

PRODUCT INTRODUCTION

■ INTRODUCTION

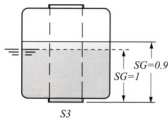
Since technologies of the product have more and more advance, the products need comply with a requirement for more safe, convenient and low cost. The float switches are extremely compact, simple and are easy to install on any small space. These switches are not effected by electrical interference. They 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 causes the float rise with the liquid level. The reed switch inside the stationary stem will not be activated by the magnet inside the float.

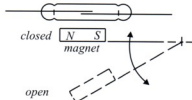
If your liquid has a high viscosity, you should specify largest size float that will provides a greatest buoyant force to ensure the units operate normally. Because the float switches are activated by the magnetic field of permanent magnet inside the float, make sure the liquid is no iron powder or magnetic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



(Fig. 3)

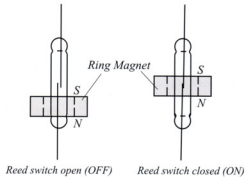
■ PRINCIPLE

Fig. 1 illustrates the method of pivot actuation (such as the RF-OH 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 RF-OV 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)

PROPERTY OF PLASTIC

■ PROPERTY OF PLASTIC

Material	Foodstuffs	Operation Temp.	Lubrication Oil	Solvent	Acid	Application
PVDF	OK	-30°C~120°C	OK	OK	OK	For use in electronics industry
Nylon	OK	-20°C~110°C	OK	OK	NO	For use in high temperature
Polysulfone	OK	-30°C~120°C	OK	NO	OK	For use in high temperature
PP	OK	-20°C~80°C	OK	OK	OK	Economical units
NBR	OK	-20°C~100°C	OK	OK	NO	Economical units

■ PROPERTY OF GASKET

The gasket come in four materials, Please refer to the table below to choose a proper gasket to suit your application.

Material	Physical Property				Resistance to Solvent						Resistance to Corrosion		
	Resistance to abrasion	Resistance to heat	Resistance to low temperature	Endurance	Gasoline	Benzene Toluene	Alcohol	Ether	Ketone	Ethyl acetate	Organic acid	Inorganic compound	Alkali
NBR	◎	130°C	-10~ -20°C	◎	◎	X~△	◎	X~△	X	X~△	X~△	△	○
EPDM	○	150°C	-40~ -60°C	◎	X	△	◎	○	◎	◎	X	○	◎
SILICON	△ ~ X	200°C	-70~ -120°C	◎	X~△	X~△	◎	X~△	○	△	○	△	◎
VITON	○	200°C	-40°C	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

◎ Excellent ○ Good △ Acceptable X Not good

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.

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

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

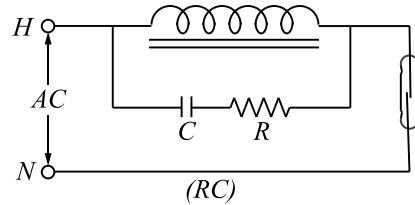


Fig. 4 (a)

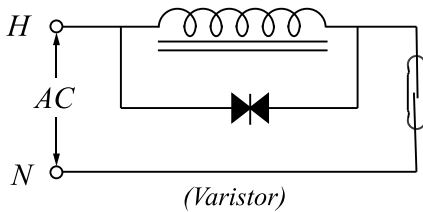


Fig. 4 (b)

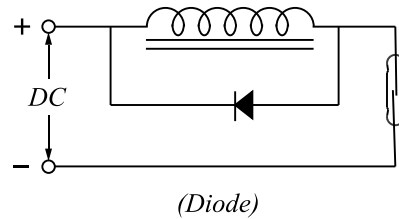


Fig. 4 (c)

■ CAPACITIVE LOADS

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

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

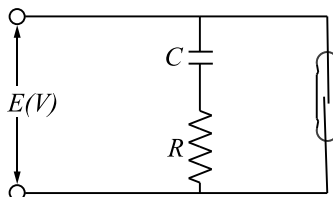


Fig. 5 (a)

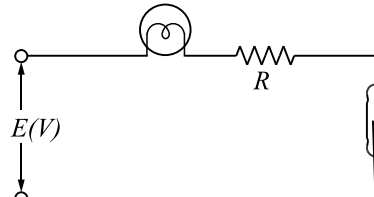


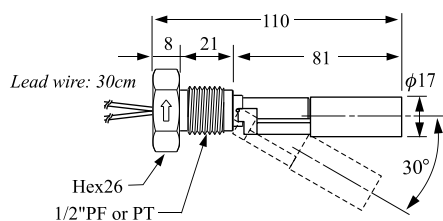
Fig. 5 (b)

FLOAT SPECIFICATIONS

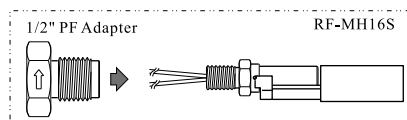
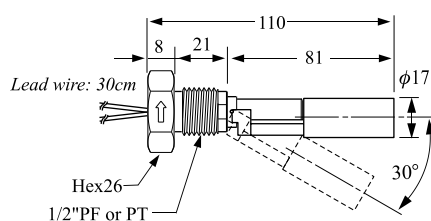
MODEL	TYPE	$\phi A \times B \times \phi C$	S.G.	Max. Pressure (kg/cm ²)	Weight (g)	Material / Color	Max. Temp. (°C)
	S1	28 × 28 × 9.5	E>0.8	10	8	SUS316	200
	S3	45 × 55 × 15	E>0.65	12	36	SUS316	200
	S6	75 × 108 × 19	E>0.5	10	145	SUS 304	200
	S2	41 × 38 × 11	E>0.7	45	19	SUS 316	200
	S4	52 × 52 × 15	E>0.55	30	33	SUS 316	200
	S5	75 × 73 × 19	E>0.55	30	103	SUS 304	200
	S7	30 × 29 × 9.5	E>0.75	30	7	SUS316	200
(hollow)	P1	25 × 15 × 10	E>0.8	4	4	PP / white black	80
	P2	25 × 25 × 10	E>0.7	4	5	PP / white black	80
	P3	48 × 45 × 18.5	E>0.6	4	37	PP / black	80
	P4	20 × 25 × 10	E>0.8	4	5	PP / black	80
	P5	20 × 20 × 8.1	E>0.8	4	4	PP / black	80
(foam)	P6	20 × 20 × 7.5	E>0.8	ATM	3.5	PP / white	80
	P7	25 × 25 × 10	E>0.8	ATM	6.5	PP / white	80
	N1	25 × 15 × 10	E>0.8	ATM	4.5	NBR / black	100
	N2	18.5 × 26 × 10	E>0.8	ATM	2.6	NBR / black	100
	N3	19 × 20 × 10	E>0.8	ATM	2.4	NBR / black	100
	N4	17.5 × 25 × 10	E>0.8	ATM	2.4	NBR / black	100
(hollow)	F1	55 × 70 × 22	E>0.9	3	100	PVDF	120
	F2	42 × 44 × 14	E>0.8	3	20	PP	80
	F3	45 × 45 × 20	E>0.5	3	25	PP	120

