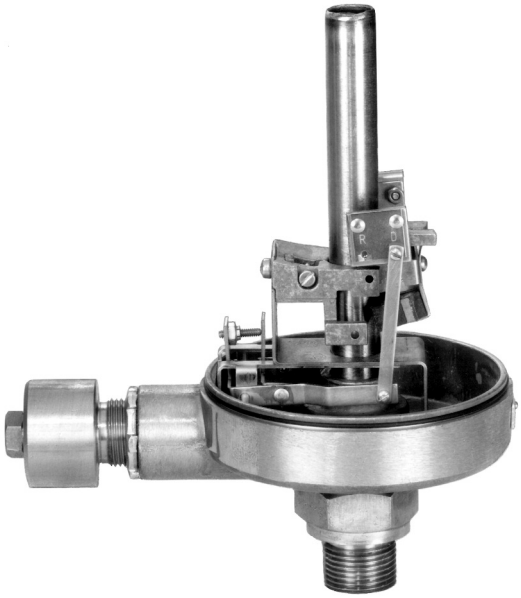
Series K

Installation and Operating Manual



Pneumatic

switch mechanism

and housings

Magnetrol®

UNPACKING

Unpack the instrument carefully. Make sure all components have been removed from the foam protection. Inspect all components for damage. Report any concealed damage to the carrier within 24 hours. Check the contents of the carton/crates against the packing slip and report any discrepancies to Magnetrol. Check the nameplate model number to be sure it agrees with the packing slip and purchase order. Check and record the serial number for future reference when ordering parts.

CE 0038

These units are in conformity with the provisions of:

The PED directive 97/23/EC (pressure equipment directive). Safety accessories per category IV module H1.

PRINCIPLE OF OPERATION

Magnetic force and the lever mechanism transmit movement from the pressure vessel to the pneumatic valve.

Figure 1 shows the position of the attraction sleeve and magnet when the liquid level is such that the attraction sleeve is below the field of the magnet. In this position, the flapper has been drawn away from the valve rod, permitting the inlet air or gas to flow to a pneumatic operator. Inlet air pressure against the ball allows the ball to seal off the exhaust outlet.

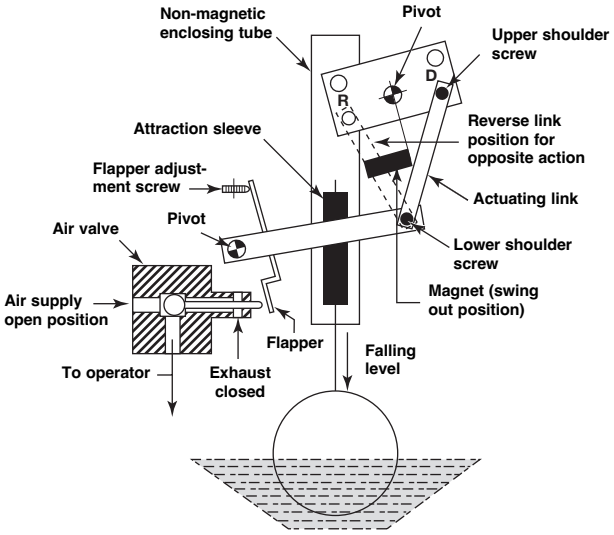


Figure 1
Attraction sleeve below field of magnet

Figure 2 shows the position of the attraction sleeve and the magnet when the liquid level has risen, causing the attraction sleeve to attract the magnet against the enclosing tube. In this position, the flapper actuates the air valve, closing the supply inlet and opening the exhaust port, which reduces the pressure in the operator to atmospheric. This action, "close" on high, is reversible to "open" on high with two simple adjustments (refer to page 3).

NOTE: In order to protect the switch assembly from contaminants, filtered and dried gas/air supply is recommended.

