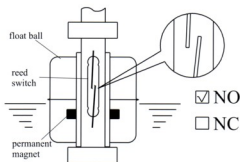


INTRODUCTION

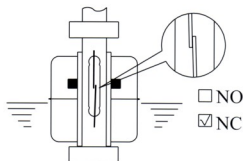
PRINCIPLE

The single unit or multiple reed switch units are housed tightly in stainless steel or engineering plastic stem, and the permanent magnet is intercircled into the middle of the specified float ball(s). You can mount the float ball to penetrating through the stem, then the liquid buoyancy will deliver the float ball up and down at the specified position by graduat-

ing rings. When the float internal magnet approaches the reed switch, it will actuate the reed switch contact point to create an open or close circuit. We can apply such on-off output signals to reach liquid level controlling and monitoring purpose. The figures below show the float orientations on N.O. (Normal Open) and N.C. (Normal Close).



rising float ball to actuate the reed switch



rising float ball to switch off.

FEATURES

- ★ Multiple points measuring, multiple level points are available for custom-built.
- ★ It is used the magnet to actuate the reed switch without any extra electric power source. Each reed switch is durable for operation life reaching 2 million times.
- ★ All output signal wiring are simplified in same junction box (housing) to economize the external wiring construction.
- ★ FC(D) type magnetic float level switches are more economical in budget than other level switches by comparison in multiple points.
- ★ The housing protection rating up to IP-65.
- ★ Rugged construction and multiple options for materials from engineering plastics as PVDF, PP, PVC, and stainless steels as SUS 304, SUS316, float switches can be applied to versatile applications in chemical corrosion of acidity and alkalinity liquid, solvents, or oil fuels.
- ★ The reed switch and lead wire are isolated absolutely with liquids. All stainless steel switches are applicable to high pressure and high temperature performances.

INTRODUCTION

APPLICATIONS

Shipbuilding Industry, Power Generator Facilities, Petrochemical Industry, Food/Beverage Industry, Waste Water/Water Purified Facilities, Electronic Industry, Dyeing and Finishing Industry, Chemical Industry, Rubber/Plastic Industry, Hydraulic.

SPECIFICATION

Tube Type	SUS ϕ 8		SUS ϕ 9.5		SUS ϕ 12.7		SUS ϕ 17.2		PP ϕ 17.2		PVDF ϕ 16	
Switching Contact form	SPDT	SPST	SPDT	SPST	SPDT	SPST	SPDT	SPST	SPDT	SPST	SPDT	SPST
Switching Capacity Max.	20W	50W	20W	50W	30W	50W	30W	50W	30W	50W	30W	50W
Switching Voltage Max.	150VAC 200VDC	240VAC 220VDC	150VAC 200VDC	240VAC/200VDC								
Switching Current Max. (A)	0.5A	0.5A	0.5A	0.5A	0.5A	0.5A	0.5A	0.5A	0.5A	0.5A	0.5A	0.5A
Carry Current Max. (A)	1A	1A	1A	1A	1A	1A	1A	1A	2.5A	2.5A	2.5A	2.5A
Lead Wire	XLPE (UL3266, AWG22)											

APPLICATION FIELDS OF FLOAT

environments Float	Working Temp.	Pressure Rating	Acid	Alkaline	Oil	Solvent
SUS304	- 20°C ~120°C (200°C Max.)	10 ~ 30kg/cm ²	×	△	◎	◎
SUS316	- 20°C ~120°C (200°C Max.)	10 ~ 30kg/cm ²	△	○	◎	◎
Polypropylene	- 20°C ~80°C	4kg/cm ²	○	○	○	×
PVDF	- 20°C ~120°C	3kg/cm ²	◎	◎	○	○

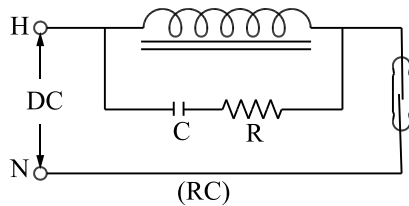
Note: ◎ = excellent ○ = good △ = acceptable × = not good

CONTACT PROTECTION CIRCUITS

INDUCTIVE LOADS

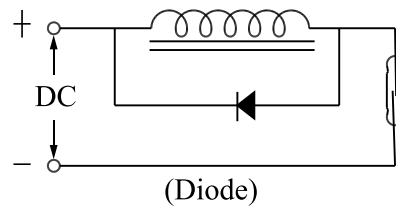
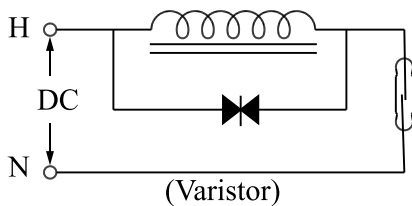
When using a reed switch with inductive loads such as motors, relays, solenoids, etc., the contact will be subjected to a high induced voltage during opening of the contact (load circuit).

Such high induced voltage (transients) may cause damages to the reed switch or significantly reduce its life. Therefore, protective circuits such as: RC (snubber), varistors or clamping diodes are recommended.



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

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

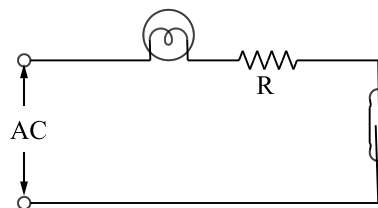
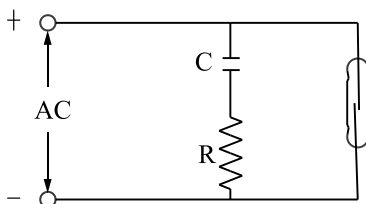


* It is prohibited to connect directly with any solenoid valve, motor or magnetic switch.

CAPACITIVE LOADS

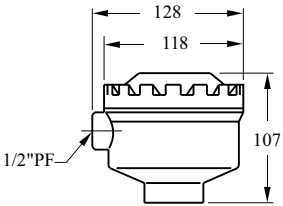
When using a reed switch with capacitive loads such as capacitors, incandescent lamps or long cables, the contact will be subjected to a high surge (inrush) current.

Therefore, protective circuits such as: surge suppressors or current limiting resistors, are recommended.



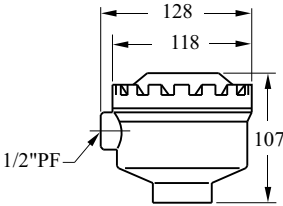
HOUSING SPECIFICATION

B



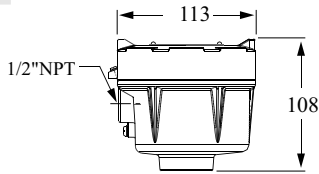
Material : Aluminum
Enclosure : IP65
Poles : 2 ~12
Max.Temp. : -20 C ~200 C

C



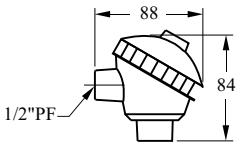
Material : PP+FIBER
Enclosure : IP65
Poles : 2 ~12
Max.Temp. : -20 C ~80 C

D Explosion-proof



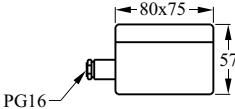
Material : Aluminum
Enclosure : Ex d IIB T4
Poles : 2 ~6
Max.Temp. : -20 C ~200 C

E



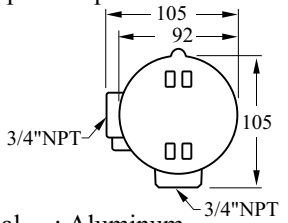
Material : Aluminum
Enclosure : IP65
Poles : 2 ~6
Max.Temp. : -20 C ~200 C

