Magnetrol®

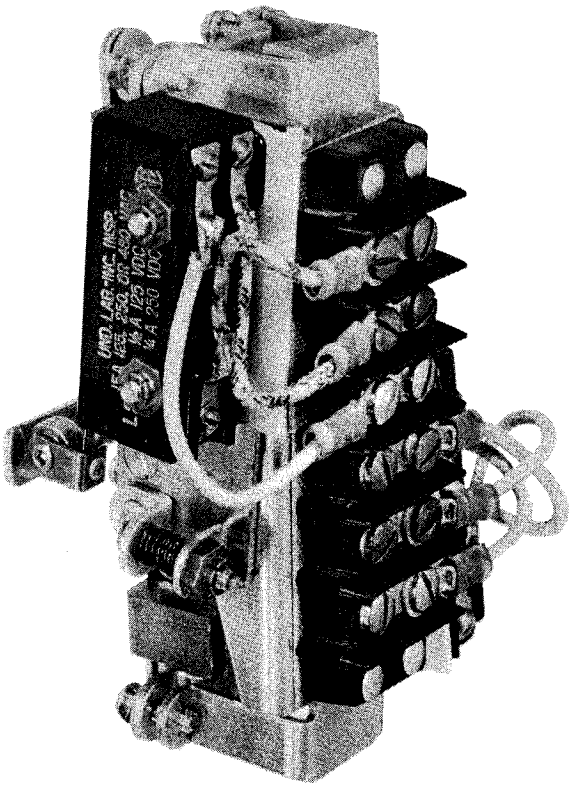
Series G, H and I

Dry Contact Switch Mechanisms

INSTRUCTION MANUAL AND PARTS LIST

DESCRIPTION

These switch mechanisms use dry contact switches actuated by a dual magnet rocker arm assembly. Mechanisms are adaptable to most Magnetrol® liquid level controls and flow switches. Units are available with a single SPDT switch or two SPDT switches arranged for DPDT operation.



MODEL NUMBER DESCRIPTION

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

Model number construction

Example: **B75-1 B20-** □□□

Basic part number — B75-1

Tank connection — B20-

Switch mechanism & enclosure — □□□

SWITCH MECHANISM & ENCLOSURE CODES

Switch Description	*Max. Process Temp. °C (°F)*	*One Contact Per Encl.*	*USED WITH MATERIAL CODE 1*								
			NEMA 4		*NEMA 7/9*			*BASEEFA*		*CENELEC*	
			Std. Tall	*Epoxy Cover Tall*	*Std. Tall*	*Group B Tall*	*W/Drain Tall*	*M 20 X 1.5 entry*	*3/4" NPT entry*	*M 20 X 1.5 entry*	*3/4" NPT entry*
Series G Snap Switch	120°C (250°F)	SPDT	GAH	GAD	GKD	GKV	GUD	GK8	GU8	GK7	GU7
		DPDT	GDH	GDD	GND	GNV	GXD	GN8	GX8	GD7	GW7
Series H Snap Switch	230°C (450°F)	SPDT	HAH	HAD	HKD	HKV	HUD	HK8	HU8	HK7	HU7
		DPDT	HDH	HDD	HND	HNV	HXD	HN8	HX8	HD7	HW7
Series I Snap Switch	120°C (250°F)	SPDT	IAH	IAD	IKD	IKV	IUD	IK8	IU8	IK7	IU7
		DPDT	IDH	IDD	IND	INV	IXD	IN8	IX8	ID7	IW7