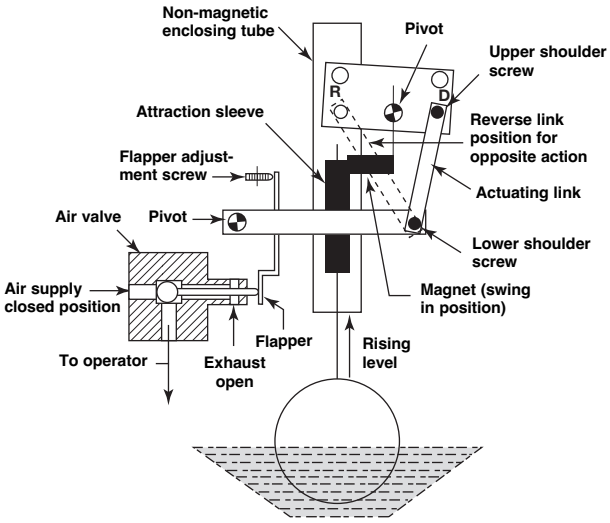


Figure 2
Attraction sleeve in field of magnet

DESCRIPTION

The series K is a non-bleed pneumatic switch. It incorporates a three-way pneumatic valve assembly, actuated by a magnet swing carriage. Mechanisms are available as an option for most Magnetrol liquid level controls.

PNEUMATIC CONNECTION

Circuits shown are for direct-acting level switches and are reversed in side mounting float-in-tank models, which utilize a reversing float pivot. The airline connections are 1/4" NPT-F.

Reversing pilot action

All series K pneumatic switch mechanisms are shipped from the factory in the direct (close) position at high level. They can be field modified for the reverse (open) position by following the steps below:

1. The action can be reversed by first removing the upper shoulder screw from the actuator link and moving it from the direct (D) position to the reverse (R); refer to Figure 3.
2. Loosen the screw that positions the spring bracket and move it from the direct (D) position to the reverse (R) position; refer to Figure 4.
3. Fasten screw securely.

The switch is now setup for reverse action.

Locating air line connection

Caution: Instrument is designed for dry air/gas service.

The housing base may be rotated a full 360° for your convenience in connecting the air supply.

1. Loosen both the special locking screw above the enclosing tube nut and the frame screw. Refer to Figure 3.
2. Rotate the entire base to the desired position.
3. Tighten both the locking screw and the frame screw.

Remove complete mechanism

1. Disconnect air line from air line adapter.
2. Loosen both the special locking screw, above the enclosing tube nut, and the frame screw approximately 3 to 4 turns. Refer to Figure 3.
3. Lift the entire base straight up and off the enclosing tube.

