6008347E
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Dayton, OH USA

Instruction Bulletin

Replaces 6008347D 02/2000

Magnet Actuated Proximity Switches, SG

Retain for future use.

Features

- "No Touch" proximity sensing
- No mechanical linkage or levers
- Senses magnetic fields—senses through non-magnetic material
- Epoxy-encapsulated construction
- Solid state outputs
- Precise 0.003 in. repeatability
- Fast switching speeds

Operation

Magnetic proximity switches are actuated by the presence of a magnetic field. This can be accomplished either by bringing a permanent magnet close to the sensing face of the switch or by energizing an electromagnetic coil. A permanent magnet is the most common method of operating the magnet actuated proximity switch.

Methods of Actuation

Perpendicular or Parallel—The magnet and switch must be brought within a specific proximity of one another. The distance varies according to the strength of the magnet. When the magnet is close enough, the reed closes or "pulls in." When the magnet is taken away, the reed contact opens or "drops out."

⚠ DANGER

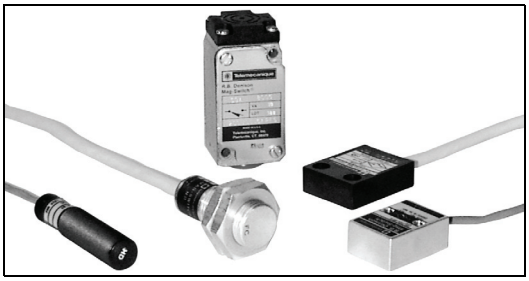
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Turn off power before installing or servicing.

Failure to follow these instructions will result in death or serious injury.

Table 1: Maximum Ratings

Switch Model No.	AC Ratings (Inductive or Resistive) VA	V	A	DC Ratings (Resistive Only) VA	V	A	Wiring Fig.
SGA-8016	—	—	—	10	200	0.5	AA
SGA-8031	—	—	—	10	200	0.5	AA
SGA-8182	—	—	—	10	200	0.5	AA
SGA-8053	—	—	—	10	200	0.5	AA
SGA-8175	3	130	0.25	3	100	0.25	AB
SGA-8176	10	130	0.5	10	200	0.5	AA
SGA-8177	10	130	0.5	10	200	0.5	AA
SGO-8168	240	120	2.0	—	—	—	AA
SG2-8195	50	240	0.5	—	—	—	AC
SGO-8239	50	130	0.5	—	—	—	AA
SGO-8003	360	120	3.0	—	—	—	AA
SGOB-8114	360	120	3.0	—	—	—	AA
SG1-8004	360	120	3.0	—	—	—	AB
SG1B-8147	360	120	3.0	—	—	—	AB
SGO-8079	—	—	—	7.5	30	0.25	AD
SG1-8056	—	—	—	7.5	30	0.25	AE
SGA-8005	—	—	—	10	200	0.5	AA
SGA-8040	15	130	1.0	15	250	1.0	AA
SGC-8027	—	—	—	3	200	0.25	AC
SGC-8025	—	—	—	20	500	1.5	AC
SGA-8057	15	130	1.0	12	48	0.25	AA
SGA-8189	15	130	1.0	12	48	0.25	AA
SGC-8058	15	130	1.0	15	100	1.0	AC
SGA-8072	15	130	1.0	15	250	1.0	AA
SGA-8179	25	480	1.0	25	480	1.0	AA
SGA-8180	—	—	—	10	200	0.5	AA
SGC-8181	—	—	—	3	100	0.25	AC
SGA-8038	15	130	1.0	15	250	1.0	AA
SGA-8018	—	—	—	15	250	1.0	AA
SGO-8026	360	120	3.0	—	—	—	AA
SGO-8110	360	120	3.0	—	—	—	AB
SGO-8141	—	—	—	50	150	1.0	AA



Power Rating—The load switching capability of reed, transistor, or triac output switches is expressed in power (VA). Power is calculated by multiplying voltage times current. *Be sure that the switch's voltage times its current in amperes does not exceed the power rating.*

Reeds used with inductive loads, such as relays and solenoids, require protection to minimize the erosion of contacts. This can be accomplished by using a resistor and capacitor (RC) network. Contact Schneider Electric for technical advice.

Reeds used with capacitive loads require a current-limiting resistor that limits the inrush current to an acceptable value. This can be accomplished by using an RC network connected across the contact. For the recommended circuit, contact Schneider Electric.

Capacitive loading may also occur due to distributed capacity in cable runs over 25 ft. Contact Schneider Electric for technical advice.

Lamps can have inrush currents that are many times greater than relay coils. This is due to the lower resistance of the cold filament. Tungsten lamps have inrush currents greater than relay coils due to the low resistance of the cold filament. This factor must be considered when using proximity switches in a circuit including such lamps.

