



MAG-TEK SPHERE DETECTOR SWITCHES

**MODEL M-5 • MODEL M-5D
MODEL M-5T • MODEL M-5TD
INSTALLATION, OPERATION &
MAINTENANCE INSTRUCTIONS**

General Information

Mag-Tek features a pressure balanced, piston actuated, proximity switch with no dynamic seals. The switch is factory sealed, with no field adjustment, eliminating the chance of slipping from the original setting. The hemispherical shape of the piston allows either uni-directional or bi-directional operation. The detector switch is manufactured from stainless steel and designed for either above ground or below ground applications. Once installed the Mag-Tek has only one moving part, the pressure-balanced piston, thus allowing continuous, maintenance free, and accurate operation. Mag-Tek switches are also interchangeable with most other brands of switch mountings.

Installation Instructions

The standard Mag-Tek detector switch is designed for installation on pipe having a nominal wall thickness of 0.375 inches or less. If the Mag-Tek is to be used on pipe having a wall thickness greater than 0.375 inches, be sure to specify when ordering.

1. Select the desired location on the pipe for the Mag-Tek detector switches. These points are usually, but not necessarily, on top of the pipe.
2. Drill a 7/8" diameter hole at each point. Care should be taken to keep the drill bit centered and perpendicular to the pipe.
3. All drill cuttings should be removed from inside the pipe. If, due to design, this cannot readily be done with a cloth or a stream of air, it can usually be done with a small mechanic's extension type, hand-held magnet inserted through the 7/8" drilled hole.
4. The inside of the drilled hole should be rounded or chamfered with a file or stone to remove sharp edges.

Note: Mag-Tek Switches are subject to internal piping pressure. Pressure must be relieved prior to switch removal.

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5. Center the base plate guide-lip in the 7/8" diameter hole in the pipe, taking care to orient the base plate properly so that it is level and square with the pipe.
6. With the base plate level and square, lightly tack weld onto the pipe. Check to be sure the base plate guide lip is still seated. If so, complete the seal welding with the required passes. Do not allow weld splatter or arc on the switch mounting face of the base plate. If Mag-Tek detector switches are to be installed on a prover after it has been internally coated, care should be taken to minimize the weld heat. It is suggested the weld be cooled from time to time with wet rags or other means. Filling the prover barrel with water, if practical, prior to welding, will further minimize damage to the internal coating.
7. Check mounting face to make sure it is free from burrs and weld splatter. **DO NOT PAINT** the face of the mounting plate.
8. Mount switch on base with (4) 3/8" cap screws. Recommended torque 240 inch pounds. Maximum torque 300 inch pounds.

Operation

Once installed the hemispherical portion of the probe extends into the I.D. of the pipe approximately 3/8". When the sphere passes the switch, it forces the probe upward. This upward movement causes the ferrous body of the piston to enter the magnetic field of the proximity switch sensor. The result of the attracting forces causes the magnet in the sealed switch to move toward the ferrous piston causing the normally open contacts to close and complete the electrical circuit.

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Trouble Shooting

Due to the limited number of moving parts, problems with the Mag-Tek detector switch are few. The most common problems can be attributed to one of the following:

1. Switch damage - the switch may have been damaged by excessive electrical currents, or by dropping the switch. To check, remove the switch from the base, connect it to a volt/ohm meter and slide the piston into the lower portion of the switch. The switch should close and open as the piston is moved into and out of the switch. If it does not function properly, a replacement element is required.
2. No indication - The sphere is not contacting the piston properly. Measure the O.D. of the scraper cup or sphere to be certain they are the proper diameter.
3. No indication - Foreign material has accumulated above the piston in the sensing chamber preventing the piston from traveling upward. Remove the switch and clean the base of the switch and the spring. Check the bleed grooves in the piston to be sure they are clear.
4. Switch is clean and checks out OK, the switch is sized properly, but the switch is intermittent or still does not function properly - misalignment of the base and hole causing the piston to bind or preventing it from extending into the pipe ID. Recheck the base fit and probe insertion depth.