METAL SINGLE SWITCH TYPES NEW

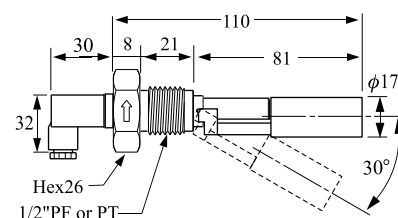
► RF- MH16



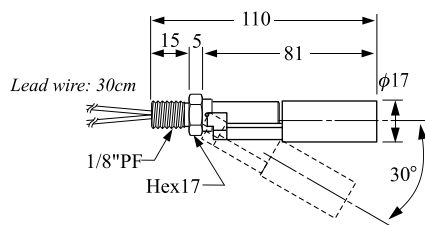
► RF- MH16A
(MH16S+Adapter)



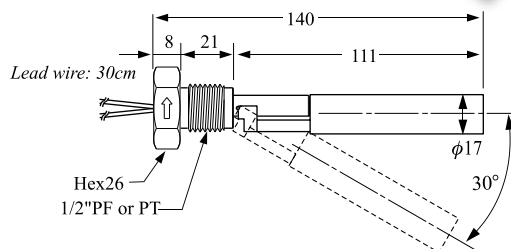
► RF- MH16C



► RF- MH16S



► RF- MH26

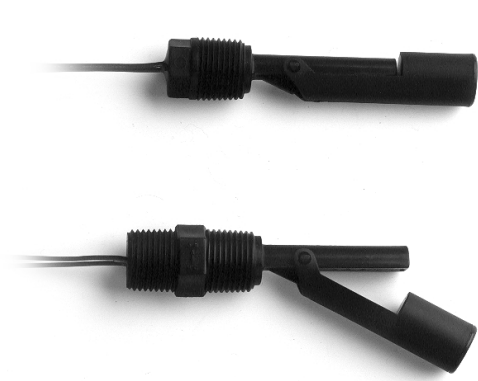


■ SPECIFICATIONS

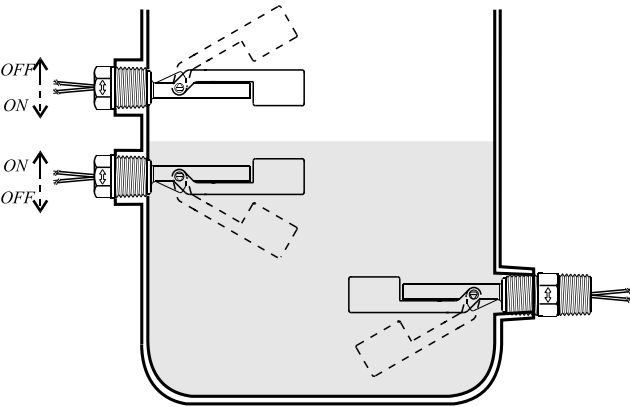
Type	Material	Switching Capacity Max.	Switching Voltage Max.	Switching Current Max.	Carry Current Max.	Lead Wire	Max. Pressure	Operating Temp.	Suitable Sp. Gr.
RF-MH16	SUS304	50W/SPST	240VAC	0.5A	1A	XLPE or TEFLON	5 kg/cm ²	-10~120°C (Max.200°C)	0.8
RF-MH26			200VDC						0.7

PLASTIC OH TYPES

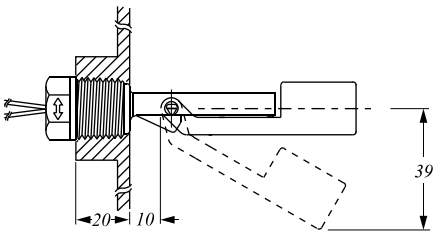
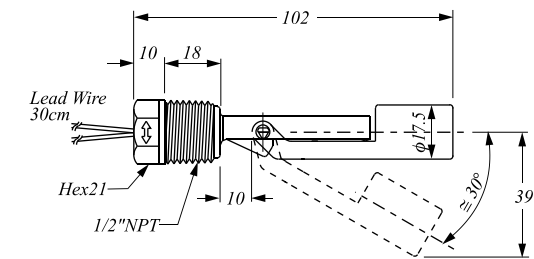
► RF-OH4 / OH5



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

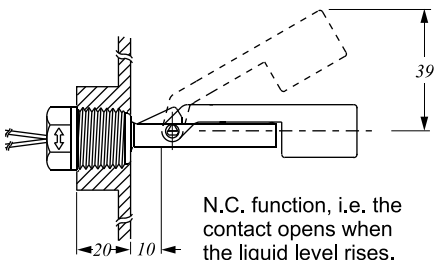
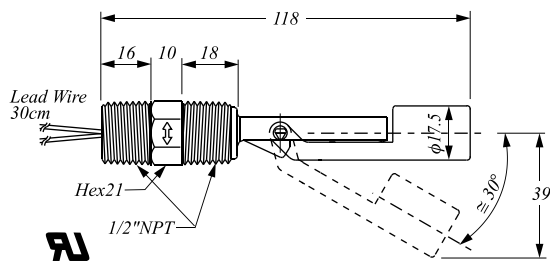


■ RF-OH41



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

■ RF-OH51



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

■ 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
RF-OH41D	PP	50W/SPST	240VAC	0.5A	1A	XLPE	4 kg/cm ²	-20~80°C	0.65	20g
RF-OH51D			200VDC							25g

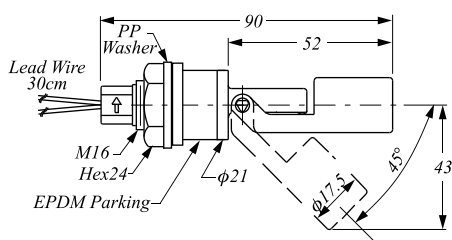
PLASTIC OH TYPES

► RF-OH2 / OH3



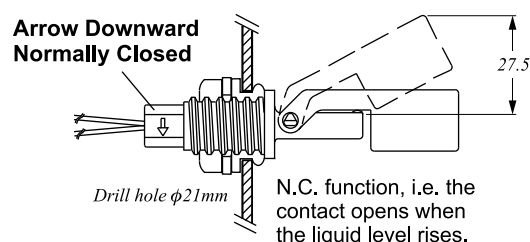
- For models RF-OH2 and OH3, three different types of material are available PP, Nylon, and PVDF.
- The special lead wire or cable can be supplied according to the requirement of the customer.
- The customer can select the type of reed switch which they requires.
- For specifications of the standard design see catalog (page 8).
- OEM customers are welcome.

■ Optional RF-OH21DO(Round)

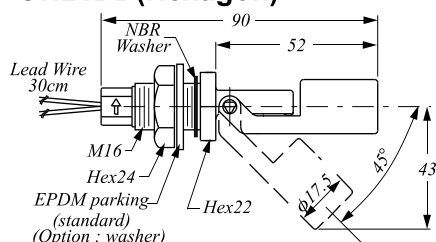


■ Installation / N.C. / N.O. Action Position

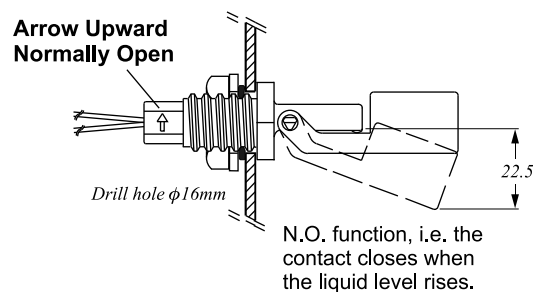
[External mounting]



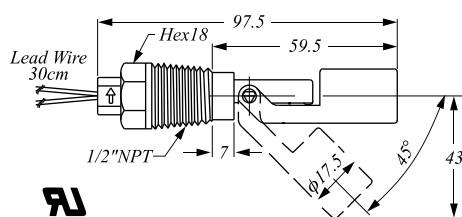
■ Standard RF-OH21DD(Hexagon)



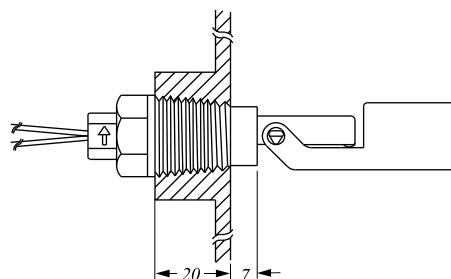
[Internal mounting]



■ RF-OH31

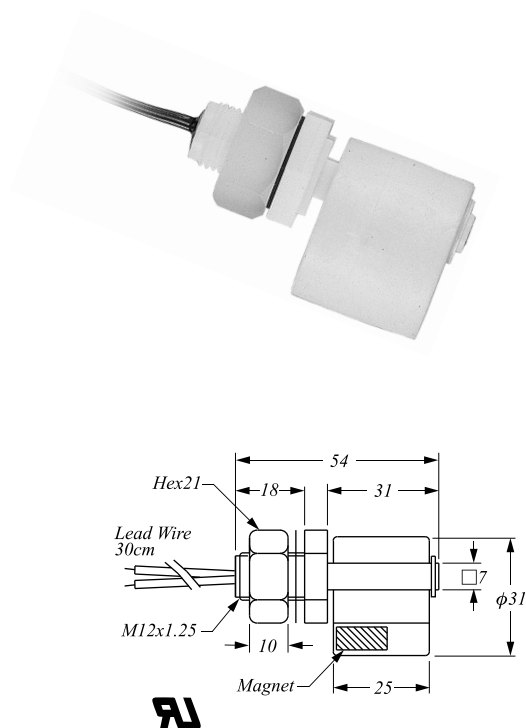


[External mounting]

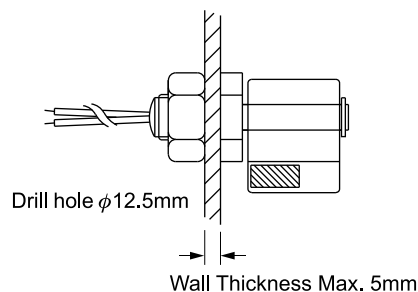


PLASTIC OH TYPES

► RF-OH1

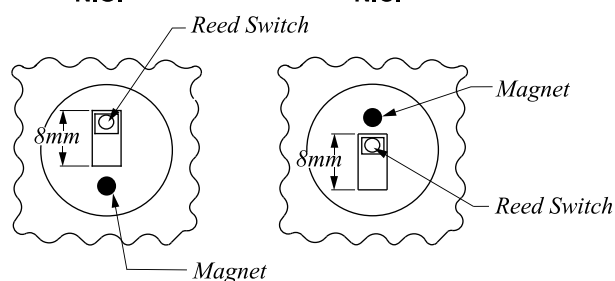


■ Installation / N.C./ N.O. Action Position



Normally open
N.O.

Normally closed
N.C.



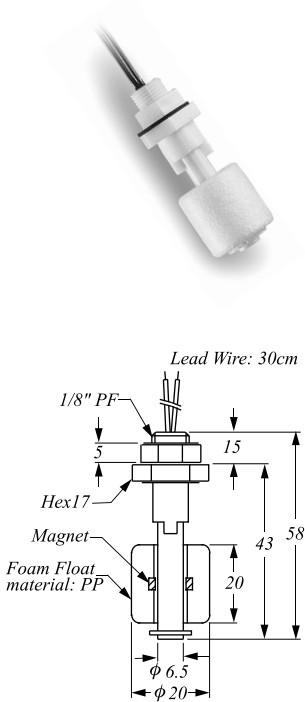
- All the products in this range come with the UL E161587 approval.
- All the products in this range are designed to be mounted on the side.
- For the specific gravity of water is used as a reference point in calculating specific gravity.

■ SPECIFICATIONS

Type	Description			
	RF-OH11D	RF-OH21D RF-OH31D	RF-OH23D RF-OH33D	RF-OH24D RF-OH34D
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 ²)	ATM	4	2	
Operating Temperature	-20~80°C		-20~120°C	
Material	PP		PVDF	Nylon
Suitable Specific Gravity	0.78	0.75	0.85	0.8
Weight	25 g	OH2: 22 g OH3: 21 g	25 g	23 g

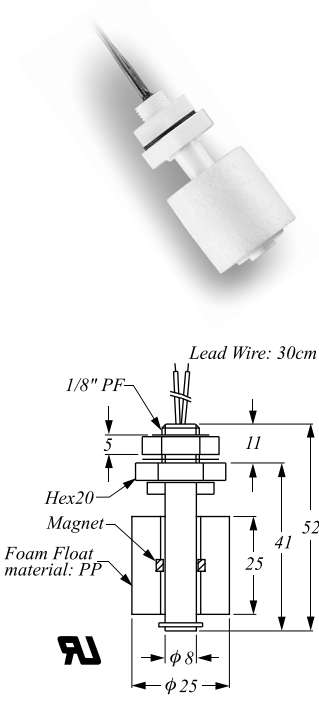
PLASTIC OV TYPES

► RF-OV11



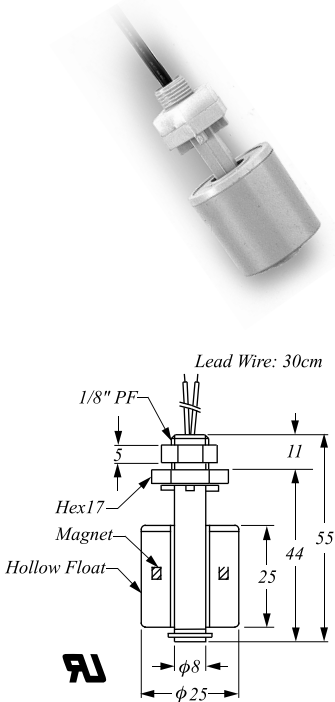
Drill hole ϕ10mm

► RF-OV21



Drill hole ϕ10mm

► RF-OV31, 33, 34



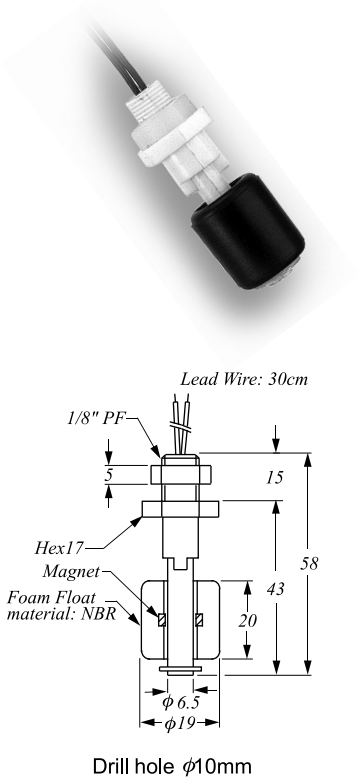
Drill hole ϕ10mm

SPECIFICATIONS

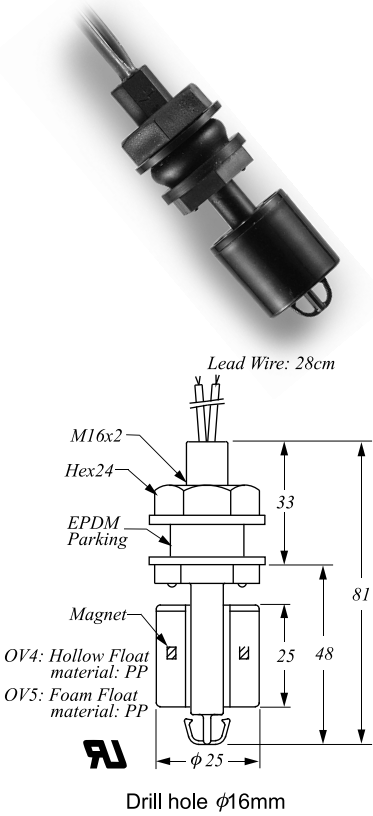
Type \ Description	RF-OV11F	RF-OV21D	RF-OV31D	RF-OV33D	RF-OV34D
Switching Capacity Max.	10W SPST	50W SPST	50W SPST	50W SPST	
Switching Voltage Max.	125VAC Break Down 250VAC	240VAC / 200VDC	240VAC / 200VDC		
Switching Current Max. (A)	0.5A		0.5A		
Carry Current Max. (A)	1A		1A		
Lead Wire	UL 1007 AWG22 PVC		UL 1007 AWG22 PVC	XLPE AWG22	
Reversible Switch Action	YES		YES		
Max. Pressure (Kg/cm ²)	ATM		4 kg/cm ²	2 kg/cm ²	
Operating Temperature	-20~80℃		-20~80℃	-20~120℃	-20~110℃
Material	PP		PP	PVDF	Nylon
Suitable Specific Gravity	0.8		0.7	0.85	0.8
Weight (g)	12 g	18 g	15 g		

PLASTIC OV TYPES

► RF-OV12



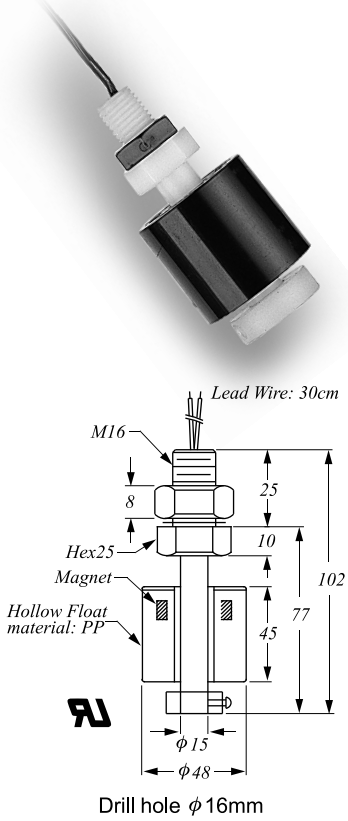
► RF-OV41, 51



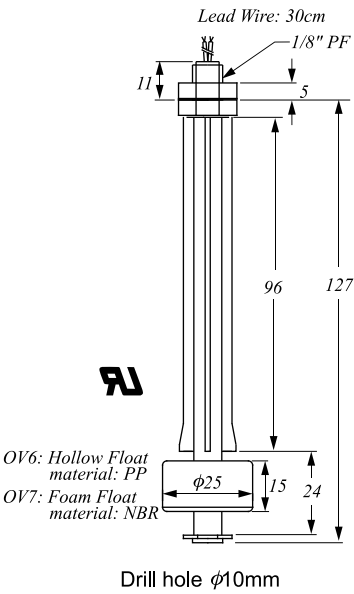
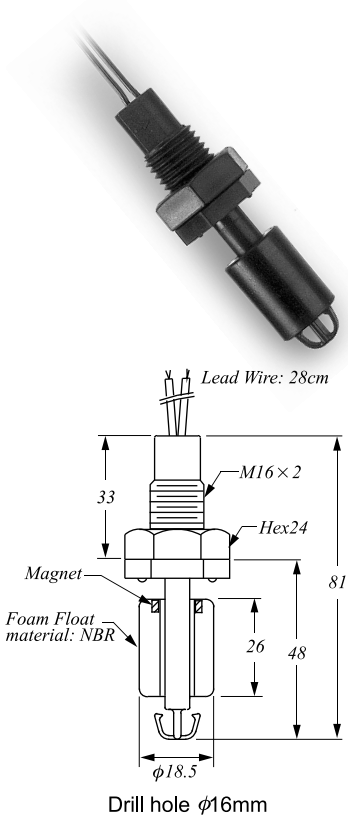
► RF-OV61, OV72



► RF-OV81



► RF-OV92

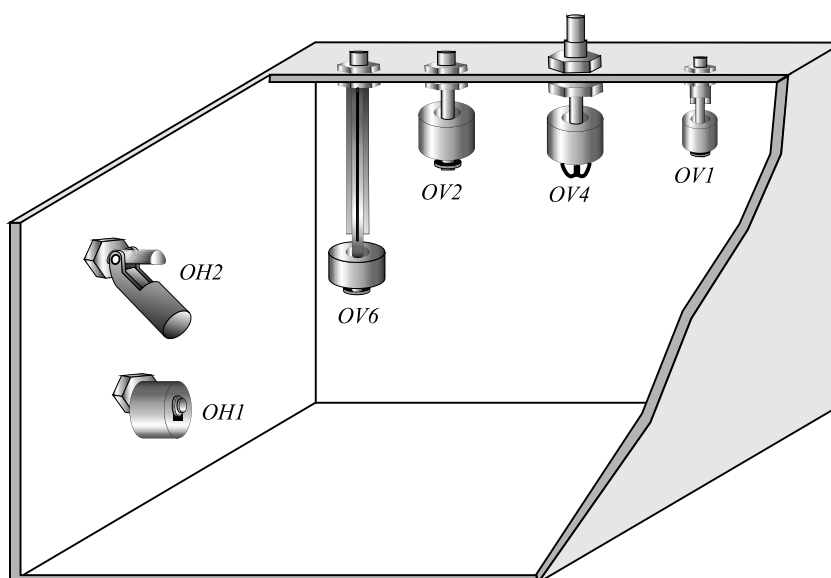


PLASTIC OV TYPES

■ SPECIFICATIONS

Type \ Description	RF-OV12F	RF-OV61F RF-OV72F	RF-OV41D RF-OV51D	RF-OV81D	RF-OV92D
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	XLPE AWG22	UL 1007 AWG22 PVC			XLPE AWG22
Reversible Switch Action	NO	NO	YES	NO	NO
Max. Pressure (kg/cm ²)	2 kg/cm ²	OV-6: 4kg/cm ² OV-7: ATM	OV-4: 4kg/cm ² OV-5: ATM	4 kg/cm ²	ATM
Operating Temperature	-20 ~100°C	-20~80°C			-20 ~100°C
Material	PP (except OV-12, OV-72, OV-92: NBR float)				
Suitable Specific Gravity	0.8	0.7 ~ 0.8		0.6	0.8
Weight (g)	12 g	19 g	32 g	180 g	

■ TYPICAL APPLICATION



ORDER INFORMATION

RF- **OV2** **1** **D** **A** **03** **P**

Type

OV1~OV9 (Top or bottom Mounting)

OH1~OH5 (Side Mounting)

Material of Wetted parts

1 : PP

2 : NBR (only float)

3 : PVDF

4 : Nylon

Switching Capacity Max.

D: 50W 200VDC/240VAC SPST 

F: 10W 125VAC SPST

H: 3W 30VAC/60VDC SPDT

K: 20W 150VAC/200VDC SPDT

Contact Form

A: Normally Open (N.O.) SPST

B: Normally Close (N.C.) SPST

C: 1AB SPDT

D: NC Reversible

E: NO Reversible

Lead wire Length (L: unit=10cm)

03: 30cm (Standard length) ※except of (RF OV4, OV5 & OV9 standard by 28cm)

05: 50cm

10: 100cm (1 Meter)

15: 150cm

Material of Lead wire

C: PVC cable (80°C) --- AWG22 x2C xφ4

D: XLPVC (105°C) ---- AWG22

F: SILICON cable (200°C) ---- AWG24 x2C xφ4

P: PVC (80°C) ---- AWG22

S: SILICON (200°C) ---- AWG22

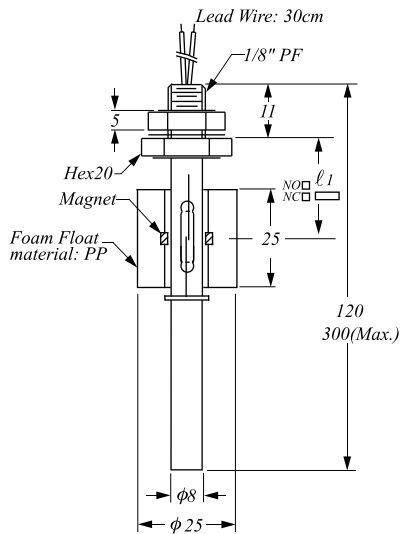
T: TEFLON (200°C) ---- AWG24

X: XLPE (125°C) --- AWG22

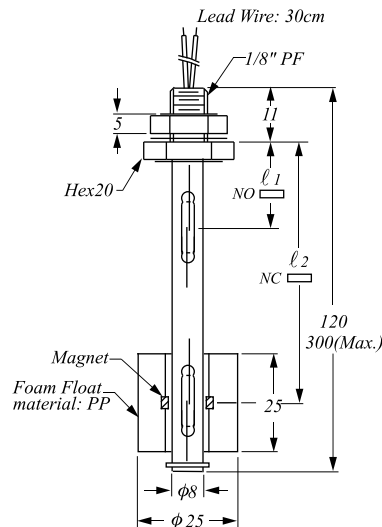
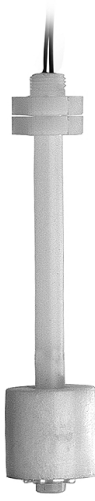
※ "A" (Normal Open) contact form is our standard specified switch activation, others contact form and target lead wire length subject to above data, except of above, please refer pages 6, 8, 9 and 11.

PLASTIC SPECIAL TYPES

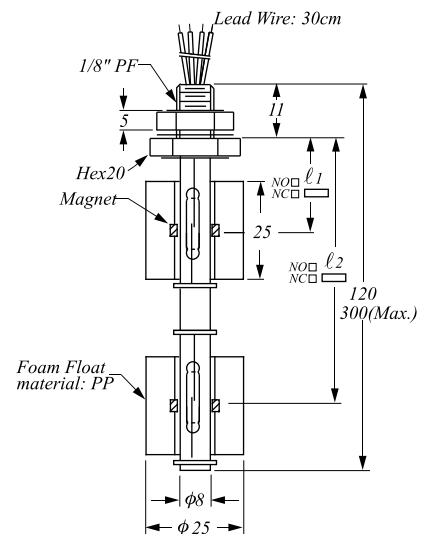
► RF-PV1



► RF-PV2



► RF-PV3



● NOTE: Float material can be optional.

Above items are done by custom-built when the standard specification is unable to be coped with their unique demand. There are with below special benefits:

- RF-PV1 One float for one level activation switch location by custom-order.
- RF-PV2 One float with 2 reed switches, applicable for high / low two level activation, especial design by one float to drive two contacts activation.
- RF-PV3 Two floats drive with two independent reed switches, the compared difference with RF-PV2 base on below character : Each one float unit can be performed by N.O. or N.C. level activation as per customer's option.

ORDER INFORMATION

RF- **P V 1 2 D A 0 5 P**

Type

PV1 (Vertical Mounting, Single Float Single Switch)

PV2 (Vertical Mounting, Single Float Dual Switch)

PV3 (Vertical Mounting, Dual Float Dual Switch)

Material of Wetted parts

1 : PP; Lead wire---PVC---Temp. 80°C

2 : NBR (only float); Lead wire---PVC---Temp. 60°C
Lead wire---XLPE---Temp. 100°C

3 : PVDF; Lead wire---XLPE---Temp. 125°C

4 : Nylon; Lead wire---XLPE---Temp. 125°C

Switching Capacity Max.

D: 50W 200VDC/240VAC SPST 

F : 10W 125VAC SPST

H: 3W 30VAC/60VDC SPDT

K: 20W 150VAC/200VDC SPDT

Contact Form

A: Normally Open (N.O.) SPST

B: Normally Close (N.C.) SPST

Lead wire Length (L: Unit=10cm)

03: 30cm (Standard length)

05: 50cm

15: 150cm

20: 200cm

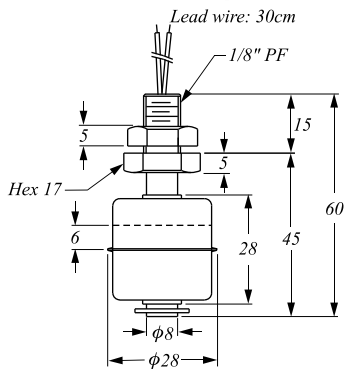
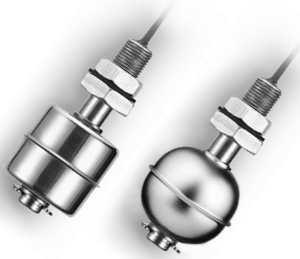
Material of Lead wire

P: PVC ---- 80°C

X: XLPE --- 125°C

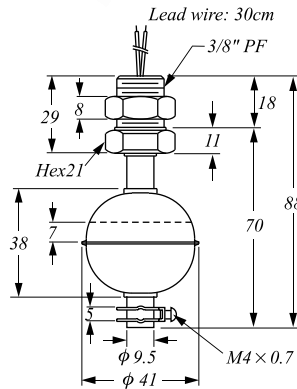
METAL TYPES

► RF- 30□1/ RF- 35□1



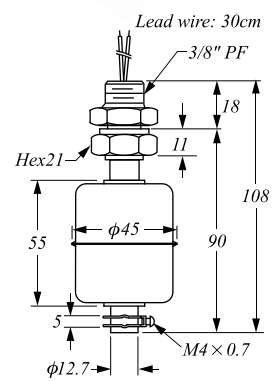
Drill hole $\phi 10\text{mm}$

► RF- 40□1



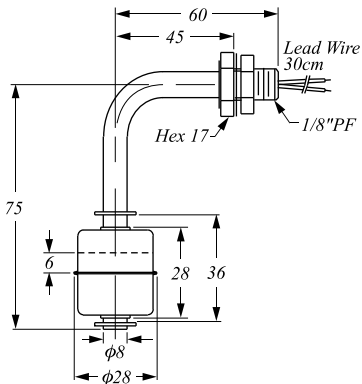
Drill hole $\phi 17\text{mm}$

► RF- 45□1



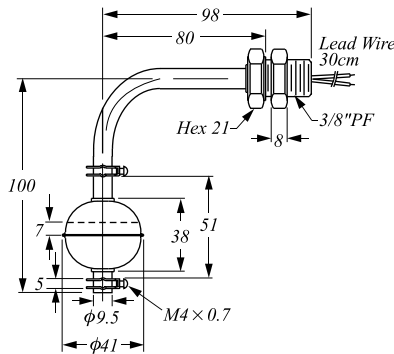
Drill hole $\phi 17\text{mm}$

► RF- 30□2



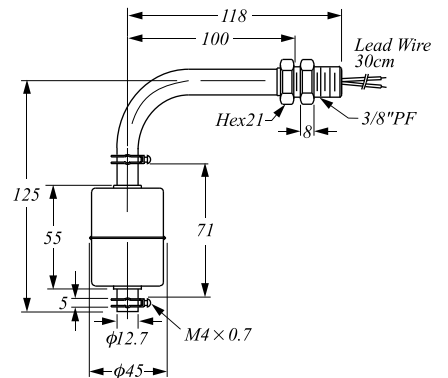
Drill hole $\phi 10\text{mm}$

► RF- 40□2



Drill hole $\phi 17\text{mm}$

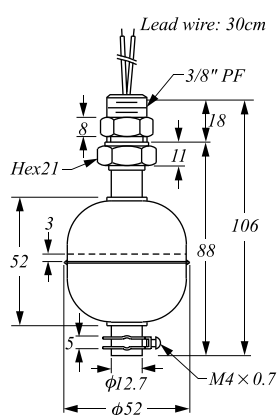
► RF- 45□2



Drill hole $\phi 17\text{mm}$

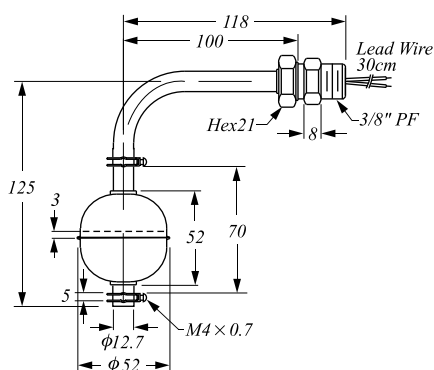
METAL TYPES

► RF-50□1



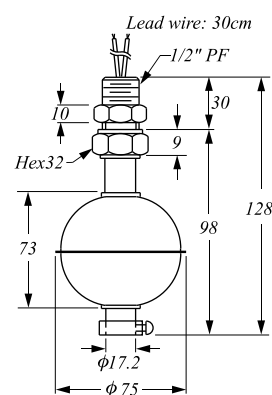
 Drill hole φ17mm

► RF-50□2



 Drill hole φ17mm

► RF-75□1



Drill hole φ21mm

■ SPECIFICATIONS

Description	Type	RF-30□1D	RF-40□1D	RF-45□1D	RF-50□1D	RF-75□1G	RF-10□1G
		RF-30□2D	RF-40□2D	RF-45□2D	RF-50□2D		
Switching Capacity Max.		50W SPST	50W SPST	50W SPST	50W SPST	60W SPDT	
Switching Voltage Max.		240VAC/200VDC				220VAC	
Switching Current Max. (A)		0.5A	0.5A	0.5A	0.5A	2A	
Carry Current Max. (A)		1A	1A	1A	1A	3A	
Lead Wire		XLPE (UL3266, AWG22)					
Reversible Switch Action		YES	YES	YES	YES	NO	NO
Max. Pressure (Kg/cm ²)		10	30	12	30	30	10
Operating Temperature		-10~120°C (OPTION 200°C)					
Material		Stainless Steel SUS304, 316					
Suitable Specific Gravity		0.8	0.7	0.65	0.55	0.55	0.5

ORDER INFORMATION

RF- **3 0 6 2 D A 1 0**

Type

- 30** Float : $\phi 28 \times 28$, Screw : 1/8"PF
- 35** Float : $\phi 30 \times 29$, Screw : 1/8"PF
- 40** Float : $\phi 41 \times 38$, Screw : 3/8"PF
- 45** Float : $\phi 45 \times 55$, Screw : 3/8"PF
- 50** Float : $\phi 52 \times 52$, Screw : 3/8"PF
- 75** Float : $\phi 75 \times 70$, Screw : 1/2"PF
- 10** Float : $\phi 75 \times 108$, Screw : 1/2"PF

Material of Wetted parts

- 0** : SUS304
- 6** : SUS316

Mounting

- 1** : Top or Bottom Mounting
- 2** : Side Mounting

Switching Capacity Max.

- D**: 50W 200VDC/240VAC SPST 
- F**: 10W 125VAC SPST
- G**: 60W 220VAC SPDT (only use for tube $\geq \phi 12.7$)
- H**: 3W 30VAC / 60VDC SPDT (only use for tube $\leq \phi 9.5$)
- K**: 20W 150VAC/200VDC SPDT

Contact Form

- A**: Normal Open (N.O.) SPST
- B**: Normal Close (N.C.) SPST
- C**: 1AB SPDT
- D**: N.C. Reversible
- E**: N.O. Reversible

Lead wire Length (XLPE 125°C) L: Unit=10cm

- 03**: 30cm (Standard length)
- 05**: 50cm
- 15**: 150cm

METAL SPECIAL TYPES

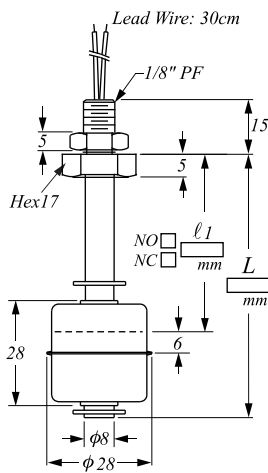
Below items are custom-built subject to special application place and existed equipment facilities. Their unique characters as follow:

- Any size measuring range, but $\phi 8\text{mm}$ stem

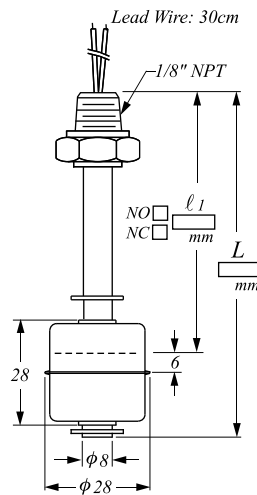
Max. 500mm.

- Customized mounting thread specification are acceptable.
- Single or multiple contact form (point) are workable.

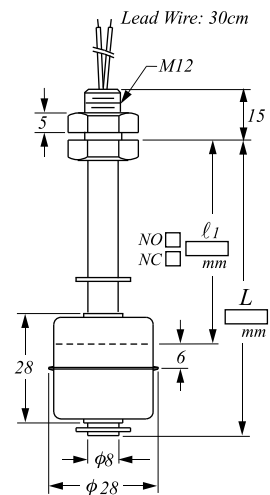
► RF-SA□11



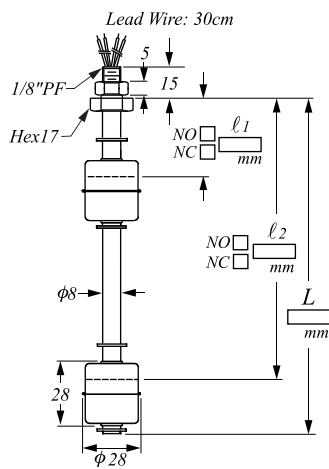
► RF-SB□11



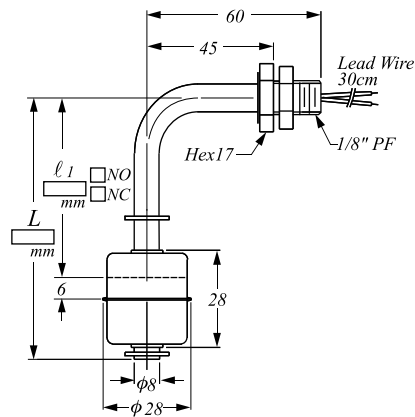
► RF-SC□11



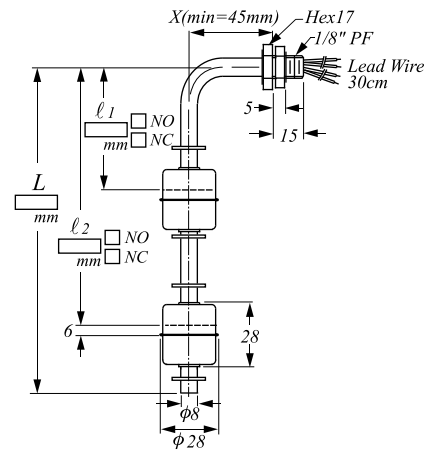
► RF-SA□12



► RF-SA□21



► RF-SA□22

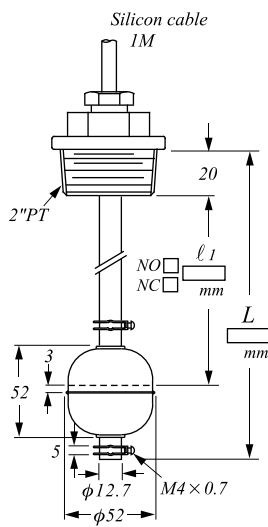


METAL SPECIAL TYPES

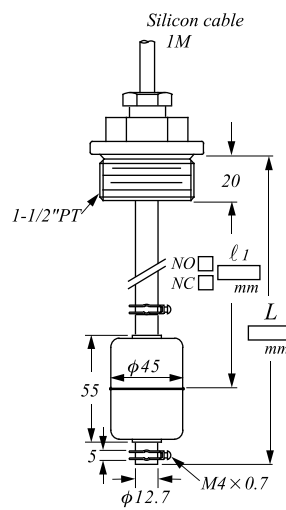
Below items are custom-built subject to special application place and existed equipment facilities. Their unique characters as follow:

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

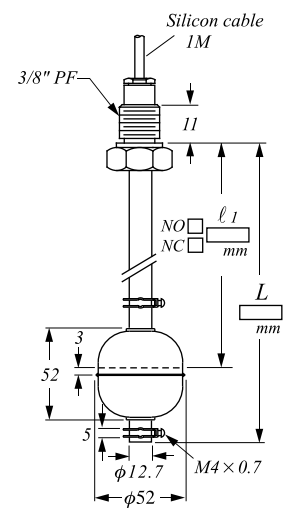
► RF-SD□11



► RF-SE□11



► RF-SF□11



ORDER INFORMATION

RF- **S** **A** **6** **1** **2** **D** **A** **0** **5**

Type

- SA** Float : $\phi 28 \times 28$, Screw : 1/8"PF
SB Float : $\phi 28 \times 28$, Screw : 1/8"PT
SC Float : $\phi 28 \times 28$, Screw : M12
SD Float : $\phi 52 \times 52$, Screw : 2"PT
SE Float : $\phi 45 \times 55$, Screw : 1-1/2"PF
SF Float : $\phi 75 \times 108$, Screw : 3/8"PF

Material of Wetted parts

- 0** : SUS304
6 : SUS316
B : Brass

Mounting

- 1** : Top or Bottom Mounting (tube only)
2 : Side Mounting

Float Number

1~2 floats

Switching Capacity Max.

- D**: 50W 200VDC/240VAC SPST 
F: 10W 125VAC SPST Break Down 220VAC
G: 60W 220VAC SPDT (only use for tube $\geq \phi 12.7$)
H: 3W 30VAC / 60VDC SPDT (only use for tube $\leq \phi 9.5$)
K: 20W 30VAC / 60VDC SPDT (only use for tube $\leq \phi 9.5$)

Contact Form

- A**: Normal Open (N.O.) SPST
B: Normal Close (N.C.) SPST
C: 1AB SPDT

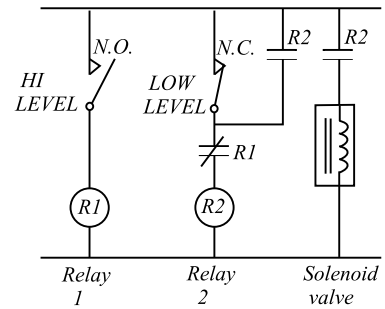
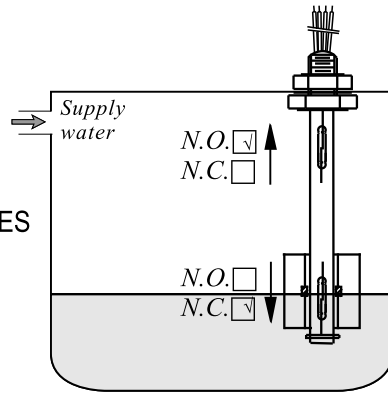
Lead wire Length (Silicon Cable) L: Unit=10cm

- 03**: 30cm (SA, SB, SC, Standard length)
05: 50cm
10: 100cm (SD, SE, SF, Standard length)
15: 150cm

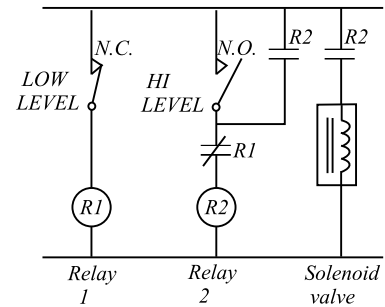
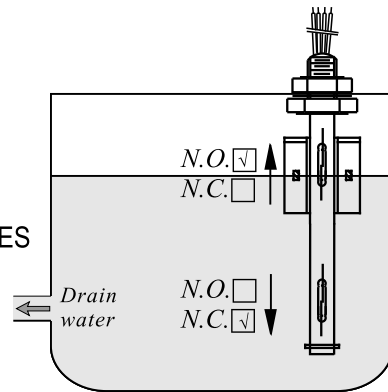
- ※ Tolerance of the total product length is ± 5 mm.
- ※ Characteristics, specifications and dimensions are subject to change without notice.
- ※ Please contact your nearest distributing office for further informations.

TYPICAL WIRING DIAGRAMS

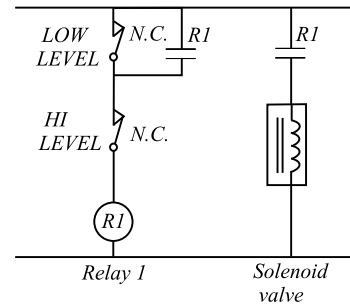
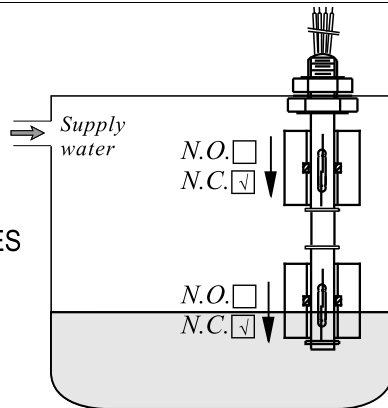
* AUTO SUPPLY CASE:
SINGLE FLOAT DUAL SWITCHES



* AUTO DRAIN CASE:
SINGLE FLOAT DUAL SWITCHES



* AUTO SUPPLY CASE:
DUAL FLOATS DUAL SWITCHES



* AUTO DRAIN CASE:
DUAL FLOATS DUAL SWITCHES