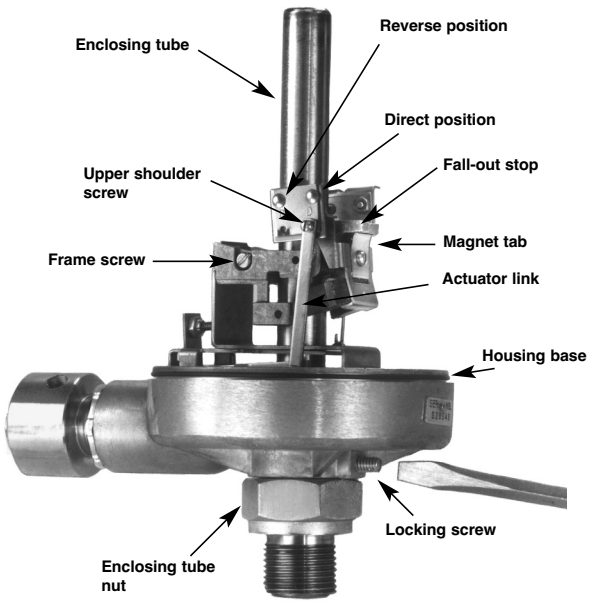


Figure 3

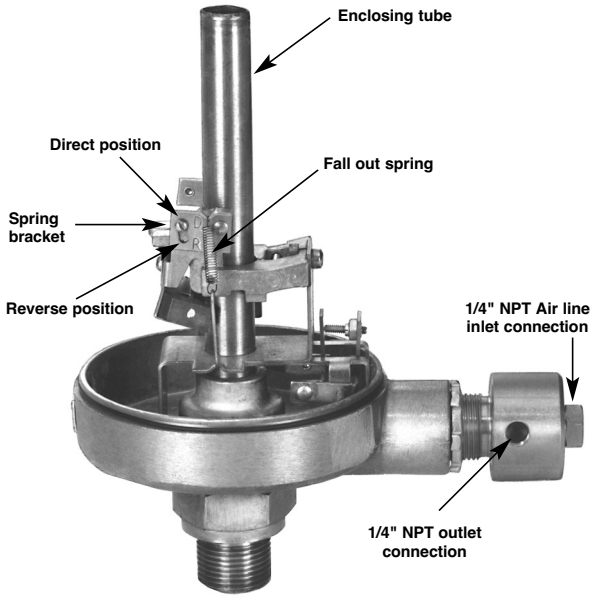


Figure 4

Nozzle cleaning

To clean the nozzle, follow the steps below:

1. Unscrew and remove the adapter. Refer to Figure 5.

Caution: Do not lose the ball which will drop out when the adapter is removed.

2. The ball and actuating rod will now fall out when the switch is tipped.
3. Unscrew the socket set screw with a 1⁄16" Allen wrench. This will prevent damage to the flapper when performing step 4.
4. Insert a 1⁄16" diameter wire into the nozzle from the air line connection side. Refer to Figure 6. The wire may be moved back and forth to clean the opening of any accumulated matter.
5. Reassemble the actuating rod, ball, and adapter; insert into nozzle. Refer to Figure 5.
6. Securely tighten the air line adapter.
7. Readjust the flapper to its original position; refer to Nozzle Flapper Readjustment procedure.

Nozzle flapper readjustment

1. Connect an air line to the adapter.
2. Pressurize the air line.
3. Adjust the flapper with the socket set screw for the desired action:

Direct Action

a. Hold the magnet against the enclosing tube.
b. Adjust the socket set screw with a 1⁄16" Allen wrench until the air flow stops, plus an extra one-eighth turn.

Reverse Action

a. Hold the magnet tab against the fall out stop. Refer to Figure 3.
b. Adjust the socket set screw with a 1⁄16" Allen wrench until the air flow stops.

4. Manually actuate the switch under pressure to assure its correct actuation. The unit is now ready for service.
5. Operate control at normal process conditions to verify adjustments.

