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## Mini Float Level Switch



# PRODUCT INTRODUCTION

## ■ INTRODUCTION

The reed switch relies on two basic scientific principles namely: buoyancy and magnetism. Buoyancy causes the float (which contains a magnet) to rise with the liquid and magnetism helps open and close the switch.

Since this product's this product has been introduced to the market, it has seen significant improvement and advances with regards to convenience, safety and lowering costs.

The float switches are extremely compact, simple and are easy to install on any small locations.

These switches are not affected by electrical interference and can withstand chemicals, high temperatures and pressures if the correct material of float switch is selected.

## ■ LIQUID PROPERTIES AND FLOATS

The switch's float should always have a specific gravity (SG) less than the liquid that holds the float.

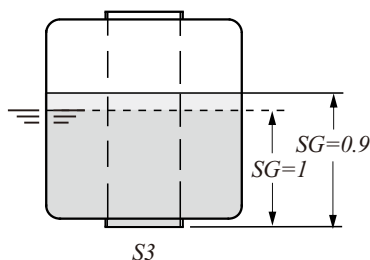
(SG float < SG liquid)

When the liquid level rises the float will rise up due to its buoyancy. The float's upward movement will actuate the switch and close the circuit.

Different float materials can be used to ensure the float's SG level is less than the liquid.

(Water's SG level is 1 while gasoline SG levels tend to be less than 1).

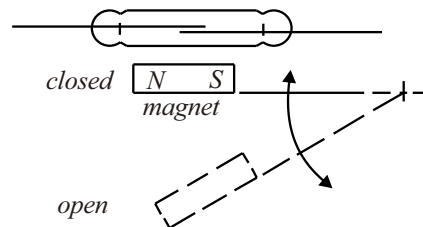
Because the float switches are activated by the magnetic field inside the float, make sure the liquid contains no iron traces or substances that can induce magnetic interference.



(Fig. 3)

## ■ WORKING PRINCIPLE

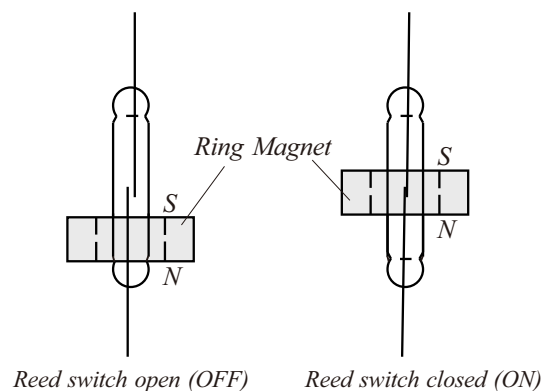
Fig. 1 illustrates the pivot activation (FCH Type reed switch). When float's magnet is moved close to the switch's stationary stem, the float magnet pushes the stem's switch circuit together and closes the electrical circuit. When the float magnet is moved away from the stem, the switch circuit separates and the circuit is opened.



(Fig. 1)

Fig. 2 illustrates perpendicular activation (FC V TYPE float reed switches). When the liquid level rises and pushes the float up, the float's ring magnet (sealed in the float) moves close to the switch's stationary stem.

The magnet pushes the circuit together and when it makes contact, it closes the electrical circuit. When the float magnet moves away from the switch, the circuit contact is released and the switch is opened.



(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 NH <sub>4</sub> OH	10	40	104	●	●	●	●	○			
	10	80	176		○	●	●				
Aque Regia 3HCl+HNO <sub>3</sub>	10	40	104	△	△	●	●				
	10	80	176			●	●				
Benzene C <sub>6</sub> H <sub>6</sub>	Pure	40	104	×	△	○	●				
		80	176			△	●				
Bleaching Liquor Ca(ClO) <sub>2</sub>	5	40	104	●		●	●				
	5	80	176			●	●				
	20	40	104	●		●	●				
	20	80	176			●	●				
Boric Acid H <sub>3</sub> BO <sub>3</sub>	Satu	40	104	●	●	●	●	●			
		80	176		●	●	●	○			
Brine		40	104	●	●	●	●	●			
		80	176		●	●	●				
Butadiene CH <sub>2</sub> =CH=CH=CH <sub>2</sub>	Gas	40	104	●		●	●				
		80	176			●	●				
Butane CH <sub>3</sub> (CH <sub>2</sub> ) <sub>2</sub> CH <sub>3</sub>	Gas	40	104	●	●	●	●				
		80	176		●	●	●				
Nitric Acid HNO <sub>3</sub>	10	40	104	●	●	●	●	●	●	●	
	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 HOOCOOH	20	40	104	●	●	●	●	●		△	
	20	80	176		●	●	●				
	50	40	104	●	●	●	●			△	
	50	80	176		●	●	●				
Phosphoric Acid H <sub>3</sub> PO <sub>4</sub>	10	40	104	●	●	●	●	●	●	●	
	10	80	176		○	●	●	△	●	●	
	50	40	104	●	●	●	●	●	●	●	
	50	80	176		△	●	●	×	●	●	
	80	40	104	●	●	●	●	○	●	●	
	80	80	176		△	●	●		●	●	
Sodium Hydroxide NaOH	15	40	104	●	●	●	●	●	●	●	
	15	80	176		○	△	●	△	×	×	
	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 Hypochlorite NaClO	3	40	104	●	○	●	●			△	○	
	3	80	176									
	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 H <sub>2</sub> SO <sub>4</sub>	10	40	104	●	●	●	●	●	●	●	●
		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		○	●	●	△				
Toluene C <sub>6</sub> H <sub>5</sub> CH <sub>3</sub>		40	104		△	△	●					
		80	176				○					
	Chlorine Gas Cl <sub>2</sub>	Wet	40	104	○		●	●				
		Wet	80	176			△	●				
		Dry	40	104	●		●	●				
		Dry	80	176			●	●				
Chromic Acid H <sub>2</sub> CrO <sub>4</sub>	10	40	104	●		●	●					
	10	80	176			●	●					
	20	40	104	△		●	●					
	20	80	176			●	●					
	40	40	104	△		●	●					
	40	80	176			●	●					
	50	40	104	×		●	●					
	50	80	176			△	●					
Hydrochloric Acid HCl	15	40	104	●	●	●	●	○				
	15	80	176		●	●	●					
	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	●		●	●			
		80	176			●	●			
Diesel Fuels		40	104			●	●		●	●
		80	176			●	●		●	●
Ethyl Alcohol	Pure	40	104	●	●	●	●	●	○	○
		80	176		○	●	●	○		
Formic Acid	90	40	104	○	○	●	●			
		80	176			●	●			
Hydrofluoric Acid HF	Dilute	40	104	●	○	●	●			
		80	176		○	●	●			
	30	40	104	○	○	●	●			
		80	176	×	○	●	●			
	40	40	104	△	○	●	●			
		80	176		○	●	●			
	50	40	104	△	○	●	●			
		80	176		○	●	●			
Hydrogen peroxide $H_2O_2$	5	40	104	●	●	●	●		○	●
		80	176		○	●	●			
	20	40	104	●	●	●	●			
		80	176		○	●	●			
	30	40	104	○	○	●	●			
		80	176		△	●	●			
	50	40	104	△	×	●	●			
		80	176			●	●			
	90	40	104			●	●			
		80	176			●	●			
Isopropyl Alcohol $(CH_3)_2CHOH$	Pure	40	104	●	●	●	●	○		
		80	176			●	●			
Kerosene		40	104	●	○	●	●			
		80	176			●	●			
Methyl Alcohol $CH_3OH$		40	104	○	●	●	●	△		
		80	176		○	●	●			
Methyl Ethyl Ketone $CH_3COC_2H_5$		40	104		△		●			
		80	176				●			
Potassium Chromate $K_2CrO_4$		40	104	●	●	●	●	●		
		80	176		○	●	●	○		

# REED SWITCH PROTECTION

## ■ INDUCTIVE LOADS

When using reed switches for inductive loads such as motors, relay coil, solenoids, etc., the contact points will sometimes be subjected to high voltages. Such high induced voltages may damage the reed switch or significantly reduce its life.

Therefore, circuit protectors such as: RC snubbers, varistors or clamping diodes are recommended. (see Fig. 4a, Fig. 4b, Fig. 4c)

- Do not directly connect the solenoid valve, motor or magnetic switch.

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

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

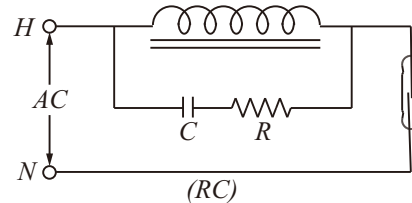
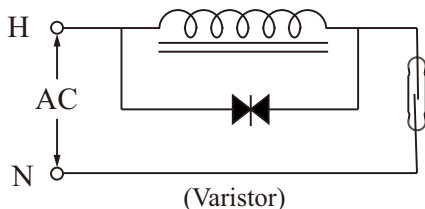
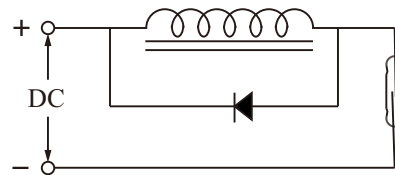


Fig. 4 (a)



(Varistor)

Fig. 4 (b)



(Diode)

Fig. 4 (c)

## ■ CAPACITIVE LOADS

When using reed switches for capacitive loads such as capacitors, incandescent lamps or long cables, the contact points will be subjected to electrical surges. Therefore, protective circuits such as: surge suppressors or current limiting resistors are recommended. (Fig. 5a, Fig. 5b)

Therefore, circuit protectors such as: RC snubbers, varistors or clamping diodes are recommended (Fig. 5a, Fig. 5b)

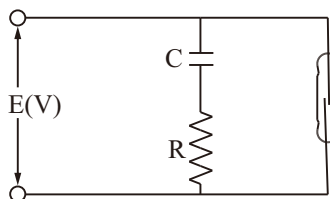


Fig. 5 (a)

