PRODUCT INTRODUCTION

■ INTRODUCTION

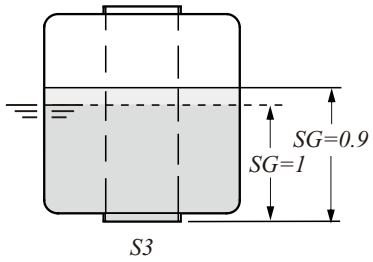
Since technologies of the product have more and more advance, the products need comply with a requirement for more convenient, safe and low cost.
The float switches are extremely compact, simple and are easy to install on any small space.
These switches are not effected by electrical interference. They can withstand to chemicals, high temperatures and pressures if the correct material of float switch is selected by the customers.

■ LIQUID PROPERTIES AND FLOATS

When the liquid specific gravity is less or more than the water, the float on the switch will either increase or decrease the immersion depth. The switch actuation level will also change.

All actuation levels are assumed with the water (SG=1). If your liquid has a different specific gravity, you should not specify the float specific gravity more than liquid, that will not cause the float rise with the liquid level. The reed switch inside the stationary stem will not be activated by the magnet inside the float.

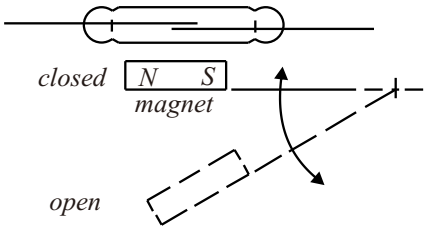
If your liquid has a high viscosity, you should specify largest size float that will provide a greatest buoyant force to ensure the units operate normally.
Because the float switches are activated by the magnetic field of permanent magnet inside the float, make sure the liquid is no iron powder or magnetic material to avoid magnetic interference.



(Fig. 3)

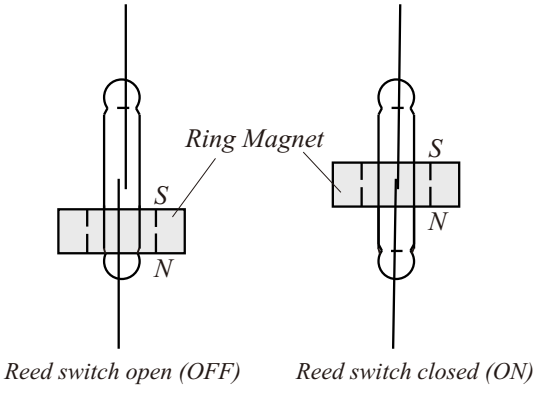
■ PRINCIPLE

Fig. 1 illustrates the method of pivot actuation (such as the FCH TYPE float switches). When the magnetic field of permanent magnet inside the float is moved into to the proximity of the reed switch inside the stationary stem, the reed switch "snaps" the contact together and closes the electrical circuit. When the magnetic field is moved away from the reed switch, the reed switch does not touch. The circuit is open.



(Fig. 1)

Fig. 2 illustrates the method of perpendicular actuation (such as the FC V TYPE float switches). When the magnetic field of ring magnet inside the float is moved into the proximity of reed switch inside the stationary stem, the reed switch "snaps" the contact together and closes the electrical circuit. When the magnetic field is moved away from the reed switch, the reed switch does not touch.
The circuit is open.



(Fig. 2)

CHEMICAL RESISTANCE

● Excellent ○ Good △ Fair × Corroded

Chemical	Concentration	Temp		Plastic				Rubber	Stainless	
	%	°C	°F	PVC	PP	PVDF	PTFE	NBR	304	316
Ammonia Water	10	40	104	●	●	●	●	○		
NH_4OH	10	80	176		○	●	●			
Aque Regia	10	40	104	△	△	●	●			
$3HCl+HNO_3$	10	80	176			●	●			
Benzene	Pure	40	104	×	△	○	●			
C_6H_6		80	176			△	●			
Bleaching Liquor	5	40	104	●		●	●			
$Ca(ClO)_2$	5	80	176			●	●			
	20	40	104	●		●	●			
	20	80	176			●	●			
Boric Acid	Satu	40	104	●	●	●	●	●		
H_3BO_3		80	176		●	●	●	○		
Brine		40	104	●	●	●	●	●		
		80	176		●	●	●			
Butadiene	Gas	40	104	●		●	●			
$CH_2=CH-CH=CH_2$		80	176			●	●			
Butane	Gas	40	104	●	●	●	●			
$CH_3(CH_2)_2CH_3$		80	176		●	●	●			
Nitric Acid	10	40	104	●	●	●	●	●	●	●
HNO_3	10	80	176	×	○	●	●		●	
	30	40	104	●	●	●	●		●	●
	30	80	176	×	○	●	●		●	●
	50	40	104	○	○	●	●		●	●
	50	80	176	×	×	○	●			
	70	40	104	○	×	●	●		○	●
	70	80	176	×		○	●			
	98	40	104			○	○			
	98	80	176				△			
Oxalic Acid	20	40	104	●	●	●	●	●		△
HOOCCOOH	20	80	176		●	●	●			
	50	40	104	●	●	●	●			△
	50	80	176		●	●	●			
Phosphoric Acid	10	40	104	●	●	●	●	●	●	●
H_3PO_4	10	80	176		○	●	●	△	●	●
	50	40	104	●	●	●	●	●	●	●
	50	80	176		△	●	●	×	●	●
	80	40	104	●	●	●	●	○	●	●
	80	80	176		△	●	●		●	●
Sodium	15	40	104	●	●	●	●	●	●	●
Hydroxide	15	80	176		○	△	●	△	×	×
NaOH	30	40	104	●	●	●	●	●	●	●
	30	80	176		○	△	●	●	×	×
	50	40	104	●	●	○	●	●	●	●
	50	80	176		○	×	●	●	×	×
	70	40	104	○	○	○	●			
	70	80	176		○	×	●			

