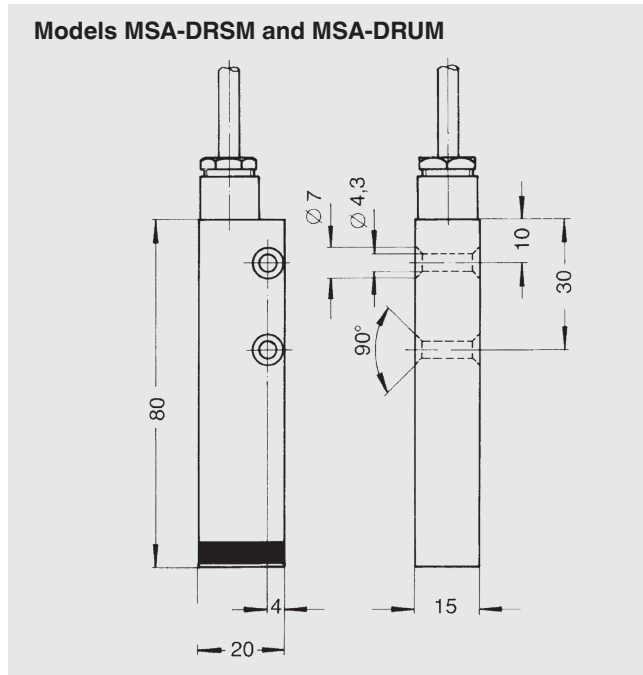
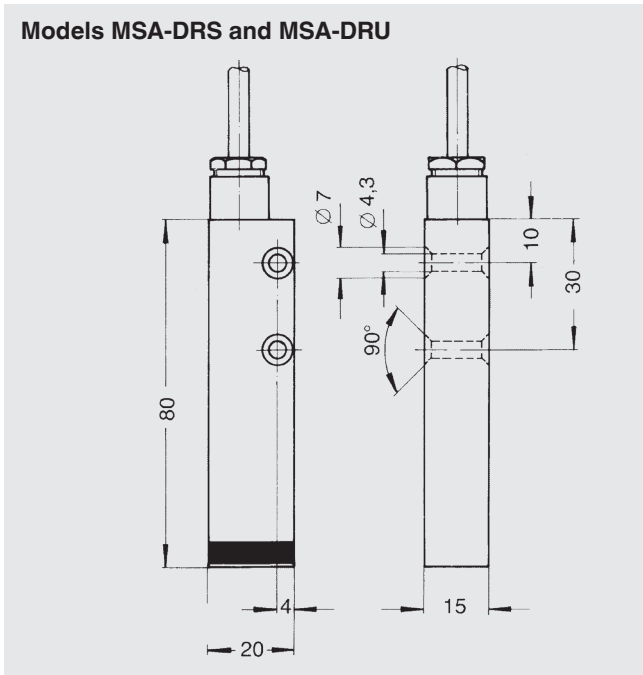
Models MSA-GMx 18 and MSA-GMUM 18



Specifications	
Switching function	
Model MSA-GMS 18	Normally open
Model MSA-GMU 18	Change-over
Switch behaviour	Monostable
Contact material	Rhodium
Switching power	
Model MSA-GMS 18	AC 60 VA DC 30 W
Model MSA-GMU 18	AC 30 VA DC 20 W
Switching voltage	AC/DC 230 V
Switching current	
Model MSA-GMS 18	AC 1 A DC 0.5 A
Model MSA-GMU 18	AC 0.5 A DC 0.35 A
Switching frequency	300 1/sec
Switch hysteresis	approx. 5 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	(specify length when ordering)
Model MSA-GMS 18	2-wire PVC
Model MSA-GMU 18	3-wire PVC
Case	Polyamide

Specifications	
Switching function	Change-over
Switch behaviour	Bistable
Contact material	Rhodium
Switching power	AC 40 VA DC 20 W
Switching voltage	AC/DC 230 V
Switching current	AC 1 A DC 0.5 A
Switching frequency	300 1/sec
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	3-wire PVC (specify length when ordering)
Case	Polyamide

