



# HS Hermetically Sealed Switch

## INSTALLATION/INSTRUCTION MANUAL AND PARTS LIST

HS switch with terminal block



HS switch with wiring leads

### DESCRIPTION

The HS switch contains a snap action micro switch which is hermetically sealed in a positively pressurised capsule for extended switch mechanism and contact life.

### AGENCY APPROVALS

CENELEC, BASEEFA, CSA, FM:  
approved for hazardous/ non-hazardous locations.

### MODEL NUMBER DESCRIPTION

Magnetrol controls are identified by an alphanumeric numbering system. The last 3 digits of the number describe the type of switch mechanism furnished.

Example: 

B	7	5	-	1	B	2	0	-	H	M	H
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Basic model number

Switch mechanism & enclosure

Tank connection & cage material

### BASIC ELECTRICAL RATINGS

Voltage	Series HM/H4/H5/HW/HS and HB	Series H2/H3/H8 and HK
240/120 V AC	5.0 A	1.0 A
24 V DC	5.0 A	1.0 A
120 V DC	0.5 A	0.4 A
240 V DC	-	0.25 A
Max. process temp.	290°C (550°F)	400°C (750°F)
Max. ambient temp.	70°C (160°F)	-

Contacts	Housing & electrical entry size	Cover HT mm (inches)	HS switch code			
			wiring leads 5 A	terminal block 5 A		
SPDT - One cont. per encl.	NEMA 4X (1" NPT entry)	102 (4")	HMB	Not available		
	NEMA 4X (M20 x 1.5 entry)		H4B			
	NEMA 4X (PG 16)		H5B			
	NEMA 7/9 std (1" NPT entry) ①		HMC		HWS	
DPDT - One cont. per encl.	NEMA 4X (1" NPT entry)	102 (4")	HME	Not available		
	NEMA 4X (M20 x 1.5 entry)		H4E			
	NEMA 4X (PG 16)		H5E			
	NEMA 7/9 std (1" NPT entry) ①		HMF		HWW	
SPDT - One cont. per encl.	NEMA 4X (1" NPT entry)	152 (6")	HMH	HM2		
	NEMA 4X (M20 x 1.5 entry)		H4H	H42		
	NEMA 4X (PG 16)		H5H	H52		
	NEMA 7/9 std (1" NPT entry) ①		HMJ	HS3		
	NEMA 7/9 Group B (1" NPT entry)		HMK	HM4		
	BASEEFA (M20 x 1.5 entry) ①		Not available	HB1		
	BASEEFA (3/4" NPT entry) ①			HB2		
	CENELEC (M20 x 1.5 entry) ①			HB3		
	CENELEC (3/4" NPT entry) ①			HB4		
	SPDT - Two cont. per encl.		NEMA 4X (1" NPT entry)	152 (6")	HMM	Not available
			NEMA 4X (M20 x 1.5 entry)		H4M	
NEMA 4X (PG 16)		H5M				
NEMA 7/9 std (1" NPT entry) ①		HMN				
NEMA 7/9 Group B (1" NPT entry)		HMP				
DPDT - One cont. per encl.	NEMA 4X (1" NPT entry)	152 (6")	HMR	HM6		
	NEMA 4X (M20 x 1.5 entry)		H4R	H46		
	NEMA 4X (PG 16)		H5R	H56		
	NEMA 7/9 std (1" NPT entry) ①		HM5	HS7		
	NEMA 7/9 Group B (1" NPT entry)		HMT	HM8		
	BASEEFA (M20 x 1.5 entry) ①		Not available	HB5		
	BASEEFA (3/4" NPT entry) ①			HB6		
	CENELEC (M20 x 1.5 entry) ①			HB7		
	CENELEC (3/4" NPT entry) ①			HB8		
	DPDT - Two cont. per encl.		NEMA 4X	152 (6")	HMX	Not available
NEMA 4X (M20 x 1.5 entry)		H4X				
NEMA 4X (PG 16)		H5X				
NEMA 7/9 std (1" NPT entry) ①		HMY				
NEMA 7/9 Group B (1" NPT entry)		HMZ				

Contacts	Housing	Cover HT mm (inches)	HS switch code	
			wiring leads 1 A - one cont.	terminal block 1 A - two cont.
SPDT	NEMA 4X (1" NPT entry)	102 (4")	HKB	Not available
	NEMA 4X (M20 x 1.5 entry)		H2B	
	NEMA 4X (PG 16)		H3B	
	NEMA 7/9 std (1" NPT entry) ①		H8C	
	NEMA 7/9 Group B (1" NPT entry)		-	
SPDT	NEMA 4X (1" NPT entry)	152 (6")	HKH	HKZ
	NEMA 4X (M20 x 1.5 entry)		H2H	H2Z
	NEMA 4X (PG 16)		H3H	H3Z
	NEMA 7/9 std (1" NPT entry) ①		H8J	H8N
	NEMA 7/9 Group B (1" NPT entry)		HKK	HKP

All housings are cast aluminium, except for those with a ①: cast iron.