G



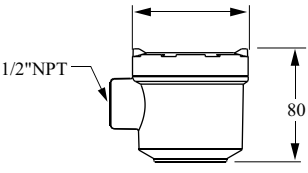
Material : PC
Enclosure : IP65
Poles : 2 ~6
Max.Temp. : -20 C ~80 C

K Explosion-proof



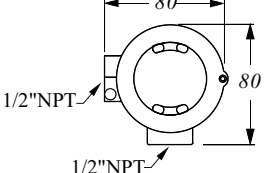
Material : Aluminum
Enclosure : EEx d IIC T6
Poles : 2 ~6
Max.Temp. : -20 C ~100 C

N Explosion-proof



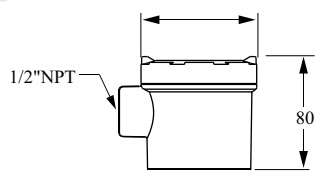
Material : SUS304 or SUS316
Enclosure : Ex d IIB T4
Poles : 2 ~6
Max.Temp. : -20 C ~200 C

L Explosion-proof



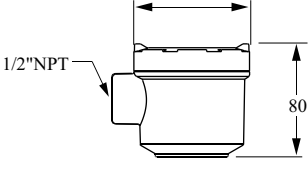
Material : Aluminum
Enclosure : Ex d IIC T6
Poles : 2 ~6
Max.Temp. : -20 C ~100 C

M Explosion-proof



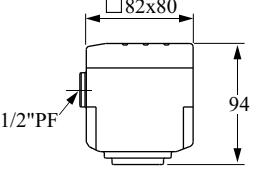
Material : SUS304 or SUS316
Enclosure : Ex d IIB T4
Poles : 2 ~6
Max.Temp. : -20 C ~200 C

N Explosion-proof



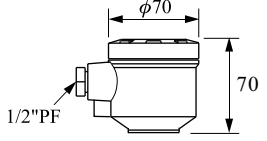
Material : SUS304 or SUS316
Enclosure : Ex d IIB T4
Poles : 2 ~6
Max.Temp. : -20 C ~200 C

P



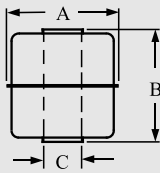
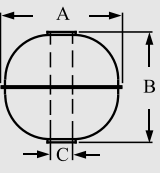
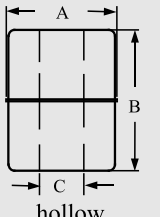
Material : Plastic
Enclosure : IP65
Poles : 2 ~6
Max.Temp. : -20 C ~80 C

X



Material : Aluminum
Enclosure : IP65
Poles : 2 ~6
Max.Temp. : -20 C ~100 C

FLOAT SPECIFICATIONS

FLOAT	TYPE	$\phi A \times B \times \phi C$	S.G.	Max. Pressure (kg/cm ²)	Weight (g)	Material	Max. Temp. (°C)
	S1	28x28x9.5	E>0.8	10	8	SUS 304 /316	200
	S3	45x55x15	E>0.65	12	37	SUS 304 /316	200
	S6	75x108x19	E>0.5	10	147	SUS 304	200
	S2	41x38x11	E>0.7	30	19	SUS 316	200
	S4	52x52x15	E>0.55	30	33	SUS 316	200
	S5	75x73x19	E>0.55	30	105	SUS 304	200
	P1	25x15x10	E>0.8	4	4	PP	80
	P2	25x25x10	E>0.7	4	5	PP	80
	P3	48x45x18.5	E>0.6	4	37	PP	80
	F1	55x70x22	E>0.9	3	100	PVDF	120

THE PROPERTIES BETWEEN LIQUID AND FLOAT

Please choose the proper float subject to above independent specified terms and chemical characters.

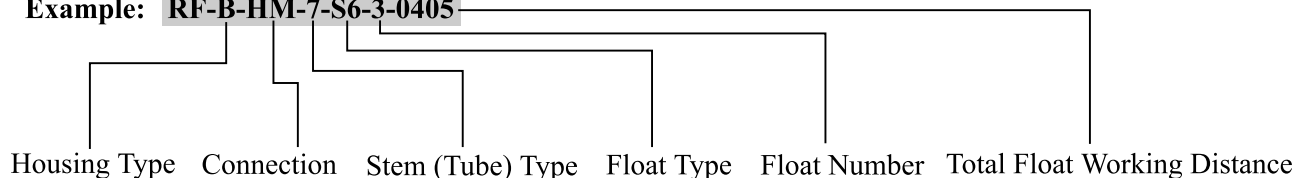
- Temperature:** PVDF Max. 120°C, PP Max. 80°C, SUS304/316 Max. 200°C
- Pressure:** SUS304 / 316 Max. 30kg / cm², engineering plastic float pressure Max. 4kg/cm²
- Viscosity:** Please choose smaller S.G. with greater diameter floats to cope with high viscosity liquid applications.
- Chemical:** Please use plastic float for acid /alkaline corrosion of chemical applications. PVDF float is noted for high temperature cases.
- Benzine:** Please choose stainless steel floats to apply in any gasoline, fuel oil, petroleum application.
- S.G. :** The float S.G. must be smaller than the liquid, otherwise, the liquid buoyancy can not deliver the float upward.

ORDER SPECIFIED

The magnetic level switch can be done as per customer's specified technical data such as the flange, thread, housing, float ball diameter, float ball number, the float traveling up or down actuated position by N.C. or N.O. output, the total float working distance (L) or

each independent float actuating position, please refer the order information to define the application specifications. A single ball driving dual actuated points or multiple balls driving multiple actuated points is available to apply on the order form.

Example: RF-B-HM-7-S6-3-0405

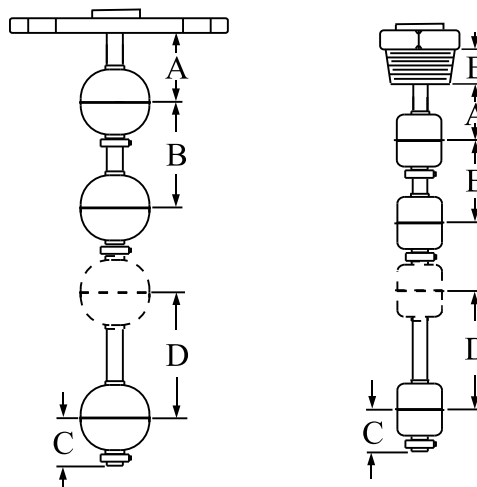


It is requested the minimum interval for a single ball driving dual actuated positions (D) or neighboring two balls (B), or from the bottom to the lowest ball interval (C) or from the mounting position to the first ball (A), otherwise, there will be some magnetic mutually interference involved by insufficient interval. To ensure the defined distance, please see the data below:

- A = Minimum distance from the mounting position to the highest actuation level.
- B = Minimum distance between any two actuation levels.
- C = Minimum distance from end of unit to the lowest level.
- D = Minimum distance between two actuation levels by one float.
- E = Screw length