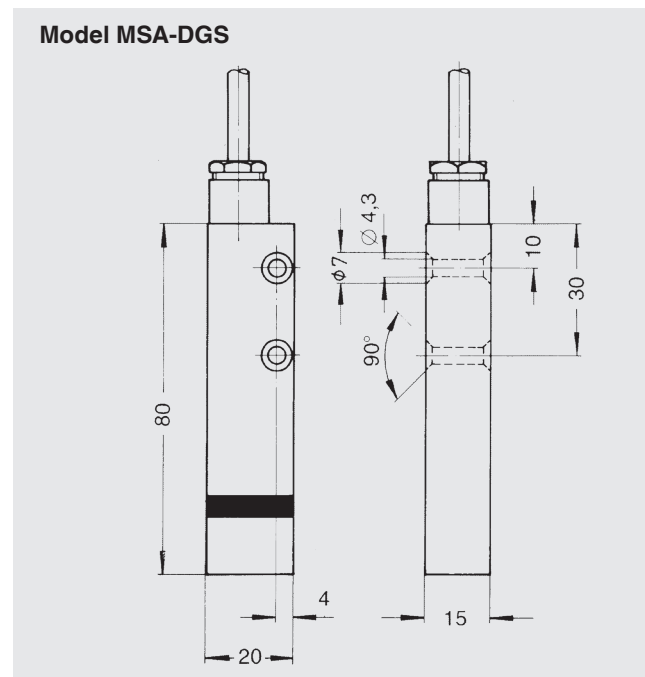
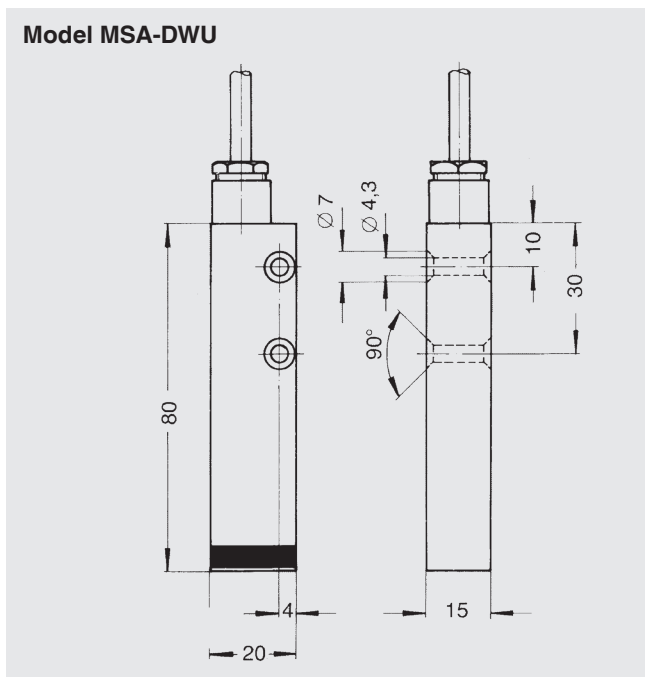
Magnetic switch in flat polyamide case, glass-fibre reinforced Models MSA-DRx, MSA-DRSM and MSA-DRUM



Specifications	
Switching function	
Model MSA-DRS	Normally open
Model MSA-DRU	Change-over
Switch behaviour	Monostable
Contact material	Rhodium
Switching power	
Model MSA-DRS	AC 60 VA DC 30 W
Model MSA-DRU	AC 30 VA DC 20 W
Switching voltage	AC/DC 230 V
Switching current	
Model MSA-DRS	AC 1 A DC 0.5 A
Model MSA-DRU	AC 0.5 A DC 0.35 A
Switching frequency	300 1/sec
Switch hysteresis	approx. 5 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	(specify length when ordering)
Model MSA-DRS	2-wire PVC
Model MSA-DRU	3-wire PVC
Case	Polyamide, glass-fibre reinforced

Specifications	
Switching function	
Model MSA-DRSM	Normally open
Model MSA-DRUM	Change-over
Switch behaviour	Bistable
Contact material	Rhodium
Switching power	
Model MSA-DRSM	AC 100 VA DC 50 W
Model MSA-DRUM	AC 30 VA DC 20 W
Switching voltage	AC/DC 230 V
Switching current	
Model MSA-DRSM	AC 1 A DC 0.5 A
Model MSA-DRUM	AC 0.5 A DC 0.35 A
Switching frequency	300 1/sec
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	(specify length when ordering)
Model MSA-DRSM	2-wire PVC
Model MSA-DRUM	3-wire PVC
Case	Polyamide, glass-fibre reinforced

Magnetic switch in flat polyamide case, glass-fibre reinforced Models MSA-DWU and MSA-DGS

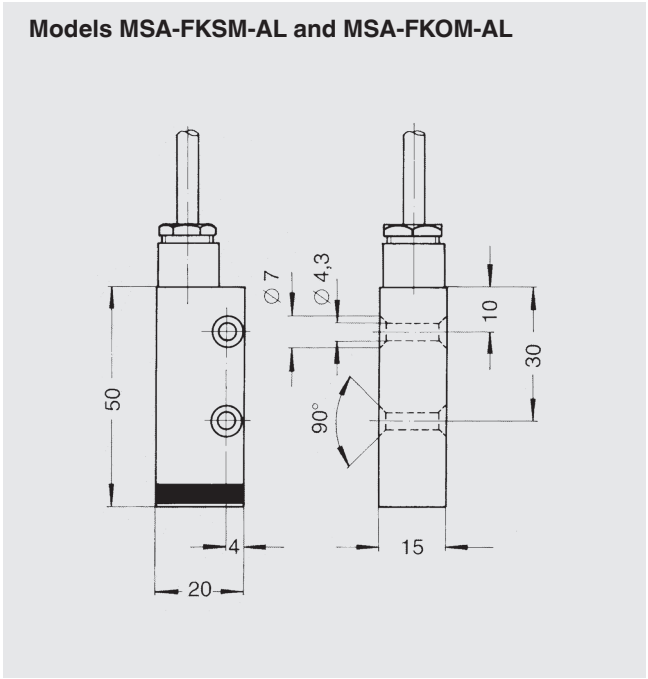
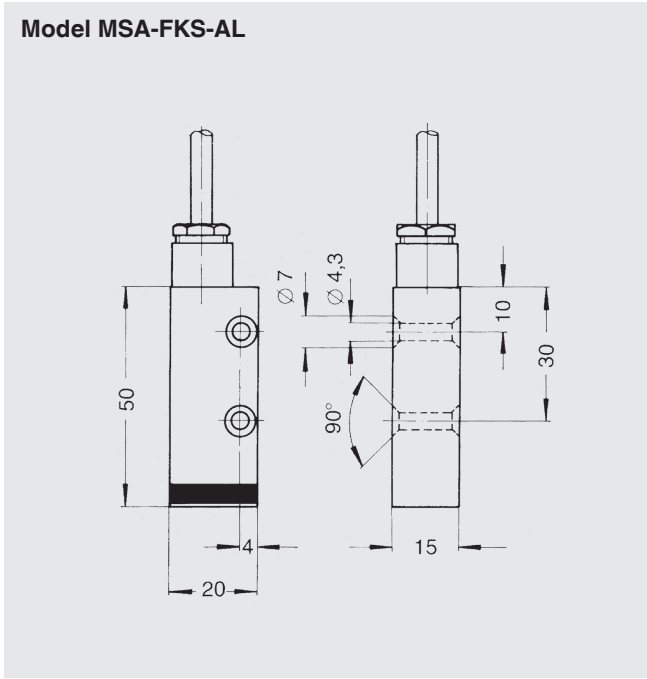