Switch Description	*Max. Process Temp. °C (°F)*	*One Contact Per Encl.*	*USED WITH MATERIAL CODE 2, 3 or 4*								
			NEMA 4		*NEMA 7/9*			*BASEEFA*		*CENELEC*	
			Std. Tall	*Epoxy Cover Tall*	*Std. Tall*	*Group B Tall*	*W/Drain Tall*	*M 20 X 1.5 entry*	*3/4" NPT entry*	*M 20 X 1.5 entry*	*3/4" NPT entry*
Series G Snap Switch	120°C (250°F)	SPDT	GAF	GAM	GKM	GKW	GUM	GK6	GU6	GK5	GU5
		DPDT	GDF	GDM	GNM	GNW	GXM	GN6	GX6	GD5	GW5
Series H Snap Switch	230°C (450°F)	SPDT	HAF	HAM	HKM	HKW	HUM	HK6	HU6	HK5	HU5
		DPDT	HDF	HDM	HNM	HNW	HXM	HN6	HX6	HD5	HW5
Series I Snap Switch	120°C (250°F)	SPDT	IAF	IAM	IKM	IKW	IUM	IK6	IU6	IK5	IU5
		DPDT	IDF	IDM	INM	INW	IXM	IN6	IX6	ID5	IW5

OPERATING PRINCIPLE

Diagrams "A" and "B" illustrate the simple and foolproof Magnetrol operating principle. Switching action is obtained through the use of a magnetic sleeve actuated by a float (or flow sensing device) and a switching mechanism. These two basic component assemblies are separated by a non-magnetic, pressure tight enclosing tube. A balanced dual magnet arm, operating on precision stainless steel pivots, actuates the switch.

OPERATING CYCLE

At "Normal Operating Level" of a liquid in a storage vessel (diagram "A"), the float moves the magnetic sleeve up within the field of the upper magnet, drawing it in tightly to the enclosing tube. In this position, the switch actuating arm depresses the switch arm "making" one circuit and "breaking" the other circuit of the SPDT switch. As liquid level recedes, the float pulls the magnetic sleeve downward until, at a pre-determined "low level", it releases the upper magnet and simultaneously enters the field of the lower magnet, drawing it in tightly to the enclosing tube. This causes the switch actuating arm to release the switch arm, reversing the switch action.

When liquid level returns to normal, the float again moves the magnetic sleeve up the enclosing tube, causing the switch to assume its original position.

Switch mechanisms may include a single switch or multiple switches depending on operational requirements and switching action desired.

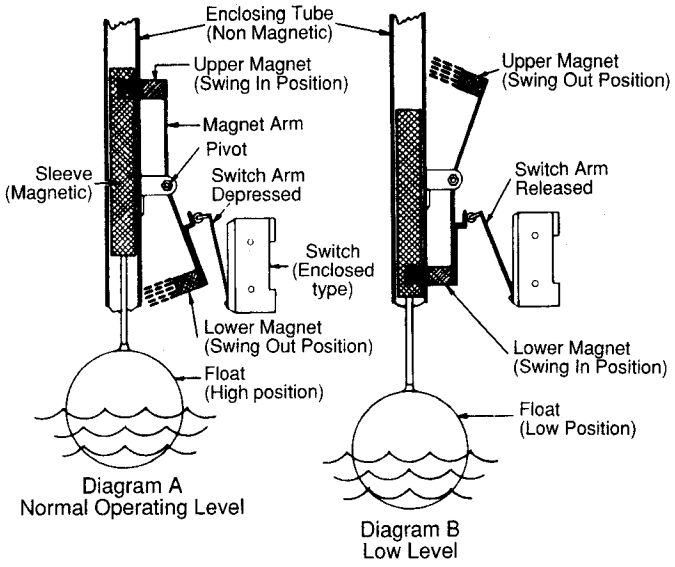


Figure 1

WIRING DIAGRAMS

SPDT MECHANISM

Wiring Diagram

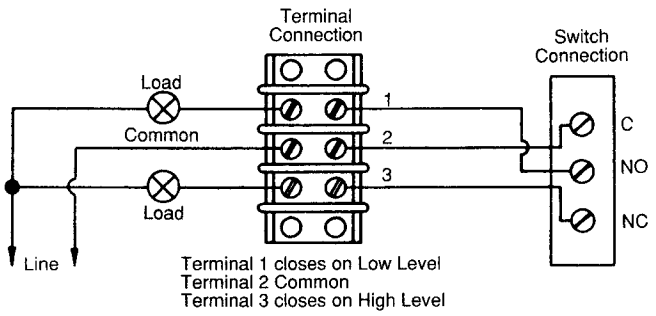


Figure 2

NOTE: When used on side mounted float-in-tank models, the wiring diagram is reversed. (Make on Low Level becomes Make on High Level, etc.)