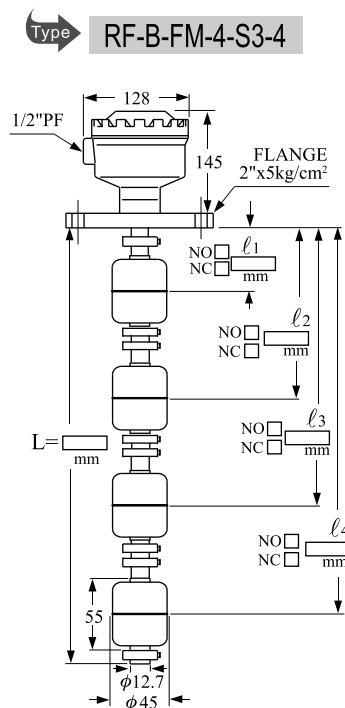
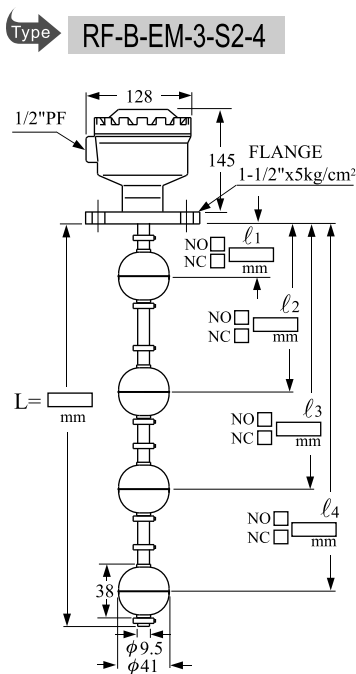
FLOAT TYPE	S1	S2	S3	S4	S5	S6	P2	P3	F1
A(mm)	25	34	40	39	50	70	27	45	50
B(mm)	50	68	82	78	99	136	55	75	99
C(mm)	25	34	40	39	50	70	27	38	50
D(mm)	30	40	55	50	65	70	30	45	65

E (mm)	SCREW
14	1/2"PT
16	3/4"PT
19	1"PT
19	1-1/4"PT
22	1-1/2"PT
25	2"PT
28	2-1/2"PT
37	3"PT



STANDARD FLANGE TYPE

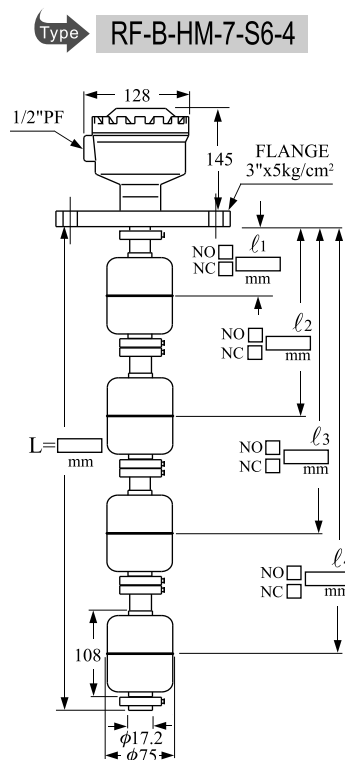
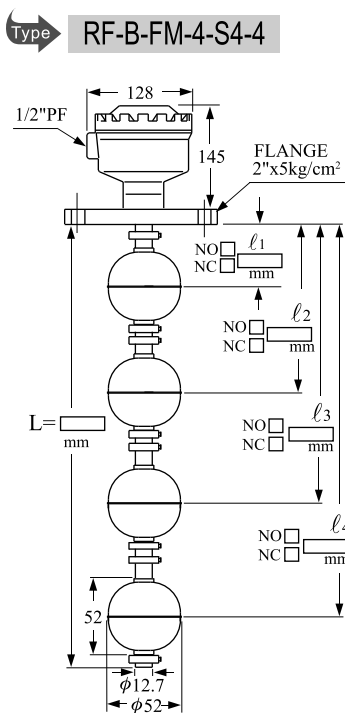
* The housing complies with the IP65 rating and can therefore be used in outdoor environment.



Order information

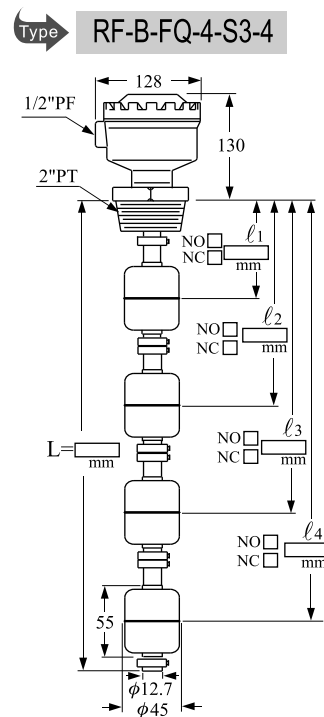
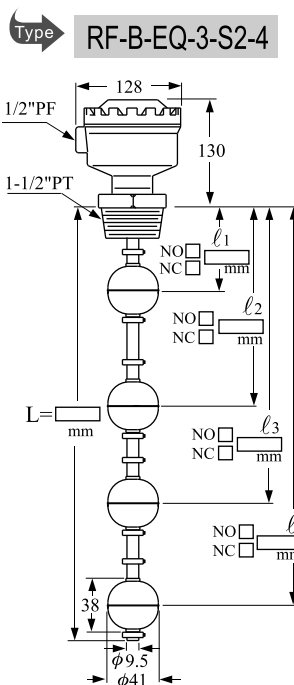
Type Housing Type
RF - B - HM - 7 - S6 - 4

Connection Flanges	Pipe Diameter	Float Type	Float Quantity
EM=1-1/2" 5kg/cm²	3= ϕ 9.5	S2= ϕ 41x38	1~4
FM=2" 5kg/cm²	4= ϕ 12.7	S3= ϕ 45x55	1~4
FM=2" 5kg/cm²	4= ϕ 12.7	S4= ϕ 52x52	1~4
HM=3" 5kg/cm²	7= ϕ 17.2	S6= ϕ 75x108	1~4



STANDARD THREAD TYPE

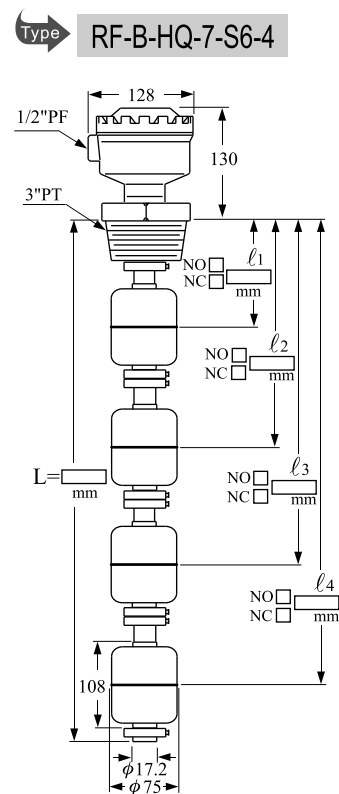
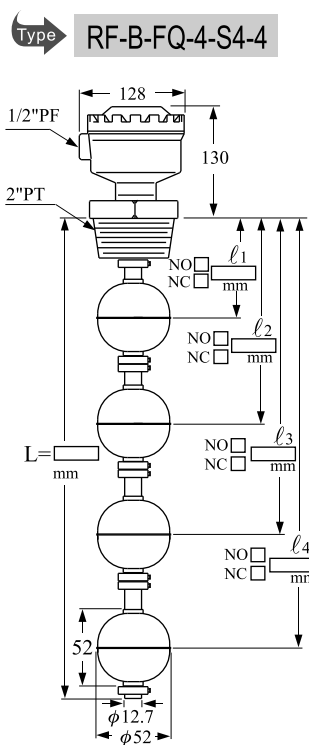
* The housing complies with the IP65 rating and can therefore be used in outdoor environment.