Specifications	
Switching function	Change-over
Switch behaviour	Monostable
Contact material	Tungsten
Switching power	AC 50 VA DC 30 W
Switching voltage	AC/DC 230 V
Switching current	AC 1 A DC 0.5 A
Switching frequency	100 1/sec
Switch hysteresis	approx. 2 ... 3 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	3-wire PVC (specify length when ordering)
Case	Polyamide, glass-fibre reinforced

Specifications	
Switching function	Normally open
Switch behaviour	Monostable
Contact material	Rhodium
Switching power	AC 100 VA DC 50 W
Switching voltage	AC/DC 230 V
Switching current	AC 1 A DC 0.5 A
Switching frequency	300 1/sec
Switch hysteresis	approx. 3 ... 4 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	2-wire PVC (specify length when ordering)
Case	Polyamide, glass-fibre reinforced

Magnetic switch in aluminium case

Models MSA-FKS-AL, MSA-FKOM-AL and MSA-FKSM-AL

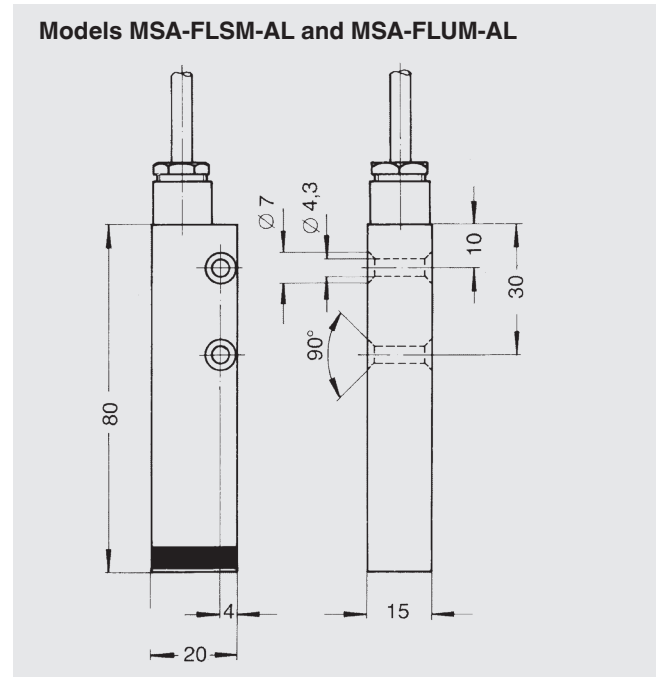
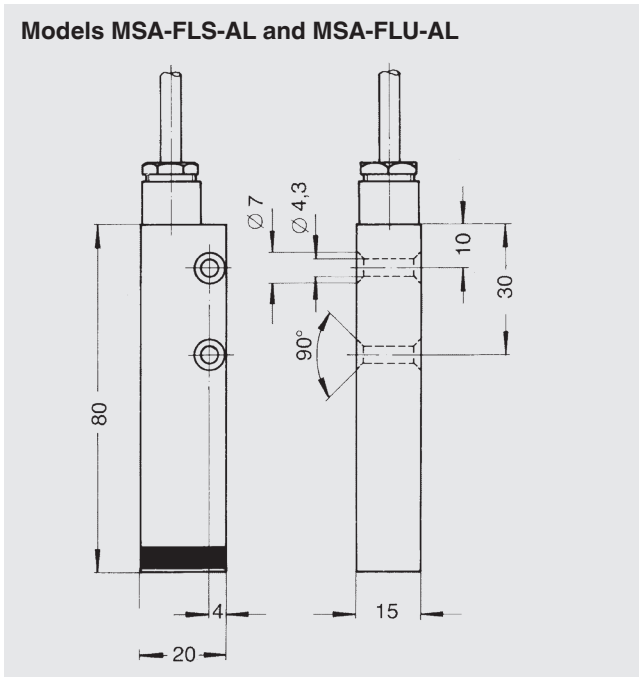