Recommended Spare Parts

Due to the simplicity of the switch, once it is installed the detector can operate indefinitely without the need for spare parts.

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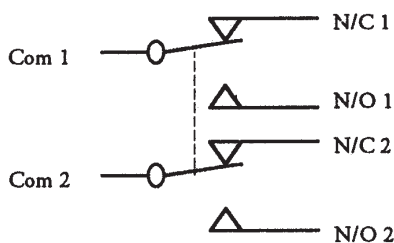
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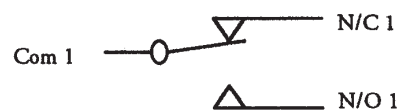
Specifications

Contact:	Model M-5, M-5T	SPDT Environmentally Sealed
	Model M-5D, M-5TD	DPDT Environmentally Sealed
Classification:	CSA NRTL/C Class I, Division 1, Groups C and D Hazardous Locations	
Rating:	2 Amps @ 240 V.A.C 50 Milliamps @ 24 V.D.C.	
Repeatability:	0.002" units (Under identical operating conditions.)	
Response Time:	0.008 Seconds	
Temperature:	-40°F to +221°F	
Pressure:	2220 Psi Max. Rating	
Weld on Base:	Carbon Steel	
Spring:	302 Stainless Steel	
Piston:	416 Stainless Steel	
Body:	303 Stainless Steel	
O-Ring:	Viton	
Conduit Opening:	1/2" FNPT for SPDT 3/4" FNPT for DPDT	

DPDT Contact Arrangement



SPDT Contact Arrangement



Wire Color Code:

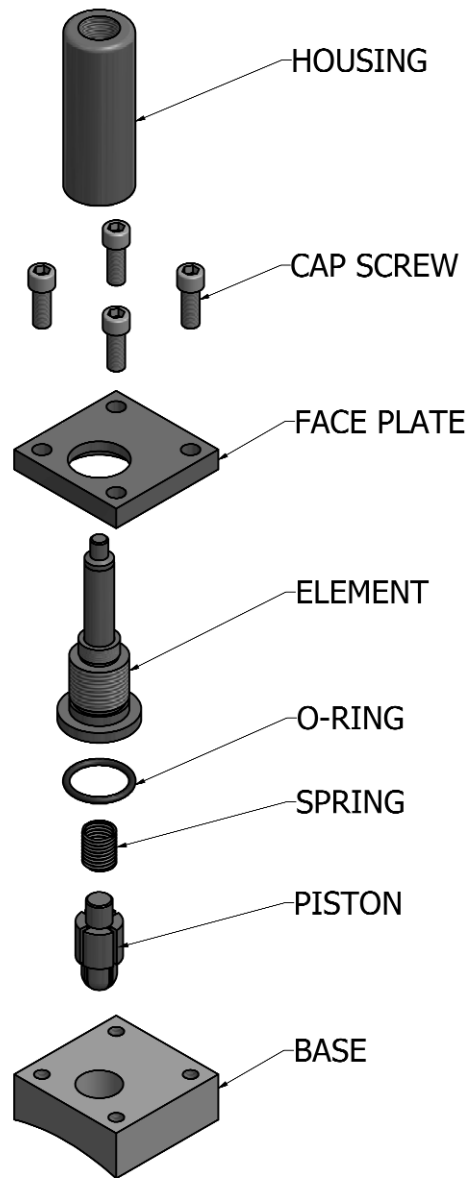
Circuit 1	RED-N/C	RED-N/C
	BLUE-N/O	BLUE-N/O
	BLACK-COM 1	BLACK-COM
Circuit 2	RED w/STRIPE-N/C	
	BLUE w/STRIPE-N/O	
	BLACK w/STRIPE-COM 2	
	GREEN-GROUND	

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