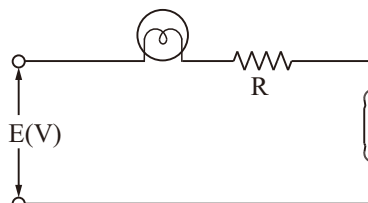
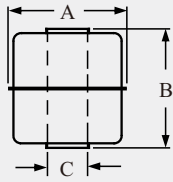
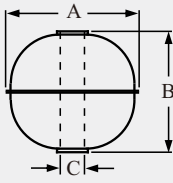
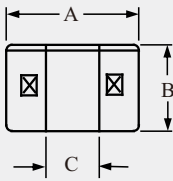
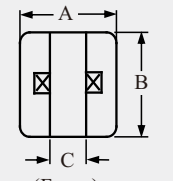
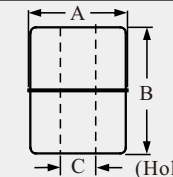


Fig. 5 (b)

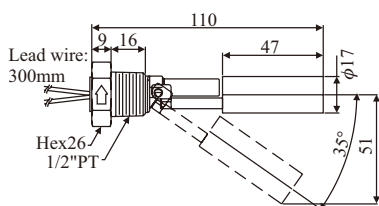
# FLOAT SPECIFICATIONS

MODEL	TYPE	$\phi A \times B \times \phi C$	S.G.	Max. Pressure (kg/cm <sup>2</sup> )	Weight (g)	Material/Color	Max. Temp. (°C)
	S1	28x28x9.5	E>0.7	10	8	SUS 316 / 316L	200
	S3	45x55x15	E>0.65	12	37.6	SUS 316	200
	S6	75x108x20	E>0.5	10	165	SUS 316	200
	S13	38x50x15	E>0.62	12	22.9	SUS 316L	200
	S2	41x38x11	E>0.7	35	19.5	SUS 316	200
	S4	52x52x15	E>0.55	30	33.4	SUS 316	200
	S5	75x73x20	E>0.70	30	102.4	SUS 316	200
	S7	30x28x9.5	E>0.75	25	8	SUS 316 / 316L	200
	S8	100x100x20	E>0.5	15	249.7	SUS 304	200
	S9	150x150x30	E>0.45	15	534	SUS 304	200
	S10	30x32x9.5	E>0.75	50	8.6	SUS 316	200
	S11	28x32x9.5	E>0.82	30	8.1	SUS 316	200
 <p>(Hollow)</p>	P1	25x15x10	E>0.65	4	3.5	PP / white black	80
	P2	25x25x10	E>0.7	4	5	PP / white black	80
	P3	48x45x18.5	E>0.6	5	35.5	PP / black	80
	P4	20x25x10	E>0.7	4	3.7	PP / black	80
	P5	20x20x8.1	E>0.75	4	4	PP / black	80
	P8	18.2x15.3x7.2	E>0.8	4	1.82	PP / black	80
 <p>(Foam)</p>	Q6	20x20x7.5	E>0.75	ATM	3.5	PP / white	80
	Q7	25x25x8.8	E>0.7	ATM	6.7	PP / white	80
	N1	25x15x10	E>0.5	ATM	2.7	NBR / black	100
	N2	18.5x26x10	E>0.7	ATM	3.3	NBR / black	100
	N4	17.5x25x10	E>0.65	ATM	2.5	NBR / black	100
	N5	30x45x12.8	E>0.5	ATM	11.5	NBR / black	100
 <p>(Hollow)</p>	F2	42x44x14	E>0.45	5	18.5	PP	80
	F3	45x45x20	E>0.65	5	35.7	PP	80
	F4	48x62x18	E>0.8	5	65.3	PVDF	120

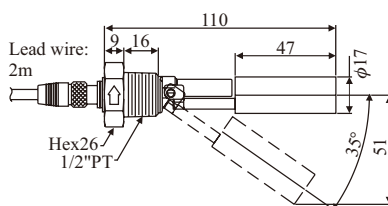
# STAINLESS STEEL SWITCHES



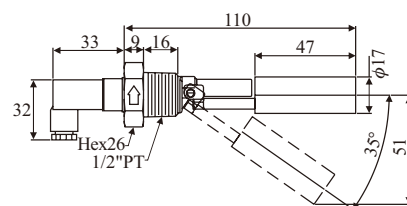
► FD MH50/ 56



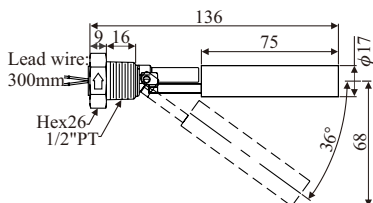
► FD MH50A /56A



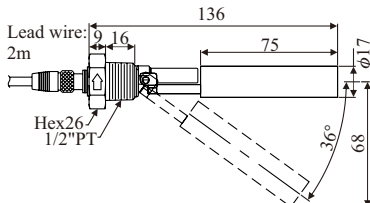
► FD MH50C /56C



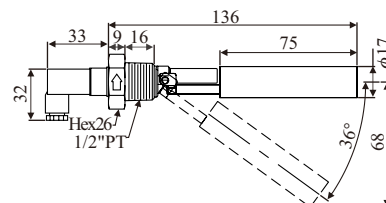
► FD MH60/ 66



► 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	50W/SPST	240Vac 200Vdc	0.5A	1A	XLPE or TEFLON	5 kg/cm <sup>2</sup>	-20~120°C (Max.200°C)	FDMH5:0.92 FDMH6:0.75
FDMH50A/56A FDMH60A/66A	SUS 304 SUS 316L	50W/SPST	240Vac 200Vdc	0.5A	1A	PVC or PUR	5 kg/cm <sup>2</sup>	80°C	FDMH5:0.92 FDMH6:0.75
FDMH50C/56C FDMH60C/66C	SUS 304 SUS 316L	50W/SPST	240Vac 200Vdc	0.5A	1A	NA	5 kg/cm <sup>2</sup>	-20~120°C	FDMH5:0.92 FDMH6:0.75





# ORDER INFORMATION (STAINLESS STEEL SWITCHES)

FDM 1 0 0 ⑦⑧ ⑨⑩ ⑪⑫ ⑬⑭ ⑮⑯ ⑰⑱ ⑲⑳ ㉑㉒ ㉓

**⑦⑧ Certification**

- 00: None
- 3A: UL

**⑨⑩ Type**

- 05:  $\phi$ 17x47L (SG: 0.92)
- 06:  $\phi$ 17x75L (SG: 0.75)

**⑪⑫ Material**

- MA: SUS 304
- MB: SUS 316
- MC: SUS316L

**⑬ Wiring**

- A: M12
- B: DIN
- C: Cable wire type 1

**⑭⑮⑯⑰ Connection**

- A503: 1/2"PF
- A501: 1/2"PT
- A507: 1/2"NPT
- A505: 1/2"BSP

**⑱⑲⑳ Material of Lead wire**

- 000: None
- 210: Teflon(200°C AWG24)
- 220: PUR(For M12)
- 250: Silicon(150°C AWG24 Cable)
- 291: XLPE(125°C AWG22)

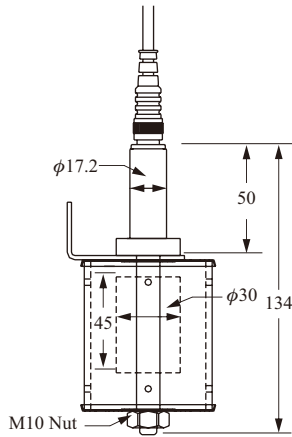
**㉑㉒㉓ Lead wire Length**

- |            |             |
|------------|-------------|
| 001: 100mm | 008: 800mm  |
| 002: 200mm | 009: 900mm  |
| 003: 300mm | 010: 1000mm |
| 004: 400mm | 020: 2000mm |
| 005: 500mm | 100: 10m    |
| 006: 600mm | 000: None   |
| 007: 700mm |             |

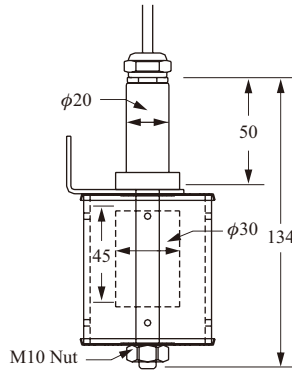
※Connector M12 whose standard wire length is 2m ,5m,10m,15m

# MARINE LEVEL SWITCHES

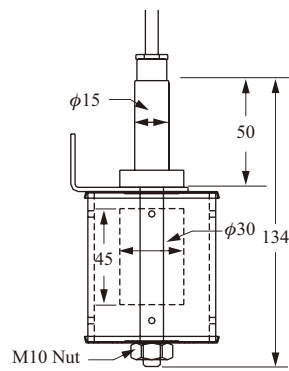
## ► FDMRN5A0B



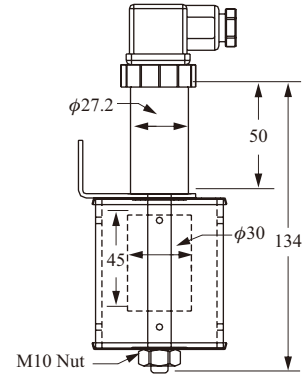
## ► FDMRN5B0B



## ► FDMRN5C0B



## ► FDMRN5D0B

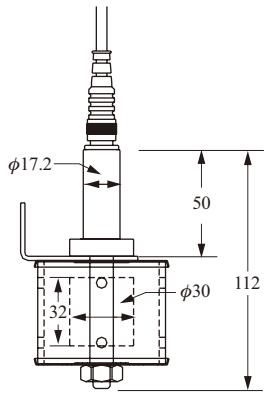


## ■ SPECIFICATIONS

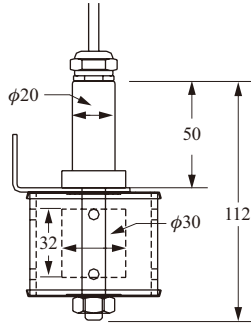
Type	Material	Switching Capacity Max.	Switching Voltage Max.	Switching Current Max.	Carry Current Max.	Lead Wire	Max. Pressure	Operating Temp.	Suitable Sp. Gr.
FDMRN5A0B	SUS 304 (Float:NBR)	50W/SPST	240Vac 200Vdc	0.5A	1A	M12, 2 meter	ATM	Max. 80°C	0.5
FDMRN5B0B	SUS 304 (Float:NBR)	50W/SPST	240Vac 200Vdc	0.5A	1A	PVC,22 AWG	ATM	Max. 80°C	0.5
FDMRN5C0B	SUS 304 (Float:NBR)	50W/SPST	240Vac 200Vdc	0.5A	1A	Silicon	ATM	Max. 100°C	0.5
FDMRN5D0B	SUS 304 (Float:NBR)	50W/SPST	240Vac 200Vdc	0.5A	1A	DIN 43650	ATM	Max. 80°C	0.5