DPDT MECHANISM

Wiring Diagram

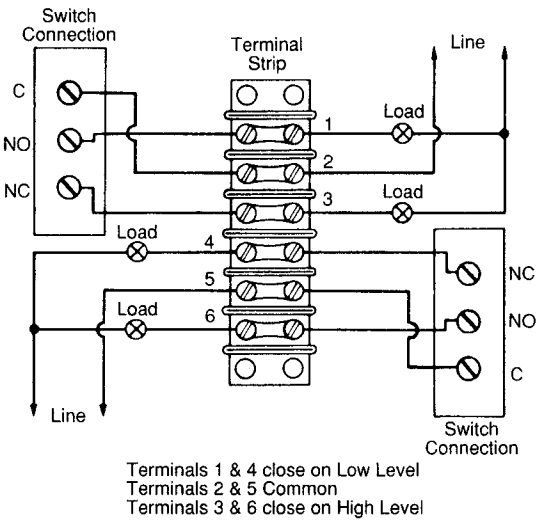


Figure 3

NOTE: When used on side mounted float-in-tank models, the wiring diagram is reversed. (Normally open "NO" becomes normally closed "NC", etc.)

SERVICE INSTRUCTIONS

TYPICAL SWITCH MECHANISM

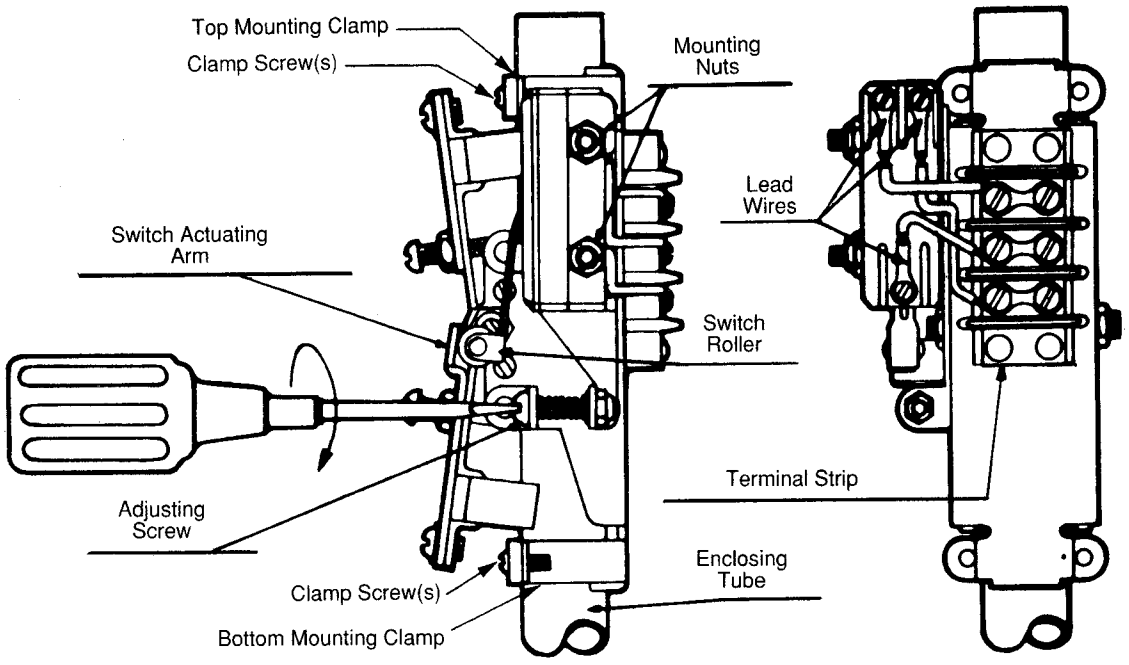


Figure 4

Removing the switch mechanism

All switch mechanisms can be easily removed from a Magnetrol control without disturbing piping connections or the rest of the control. Switch mechanisms are secured in the controls by means of upper and lower mounting clamps.