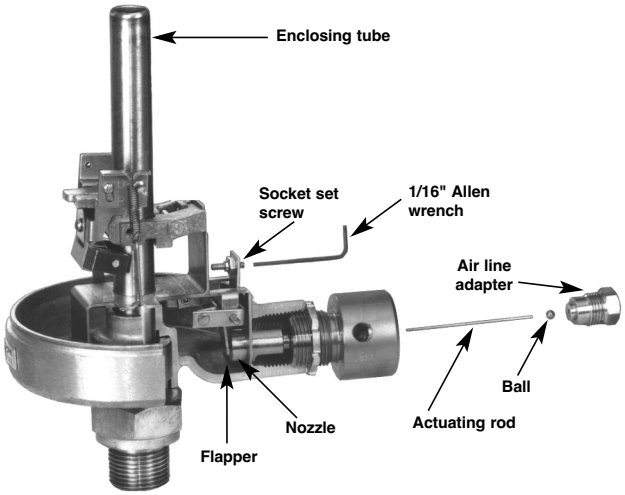


Figure 5

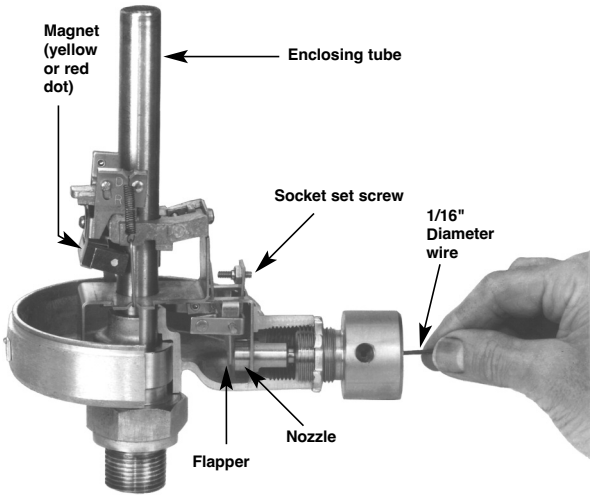


Figure 6

SWITCH & HOUSING MODEL CODES

Magnetrol level controls are identified by an alpha-numbering system. The last digits describe the type of switch mechanism furnished.

Switch code			Maximum supply pressure	Maximum process temp.	Maximum air flow	Cover height mm (inches)
Red dot magnet	Yellow dot magnet					
–	KOE	KPE	6,9 bar (100 psig)	200 °C (400 °F)	1,87 m³/h (1.1 SCFM)	102 (4)
KOG	–	–	2,8 bar (40 psig)	200 °C (400 °F)	1,19 m³/h (0.7 SCFM)	102 (4)
–	KOF	KPF	6,9 bar (100 psig)	200 °C (400 °F)	1,87 m³/h (1.1 SCFM)	152 (6)
KOH	–	–	2,8 bar (40 psig)	200 °C (400 °F)	1,19 m³/h (0.7 SCFM)	152 (6)

Note: Maximum leakage rate is 0,014 m³/h (0.5 SCFH) at maximum supply pressure.

Example model number:

B	7	5	–	A	B	2	0	–			

REPLACEMENT SWITCH MECHANISMS

Magnet strength

Switch mechanisms are provided with different strength magnets as determined by the characteristics of the level switch. A red or yellow dot is visible on each magnet. When ordering replacement switch mechanisms, be certain to determine the color dot on the magnet. For these types of switches, the tenth digit of the model number identifies the magnet used on the control. The correct magnet dot color may be chosen by finding the tenth digit of your model number at the top of the chart. Any model numbers preceded with an "X" are specially modified controls. Contact the factory for replacement part numbers.

Partn°: | | | | – | | | | | – | | | |

Serial n°: | | | | | | | – | | – | | | |

Digit in partn°:

X	1	2	3	–	4	5	6	7	–	8	9	10

See nameplate, always provide complete partn° and serial n° when ordering spares.

X = product with a specific customer requirement

K series pneumatic switch

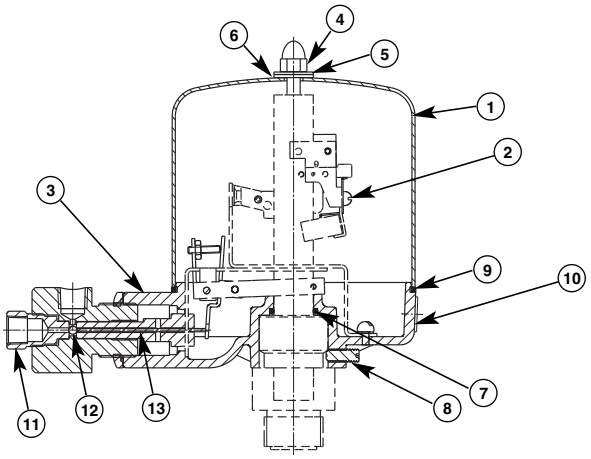
Replacement parts for K series pneumatic switch mechanisms are available as an assembly only. This assembly contains also the housing base and base lock screw. When ordering an assembly, be certain to specify:

1. The model number of the level control in which the switch was installed, for example B75-AB20-KOG.
2. The serial number of the level control in which the switch was installed. Refer to nameplate attached to control.