Specifications	
Switching function	Normally open
Switch behaviour	Monostable
Contact material	Rhodium
Switching power	AC 10 VA DC 5 W
Switching voltage	AC/DC 230 V
Switching current	AC 0.5 A DC 0.25 A
Switching frequency	1,000 1/sec
Switch hysteresis	approx. 5 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	2-wire PVC (specify length when ordering)
Case	Aluminium

Specifications	
Switching function	
Model MSA-FKSM-AL	Normally open
Model MSA-FKOM-AL	Normally closed
Switch behaviour	Bistable
Contact material	Rhodium
Switching power	AC 10 VA DC 5 W
Switching voltage	AC/DC 230 V
Switching current	AC 0.5 A DC 0.25 A
Switching frequency	1,000 1/sec
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	(specify length when ordering)
Model MSA-FKSM-AL	2-wire PVC
Model MSA-FKOM-AL	2-wire PVC
Case	Aluminium

Magnetic switch in aluminium case

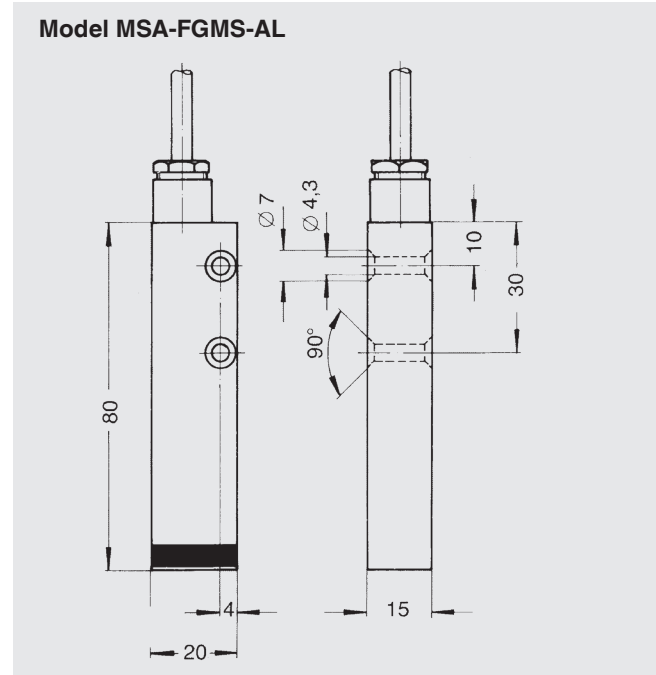
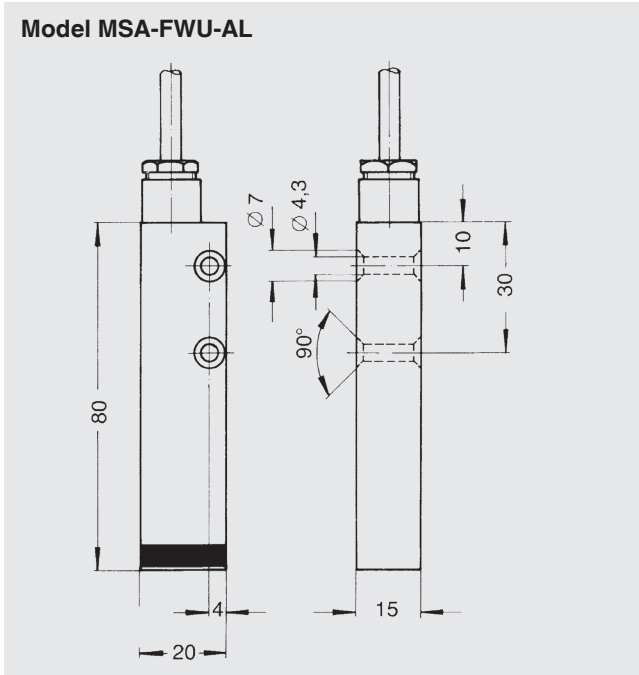
Models MSA-FLS-AL, MSA-FLU-AL, MSA-FLSM-AL and MSA-FLUM-AL



Specifications	
Switching function	
Model MSA-FLS-AL	Normally open
Model MSA-FLU-AL	Change-over
Switch behaviour	Monostable
Contact material	Rhodium
Switching power	
Model MSA-FLS-AL	AC 60 VA DC 30 W
Model MSA-FLU-AL	AC 30 VA DC 20 W
Switching voltage	AC/DC 230 V
Switching current	
Model MSA-FLS-AL	AC 1 A DC 0.5 A
Model MSA-FLU-AL	AC 0.5 A DC 0.35 A
Switching frequency	300 1/sec
Switch hysteresis	approx. 5 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	(specify length when ordering)
Model MSA-FLS-AL	2-wire PVC
Model MSA-FLU-AL	3-wire PVC
Case	Aluminium