# MARINE LEVEL SWITCHES

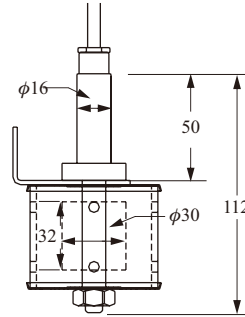
## ► FDMRN8A0B



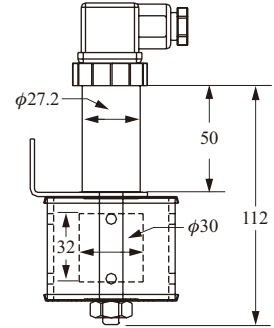
## ► FDMRN8B0B



## ► FDMRN8C0B



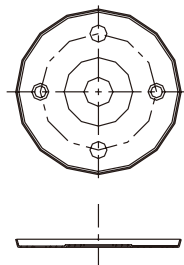
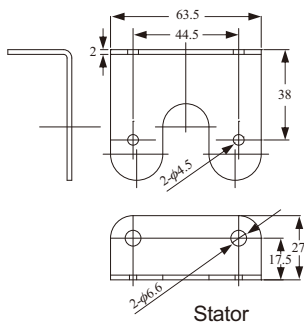
## ► FDMRN8D0B



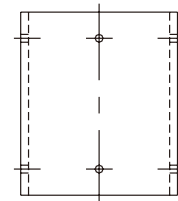
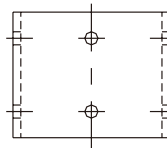
## ■ SPECIFICATIONS

Type	Material	Switching Capacity Max.	Switching Voltage Max.	Switching Current Max.	Carry Current Max.	Lead Wire	Max. Pressure	Operating Temp.	Suitable Sp. Gr.
FDMRN8A0B	SUS 304 (Float:NBR)	50W/SPST	240Vac 200Vdc	0.5A	1A	M12, 2 meter	ATM	Max. 80°C	0.7
FDMRN8B0B	SUS 304 (Float:NBR)	50W/SPST	240Vac 200Vdc	0.5A	1A	PVC,22 AWG	ATM	Max. 80°C	0.7
FDMRN8C0B	SUS 304 (Float:NBR)	50W/SPST	240Vac 200Vdc	0.5A	1A	Silicon	ATM	Max. 100°C	0.7
FDMRN8D0B	SUS 304 (Float:NBR)	50W/SPST	240Vac 200Vdc	0.5A	1A	DIN 43650	ATM	Max. 80°C	0.7

## ■ FDB-0450 PARTS OF SLOSH SHIELD



Acrylic for case Upper/Lower



Acrylic cover

# HOW TO ORDER MARINE LEVEL SWITCHES

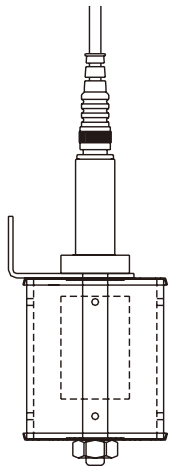
▶ FDMRN5A

▶ FDMRN5B

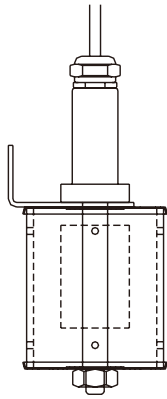
▶ FDMRN5C

▶ FDMRN5D

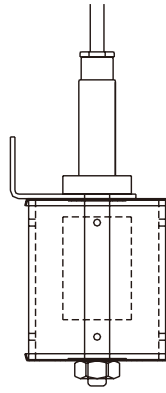
▶ FDMRN8C



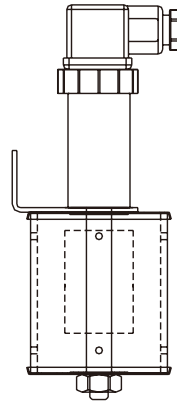
A TYPE



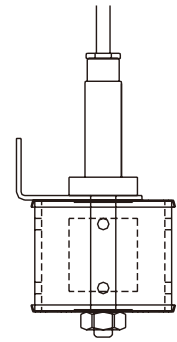
B TYPE



C TYPE



D TYPE



C TYPE



# ORDER INFORMATION (MARINE LEVEL SWITCHES)

FDM 2 0 0 <sup>07</sup> <sup>08</sup> - <sup>09</sup> <sup>10</sup> <sup>11</sup> <sup>12</sup> <sup>13</sup> <sup>14</sup> <sup>15</sup> <sup>16</sup> <sup>17</sup> <sup>18</sup> <sup>19</sup> <sup>20</sup>

**<sup>07</sup> <sup>08</sup> Certification**

00: None

**<sup>09</sup> <sup>10</sup> The material of the float**

N5:  $\phi$ 30x45L (NBR)

N8:  $\phi$ 30x32L (NBR)

**<sup>11</sup> <sup>12</sup> The material of the probe**

MA: SUS 304

MC: SUS 316L

**<sup>13</sup> Wiring**

A: M12

B: DIN

C: Cable wire type 1 (B type)

D: Cable wire type 2 (C Type)

**<sup>14</sup> Contact type**

A: NO

B: NC

**<sup>15</sup> <sup>16</sup> <sup>17</sup> Material of Lead wire**

000: None

220: PUR (for M12)

231: PVC (80°C AWG22 Cable)

250: Silicon (150°C AWG24 Cable)

**<sup>18</sup> <sup>19</sup> <sup>20</sup> Lead wire Length**

001: 100mm

008: 800mm

002: 200mm

009: 900mm

003: 300mm

010: 1000mm

004: 400mm

020: 2000mm

005: 500mm

100: 10m

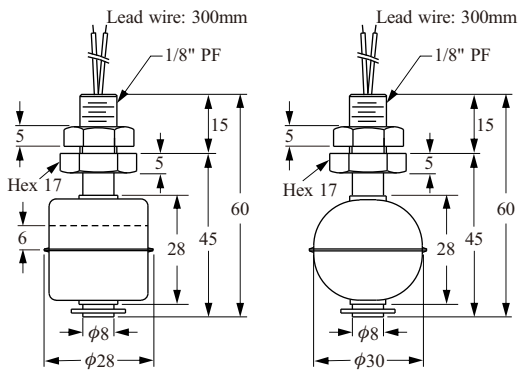
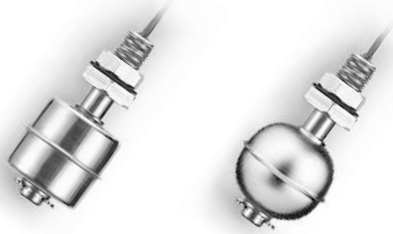
006: 600mm

000: None

007: 700mm

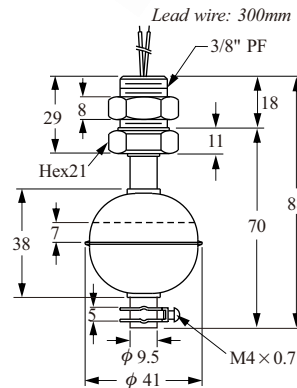
# STAINLESS STEEL MODELS

► FD 30□1/ FD 35□1



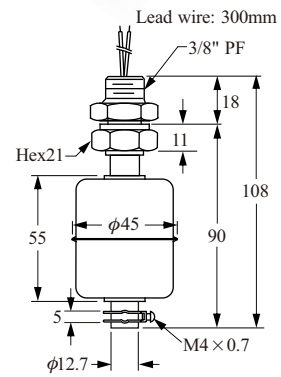
Washer: NBR  
Drill hole  $\phi 10\text{mm}$

► FD 40□1



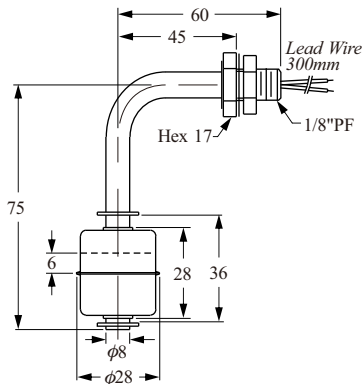
Washer: NBR  
Drill hole  $\phi 17\text{mm}$

► FD 45□1



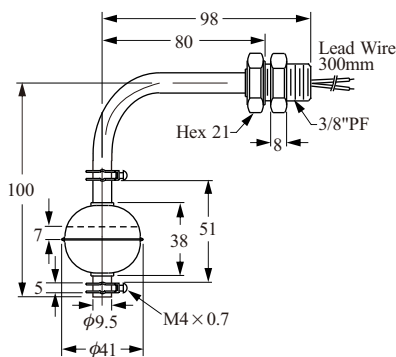
Washer: NBR  
Drill hole  $\phi 17\text{mm}$

► FD 30□2



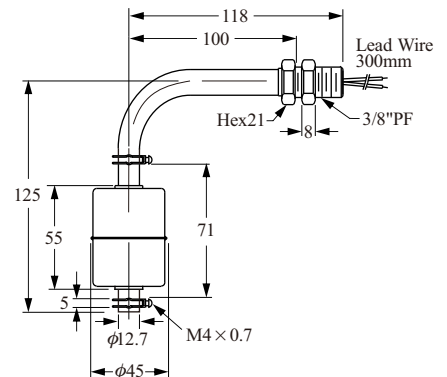
Washer: NBR  
Drill hole  $\phi 10\text{mm}$