# WIRING OF SWITCH MECHANISM WITH TERMINAL BLOCK

1. Remove switch housing cover.
  - a. **NEMA 4X & 7/9** – Unscrew cover and set aside.
  - b. **BASEEFA & CENELEC** – Loosen cover and set screw. Unscrew cover and set aside.
2. Make sure power to control wires is disconnected. Bring in control wires through electrical entry.
3. Wire the switch as shown in **Fig. 1 & 2**:
  - a. SPDT switch – see **Fig. 1**.
  - b. DPDT switch – see **Fig. 2**.

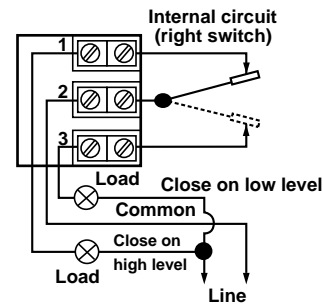


Figure 1 – SPDT terminals

**Note:** Double pole action is obtained by simultaneous operation of the right and left side SPDT switches.

4. Dress wiring to ensure no interference or contact with switch housing cover during replacement.
5. **OBSERVE ALL APPLICABLE ELECTRICAL CODES AND PROPER WIRING PROCEDURES.**
6. Prevent moisture seepage into the enclosure by installing approved seal drain fittings onto the unit.

**Caution:** In hazardous areas, do not power the unit until the enclosure cover is screwed down securely and properly sealed.

7. Replace housing cover.
8. Turn on power to the unit.
9. Test switch action by varying liquid level in float chamber.
10. Check cover to base fit to be certain gasketed joint is tight. A positive seal is necessary to prevent infiltration of moisture laden air or corrosive gases into switch housing.

**Note:** If switch mechanism fails to function properly, check vertical alignment of control housing.

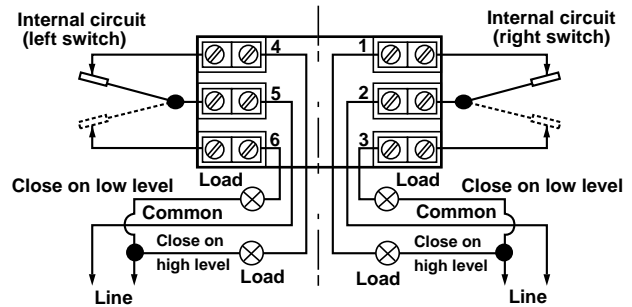


Figure 2 – DPDT terminals

# WIRING OF SWITCH MECHANISM WITH WIRING LEADS

1. Wiring leads will extend through electrical entry of the switch housing base. Each wiring lead is marked with a number; from 1 to 3 for SPDT switches; or, 1 to 6 for DPDT switches. See **Figure 3**. These numbers correspond to the numbers marked on the terminal block models.
2. Make sure power to control wires is disconnected. Wire the switch as shown in **Figure 3**.
3. **OBSERVE ALL APPLICABLE ELECTRICAL CODES AND PROPER WIRING PROCEDURES.**

**Caution:** In hazardous areas, do not power the unit until the enclosure cover is screwed down securely and properly sealed.

4. Turn on power to the unit.
5. Test switch action, by varying liquid level in the float chamber of the control.
6. Check cover to base fit to be certain gasketed joint is tight. A positive seal is necessary to prevent infiltration of moisture laden air or corrosive gases into switch housing.

**Note:** If switch mechanism fails to function properly, check vertical alignment of control housing.

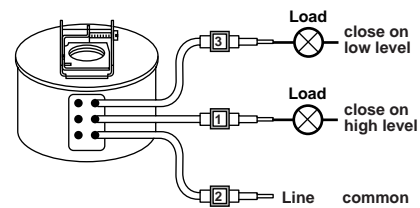


Figure 3a – SPDT switch

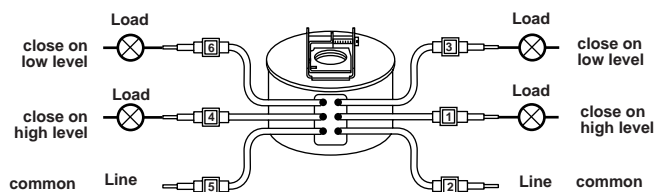


Figure 3b – DPDT switch

# REPLACEMENT PARTS

Replacement parts for the HS hermetically Sealed switch mechanism are available as a kit only.

When ordering a kit, please be sure to specify:

1. The **model number** of the level control in which the switch was installed, e.g. B75.
2. The **serial number** of the level control in which the switch was installed. See the plate attached to the control.
3. The **model code** of the switch being replaced, e.g. HS3.
4. The **part number** of the replacement switch kit.
5. The **quantity** of the replacement switch kits.