Specifications	
Switching function	
Model MSA-FLSM-AL	Normally open
Model MSA-FLUM-AL	Change-over
Switch behaviour	Bistable
Contact material	Rhodium
Switching power	
Model MSA-FLSM-AL	AC 100 VA DC 50 W
Model MSA-FLUM-AL	AC 30 VA DC 20 W
Switching voltage	AC/DC 230 V
Switching current	
Model MSA-FLSM-AL	AC 1 A DC 0.5 A
Model MSA-FLUM-AL	AC 0.5 A DC 0.35 A
Switching frequency	300 1/sec
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	(specify length when ordering)
Model MSA-FLSM-AL	2-wire PVC
Model MSA-FLUM-AL	3-wire PVC
Case	Aluminium

Magnetic switch in aluminium case Models MSA-FWU-AL and MSA-FGMS-AL



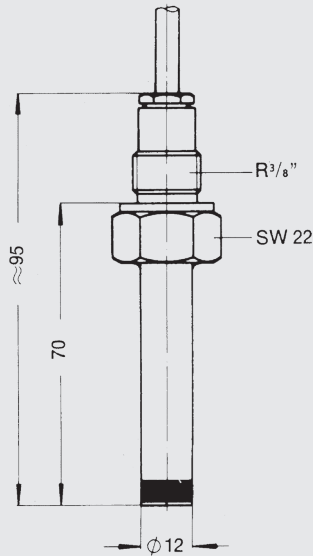
Specifications	
Switching function	Change-over
Switch behaviour	Monostable
Contact material	Tungsten
Switching power	AC 50 VA DC 30 W
Switching voltage	AC/DC 230 V
Switching current	AC 1 A DC 0.5 A
Switching frequency	100 1/sec
Switch hysteresis	approx. 2 ... 3 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	3-wire PVC (specify length when ordering)
Case	Aluminium

Specifications	
Switching function	Normally open
Switch behaviour	Monostable
Contact material	Rhodium
Switching power	AC 100 VA DC 50 W
Switching voltage	AC/DC 230 V
Switching current	AC 1 A DC 0.5 A
Switching frequency	300 1/sec
Switch hysteresis	approx. 3 ... 4 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	2-wire PVC (specify length when ordering)
Case	Aluminium

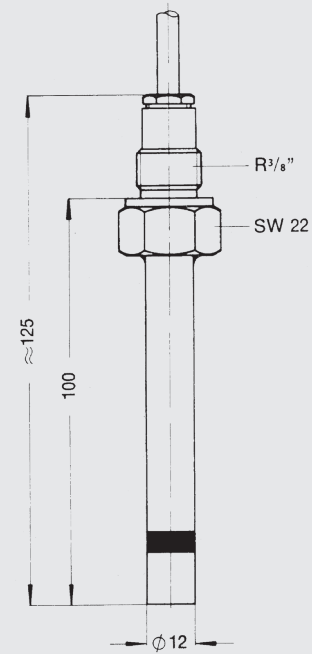
Magnetic switch in round stainless steel case

Models MSA-EVS-L70 (KRS), MSA-EVU-L70 (KRU) and MSA-EVS-L100 (GMS)

Models MSA-EVS-L70 (KRS) and MSA-EVU-L70 (KRU)



Model MSA-EVS-L100 (GMS)



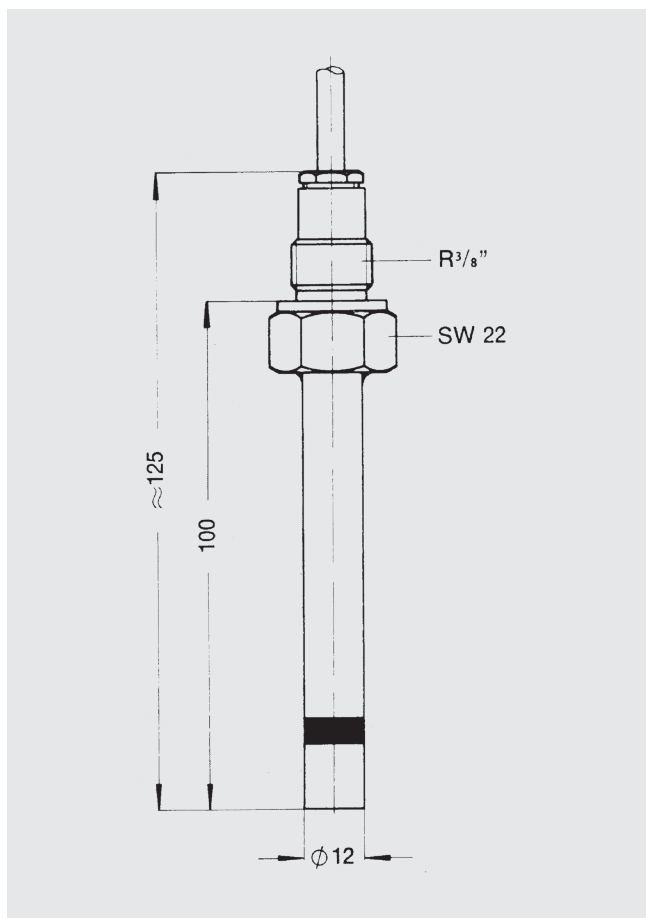
Specifications

Switching function	
Model MSA-EVS-L70 (KRS)	Normally open
Model MSA-EVU-L70 (KRU)	Change-over
Switch behaviour	Monostable
Contact material	Rhodium
Switching power	
Model MSA-EVS-L70 (KRS)	AC 60 VA DC 30 W
Model MSA-EVU-L70 (KRU)	AC 30 VA DC 20 W
Switching voltage	AC/DC 230 V
Switching current	
Model MSA-EVS-L70 (KRS)	AC 1 A DC 0.5 A
Model MSA-EVU-L70 (KRU)	AC 0.5 A DC 0.35 A
Switching frequency	300 1/sec
Switch hysteresis	approx. 5 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	(specify length when ordering)
Model MSA-EVS-L70 (KRS)	2-wire PVC
Model MSA-EVU-L70 (KRU)	3-wire PVC
Case	Stainless steel