► FD 40□2



Washer: NBR  
Drill hole  $\phi 17\text{mm}$

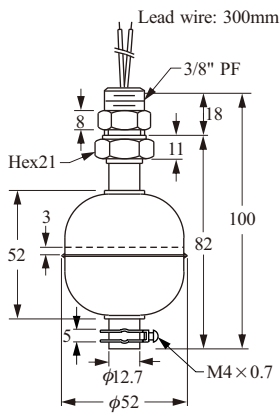
► FD 45□2



Washer: NBR  
Drill hole  $\phi 17\text{mm}$

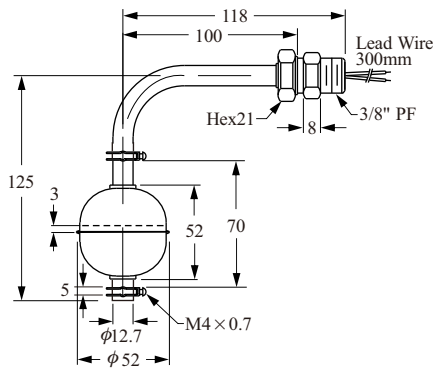
# METAL TYPES

► FD 50□1



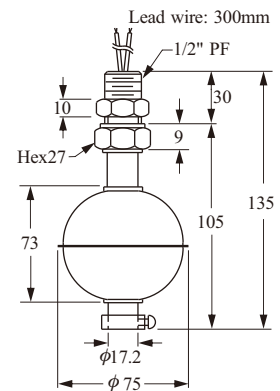
Washer: NBR  
Drill hole φ17mm

► FD 50□2



Washer: NBR  
Drill hole φ17mm

► FD 75□1



Washer: NBR  
Drill hole φ21mm

## ■ SPECIFICATIONS

Description	Type	FD30□1D FD30□2D	FD40□1D FD40□2D	FD45□1D FD45□2D	FD50□1D FD50□2D	FD75□1D	FD10□1D
Material		Stainless Steel SUS304, 316					
Switching Capacity Max.		50W SPST	50W SPST	50W SPST	50W SPST	50W SPST	
Switching Voltage Max.		240Vac/200Vdc				220Vac	
Switching Current Max. (A)		0.5A	0.5A	0.5A	0.5A	1A	
Carry Current Max. (A)		1A	1A	1A	1A	2A	
Lead Wire		XLPE (UL3266, AWG22)					
Reversible Switch Action		YES / below 80°C, NO / UP 80°C				NO	NO
Max. Pressure (Kg/cm <sup>2</sup> )		10	30	12	30	30	10
Operating Temperature		-20~120°C (OPTION 200°C)					
Suitable Specific Gravity		0.7	0.7	0.65	0.55	0.65	0.5



## MODEL / NUMBER ORDER CODE COMPARISON TABLE

Model Number	Order Code
FD30□1D	FDM30000-30□□VD
FD30□2D	FDM30000-30□□HD
FD40□1D	FDM30000-40□□VD
FD40□2D	FDM30000-40□□HD
FD45□1D	FDM30000-45□□VD
FD45□2D	FDM30000-45□□HD
FD50□1D	FDM30000-50□□VD
FD50□2D	FDM30000-50□□HD
FD75□1D	FDM30000-75□□VD
FD10□1D	FDM30000-10□□VD

# ORDER INFORMATION (STAINLESS STEEL SWITCHES)

FDM 3 ⑤⑥⑦⑧-⑨⑩⑪⑫⑬⑭⑮⑯⑰⑱⑲⑳㉑

⑤ ⑥ **Model**  
 00: Standard  
 02: Hi-temperature

⑦ ⑧ **Certification**  
 00: None  
 3A: UL

⑨ ⑩ **Type**  
 10:  $\phi$ 75x108, 1/2"PF      35:  $\phi$ 30x28, 1/8"PF      45:  $\phi$ 45x55, 3/8"PF  
 30:  $\phi$ 28x28, 1/8"PF      36:  $\phi$ 30x28, 1/8"NPT      50:  $\phi$ 52x52, 3/8"PF  
 31:  $\phi$ 28x28, 1/8"NPT      40:  $\phi$ 41x38, 3/8"PF      75:  $\phi$ 75x73, 1/2"PF

⑪ ⑫ **Probe material**  
 MA: SUS 304  
 MB: SUS 316

⑬ **Mounting**  
 V: Top or Bottom Mounting  
 H: Side Mounting

⑭ **Switching Capacity Max.**  
 D: 50W 240VAC/200VDC SPST  
 F: 10W 125VAC SPST  
 K: 20W 150VAC/200VDC SPDT

⑮ **Contact Mode**  
 A: SPST, Normal Open      D: Normal Closed Reversible  
 B: SPST, Normal Closed      E: Normal Open Reversible  
 C: SPDT

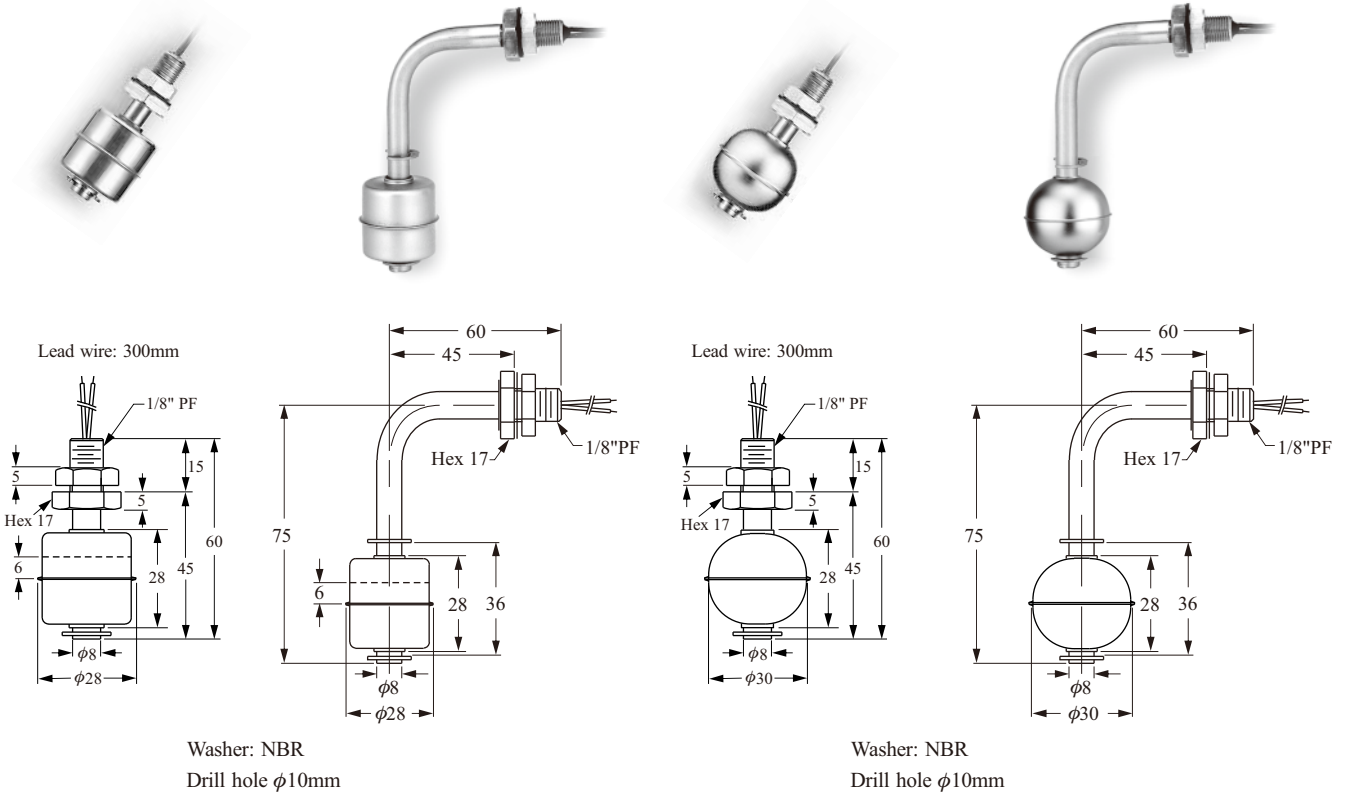
⑯ ⑰ ⑱ **Material of Lead wire**  
 210: Teflon (200°C AWG24)      250: Silicon (150°C AWG24 Cable)  
 230: PVC (80°C AWG22 )      291: XLPE (125°C AWG22)  
 231: PVC (80°C AWG22 Cable)      300: XLPVC (105°C AWG24)  
 232: PVC (80°C AWG24 Cable)

⑲ ⑳ ㉑ **Lead wire Length**  
 001: 100mm      005: 500mm      009: 900mm  
 002: 200mm      006: 600mm      010: 1000mm  
 003: 300mm      007: 700mm      020: 2000mm  
 004: 400mm      008: 800mm      100: 10m

# STAINLESS STEEL MODELS (EX-PROOF TYPE)

TS Ex mb IIB T6 Gb 

► FDM3005C-30□□V ► FDM3005C-30□□H ► FDM3005C-35□□V ► FDM3005C-35□□H



## ■ SPECIFICATIONS

(Utilizing special glue which is graded for Ex-proof to seal sensing components perfectly)

Type	FDM3005C-30□□V FDM3005C-30□□H FDM3005C-31□□V FDM3005C-31□□H	FDM3005C-35□□V FDM3005C-35□□H FDM3005C-36□□V FDM3005C-36□□H
Description		
Switching Capacity Max.	45W SPST	
Switching Voltage Max.	240Vac/200Vdc	
Switching Current Max. (A)	0.5A	
Lead Wire	XLPE (UL3266, AWG22)	
Reversible Switch Action	YES	
Max. Pressure (Kg/cm <sup>2</sup> )	10	25
Operating Temperature	-20 ~65°C	
Material	SUS304, 316, 316L	
Suitable Specific Gravity	0.7	0.75

# ORDER INFORMATION (EX-PROOF TYPE)

FDM 3 ⑤⑥⑦⑧-⑨⑩⑪⑫⑬⑭⑮⑯⑰⑱⑳

⑤⑥ **Model** \_\_\_\_\_  
 00: Standard

⑦⑧ **Certification** \_\_\_\_\_  
 5C: TS-Ex d

⑨⑩ **Type** \_\_\_\_\_  
 30:  $\phi$ 28x28,1/8"PF  
 31:  $\phi$ 28x28,1/8"NPT  
 35:  $\phi$ 30x28,1/8"PF  
 36:  $\phi$ 30x28,1/8"NPT

⑪⑫ **Probe material** \_\_\_\_\_  
 MA: SUS 304  
 MB: SUS 316  
 MC: SUS 316L

⑬ **Mounting** \_\_\_\_\_  
 V: Top or Bottom Mounting  
 H: Side Mounting

⑭ **Contact Mode** \_\_\_\_\_  
 A: SPST, Normal Open  
 B: SPST, Normal Closed  
 D: Normal Closed Reversible  
 E: Normal Open Reversible