***CAUTION:** Before attempting to remove a switch mechanism, be certain to pull disconnect switch or otherwise assure that electrical circuit through control is deenergized.*

1. Disconnect wiring from supply side of terminal block(s) on switch mechanism. Note and record lead wire terminal block locations.

NOTE: Measure location of switch mechanism on enclosing tube and record for reference use during reassembly. Measure from top of enclosing tube to top of upper mounting clamp.

2. Loosen screws in upper and lower mounting clamps until mechanism slides freely on enclosing tube.

3. Carefully lift off switch mechanism and place on clean surface, free of metal particles which may be attracted to switch magnets.

4. Replace switch mechanism in reverse of steps 1 through 3 above. Be certain that assembly has the correct end up to insure duplicating original switch action.

NOTE: All switch mechanisms have terminal identification numbers. These numbers should read from top to bottom when switch mechanism is correctly positioned on enclosing tube.

Replacing the switch

Dry contact switches are easily removed and replaced when damaged or broken.

1. Disconnect Magnetrol control from power supply.

2. Disconnect switch leads from terminal block(s) or, if replacement switch is not supplied with lead wires, disconnect leads from switch. Note and record terminal connections of switch being replaced.

3. Remove two mounting nuts holding existing switch.

4. Remove existing switch and install replacement switch in the same position, tightening mounting nuts securely.

***CAUTION:** Do not overtighten mounting nuts or damage to switch enslosure may occur.*

NOTE: For proper operation of the replacement switch, it must actuate (or reset) in the middle portion of magnet arm swing.

5. Check switch action and adjust as follows:
   A. Slowly rotate magnet arm by hand, back and forth through its full swing, listening closely for the actuating "click" of the switch in each direction.
   B. Check to see if there is equal additional over-travel of the magnet arm in its swing after the switch "click" in either direction.
   C. If switch actuation is not correct, change adjustment by turning adjusting screw.

NOTE: On double pole mechanisms, hold switch arm on second switch in depressed position to allow for audible adjustment of new switch only.

   D. With new switch in adjustment, release switch arm of second switch and perform "fine tuning" of both switches to provide simultaneous actuation (required DPDT switch mechanisms only).

6. Re-connect power supply and test switch action by varying liquid level in the vessel or by "blowing down" float chamber.

REPLACEMENT PARTS

CAUTION: When ordering replacement switch mechanisms, be certain to determine colour dot on magnet. NEVER replace a mechanism having a red dot magnet with one having a yellow dot magnet, and vice versa.

Switch Series	*Contacts*	*Replacing Switch Mechanism With Switch (ES)*		*Replacement Switch Only*
		Yellow Dot Magnet	*Red Dot Magnet*	
G	SPDT	89-7601-002	89-7601-001	89-7101-018
	DPDT	89-7601-006	89-7601-005	89-7101-018 (2 req'd.)
H	SPDT	89-7601-010	89-7601-009	89-7101-016
	DPDT	89-7601-012	89-7601-011	89-7101-016 (2 req'd.)
I	SPDT	89-7601-004	89-7601-003	89-7101-019
	DPDT	89-7601-008	89-7601-007	89-7101-019 (2 req'd.)

IMPORTANT:
When ordering, please specify
1. Model and Serial number of control.
2. Name and Number of part

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 of workmanship.

If the trouble is the result of conditions beyond our control; or, is NOT covered by the warranty, there will be charges for labor 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, labor, 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 Authorization» tag be obtained from the factory for attachment to the goods. This is available through Magnetrol's local representative or by contacting Magnetrol Customer Satisfaction supplying the following information :

1. Purchaser Name
2. Description of Material
3. Magnetrol Order Number
4. Serial Number
5. Reason for Return
6. Desired Action

All shipments returned to the factory must be by prepaid transportation. Magnetrol will not accept collect shipments.
All replacements will be shipped FOB factory.

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UNDER RESERVE OF MODIFICATIONS

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