Specifications

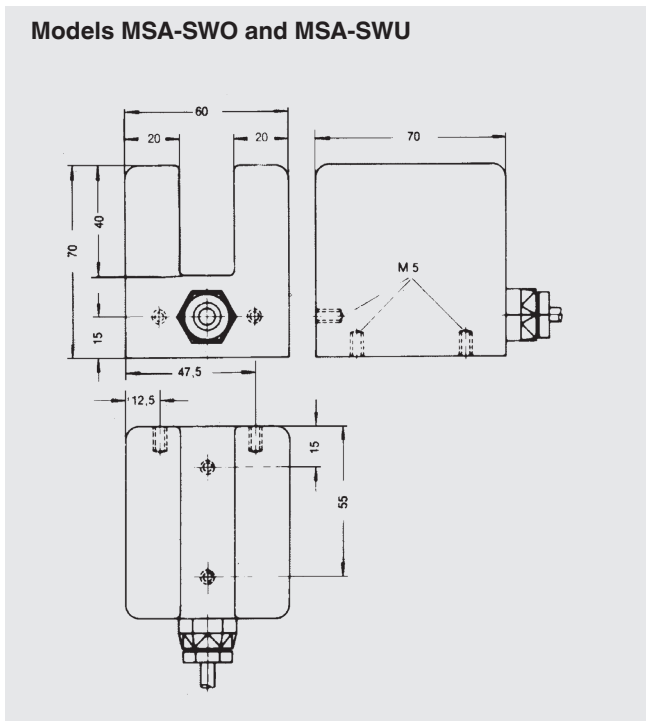
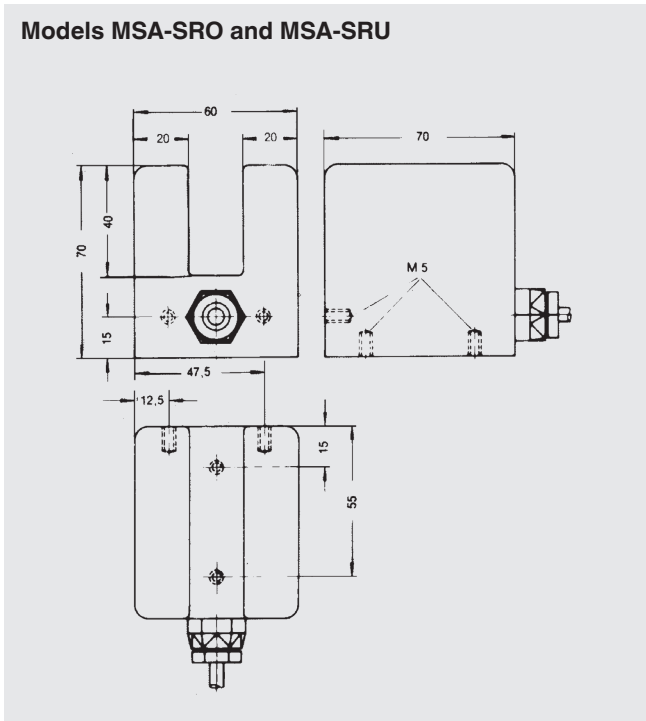
Switching function	Normally open
Switch behaviour	Monostable
Contact material	Rhodium
Switching power	AC 100 VA DC 50 W
Switching voltage	AC/DC 230 V
Switching current	AC 1 A DC 0.5 A
Switching frequency	300 1/sec
Switch hysteresis	approx. 3 ... 4 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	2-wire PVC (specify length when ordering)
Case	Stainless steel

Magnetic switch in round stainless steel case
Models MSA-EVSM-L100 (GMSM), MSA-EVOM-L100 (GMOM) and
MSA-EVUM-L100 (GMUM)



Specifications	
Switching function	
Model MSA-EVSM-L100 (GMSM)	Normally open
Model MSA-EVOM-L100 (GMOM)	Normally closed
Model MSA-EVUM-L100 (GMUM)	Change-over
Switch behaviour	Bistable
Contact material	Rhodium
Switching power	
Model MSA-EVSM-L100 (GMSM)	AC 100 VA DC 50 W
Model MSA-EVOM-L100 (GMOM)	AC 100 VA DC 50 W
Model MSA-EVUM-L100 (GMUM)	AC 30 VA DC 20 W
Switching voltage	AC/DC 230 V
Switching current	
Model MSA-EVSM-L100 (GMSM)	AC 1 A DC 0.5 A
Model MSA-EVUM-L100 (GMUM)	AC 0.5 A DC 0.35 A
Switching frequency	300 1/sec
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	(specify length when ordering)
Model MSA-EVSM-L100 (GMSM)	2-wire PVC
Model MSA-EVOM-L100 (GMOM)	2-wire PVC
Model MSA-EVUM-L100 (GMUM)	3-wire PVC
Case	Stainless steel