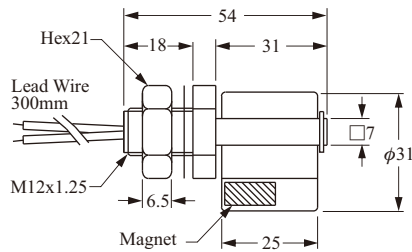
⑮⑯⑰ **Material of Lead wire** \_\_\_\_\_  
 210: Teflon (200°C AWG24)  
 231: PVC (80°C AWG22 Cable)  
 232: PVC (80°C AWG24 Cable)  
 291: XLPE (125°C AWG22)  
 300: XLPVC (105°C AWG24)

⑱⑲⑳ **Lead wire Length** \_\_\_\_\_

001: 100mm	005: 500mm	009: 900mm
002: 200mm	006: 600mm	010: 1000mm
003: 300mm	007: 700mm	020: 2000mm
004: 400mm	008: 800mm	100: 10m

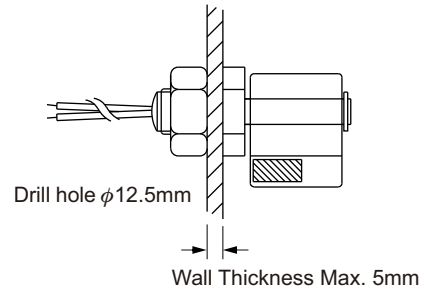
# PLASTIC OH MODELS

## ► F CH11QD



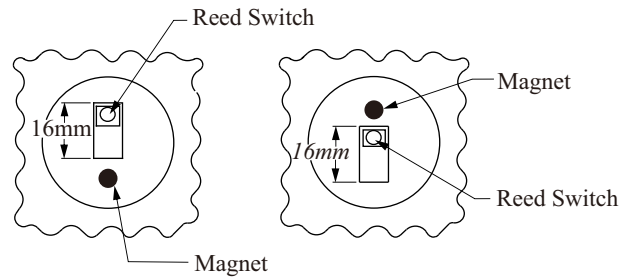
Washer: NBR


## ■ Installation / N.C./ N.O. Action Position



Normally open  
N.O.

Normally closed  
N.C.



- All the products in this range come with .
- All the products in this range are designed to be side mounted.
- Water's specific gravity is used as the reference point for calculations.

## ■ SPECIFICATIONS

Description \ Type	F CH11QD	F CH21PD F CH31PD	F CH23FD F CH33FD	F CH25GD F CH35GD
Switching Capacity Max.	50W SPST			
Switching Voltage Max.	240VAC / 200Vdc			
Switching Current Max. (A)	0.5A			
Carry Current Max. (A)	1A			
Lead Wire	PVC AWG22	XLPE AWG22		
Max. Pressure (Kg/cm <sup>2</sup> )	ATM	4 kg/cm <sup>2</sup>	2 kg/cm <sup>2</sup>	
Operating Temperature	-20~80°C		-20~120°C	
Material	PP		PVDF	Polysulfone
Suitable Specific Gravity	0.6	0.65	0.85	0.85
Weight	25 g	H21: 22 g H31: 21 g	25 g	25.4 g

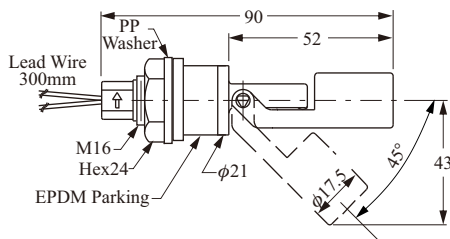
# PLASTIC OH MODELS

## ► F CH21PD / F CH31PD



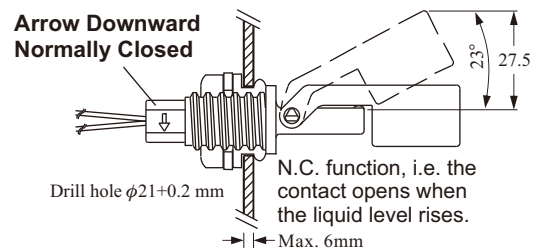
- F CH2 and F CH3 models have certification.
- F CH2 and F CH3 models are available in PP and PVDF.
- Special lead wire/cable are available on request.
- Different reed switches are available for selection.
- OEM designs are welcome.

### ■ Optional F CH21PDO(Round)

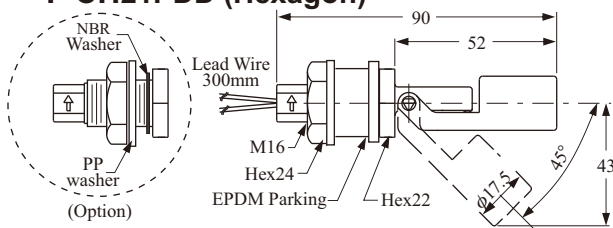


### ■ Installation / N.C. / N.O. Action Position

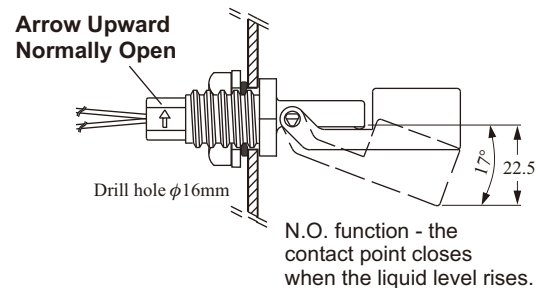
#### [ External mounting ]



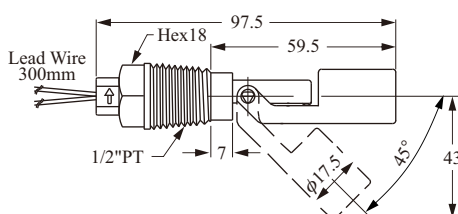
### ■ Standard F CH21PDD (Hexagon)



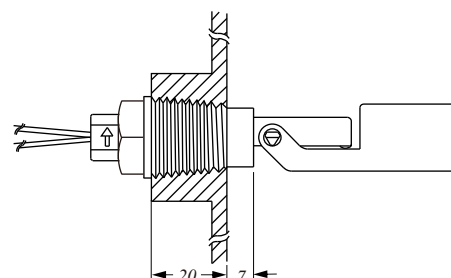
#### [ Internal mounting ]



### ■ F CH31PD

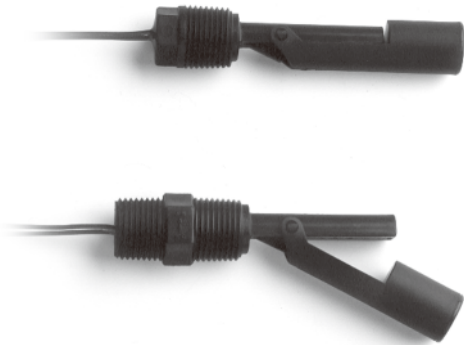


#### [ External mounting ]

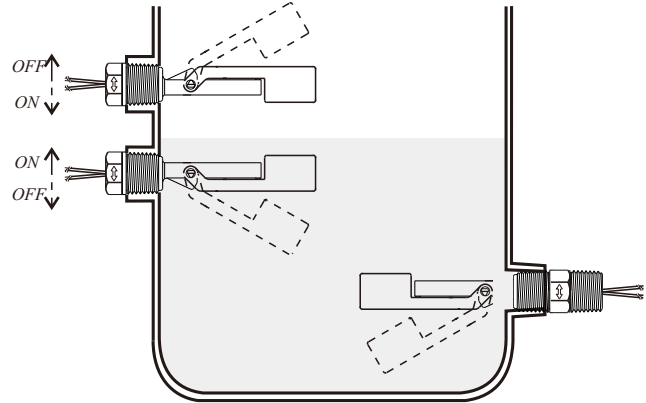


# PLASTIC OH MODELS

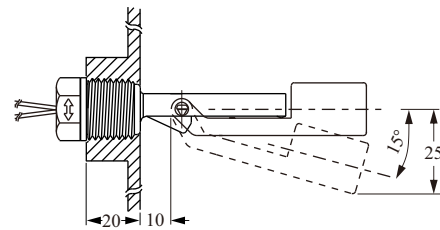
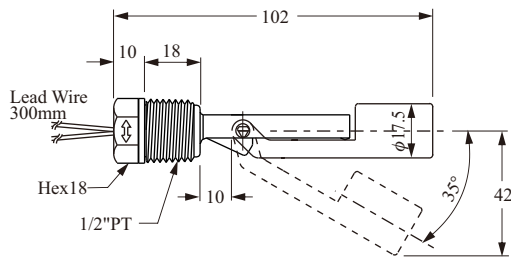
## ► F CH41PD / H51PD



## ■ Installation / N.C. / N.O. Action Position

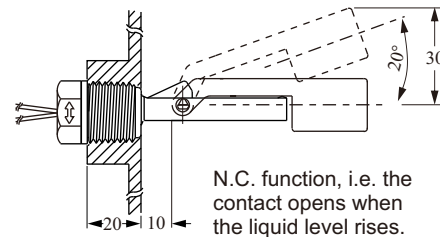
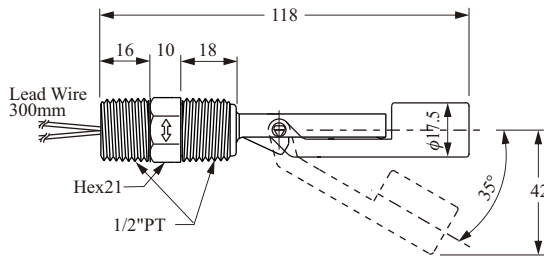


## ■ F CH41PD



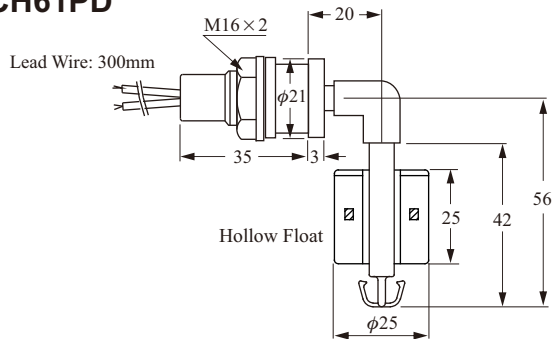
N.O. function, i.e. the contact closes when the liquid level rises.

## ■ F CH51PD



N.C. function, i.e. the contact opens when the liquid level rises.