Order information

Type Housing Type
RF - B - HQ - 7 - S6 - 4

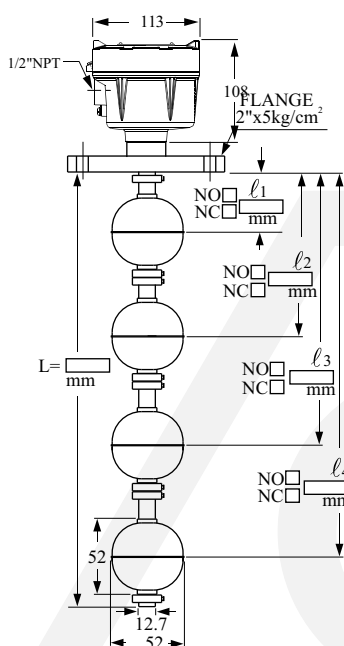
Connection Flanges	Pipe Diameter	Float Type	Float Quantity
EQ=1-1/2" PT	3= $\phi 9.5$	S2= $\phi 41 \times 38$	1~4
FQ=2" PT	4= $\phi 12.7$	S3= $\phi 45 \times 55$	1~4
FQ=2" PT	4= $\phi 12.7$	S4= $\phi 52 \times 52$	1~4
HQ=3" PT	7= $\phi 17.2$	S6= $\phi 75 \times 108$	1~4



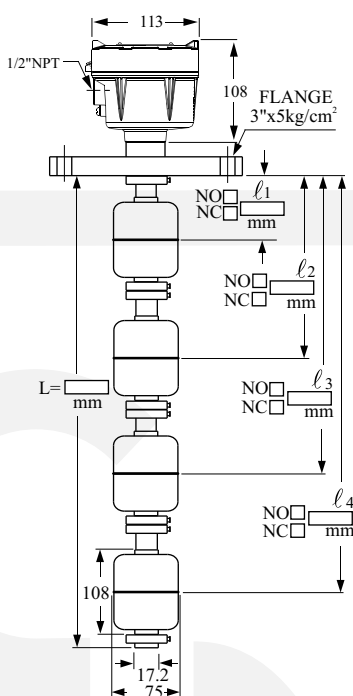
EXPLOSION-PROOF FLANGE TYPE

The housing complies with the Ex d IIB T4 approval and can therefore be used in hazardous gases conditions.

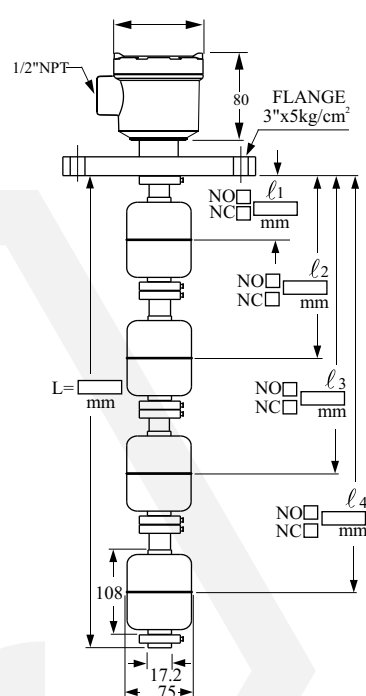
Type RF-D-FM-4-S4-4



Type RF-D-HM-7-S6-4



Type RF-N-HM-7-S6-4



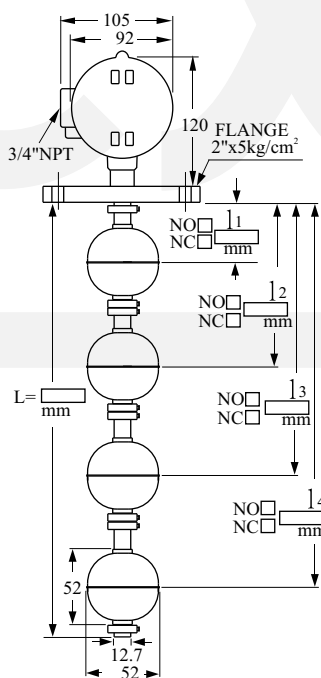
Order information

Type
Housing Type (D, K, N Type)

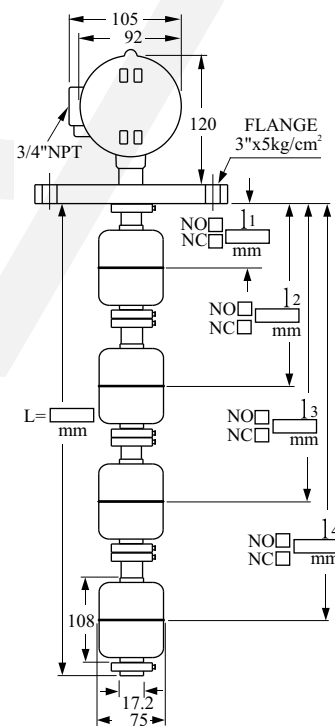
RF - D - HM - 7 - S6 - 4

Connection Flanges	Pipe Diameter	Float Type	Float Quantity
EM=1-1/2" 5kg/cm ²	3= 9.5	S2= 41x38	1~ 4
FM=2" 5kg/cm ²	4= 12.7	S3= 45x55	1~ 4
FM=2" 5kg/cm ²	4= 12.7	S4= 52x52	1~ 4
HM=3" 5kg/cm ²	7= 17.2	S6= 75x108	1~ 4

Type RF-K-FM-4-S4-4



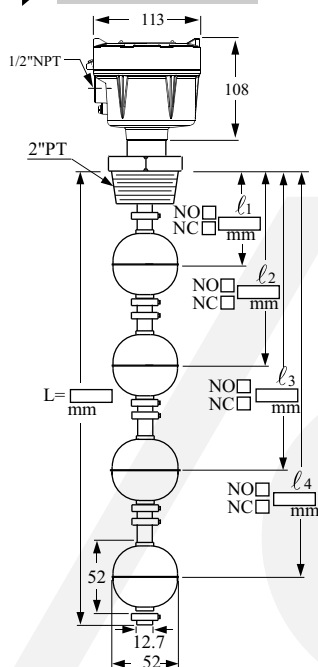
Type RF-K-HM-7-S6-4



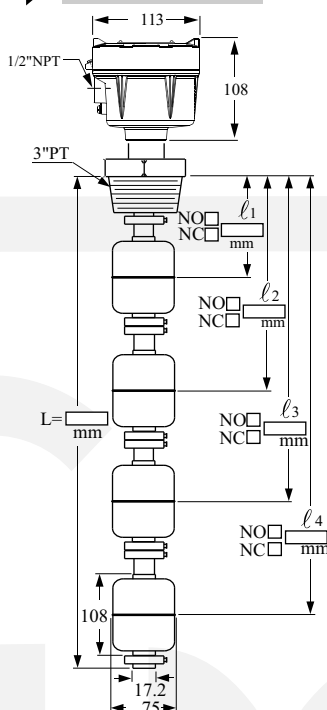
EXPLOSION-PROOF SCREW TYPE

The housing complies with the Ex d IIB T4 approval and can therefore be used in hazardous gases conditions.