Chemical	Concentration	Temp		Plastic				Rubber	Stainless	
	%	°C	°F	PVC	PP	PVDF	PTFE	NBR	304	316
Sodium	3	40	104	●	○	●	●		△	○
Hypochlorite	3	80	176							
NaClO	5	40	104	●	○	●	●		△	○
	5	80	176							
	7	40	104	●	△	○	●		×	×
	7	80	176							
	10	40	104	●	△	●	●		×	×
	10	80	176							
	13	40	104	●	△	●	●		×	×
	13	80	176							
Sulfuric Acid	10	40	104	●	●	●	●	●	●	●
H_2SO_4	10	80	176		●	●	●	○	○	○
	30	40	104	●	●	●	●	●	×	×
	30	80	176		●	●	●	○	×	×
	50	40	104	●	●	●	●	○	×	×
	50	80	176		●	●	●	△	×	×
	60	40	104	●	●	●	●	●	×	×
	60	80	176		○	●	●	○	×	×
	70	40	104	●	●	●	●	○	×	×
	70	80	176		○	●	●	△	×	×
	80	40	104	●	●	●	●	●	×	×
	80	80	176		○	●	●	△		
	90	40	104	○	●	●	●	△	×	×
	90	80	176		○	●	●	△		
	98	40	104	△		●	○		○	○
	98	80	176			△	○			
Toluene		40	104		△	△	●			
$C_6H_5CH_3$		80	176				○			
Chlorine Gas	Wet	40	104	○		●	●			
Cl_2	Wet	80	176			△	●			
	Dry	40	104	●		●	●			
	Dry	80	176			●	●			
Chromic Acid	10	40	104	●		●	●			
H_2CrO_4	10	80	176			●	●			
	20	40	104	△		●	●			
	20	80	176			●	●			
	40	40	104	△		●	●			
	40	80	176			●	●			
	50	40	104	×		●	●			
	50	80	176			△	●			
Hydrochloric	15	40	104	●	●	●	●	○		
Acid	15	80	176		●	●	●			
HCl	25	40	104	●	●	●	●	×		
	25	80	176		●	●	●			
	35	40	104	●	●	●	●	×		
	35	80	176		○	●	●			
	38	40	104	●	●	●	●	×		
	38	80	176		○	●	○			

● Excellent ○ Good △ Fair × Corroded

Chemical	Concentration	Temp		Plastic				Rubber	Stainless	
	%	°C	°F	PVC	PP	PVDF	PTFE	NBR	304	316
Citric Acid	10	40	104	●	●	●	●	●	●	●
$C_6H_8O_7$	10	80	176		○	●	●	●		
Gasoline	10	40	104	●		●	●			
	10	80	176			●	●			
Diesel Fuels		40	104			●	●		●	●
		80	176			●	●		●	●
Ethyl Alchol	Pure	40	104	●	●	●	●	●	○	○
C_2H_5OH	Pure	80	176		○	●	●	○		
Formic Acid	90	40	104	○	○	●	●			
HCOOH		80	176			●	●			
Hydrofluric Acid	Dilute	40	104	●	○	●	●			
	Dilute	80	176		○	●	●			
HF	30	40	104	○	○	●	●			
	30	80	176	×	○	●	●			
	40	40	104	△	○	●	●			
	40	80	176		○	●	●			
	50	40	104	△	○	●	●			
	50	80	176		○	●	●			
Hydrogen peroxide	5	40	104	●	●	●	●		○	●
	5	80	176		○	●	●			
H_2O_2	20	40	104	●	●	●	●			
	20	80	176		○	●	●			
	30	40	104	○	○	●	●			
	30	80	176		△	●	●			
	50	40	104	△	×	●	●			
	50	80	176			●	●			
	90	40	104			●	●			
	90	80	176			●	●			
Isopropyl Alcohol	Pure	40	104	●	●	●	●	○		
$(CH_3)CHOH$	Pure	80	176			●	●			
Kerosene		40	104	●	○	●	●			
		80	176			●	●			
Methyl Alcohol		40	104	○	●	●	●	△		
CH_3OH		80	176		○	●	●			
Methyl Ethyl Ketone		40	104		△		●			
$CH_3COC_2H_5$		80	176				●			
Potassium Chromate		40	104	●	●	●	●	●		
K_2CrO_4		80	176		○	●	●	○		