## ■ F CH61PD



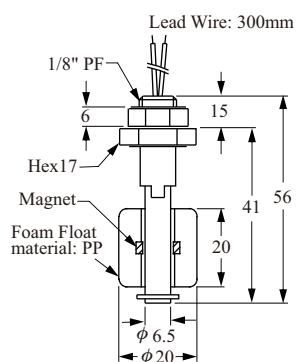
● F CH4 and F CH5 models have  certification.

## ■ SPECIFICATIONS

Type	Material	Switching Capacity Max.	Switching Voltage Max.	Switching Current Max.	Carry Current Max.	Lead Wire	Max. Pressure	Operating Temp.	Suitable Sp. Gr.	Weight
F CH41PD	PP	50W/SPST	240Vac 200Vdc	0.5A	1A	XLPE	4 kg/cm <sup>2</sup>	-20~80°C	0.55	20g
F CH51PD						PVC				25g
F CH61PD						31g				

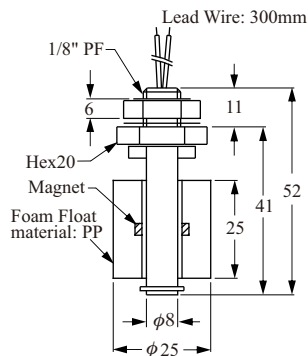
# PLASTIC OV MODELS

## ► F CV11QF



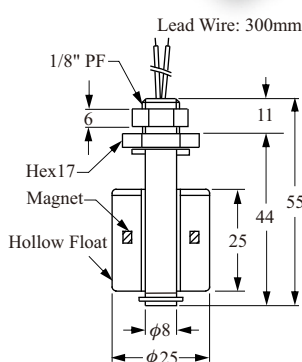
Washer: NBR  
Drill hole  $\phi$ 10mm

## ► F CV21QD



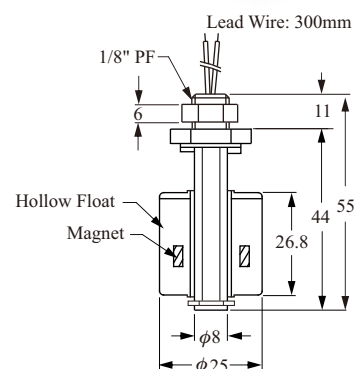
Washer: NBR  
Drill hole  $\phi$ 10mm

## ► F CV31PD



O-ring: VITON  
Drill hole  $\phi$ 10mm

## ► F CV33FD, F CV35GD



O-ring: VITON  
Drill hole  $\phi$ 10mm

- F CV1 / F CV2 / F CV3 models have  certification.

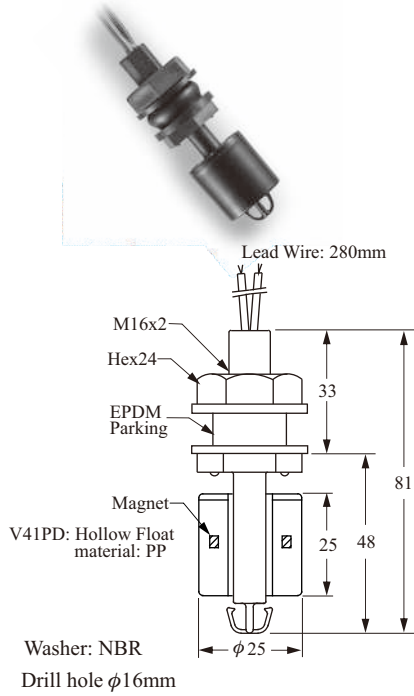
## ■ SPECIFICATIONS

Description	Type	F CV11QF	F CV21QD	F CV31PD	F CV33FD	F CV35GD
Switching Capacity Max.		10W SPST	50W SPST	50W SPST		
Switching Voltage Max.		125Vac	240Vac / 200Vdc	240Vac / 200Vdc		
Switching Current Max. (A)		0.5A		0.5A		
Carry Current Max. (A)		1A		1A		
Lead Wire		UL 1007 AWG22 PVC		UL 1007 AWG22 PVC	XLPE AWG22	
Reversible Switch Action		YES	NO	YES/ 80°C down		
Max. Pressure (Kg/cm <sup>2</sup> )		ATM		4 kg/cm <sup>2</sup>	2 kg/cm <sup>2</sup>	
Operating Temperature		-20~80°C		-20~80°C	-20~120°C	
Material		PP		PP	PVDF	Polysulfone
Suitable Specific Gravity		0.75	0.7	0.7	0.85	0.85
Weight (g)		12 g	18 g	12.8 g	18 g	18 g

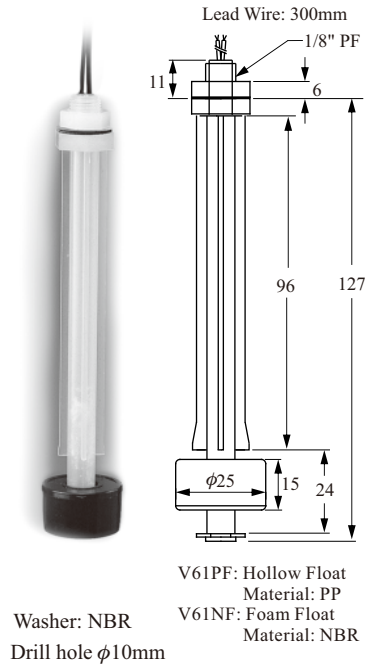


# PLASTIC OV MODELS

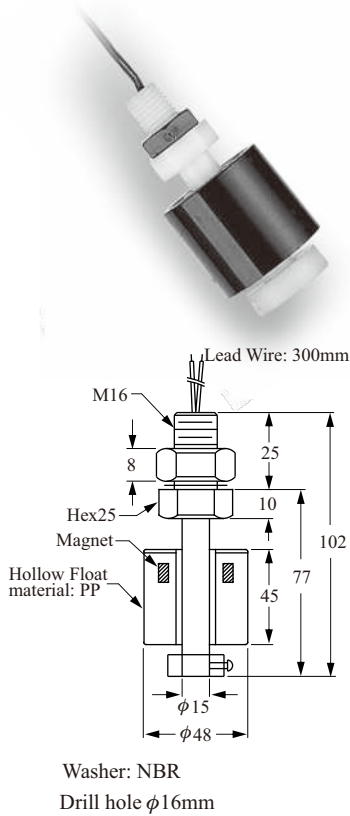
## ► F CV41PD



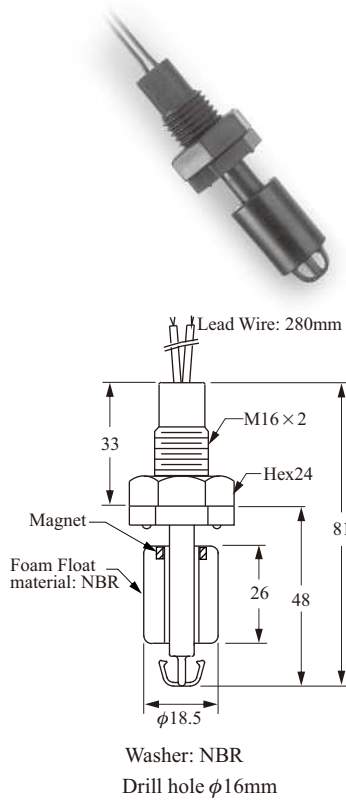
## ► F CV61PF, F CV61NF



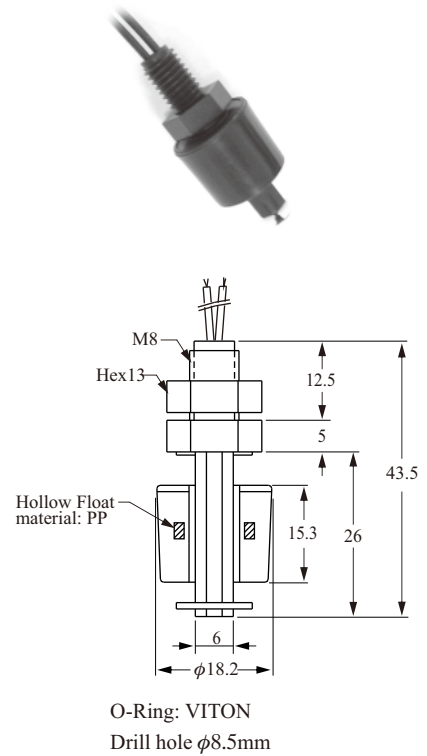
## ► F CV81PD



## ► F CV41ND



## ► F CV51PD

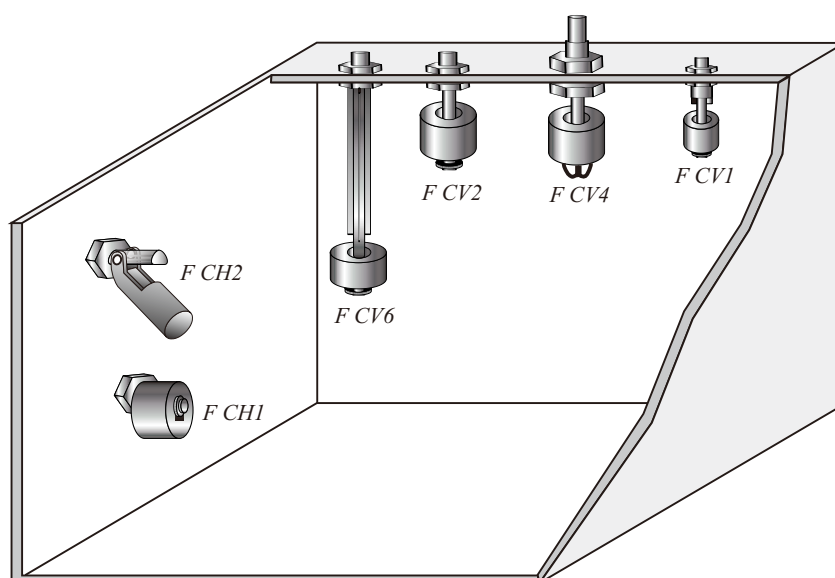


● F CV4 / F CV5 / F CV6 / F CV8 models have  certification.