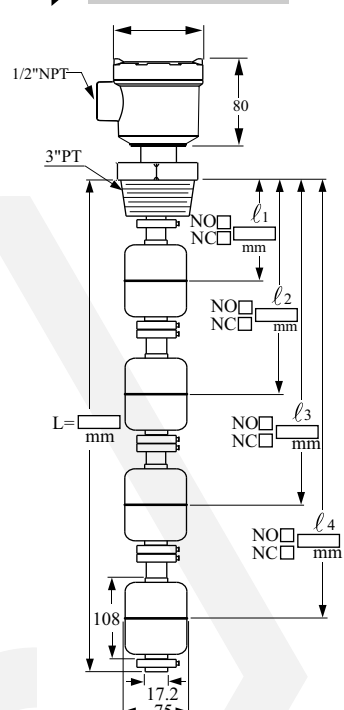
Type RF-D-FQ-4-S4-4



Type RF-D-HQ-7-S6-4



Type RF-N-HQ-7-S6-4

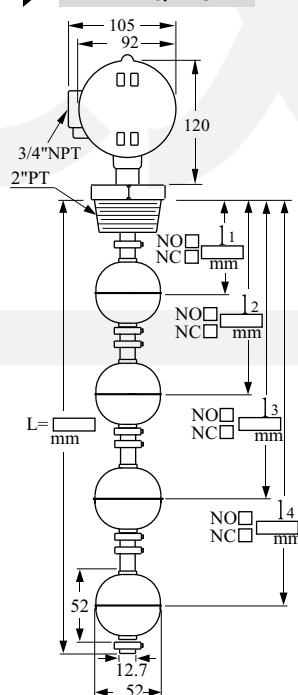


Order information

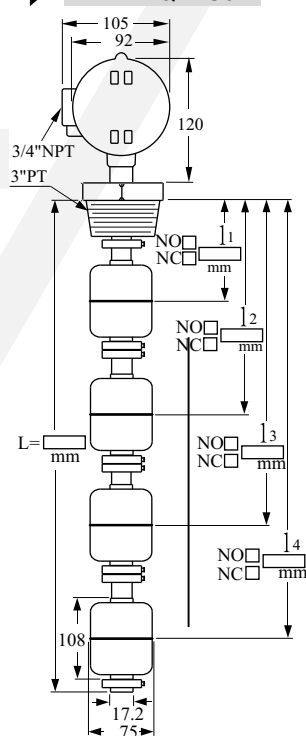
Type
Housing Type (D, K, N Type)
RF - D - HQ - 7 - S6 - 4

Connection Flanges	Pipe Diameter	Float Type	Float Quantity
EQ=1-1/2" PT	3= 9.5	S2= 41x38	1~ 4
FQ=2" PT	4= 12.7	S3= 45x55	1~ 4
FQ=2" PT	4= 12.7	S4= 52x52	1~ 4
HQ=3" PT	7= 17.2	S6= 75x108	1~ 4

Type RF-K-FQ-4-S4-4

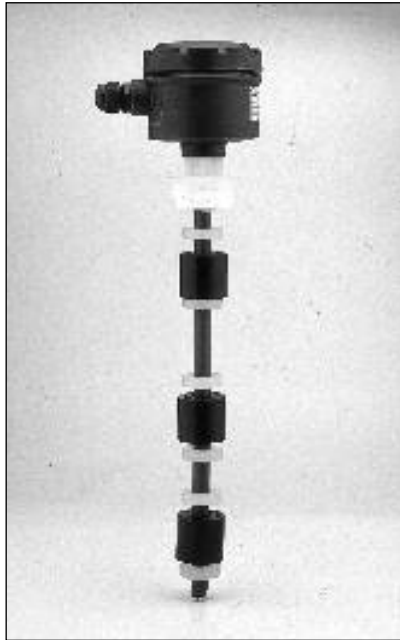


Type RF-K-HQ-7-S6-4

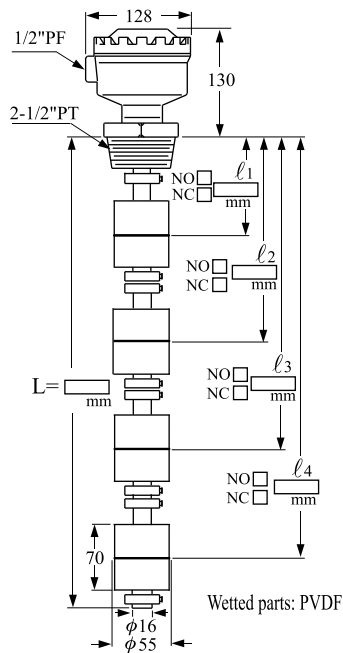


ANTI-CORROSION THREAD TYPE FLANGE TYPE

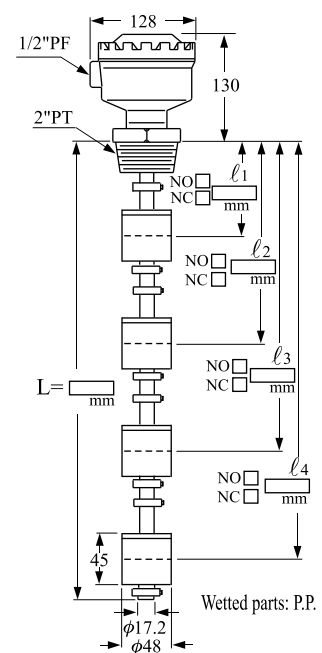
* Housing material apply by PP, wet portion material options in PP, PVDF, specially applicable for chemical applications against corrosive environments.



Type RF-C-GQ-6-F1-4



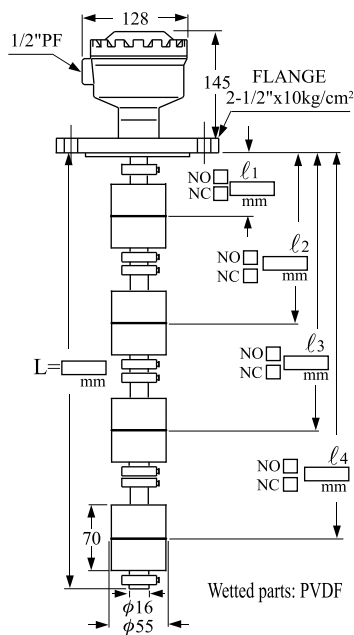
Type RF-C-FQ-5-P3-4



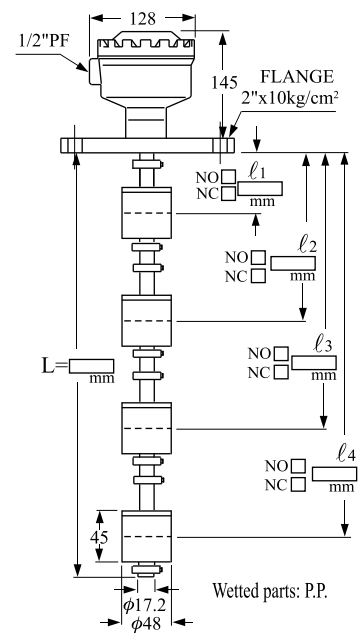
Order information

Type Housing Type			
RF - C - FQ - 6 - F1 - 4			
Connection Flanges	Pipe Diameter	Float Type	Float Quantity
GQ=2-1/2" PT	6= $\phi 16$	F1=PVDF $\phi 55 \times 70$	1~4
FQ=2" PT	5= $\phi 17.2$	P3=PP $\phi 48 \times 45$	1~4
GN=2-1/2" 10kg/cm ²	6= $\phi 16$	F1=PVDF $\phi 55 \times 70$	1~4
FN=2" 10kg/cm ²	5= $\phi 17.2$	P3=PP $\phi 48 \times 45$	1~4