Contacts	Description HS switch	Order qty.	Switch model code	Replacement part number
SPDT 5 A	with terminal block max. 290°C (550°F)	1	HM2, H42, H52, HWS, HS3, HB1, HB2, HB3, HB4, HM4	089-8301-002
	with wiring leads max. 290°C (550°F)	1	HMB, H4B, H5B, HMH, H4H, H5H, HMC, HMJ, HMK	089-8301-004
		2	HMM, H4M, H5M, HMN, HMP,	
SPDT 1 A	with wiring leads max. 540°C (1000°F)	1	HKB, H2B, H3B, HKH, H2H, H3H, H8C, H8J, HKK	089-8301-015
		2	HKZ, H2Z, H3Z, H8N, HKP	
DPDT 5 A	with terminal block max. 290°C (550°F)	1	HM6, H46, H56, HWW, HS7, HB5, HB6, HB7, HB8, HM8	089-8301-001
	with wiring leads max. 290°C (550°F)	1	HME, H4E, H5E, HMR, H4R, H5R, HMF, HM5, HMT	089-8301-003
		2	HMX, H4X, H5X, HMY, HMZ	

## REPLACEMENT OF THE SWITCH MECHANISM

Should the switch need to be replaced, it may be done by following the steps below:

1. Disconnect all power to the control.
2. Remove switch housing cover.
3. Remove all control wiring from the switch terminal block or wiring leads.
4. Loosen the clamp screw at the top of the switch by turning it counterclockwise. See **Figure 5**.
5.
  - a. **If replacing an existing single HS switch:** lift the switch assembly and the switch spacer or washer off the enclosing tube. *Discard these parts.*
  - b. **If replacing a single switch which used a baffle plate:** lift the entire switch assembly and the baffle plate off the enclosing tube. *Discard these parts.* See **Figure 4**.

**Note:** If replacing two switches, which were nested; the top switch will actuate when the level is 25 mm (1") higher than the original actuation level.

- c. **If replacing two switches with wiring leads:** lift both switch assemblies and the switch spacer or washer off the enclosing tube. *Discard these parts.*
  - d. **If replacing two stacked switches which used a baffle plate:** lift both switch assemblies and the baffle plate off the enclosing tube. *Discard these parts.*
6. Slide the new switch spacer over the enclosing tube. Discard the switch washer included in the replacement switch parts kit.

**Caution:** The switch washer must be used when replacing switches which used baffle plates to ensure that the actuation levels for the control remain the same.

7.
  - a. **Single switches:** Slide the new HS switch over the enclosing tube until it rests on top of the switch washer. See **Figure 5**.
  - b. **Two switches with wiring leads:** Slide one new HS switch over the enclosing tube until it rests on top of the switch washer. Slide the second HS switch over the enclosing tube until it rests on top of the first HS switch. Discard the second switch washer included in the second switch's part kit.

**Caution:** When replacing an HS switch with wiring leads, be sure the side of the switch with the clamp screw is on top. The HS switch will not actuate if it is installed upside down.

8. Tighten the clamp screw at the top of the switch by turning it clockwise until the switch is secure on the enclosing tube.
9. Replace the control wires on the appropriate terminals or wiring leads of the new HS switch. See **Figures 1, 2 or 3** as necessary.
10. Replace the switch housing cover.
11. Turn on power to the unit.
12. Test switch action by varying liquid level in the float cage.

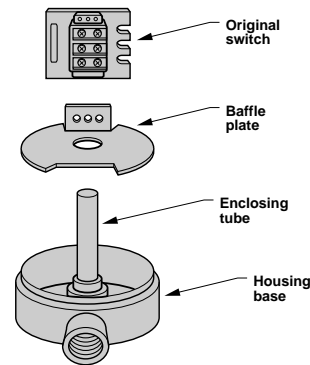


Figure 4 – Original switch configuration

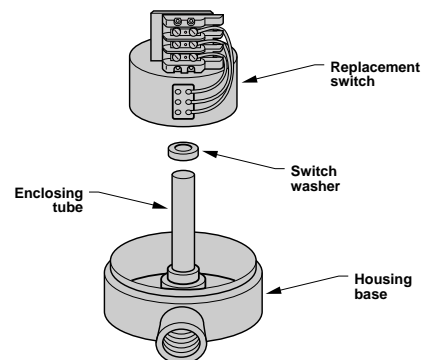


Figure 5 – Replacement switch

# 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
4. Desired Action
5. Reason for Return
6. Process details

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

All replacements will be shipped FOB factory.

UNDER RESERVE OF MODIFICATIONS

BULLETIN N°: BE 42-794.0  
EFFECTIVE: JANUARY 1994  
SUPERSEDES: New



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FRANCE	11, Rue A. Einstein, Espace Descartes, 77420 Champs-sur-Marne adresse postale: 77436 Marne-la-Vallée Cédex 2 Tel. (0) 164.68.58.28	Fax (0) 164.68.58.27
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