Slot magnetic switch for non-contact actuation using a sheet iron flag in polyamide case, glass-fibre reinforced
Models MSA-SRO, MSA-SRU, MSA-SWO and MSA-SWU



Specifications	
Switching function	
Model MSA-SRO	Normally closed
Model MSA-SRU	Change-over
Switch behaviour	Monostable
Contact material	Rhodium
Switching power	
Model MSA-SRO	AC 100 VA / DC 50 W
Model MSA-SRU	AC 30 VA / DC 20 W
Switching voltage	AC/DC 230 V
Switching current	
Model MSA-SRO	AC 1 A DC 0.5 A
Model MSA-SRU	AC 0.5 A DC 0.35 A
Switching frequency	100 1/sec
Switch hysteresis	
Model MSA-SRO	approx. 10 ... 12 mm
Model MSA-SRU	approx. 10 ... 15 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	(specify length when ordering)
Model MSA-SRO	2-wire PVC
Model MSA-SRU	3-wire PVC
Case	Polyamide, glass-fibre reinforced

Specifications	
Switching function	
Model MSA-SWO	Normally closed
Model MSA-SWU	Change-over
Switch behaviour	Monostable
Contact material	Tungsten
Switching power	AC 50 VA DC 30 W
Switching voltage	AC/DC 230 V
Switching current	AC 1 A DC 0.5 A
Switching frequency	100 1/sec
Switch hysteresis	approx. 3 ... 5 mm
Permissible temperature	-10 ... +80 °C
Ingress protection	IP65
Connection cable	(specify length when ordering)
Model MSA-SWO	2-wire PVC
Model MSA-SWU	3-wire PVC
Case	Polyamide, glass-fibre reinforced

Contact protection measures

The reed contacts should be protected against any voltage or current spikes that might occur.

Depending on the different load types different protective circuits are used.



Model KFD2-ER-1.6



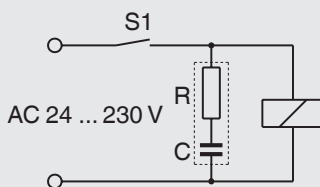
RC element

Contact protection relay	Contacts	Input	Supply voltage	Approval number	Order no.
KFD2-ER-1.6	1 x change-over AC 250 V, 2 A	2 x contacts	DC 20 ... 30 V	-	123806
KFD2-SR2-Ex2.W	2 x change-over AC 253 V, 2 A	2 x contacts	DC 20 ... 30 V	II 1GD Ex ia IIC PTB 02 ATEX 2073	124344
KFA6-ER-1.6	1 x change-over AC 250 V, 2 A	2 x contacts	AC 230 V	-	124341
KFA6-SR2-Ex2.W	2 x change-over AC 253 V, 2 A	2 x contacts	AC 230 V	II 1GD Ex ia IIC PTB 02 ATEX 2073	123794

RC element	Capacitance	Resistance	Voltage	Order No.
B3/110	0.33 μ F	470 Ω	AC 110 V	126529
B3/230	0.33 μ F	820 Ω	AC 230 V	126530

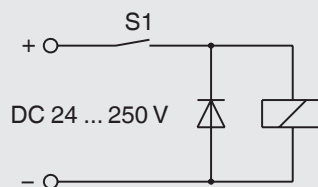
Inductive load

AC voltage

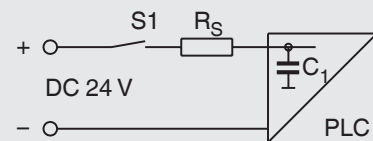


Inductive load

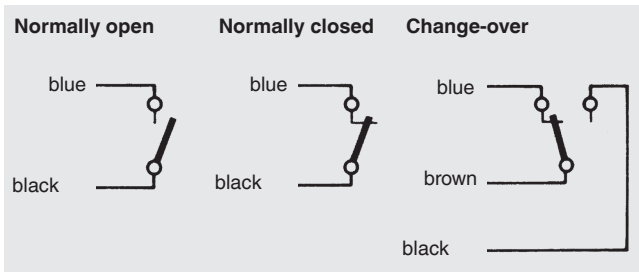
DC voltage



Capacitive load

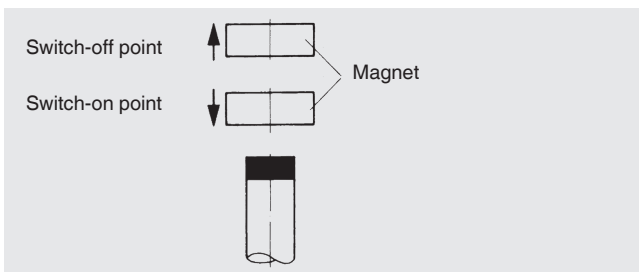


Connection diagrams



Switch hysteresis

The size of the switch hysteresis (stroke of the actuating magnet) is dependent on the size of the actuating magnet and the magnetic shunt caused by the ferrous environment. For most magnetic switches the stroke of actuating magnets is around 5 ... 10 mm.