IP 53		IP 55	
8, 9 & 10th digit	Part number	8, 9 & 10th digit	Part number
KOE, KOF	089-7501-023	KOE, KOF + X = IP 55	049-2512-001
KOG, KOH	089-7501-024	KOG, KOH + X = IP 55	049-2512-002
KPE, KPF	089-7501-025	KPE, KPF + X = IP 55	consult factory

Aluminium / Carbon steel housings

Carbon steel IP53 (NEMA 3R) switch housings (optional IP 55) are available for general purpose and weatherproof installations. The housing base is cast from aluminum while the cover is made from cold rolled steel. The housings are finished with a baked-on polyester powder coat paint.



1. Housing cover
2 & 3. Switch mechanism & housing base assembly
4. Acorn nut
5. Washer
6. Seal washer
7. Base O-ring
8. Base lock screw
9. Cover O-ring
10. Nameplate
11. Bushing
12. Ball
13. Valve stem

Figure 7
Standard aluminium /carbon steel housing (short and tall)

Assemble / Disassemble instructions

1. Disconnect air lines from air line connections.
2. Loosen acorn nut (4) or cover screw (model F10 & F50) and remove washers (5) & (6). Lift housing cover straight upwards to avoid damaging the inside switch mechanism.
3. Replacement of base O-ring (7).
   3.1 First remove housing cover (1) - see 1-2.
   3.2 Loosen base lock screw (8).
   3.3 Remove entire switch mechanism & housing base assembly (see page 3).
   3.4 O-ring (7) can be accessed/replaced.
4. Replace part and mount in opposite order.
5. Replace housing cover (1), reinstall washers (6) & (5) and fix with acorn nut (4) or cover screw (model F10 & F50).

Replacement housing kits

The housing base (3) and the base lock screw (8) are included in the assembly that contains the pneumatic switch mechanism (2). Refer to page 5 for replacement part numbers.

Description	Kit contains part(s)	Replacement part
Cover kit for short (102 mm (4")) housing	1, 4, 5, 6, 7, 9	189-6509-001
Cover kit for tall (152 mm (6")) housing	1, 4, 5, 6, 7, 9	189-6510-001
Washer + '0'-ring kit	4, 5, 6, 7, 9	189-6508-001
Cover '0'-ring	9	012-1318-001
Base '0'-ring	7	012-2201-116
Bushing (*)	11	004-7768-001
Ball (*)	12	004-7713-001
Valve stem (*)	13	004-7151-001

(*) This part is included in the switch mechanism & housing base assembly (2) & (3) but can be ordered separately too.

Notes

IMPORTANT

SERVICE POLICY

Owners of Magnetrol products may request the return of a control; or, any part of a control for complete rebuilding or replacement. They will be rebuilt or replaced promptly. Magnetrol International will repair or replace the control, at no cost to the purchaser, (or owner) ***other than transportation cost*** if:

a. Returned within the warranty period; and,
b. The factory inspection finds the cause of the malfunction to be defective material or workmanship.

If the trouble is the result of conditions beyond our control; or, is **NOT** covered by the warranty, there will be charges for labour and the parts required to rebuild or replace the equipment.
In some cases, it may be expedient to ship replacement parts; or, in extreme cases a complete new control, to replace the original equipment before it is returned. If this is desired, notify the factory of both the model and serial numbers of the control to be replaced. In such cases, credit for the materials returned, will be determined on the basis of the applicability of our warranty.
No claims for misapplication, labour, direct or consequential damage will be allowed.

RETURNED MATERIAL PROCEDURE

So that we may efficiently process any materials that are returned, it is essential that a “Return Material Authorisation” (RMA) form will be obtained from the factory. It is mandatory that this form will be attached to each material returned. This form is available through Magnetrol’s local representative or by contacting the factory. Please supply the following information:

1. Purchaser Name
2. Description of Material
3. Serial Number and Ref Number
4. Desired Action
5. Reason for Return
6. Process details

Any unit that was used in a process must be properly cleaned in accordance with the proper health and safety standards applicable by the owner, before it is returned to the factory.
A material Safety Data Sheet (MSDS) must be attached at the outside of the transport crate or box.
All shipments returned to the factory must be by prepaid transportation. Magnetrol ***will not accept*** collect shipments.
All replacements will be shipped Ex Works.

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