Wiring

Figure AA

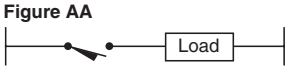


Figure AB

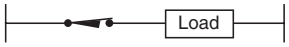


Figure AC

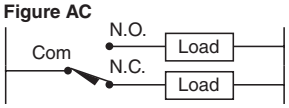


Figure AD

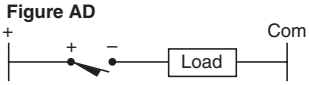
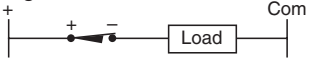


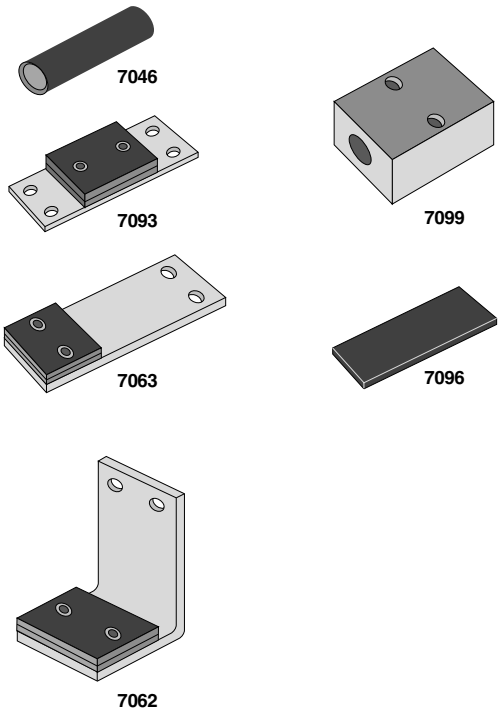
Figure AE



Connect the red terminal (+) to the power source. Connect the minus terminal (–) to the load. The housing must be grounded.

Schneider Electric

Figure 1: Magnets



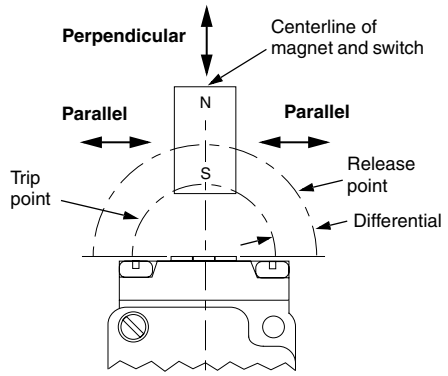


Table 3: Agency Listings

	UL File No. E42259	
Device	SGO-8003	SGO-8026
	SGO-8079	SGO-8110
	SGO-8168	SG1-8004
	SG1-8056	SG2-8195
	SGA-8018	SGA-8057
	SGA-8189	SGC-8058

Sensing Range

Table 2: Nominal Sensing Ranges (in.)

Switch	Magnet					
Model No.	7096	7099	7046	7063	7093	7062
SGO-8003	0.3	0.5	1.3	0.5	0.7	0.5
SGI-8004	0.3	0.5	1.3	0.5	0.7	0.5
SGA-8005	0.3	0.5	1.3	0.5	0.7	0.5
SGA-8016	0.3	0.5	1.3	0.5	0.7	0.5
SGA-8182	0.3	0.5	1.3	0.5	0.7	0.5
SGA-8018	0.5	0.5	1.3	0.7	1.0	0.7
SGC-8025	0.2	0.2	1.0	0.2	0.4	0.2
SGO-8026	0.5	0.5	1.3	0.7	1.0	0.7
SGC-8027	0.2	0.3	0.9	0.2	0.4	0.2
SGA-8031	0.3	0.5	1.3	0.5	0.7	0.5
SGA-8038	0.1	0.2	0.8	0.2	0.4	0.2
SGA-8040	—	0.2	0.8	0.2	0.4	0.2
SGA-8056	0.3	0.5	1.3	0.5	0.7	0.5
SGI-8057	0.1	0.2	0.8	0.2	0.4	0.2
SGC-8058	0.1	0.2	0.8	0.2	0.4	0.2
SGA-8072	0.1	0.2	0.8	0.2	0.4	0.2
SGO-8079	0.3	0.5	1.3	0.5	0.7	0.5
SGO-8110	0.5	0.5	1.3	0.7	1.0	0.7
SGOB-8114	0.3	0.5	1.3	0.5	0.7	0.5
SGIB-8147	0.3	0.5	1.3	0.5	0.7	0.5
SGO-8168	0.3	0.5	1.3	0.5	0.7	0.5
SGA-8176	0.3	0.5	1.3	0.5	0.7	0.5
SGB-8175	0.3	0.5	1.3	0.5	0.7	0.5
SGA-8177	0.3	0.5	1.3	0.5	0.7	0.5
SGA-8179	0.1	0.2	1.2	0.4	0.5	0.4
SGA-8180	0.3	0.5	1.3	0.5	0.7	0.5
SGC-8181	0.1	0.2	0.8	0.2	0.4	0.2
SG2-8195	0.2	0.2	1.0	0.2	0.4	0.2
SGA-8189	0.1	0.2	0.8	0.2	0.4	0.2
SGO-8141	0.5	0.5	1.3	0.7	1.0	0.7
SGO-8239	0.3	0.5	1.3	0.5	0.7	0.5

The sensing range of magnet actuated proximity switches is a function of the strength (gauss) of the magnet being sensed by the switch. The MAG-SWITCH is designed and constructed to sense either the north or south pole of the magnet.

Typical operating magnets are shown. However, any commercial or industrial magnet, either permanent or electromagnetically polarized, can be used.

When using magnets other than those shown, the sensing range and hysteresis (differential) will be different.

Operation

Mount the external magnet so that the centerline of the magnet is aligned with the center of the sensing head and is within the distance specified in Table 2. In this position, the switch is in the operated mode. Moving the magnet farther away from the sensing point resets the switch to the normal mode.

A permanent magnet can be mounted in a fixed position relative to the switch. Note that when a ferromagnetic material is placed in the gap between the magnet and the switch, it can short circuit enough of the field to reduce flux density below the switching level.

Schneider Electric USA
1875 Founders Drive
Dayton, OH 45420 USA
1-800-435-2121
www.schneider-electric.us