REED SWITCH PROTECTION

■ INDUCTIVE LOADS

When using reed switches for inductive loads such as motors, relay coil, solenoids, etc., the contacts will be subjected to high induced voltages during opening of the contacts (load circuit). Such high induced voltages (transients) may cause damage to the reed switch or significantly reduce its life.
Therefore, protective circuits such as: RC (snubber), varistor or clamping diodes are recommended. (see Fig. 4a, Fig. 4b, Fig. 4c)

■ It is prohibited to drive directly solenoid valve, motor or magnetic switch.

$$C=\frac{I^2}{10}\ (uF)$$

$$R=\frac{E}{10I(1+\frac{E}{50})}$$

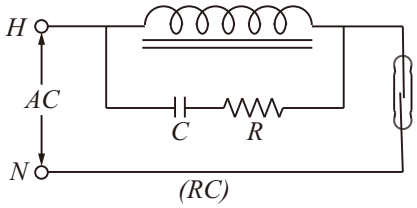


Fig. 4 (a)

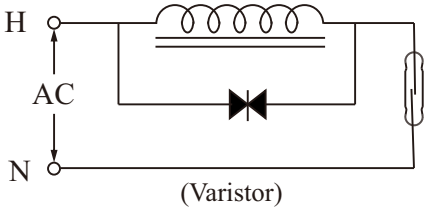


Fig. 4 (b)

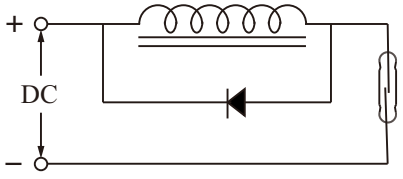


Fig. 4 (c)

■ CAPACITIVE LOADS

When using reed switches for capacitive loads such as capacitors, incandescent lamps or long cables, the contacts will be subjects to high surge (inrush) current.

Therefore, protective circuits such as: surge suppressors or current limiting resistors are recommended. (Fig. 5a, Fig. 5b)

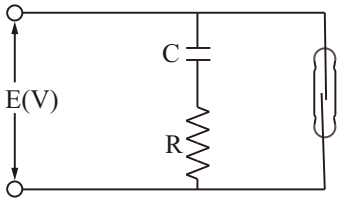


Fig. 5 (a)

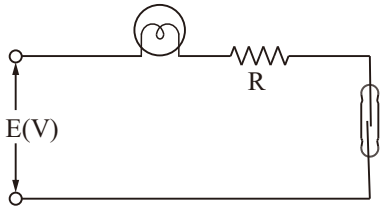
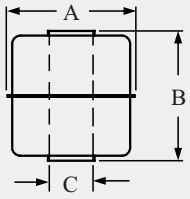
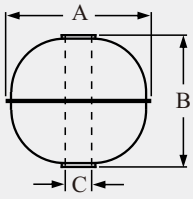
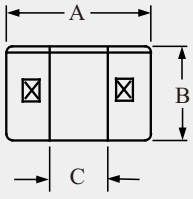
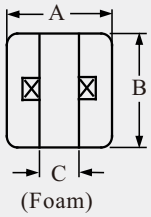
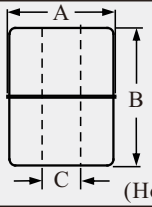


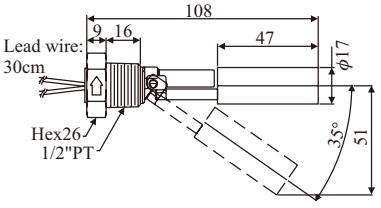
Fig. 5 (b)