Switch point accuracy

The reproducible switch point accuracy of magnetic switches is, with steady conditions, very high and is around 0.01 mm. When using barium ferrite magnets as actuating magnets, the switching point will shift with a change in the ambient temperature, since the magnetic field gets stronger with dropping temperature and with increasing temperature, it gets weaker.

The temperature behaviour with this is not linear; under 0 °C the magnetic field hardly increases and over 100 °C it is barely any weaker. With a temperature change of ± 20 °C the switching point shifts by around ± 0.05 mm. One can therefore describe the switching point of a magnetic switch as practically stable.

Vibration resistance

If strong vibrations can occur, it is recommended to secure the magnetic switch with elastic rubber. In the axial direction, the sensitivity to shock and vibration is the lowest. Magnetic switches in monostable designs, such as the models MSA-MRS 10, MSA-GMS 9, MSA-KRU 9, MSA-GMU 9 and the like, can be exposed to vibrations of up to 100 g with elastic mountings. Magnetic switches in bistable designs, such as the models MSA-GMSM 16, MSA-GMUM 16 and the like, are suitable for vibrations of 10 ... 20 g with elastic mountings (g = acceleration due to gravity).

Accessories

Permanent magnets

Permanent magnet	Measurand	Dimensions in mm	Order number
Magnet M0 north, red	M 0	15 x 4 x 6	005141
Magnet M0 south, blue	M 0	15 x 4 x 6	005140
Magnet M1 north, red	M 1	20 x 4 x 6	015529
Magnet M1 south, blue	M 1	20 x 4 x 6	015530
Magnet M2 north, red	M 2	20 x 5 x 10	015531
Magnet M2 south, blue	M 2	20 x 5 x 10	005144
Magnet M3 north, red	M 3	30 x 6 x 15	015532
Magnet M3 south, blue	M 3	30 x 6 x 15	015533



Actuating distances

Magnetic switch model	Actuating distances in mm			
	M 0	M 1	M 2	M 3
MSA-MS-Lxx	~ 8	~ 12	~ 19	~ 40
MSA-VS-Lx	~ 8	~ 12	~ 19	~ 40
MSA-MRS 9	~ 3	~ 6	~ 10	~ 27
MSA-KRS 9	~ 3	~ 6	~ 10	~ 27
MSA-KRU 9	~ 5	~ 9	~ 14	~ 30
MSA-KWU 9	~ 4	~ 7	~ 11	~ 26
MSA-GMS 9	~ 3	~ 6	~ 10	~ 22
MSA-GMU 9	~ 3	~ 5	~ 8	~ 19
MSA-GSM 16	~ 17	~ 25	~ 32	~ 60
MSA-GMOM 16	~ 7	~ 12	~ 17	~ 40
MSA-GMUM 16	~ 10	~ 16	~ 23	~ 50
MSA-MRS 10	~ 4	~ 7	~ 11	~ 28
MSA-MRS 12	~ 4	~ 7	~ 11	~ 27
MSA-MRU 12	~ 3	~ 6	~ 10	~ 28
MSA-MRS 20	~ 2	~ 4	~ 7	~ 24
MSA-MRU 20	~ 3	~ 6	~ 10	~ 26
MSA-GMS 18	~ 6	~ 10	~ 15	~ 35
MSA-GMU 18	~ 5	~ 8	~ 12	~ 26
MSA-GMUM 18	~ 13	~ 19	~ 27	~ 55

Magnetic switch model	Actuating distances in mm			
	M 0	M 1	M 2	M 3
MSA-DRS	~ 5	~ 7	~ 11	~ 27
MSA-DRU	~ 3	~ 5	~ 9	~ 17
MSA-DRSM	~ 14	~ 20	~ 28	~ 58
MSA-DRUM	~ 8	~ 15	~ 20	~ 45
MSA-DWU	~ 5	~ 8	~ 13	~ 30
MSA-DGS	~ 3	~ 5	~ 9	~ 21
MSA-FKS-AL	~ 4	~ 7	~ 11	~ 27
MSA-FKOM-AL	~ 11	~ 15	~ 21	~ 40
MSA-FKSM-AL	~ 17	~ 24	~ 30	~ 55
MSA-FLS-AL	~ 5	~ 7	~ 11	~ 27
MSA-FLU-AL	~ 3	~ 5	~ 9	~ 17
MSA-FLSM-AL	~ 14	~ 20	~ 28	~ 55
MSA-FLUM-AL	~ 8	~ 15	~ 20	~ 45
MSA-FWU-AL	~ 5	~ 8	~ 13	~ 30
MSA-FGMS-AL	~ 3	~ 5	~ 9	~ 21
MSA-EVS-L70 (KRS)	~ 3	~ 6	~ 10	~ 27
MSA-EVU-L70 (KRU)	~ 5	~ 9	~ 14	~ 30
MSA-EVS-L100 (GMS)	~ 3	~ 6	~ 10	~ 22
MSA-EVSM-L100 (GSM)	~ 17	~ 25	~ 32	~ 60
MSA-EVOM-L100 (GMOM)	~ 7	~ 12	~ 17	~ 40
MSA-EVUM-L100 (GMUM)	~ 10	~ 16	~ 23	~ 50