# PLASTIC OV MODELS

## ■ SPECIFICATIONS

Description \ Type	F CV61PF F CV61NF	F CV41PD	F CV81PD	F CV41ND	F CV51PD
Switching Capacity Max.	10W SPST	50W SPST			
Switching Voltage Max.	125Vac (Break Down 250Vac)	240Vac / 200Vdc			
Switching Current Max. (A)	0.5A				
Carry Current Max. (A)	1A				
Lead Wire	UL 1007 AWG22 PVC				
Reversible Switch Action	NO	YES	NO	NO	NO
Max. Pressure (kg/cm <sup>2</sup> )	V61P: 4kg/cm <sup>2</sup> V61N: ATM	4kg/cm <sup>2</sup>	4 kg/cm <sup>2</sup>	ATM	4 kg/cm <sup>2</sup>
Operating Temperature	-20~80°C				80°C
Material	PP (except V61N, V41N: NBR float)				
Suitable Specific Gravity	0.65	0.55	0.6	0.7	0.8
	0.5				
Weight (g)	16 g	23 g	180 g	17 g	8.2 g



## MODEL / NUMBER ORDER CODE COMPARISON TABLE

Model Number	Order Code
F CH11QD	FCM10000-H1181DD
F CH21PD	FCM10000-H2180D
F CH31PD	FCM10000-H3180DD
F CH23FD	FCM10000-H2240D
F CH33FD	FCM10000-H3240DD
F CH25GD	FCM10000-H2
F CH35GD	FCM10000-H3
F CH41PD	FCM10000-H4180DD
F CH51PD	FCM10000-H5180DD
F CH61PD	FCM10000-H6180D

F CV11QF	FCM10000-V1181F
F CV21QD	FCM10000-V2181D
F CV31PD	FCM10000-V3180D
F CV33FD	FCM10000-V3240D
F CV35GD	FCM10000-V3
F CV61PF	FCM10000-V6180F
F CV61NF	FCM10000-V6070F
F CV41PD	FCM10000-V4180D
F CV81PD	FCM10000-V8180D
F CV41ND	FCM10000-V4070D
F CV51PD	FCM10000-V5180D

# ORDER INFORMATION (PLASTIC MODELS)

FCM 1 0 0 07 08 - 09 10 11 12 13 14 15 16 17 18 19 20 21

**07 08 Certification**

00: None  
3A: UL

**09 Mounting**

V: Top or bottom mounting  
H: Side mounting

**10 Type**

1: Type 1	4: Type 4	7: Type 7
2: Type 2	5: Type 5	8: Type 8
3: Type 3	6: Type 6	

**11 12 13 Material of Wetted parts**

070: NBR(Float), PP(Floating pole)  
180: PP(Hollow float), PP(Floating pole)  
181: PP(Foam float), PP(Floating pole)  
240: PVDF(Float), PVDF(Floating pole)

**14 Switching Capacity Max.**

D: 50W 240VAC/200VDC SPST  
F: 10W 125VAC SPST  
K: 20W 150VAC/200VDC SPDT

**15 Contact Mode**

A: SPST, Normal Open  
B: SPST, Normal Closed  
D: Normal Closed Reversible  
E: Normal Open Reversible  
C: SPDT

※Side mounted types(FCH2,3,4,5) are only available with D mode.  
NO or NC depends on the installation direction.

**16 17 18 Material of Lead wire**

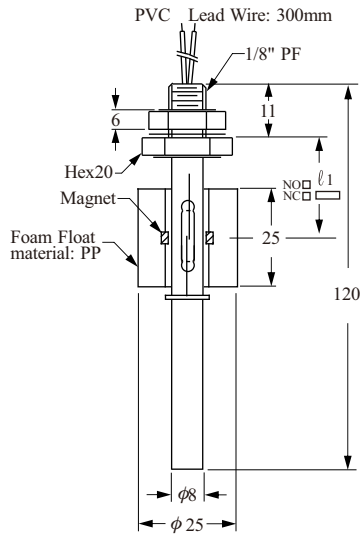
210: Teflon (200°C AWG24)	234: PVC(80°C AWG18)
230: PVC (80°C AWG22 )	250: Silicon(150°C AWG24 Cable)
231: PVC (80°C AWG22 Cable)	290: XLPE (125°C AWG22)
232: PVC (80°C AWG24)	300: XLPVC (105°C AWG24)
233: PVC (80°C AWG24 Cable)	

**19 20 21 Lead wire Length**

001: 100mm	003: 300mm	005: 500mm	008: 800mm	010: 1000mm
002: 200mm	004: 400mm	006: 600mm	009: 900mm	020: 2000mm

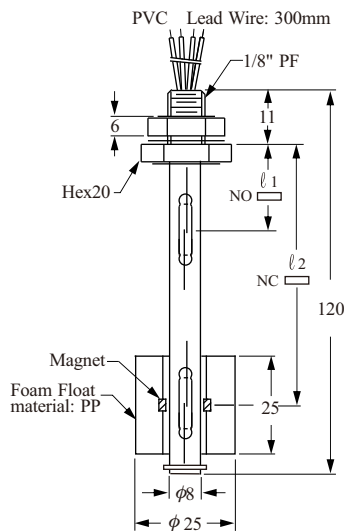
# CUSTOMIZED PLASTIC MODELS

▶ FC PV1



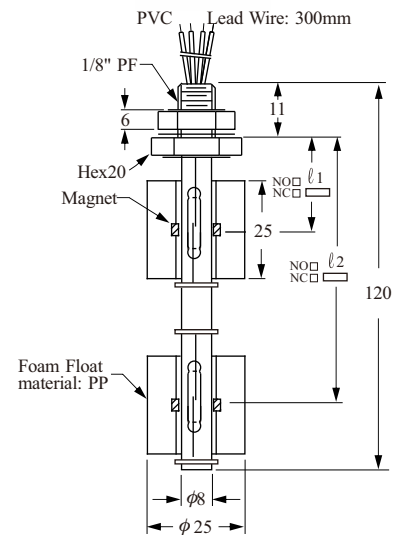
O-Ring: VITON

▶ FC PV2



O-Ring: VITON

▶ FC PV3



O-Ring: VITON

● NOTE: Float material's are optional.

The above items are custom-built when client demands are unique. The benefits are listed below:

- FCPV1 One float for one level activation.
- FCPV2 One float with 2 reed switches.
- Applicable for conditions where 1 float can actuate switches at high and low levels.
- FCPV3 Two floats actuate two independent reed switches: Each float unit's default setting can be either N.O. or N.C. as per cus

## MODEL / NUMBER ORDER CODE COMPARISON TABLE

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Model Number	Order Code
FCPV1	FCM20000-V118
FCPV2	FCM20000-V2
FCPV3	FCM20000-V318

# ORDER INFORMATION (PLASTIC MODELS)

FCM 2 0 0 <sup>07</sup> <sup>08</sup> <sup>09</sup> <sup>10</sup> <sup>11</sup> <sup>12</sup> <sup>13</sup> <sup>14</sup> <sup>15</sup> <sup>16</sup> <sup>17</sup> <sup>18</sup> <sup>19</sup> <sup>20</sup>  
  -

**<sup>07</sup> <sup>08</sup> Certification**

00: None

**<sup>09</sup> <sup>10</sup> Mounting**

V1: Single float single switch  
 V2: Single float dual switch  
 V3: Dual float dual switch

**<sup>11</sup> <sup>12</sup> Probe material**

07: NBR Float, PP(Floating pole)  
 18: PP Float  
 24: PVDF, PP(Floating pole)

**<sup>13</sup> Switching Capacity Max.**

D: 50W 240VAC/200VDC SPST  
 F: 10W 125VAC SPST  
 K: 20W 150VAC/200VDC SPDT

**<sup>14</sup> Contact Mode**

A: SPST, Normal Open  
 B: SPST, Normal Closed  
 C: SPDT  
 H: Double reed switch 1-NO ,1-NC

**<sup>15</sup> <sup>16</sup> <sup>17</sup> Material of Lead wire**

000: None  
 230: PVC (80°C AWG22)  
 231: PVC (80°C AWG22 Cable)  
 232:PVC(80°C AWG24 Cable) When 2 floats  
 291: XLPE (125°C AWG22)

**<sup>18</sup> <sup>19</sup> <sup>20</sup> Lead wire Length**

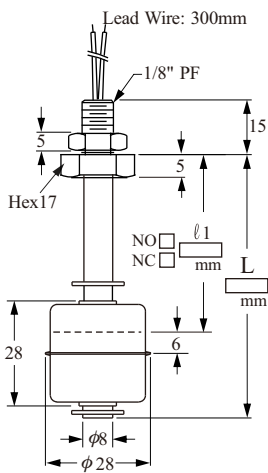
001: 100mm	006: 600mm
002: 200mm	008: 800mm
003: 300mm	009: 900mm
004: 400mm	010: 1000mm
005: 500mm	020: 2000mm

# CUSTOMIZED STAINLESS STEEL MODELS

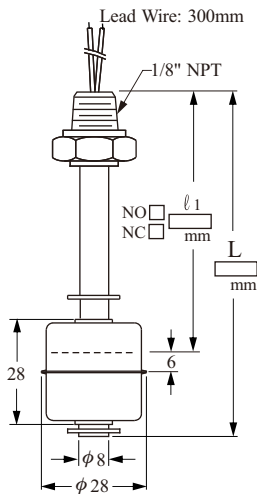
Items below are custom-built models for special applications or placement on existing facilities. Their unique characteristics are as follows:

- Any size measuring range, but  $\phi 8$ mm stem  
Max. 500mm.
- Customized mounting thread specifications are acceptable.
- Single or multiple contact points are workable.
- Switch activation N.O. or N.C. choices are available.