FLOAT SPECIFICATIONS

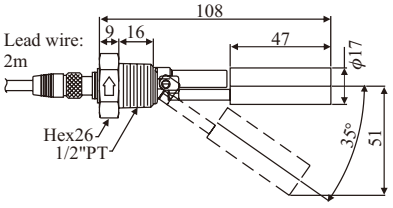
MODEL	TYPE	ϕAxBxϕC	S.G.	Max. Pressure (kg/cm²)	Weight (g)	Material/Color	Max. Temp. (°C)
	**S1**	2832839.5	E>0.7	10	8	SUS 304 / 316L	200
	S3	45355315	E>0.65	12	37.6	SUS 316	200
	S6	753108320	E>0.5	10	165	SUS 304	200
	**S2**	41338311	E>0.7	35	19.5	SUS 316	200
	S4	52352315	E>0.55	30	33.4	SUS 316	200
	S5	75373319	E>0.65	30	102.4	SUS 304	200
	S7	3032839.5	E>0.82	30	8	SUS 304 / 316L	200
	S8	1003100320	E>0.5	15	249.7	SUS 304	200
	S9	1503150330	E>0.45	15	534	SUS 304	200
	S11	2833239.5	E>0.82	30	8.1	SUS 304	200
 (Hollow)	**P1**	25315310	E>0.65	4	3.5	PP / white black	80
	P2	25325310	E>0.55	4	5	PP / white black	80
	P3	48345318.5	E>0.6	5	35.5	PP / black	80
	P4	20325310	E>0.7	4	3.7	PP / black	80
	P5	2032038.1	E>0.75	4	4	PP / black	80
	P8	18.2315.337.2	E>0.8	4	1.82	PP / black	80
 (Foam)	**Q6**	2032037.5	E>0.75	ATM	3.5	PP / white	80
	Q7	2532538.8	E>0.7	ATM	6.7	PP / white	80
	N1	25315310	E>0.5	ATM	2.7	NBR / black	100
	N2	18.5326310	E>0.7	ATM	3.3	NBR / black	100
	N3	19320310	E>0.55	ATM	2.4	NBR / black	100
	N4	17.5325310	E>0.65	ATM	2.5	NBR / black	100
	N5	30345312.8	E>0.5	ATM	11.5	NBR / black	100
 (Hollow)	**F2**	42344314	E>0.63	5	18.5	PP	80
	F3	45345320	E>0.65	5	35.7	PP	80
	F4	48362318	E>0.8	5	65.3	PVDF	120

METAL SINGLE SWITCH TYPES

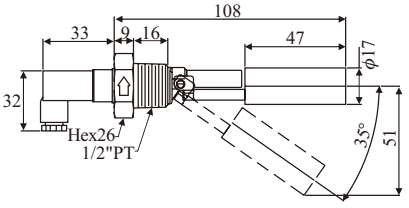
▶ FD MH50/ 56



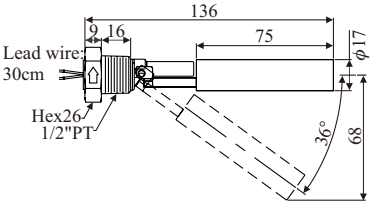
▶ FD MH50A /56A



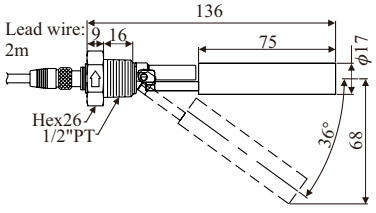
▶ FD MH50C /56C



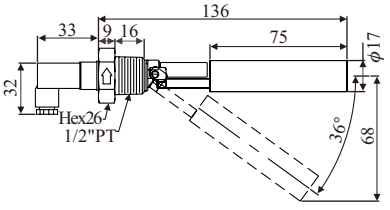
▶ FD MH60/ 66



▶ FD MH60A/ 66A



▶ FD MH60C/ 66C



■ SPECIFICATIONS

Type	Material	Switching Capacity Max.	Switching Voltage Max.	Switching Current Max.	Carry Current Max.	Lead Wire	Max. Pressure	Operating Temp.	Suitable Sp. Gr.
FDMH50/56 **FDMH60/66**	SUS 304 SUS 316L	12W/SPST	24Vac 24Vdc	0.5A	1A	XLPE or TEFLON	5 kg/cm^2	-20~120℃ (Max.200℃)	FDMH5:0.92 FDMH6:0.75
FDMH50A/56A **FDMH60A/66A**	SUS 304 SUS 316L	12W/SPST	24Vac 24Vdc	0.5A	1A	XLPE or TEFLON	5 kg/cm^2	80℃	FDMH5:0.92 FDMH6:0.75
FDMH50C/56C **FDMH60C/66C**	SUS 304 SUS 316L	12W/SPST	24Vac 24Vdc	0.5A	1A	XLPE or TEFLON	5 kg/cm^2	-20~120℃	FDMH5:0.92 FDMH6:0.75