Type RF-C-GN-6-F1-4



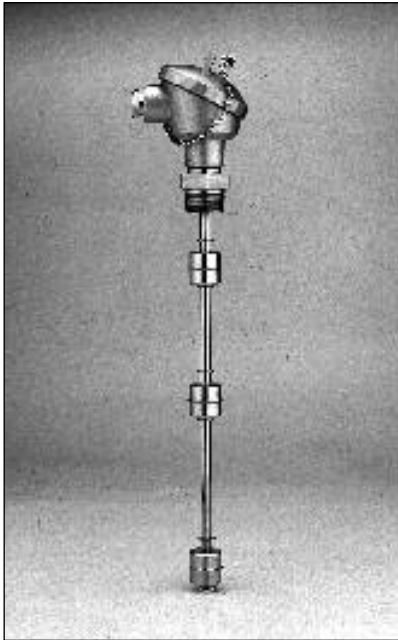
Type RF-C-FN-5-P3-4



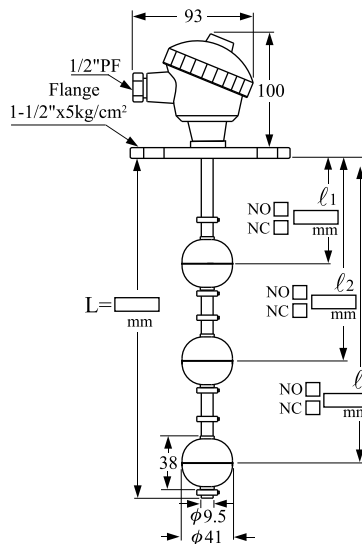
PORTABILITY

THREAD TYPE FLANGE TYPE

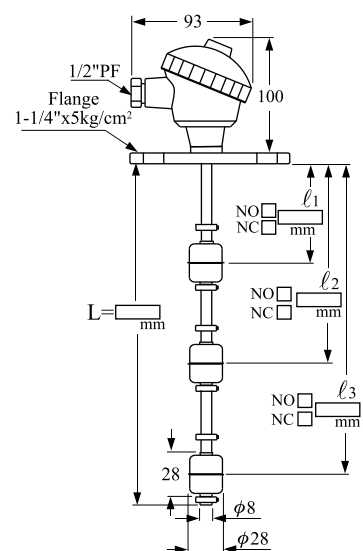
* The housing complies with the IP65 rating and can therefore be used in outdoor environment.



Type RF-E-EM-3-S2-3



Type RF-E-3M-1-S1-3

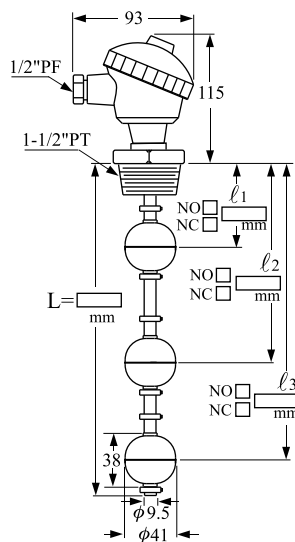


Order information

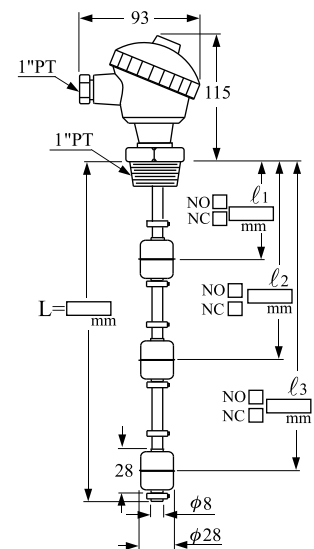
Type Housing Type
RF - E - 3Q - 1 - S1 - 3

Connection Flanges	Pipe Diameter	Float Type	Float Quantity
EM=1-1/2" 5kg/cm ²	3= ϕ 9.5	S2= ϕ 41x38	1~3
3M=1-1/4" 5kg/cm ²	1= ϕ 8	S1= ϕ 28x28	1~3
EQ=1-1/2" PT	3= ϕ 9.5	S2= ϕ 41x38	1~3
DQ=1"PT	1= ϕ 8	S1= ϕ 28x28	1~3

Type RF-E-EQ-3-S2-3



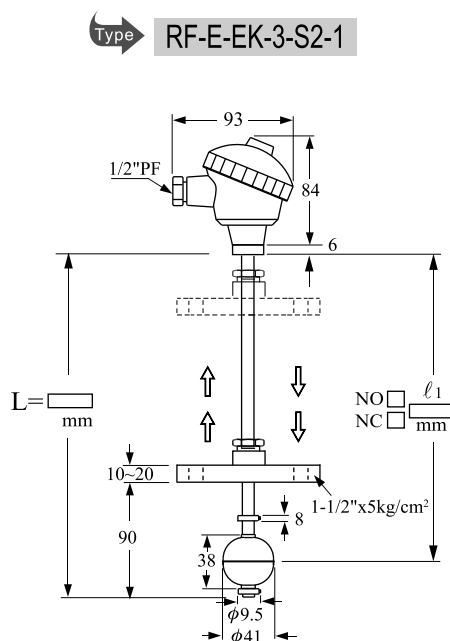
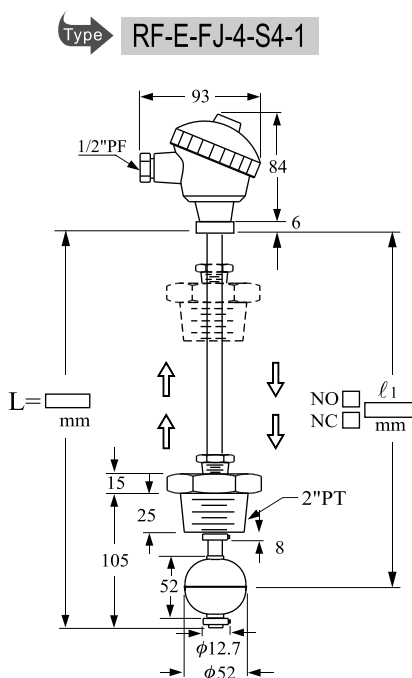
Type RF-E-DQ-1-S1-3



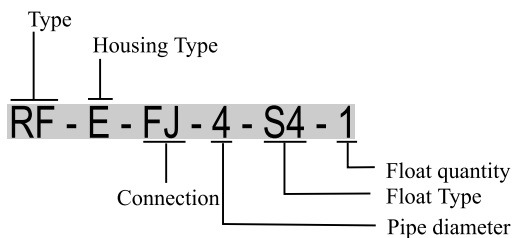
VERTICAL ADJUSTMENT TYPE

This is a special design for some liquid applications requiring monitoring different actuation levels frequently. The user needs only to loose the hexagon nut, then remove the mounted screw/flange up or down to achieve the actuated level position adjustment.

- * Applicable at tank interior pressure under 5kg/cm^2 .
- * Standard specification 80°C , special order of max. 200°C available.
- * Switch contact: 10W/250VAC SPDT
50W/250VAC SPST
40W/250VAC SPDT
- * Customer specified flange / screw acceptable.



Order information



Connection	Pipe Diameter	Float Type
EJ=1-1/2" PT	3= $\phi 9.5$	S2= $\phi 41 \times 38$
FJ=2" PT	4= $\phi 12.7$	S4= $\phi 52 \times 52$
EK=1-1/2" 5kg/cm ²	3= $\phi 9.5$	S2= $\phi 41 \times 38$

* Please specify the $\ell 1$ while placing an order. (Length from lower end of housing to center line of float ball)

MARINE GRADE APPROVAL



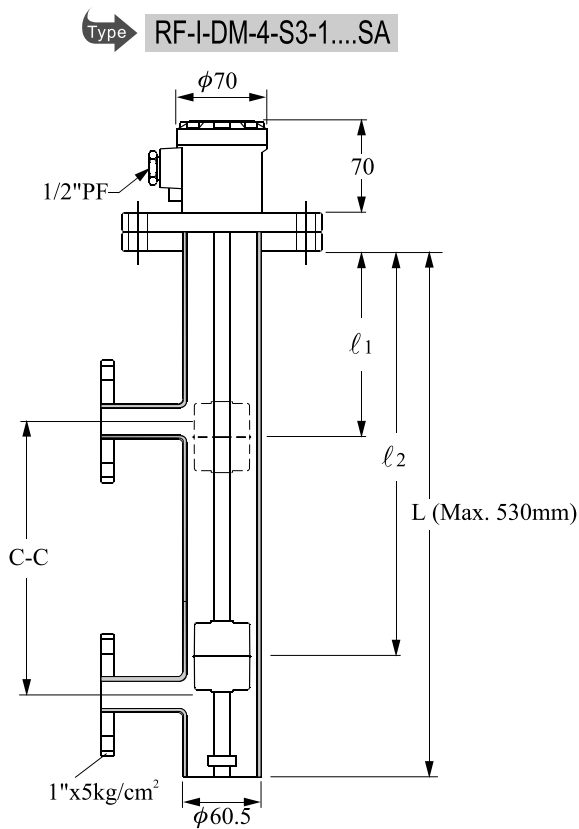
Germanischer Lloyd
(Germany)



American Bureau of
Shipping (USA)

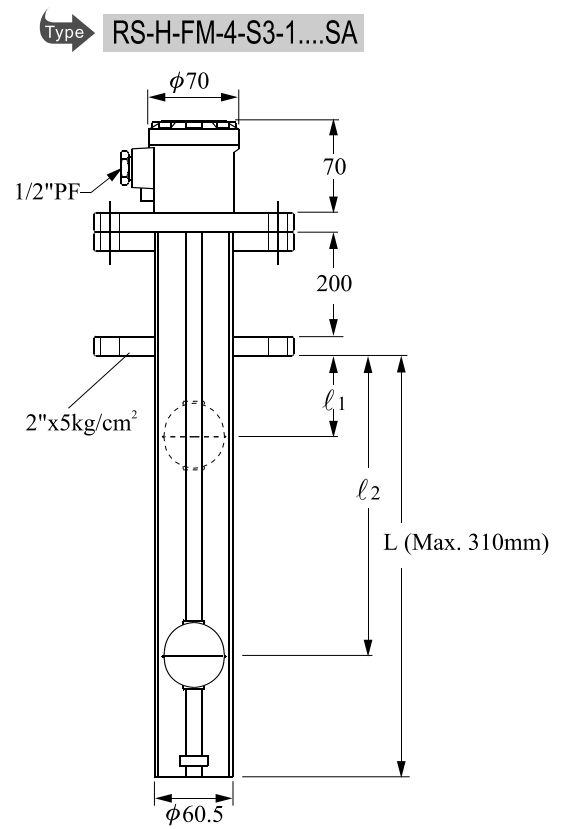


China Corporation
Register of Shipping



RF - I - DM - 4 - S3 - 1....SA

Connection Float quantity
 Float Type
 Pipe diameter



RS - H - FM - 4 - S4 - 1....SA

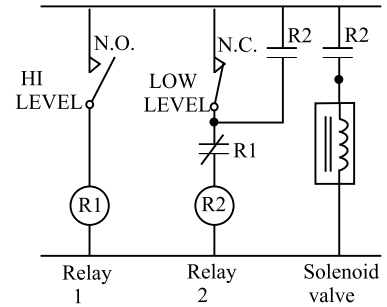
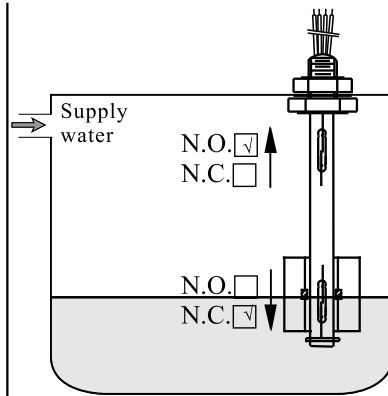
Connection Float quantity
 Float Type
 Pipe diameter

* Please specify the l_1 , l_2 , C-C and L while placing an order.
(Length from lower end of flange to center line of float ball)

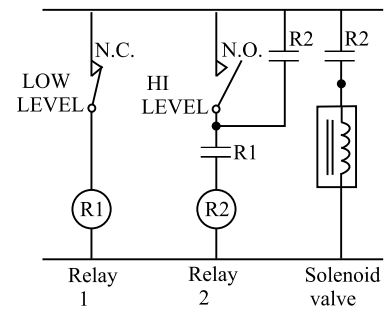
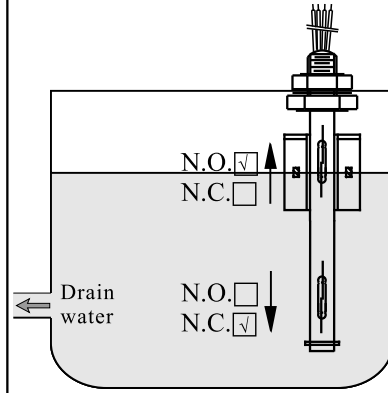
Connection	Pipe Diameter	Float Type
DM=1"x 5kg/cm ²	4= ϕ 12.7	S3= ϕ 45x55
FM=2"x 5kg/cm ²	4= ϕ 12.7	S4= ϕ 52x52

TYPICAL WIRING DIAGRAMS

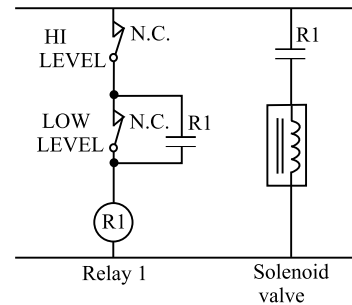
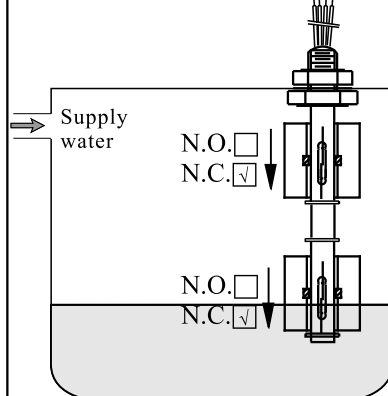
* AUTO SUPPLY CASE:
SINGLE FLOAT DUAL SWITCH



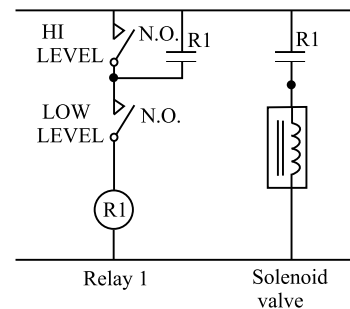
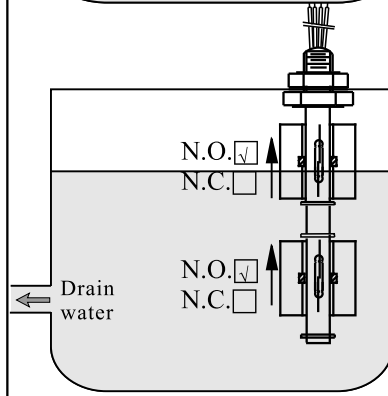
* AUTO DRAIN CASE:
SINGLE FLOAT DUAL SWITCH



* AUTO SUPPLY CASE:
DUAL FLOAT DUAL SWITCH



* AUTO DRAIN CASE:
DUAL FLOAT DUAL SWITCH

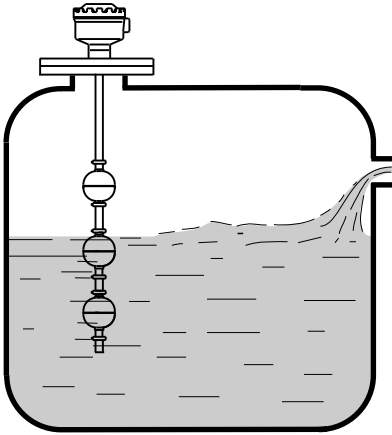


Note: The "N.O." means normally opened circuit of the reed switch (off) in lower liquid level. As the float moves up to the specified higher level, the circuit closes (on).

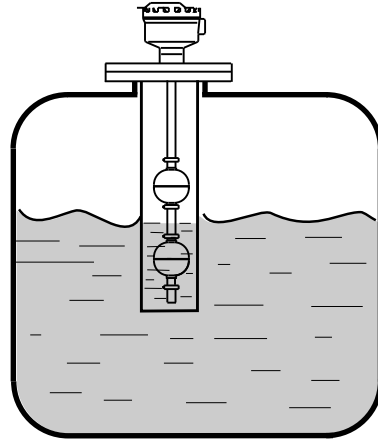
The "N.C." means normally closed circuit of the reed switch (on) in lower liquid level. As the float moves up to the specified higher level, the circuit opens (off).

INSTALLATION

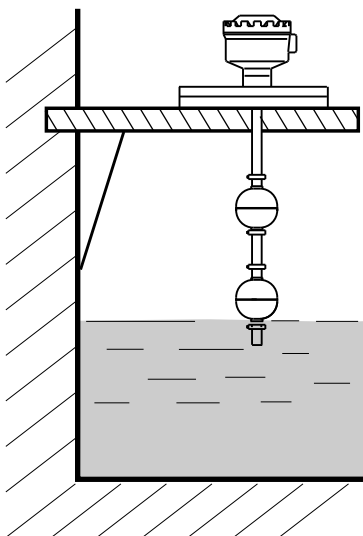
- The float level switch should be mounted far away from liquid inlet, any strong liquid fluctuation will produce error output signals.



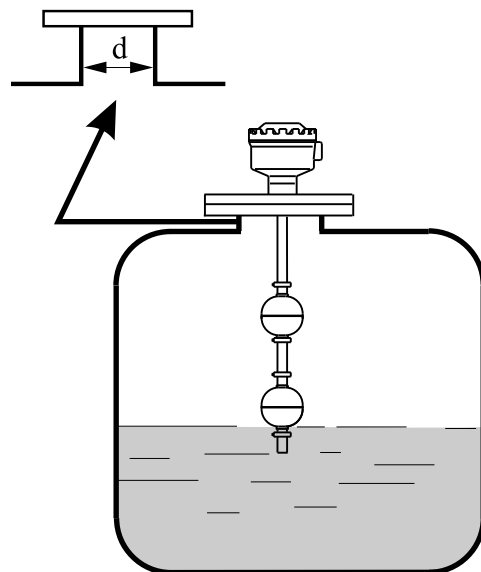
- It is requested a pipe shield or equivalent device to normalize the switch actuation if the switch is used with any agitator application.



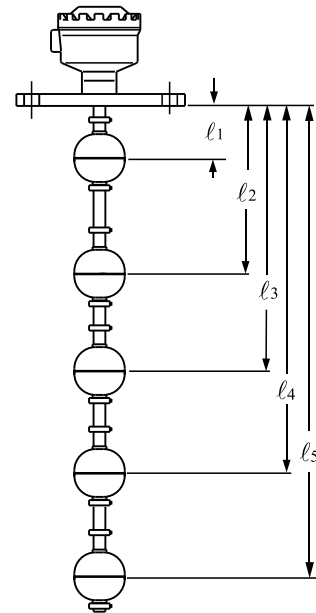
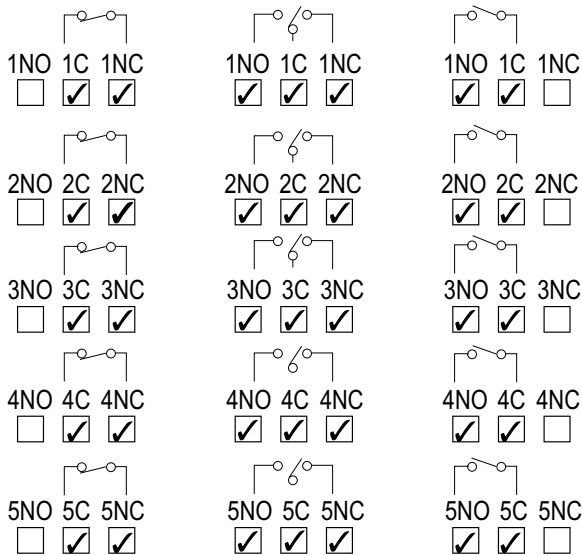
- It had better require an L type supporter, when the switch is mounted in concrete wall tank as figure below.



- It is recommended to select the standpipe with diameter larger than the float ball for installation process.



CONNECTION DIAGRAMS



- ※ $\begin{matrix} \text{NO} & \text{C} & \text{NC} \\ \square & \square & \square \end{matrix}$ means that the B-C circuit will be close while liquid level lower than the float ball, by mark of. (↓ on)
- ※ $\begin{matrix} \text{NO} & \text{C} & \text{NC} \\ \square & \square & \square \end{matrix}$ means that the A-C circuit will be close while liquid level higher than the float ball, by mark of. (↑ on)
- ※ $\begin{matrix} \text{NO} & \text{C} & \text{NC} \\ \square & \square & \square \end{matrix}$ means that the A-C circuit will be close while liquid level higher than the float ball, and B-C circuit will be close while liquid level lower than the float ball.

※ Please screw the housing cap tightly and fix the conduit outlet, it will reinforce the housing performance against the moisture and direct water. ($\phi 8\text{mm}$ multiple cord is recommended for wiring)

※ If the end user is intended to adjust the actuation level position independently, please move the float ball(s) position as well as the interior reed switches, otherwise, it will appear an error or no signal.

HOW TO MAKE YOUR ORDER

RF - - - - - -

Length: mm(total)

Quantity of float

Float Type

Type	Material	Ball dia.	Tube dia.
P1	PP	φ 25x15	φ 10
P2	PP	φ 25x25	φ 10
P3	PP	φ 48x45	φ 18.5
F1	PVDF	φ 55x70	φ 22
F2	PP	φ 44x44	φ 14
S1	SUS	φ 28x28	φ 9.5
S2	SUS	φ 41x38	φ 11
S3	SUS	φ 45x55	φ 15
S4	SUS	φ 52x52	φ 15
S5	SUS	φ 75x73	φ 19
S6	SUS	φ 75x108	φ 19

Stem

Code size	Material
1: φ 8	SUS304 or SUS316
2: φ 8	PVC
3: φ 9.5	SUS304 or SUS316
4: φ 12.7	SUS304 or SUS316
5: φ 17.2	P.P.
6: φ 16	PVDF
7: φ 17.2	SUS304

Housing type

B: AL. (Big space) IP65
 C: P.P. (Anti-acidity) IP65
 D: AL. (Explosion-proof)
 Ex d IIB T4
 E: AL. (Small space) IP65
 G: PC (Anti-acidity) IP65
 K: AL. (Explosion-proof)
 Ex d IIC T6
 N: SUS (Explosion-proof)
 Ex d IIB T4
 -: Without housing

Size for flange or screw		Pressure range or other	
A: 3/8" (10A)	I: 4" (100A)	M: 5kg/cm ² JIS	W: PN10 (10Bar)
B: 1/2" (15A)	J: 5" (125A)	N: 10kg/cm ² JIS	X: PN16 (16Bar)
C: 3/4" (20A)	K: 6" (150A)	O: 150Lbs ANSI	Y: PN25 (25Bar)
D: 1" (25A)	S: Others	P: 300Lbs ANSI	Z: PN40 (40Bar)
E: 1-1/2" (40A)	1: 1/8"	Q: PT	J: Adjustment
F: 2" (50A)	2: 1/4"	R: PF	Screw
G: 2-1/2" (65A)	3: 1-1/4" (32A)	T: BSP (DIN)	K: Adjustment
H: 3" (80A)		U: NPT	Flange
		S: Others	