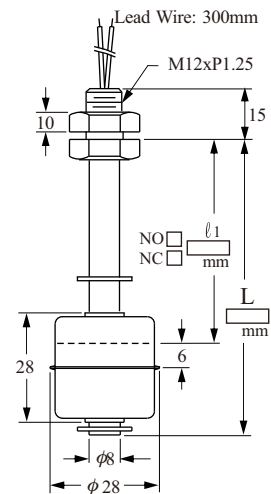
► FDSA□11



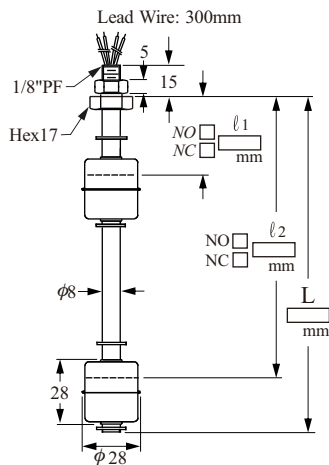
► FDSB□11



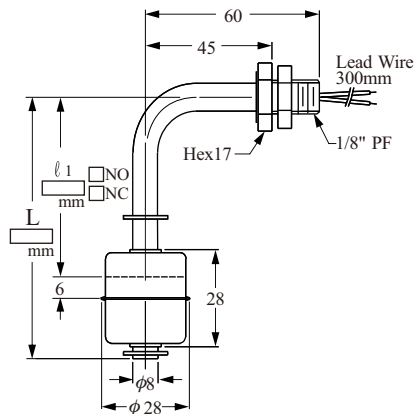
► FDSC□11



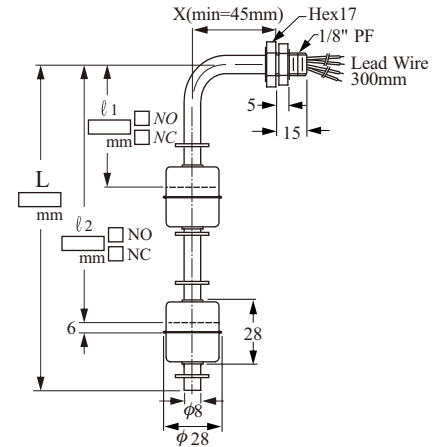
► FDSA□12



► FDSA□21



► FDSA□22





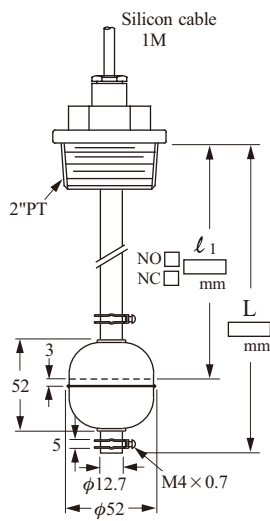
# CUSTOMIZED STAINLESS STEEL MODELS

Items below are custom-built models for special application and location on existing equipment facilities. Their unique characteristics are as follows:

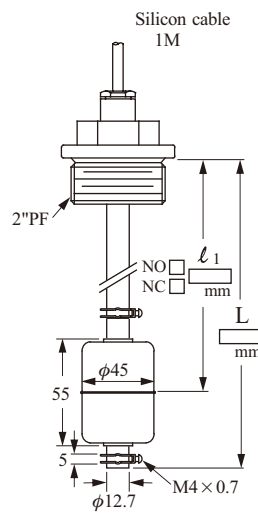
- Any size measurement range available.

- Customized mounting thread specification are acceptable.
- Single or multiple contact form (point) are workable.
- Switch activation N.O. or N.C. are available.

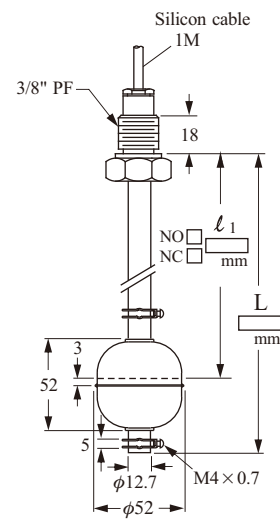
► **FDSD□11**



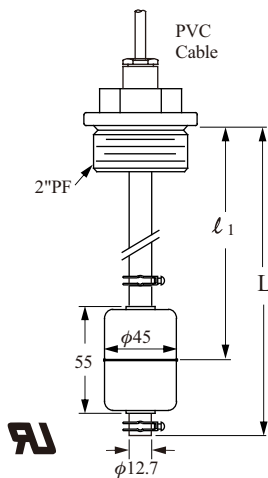
► **FDSE□11**



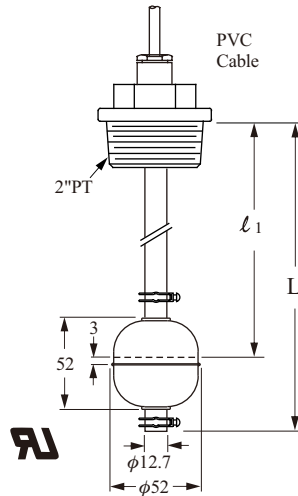
► **FDSF□11**



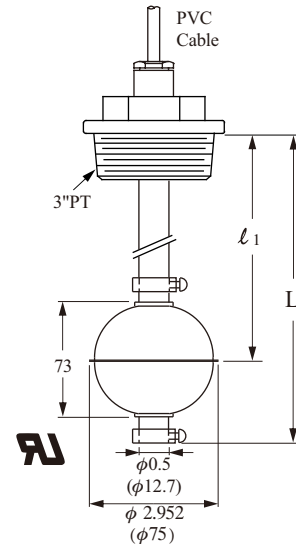
► **FD4503D**



► **FD5003G**



► **FD7503G**





# ORDER INFORMATION (CUSTOMIZED STAINLESS STEEL MODELS)

FDM 4 0 0   -

**⑦ ⑧ Certification**

00: None  
3A: UL

**⑨ ⑩ Type**

SA: Float $\phi$ 28x28, 1/8"PF	SE: Float $\phi$ 45x45, 2"PF
SB: Float $\phi$ 28x28, 1/8"NPT	SF: Float $\phi$ 52x52, 3/8"PF
SC: Float $\phi$ 28x28, M12	SG: Float $\phi$ 75x73, 3"PT
SD: Float $\phi$ 52x52, 2"PT	

**⑪ ⑫ Probe material**

MA: SUS304  
MB: SUS316

**⑬ Mounting**

V: Top or Bottom Mounting  
H: Side Mount

**⑭ Float Number**

1: 1 float  
2: 2 floats

**⑮ Switching Capacity Max.**

D: 50W 240VAC/200VDC SPST  
K: 20W 150VAC/200VDC SPDT

**⑯ Contact Mode**

A: NO  
B: NC  
C: SPDT  
H: 1 NO, 1NC

**⑰ ⑱ ⑲ Material of Lead wire**

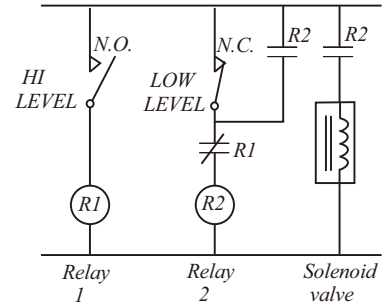
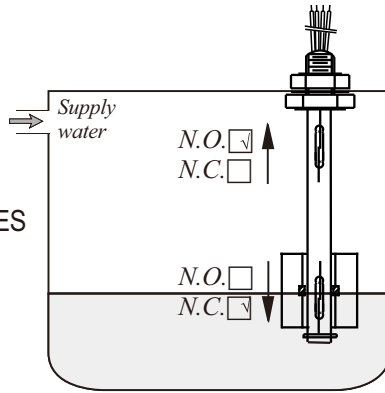
210: Teflon (200°C AWG24)  
250: Silicon(150°C AWG24 Cable)  
291: XLPE (125°C AWG22)  
230: PVC (80°C AWG22)  
231: PVC(80°C AWG22 Cable)

**⑳ ㉑ ㉒ Lead wire Length**

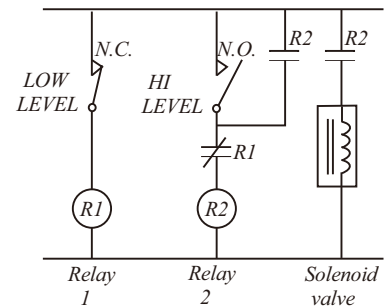
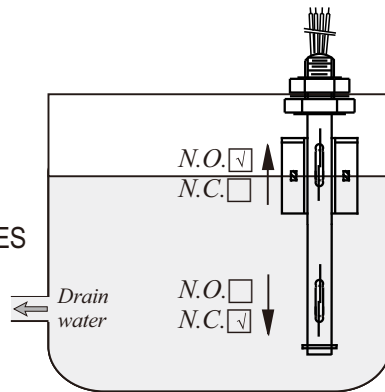
001: 100mm	003: 300mm	005: 500mm	008: 800mm	010: 1000mm
002: 200mm	004: 400mm	006: 600mm	009: 900mm	020: 2000mm

# TYPICAL WIRING DIAGRAMS

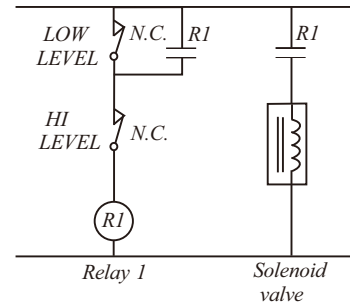
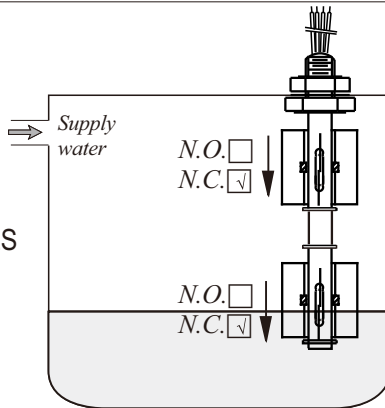
\* AUTO SUPPLY CASE:  
SINGLE FLOAT DUAL SWITCHES



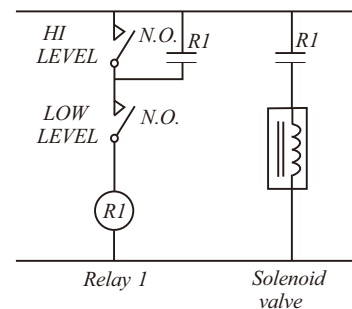
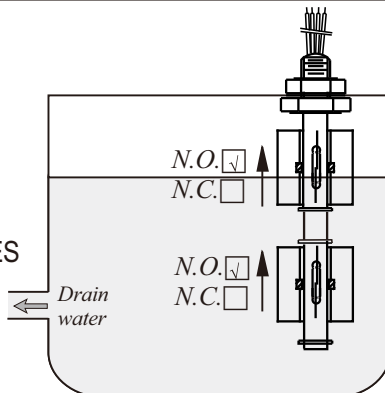
\* AUTO DRAIN CASE:  
SINGLE FLOAT DUAL SWITCHES



\* AUTO SUPPLY CASE:  
DUAL FLOATS DUAL SWITCHES



\* AUTO DRAIN CASE:  
DUAL FLOATS DUAL SWITCHES



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Distributor: