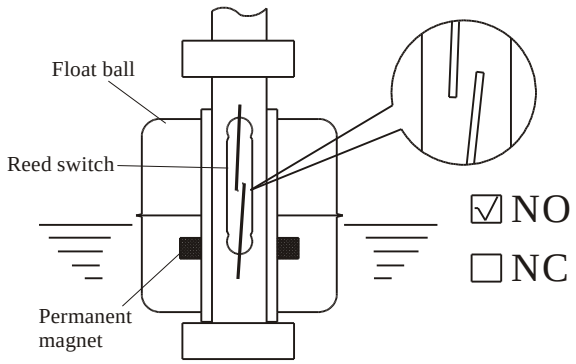
http: //www.fine-tek.com
e-mail: info@fine-tek.com
Tel: 886-2-22696789 Fax: 886-2-22686682

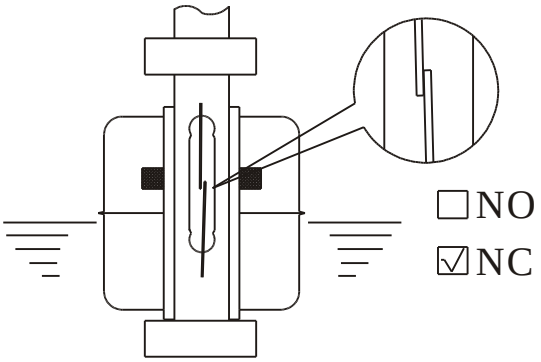
## PRINCIPLE

The single unit or multiple reed switch units are housed tightly in stainless steel or engineering plastic stem, and the permanent magnet is sealed 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 graduating 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 IP65.

★ Rugged construction and multiple options for materials from engineering plastics as PVDF, PP, PVC, and stainless steels as SUS304, 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, 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 | Material | Switching Contact from | Switching Capacity Max. | Switching Voltage Max. | Switching Current Max. | Carry Current Max. |
|---|---|---|---|---|---|---|
| OD8 | SUS | SPST | 50W | 300Vac/350Vdc | 0.5A | 2.5A |
| | PVC | SPDT | 20W | 150Vac/200Vdc | 1A | 2A |
| OD9.5 | SUS | SPST | 50W | 300Vac/350Vdc | 0.5A | 2.5A |
| | | SPDT | 20W | 150Vac/200Vdc | 1A | 2A |
| OD12.7 | SUS | SPST | 60W | 220Vac/500Vdc | 3A | 4A |
| | | SPDT | 60W | 400Vac/1000Vdc | 1A | 2A |
| OD16 | PVDF | SPST | 60W | 220Vac/500Vdc | 3A | 4A |
| | | SPDT | 60W | 400Vac/1000Vdc | 1A | 2A |
| OD17.2 | PP | SPST | 60W | 220Vac/500Vdc | 3A | 4A |
| | | SPDT | 60W | 400Vac/1000Vdc | 1A | 2A |

## 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

# CHEMICAL RESISTANCE

● Excellent ○ Good △ Fair × Corroded

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

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

● Excellent ○ Good △ Fair × Corroded

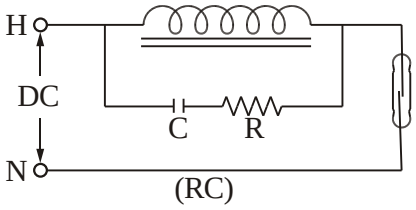
| Chemical | Concentration | Temp | | Plastic | | | | Rubber | Stainless | |
|---|---|---|---|---|---|---|---|---|---|---|
| | % | °C | °F | PVC | PP | PVDF | PTFE | NBR | 304 | 316 |
| Citric Acid | 10 | 40 | 104 | ● | ● | ● | ● | ● | ● | ● |
| $C_6H_8O_7$ | 10 | 80 | 176 | | ○ | ● | ● | ● | | |
| Gasoline | 10 | 40 | 104 | ● | | ● | ● | | | |
| | 10 | 80 | 176 | | | ● | ● | | | |
| Diesel Fuels | | 40 | 104 | | | ● | ● | | ● | ● |
| | | 80 | 176 | | | ● | ● | | ● | ● |
| Ethyl Alchol | Pure | 40 | 104 | ● | ● | ● | ● | ● | ○ | ○ |
| $C_2H_5OH$ | Pure | 80 | 176 | | ○ | ● | ● | ○ | | |
| Formic Acid | 90 | 40 | 104 | ○ | ○ | ● | ● | | | |
| HCOOH | 90 | 80 | 176 | | | ● | ● | | | |
| Hydrofluric Acid | Dilute | 40 | 104 | ● | ○ | ● | ● | | | |
| | Dilute | 80 | 176 | | ○ | ● | ● | | | |
| HF | 30 | 40 | 104 | ○ | ○ | ● | ● | | | |
| | 30 | 80 | 176 | × | ○ | ● | ● | | | |
| | 40 | 40 | 104 | △ | ○ | ● | ● | | | |
| | 40 | 80 | 176 | | ○ | ● | ● | | | |
| | 50 | 40 | 104 | △ | ○ | ● | ● | | | |
| | 50 | 80 | 176 | | ○ | ● | ● | | | |
| Hydrogen peroxide | 5 | 40 | 104 | ● | ● | ● | ● | | ○ | ● |
| | 5 | 80 | 176 | | ○ | ● | ● | | | |
| $H_2O_2$ | 20 | 40 | 104 | ● | ● | ● | ● | | | |
| | 20 | 80 | 176 | | ○ | ● | ● | | | |
| | 30 | 40 | 104 | ○ | ○ | ● | ● | | | |
| | 30 | 80 | 176 | | △ | ● | ● | | | |
| | 50 | 40 | 104 | △ | × | ● | ● | | | |
| | 50 | 80 | 176 | | | ● | ● | | | |
| | 90 | 40 | 104 | | | ● | ● | | | |
| | 90 | 80 | 176 | | | ● | ● | | | |
| Isopropyl Alcohol | Pure | 40 | 104 | ● | ● | ● | ● | ○ | | |
| $(CH_3)CHOH$ | Pure | 80 | 176 | | | ● | ● | | | |
| Kerosene | | 40 | 104 | ● | ○ | ● | ● | | | |
| | | 80 | 176 | | | ● | ● | | | |
| Methyl Alcohol | | 40 | 104 | ○ | ● | ● | ● | △ | | |
| $CH_3OH$ | | 80 | 176 | | ○ | ● | ● | | | |
| Methyl Ethyl Ketone | | 40 | 104 | | △ | | ● | | | |
| $CH_3CO\ C_2H_5$ | | 80 | 176 | | | | ● | | | |
| Potassium Chromate | | 40 | 104 | ● | ● | ● | ● | ● | | |
| $K_2CrO_4$ | | 80 | 176 | | ○ | ● | ● | ○ | | |

# 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).

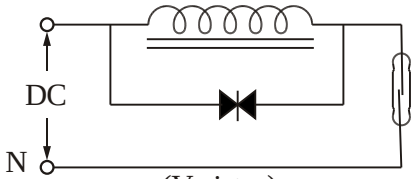
Such high induced voltage (transients) may cause damages to the reed switch or significantly reduce its life.
Therefore, protective circuits such as: RC (snubber), varistors or clamping diodes are recommended.



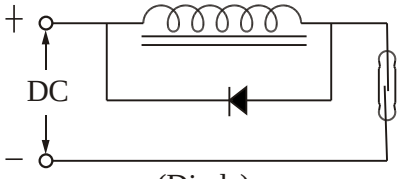
(RC)

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

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



(Varistor)



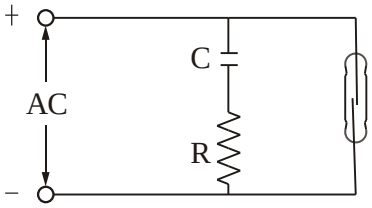
(Diode)

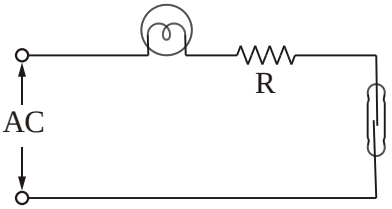
★ It is prohibited to connect directly with any solenoid valve, motor or magnetic switch.

## 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.

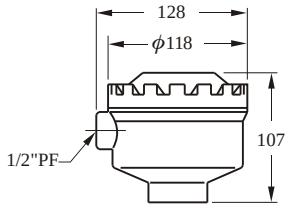
Therefore, protective circuits such as: surge suppressors or current limiting resistors are recommended.



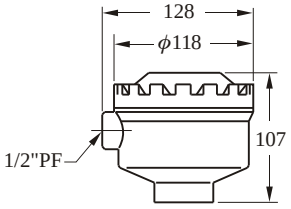
# HOUSING SPECIFICATION

## B



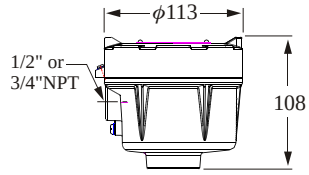

Material : Aluminum
Enclosure : IP65
Max.Temp.: -20℃ ~200℃

## C



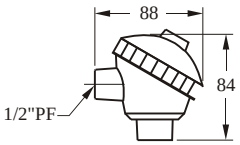

Material : PP+Fiber
Enclosure : IP65
Max.Temp.: -20℃ ~80℃

## D Explosion-proof



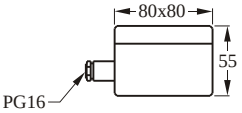

Material : Aluminum
Enclosure : NEPSI Ex d IIC T3~T6
ATEX Ex II 2G EEx d IIB T3~T6
ATEX Ex II 2D IP65 T3~T6
Max.Temp.: -20℃ ~200℃

## E



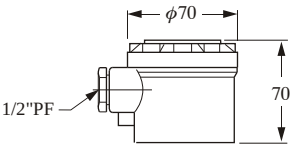

Material : Aluminum
Enclosure : IP65
Max.Temp.: -20℃ ~200℃

## G



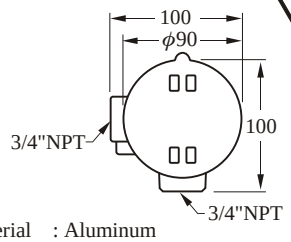

Material : PC
Enclosure : IP65
Max.Temp.: -20℃ ~80℃

## H



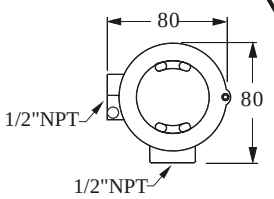

Material : Aluminum
Enclosure : IP65
Max.Temp.: -20℃ ~100℃

## K Explosion-proof




Material : Aluminum
Enclosure : CESI 03 ATEX 108
Ex II 2G EEx d IIC T6
Max.Temp.: -20℃ ~100℃

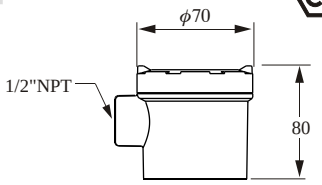
## L Explosion-proof




Material : Aluminum
Enclosure : CESI 03 ATEX 108
Ex II 2G EEx d IIC T6
Max.Temp.: -20℃ ~100℃

*Recommend for flow switch used

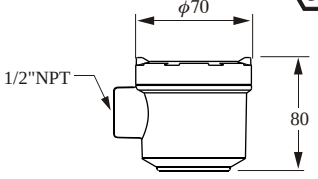
## M Explosion-proof




Material : SUS316
Enclosure : NEPSI Ex d IIC T3~T6
ATEX Ex II 2G EEx d IIB T3~T6
ATEX Ex II 2D IP65 T3~T6
Max.Temp.: -20℃ ~200℃

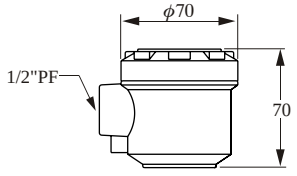
*Recommend for side float sw. used

## N Explosion-proof




Material : SUS316
Enclosure : NEPSI Ex d IIC T3~T6
ATEX Ex II 2G EEx d IIB T3~T6
ATEX Ex II 2D IP65 T3~T6
Max.Temp.: -20℃ ~200℃

## X

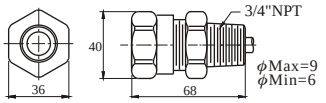



Material : Aluminum
Enclosure : IP65
Max.Temp.: -20℃ ~100℃

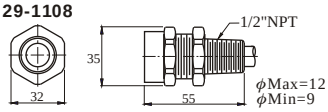
## Cable Conduit EEx d IIC

Material: Washer ---NBR
Body--- Aluminum(3/4" NPT)
Nickel plated (1/2" NPT)

**29-1104**




**29-1108**



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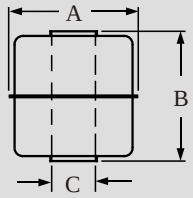
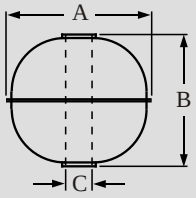
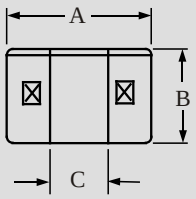
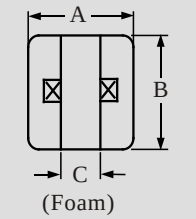
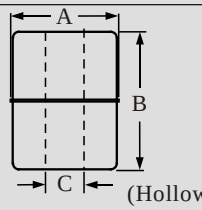
# FLOAT SPECIFICATIONS

| MODEL | TYPE | ϕAxBxϕC | S.G. | Max. Pressure ($kg/cm^2$) | Weight (g) | Material/Color | Max. Temp. (°C) |
|---|---|---|---|---|---|---|---|
|  | **S1** | 28×28×9.5 | E>0.7 | 10 | 8 | SUS 316 | 200 |
| | **S3** | 45×55×15 | E>0.65 | 12 | 37.6 | SUS 316 | 200 |
| | **S6** | 75×108×20 | E>0.5 | 10 | 165 | SUS 304 | 200 |
|  | **S2** | 41×38×11 | E>0.7 | 35 | 19.5 | SUS 316 | 200 |
| | **S4** | 52×52×15 | E>0.55 | 30 | 33.4 | SUS 316 | 200 |
| | **S5** | 75×73×19 | E>0.65 | 30 | 102.4 | SUS 304 | 200 |
| | **S7** | 30×28×9.5 | E>0.82 | 30 | 8 | SUS 316 | 200 |
| | **S10** | 30×32×9.5 | E>0.82 | 50 | 8.6 | SUS 316 | 200 |
|  (Hollow) | **P1** | 25×15×10 | E>0.65 | 4 | 3.5 | PP / white black | 80 |
| | **P2** | 25×25×10 | E>0.55 | 4 | 5 | PP / white black | 80 |
| | **P3** | 48×45×18.5 | E>0.6 | 5 | 35.5 | PP / black | 80 |
| | **P4** | 20×25×10 | E>0.7 | 4 | 3.7 | PP / black | 80 |
|  (Foam) | **Q7** | 25×25×10 | E>0.7 | ATM | 6.7 | PP / white | 80 |
| | **N1** | 25×15×10 | E>0.5 | ATM | 2.7 | NBR / black | 100 |
| | **N2** | 18.5×26×10 | E>0.7 | ATM | 3.3 | NBR / black | 100 |
| | **N3** | 19×20×10 | E>0.55 | ATM | 2.4 | NBR / black | 100 |
| | **N4** | 17.5×25×10 | E>0.65 | ATM | 2.5 | NBR / black | 100 |
| | **N5** | 30×45×12.8 | E>0.5 | ATM | 11.5 | NBR / black | 100 |
|  (Hollow) | **F2** | 42×44×14 | E>0.63 | 5 | 18.5 | PP | 80 |
| | **F3** | 45×45×20 | E>0.65 | 5 | 35.7 | PP | 80 |
| | **F4** | 48×60×18 | E>0.75 | 5 | 65.3 | PVDF | 120 |

# ORDER SPECIFIED

## THE PROPERTIES BETWEEN LIQUID AND FLOAT

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

**1. Temperature:** PVDF Max. 120°C,
PP Max. 80°C,
SUS304/ 316 Max. 200°C

**2. Pressure:** SUS304/ 316 Float, Max. 35kg/cm$^2$
Engineering plastic, Max. 5kg/cm$^2$

**3. Viscosity:** Please choose smaller S.G. with greater diameter floats to cope with high viscosity liquid applications.

**4. Chemical:** Please use plastic float for acid/ alkaline corrosion of chemical applications. PVDF float is noted for high temperature cases.

**5. Benzine:** Please choose stainless steel floats to apply in any gasoline, fuel oil, petroleum application.

**6. S.G.:** The float S.G. Must be smaller than the liquid, otherwise, the liquid buoyancy can not deliver the float upword.

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 multiple actuated points is available to apply on the order form.

**Example: FD B HM 7 S6 3 0405**

Housing Type | Connection | Stem (Tube) Type | Float Type | Float Number | Total Float Working Distance

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.

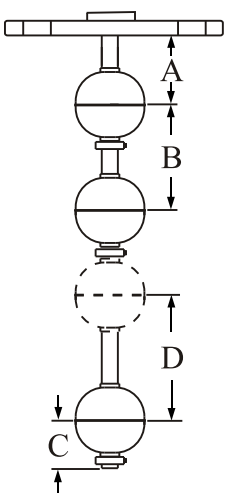
C= Minimum distance from end of the lowest level.

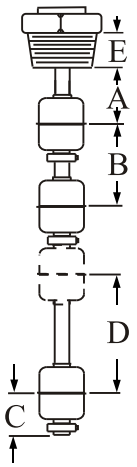
D= Minimum distance between two actuation levels by one float.

E= Screw length

| FLOAT TYPE | S1 | S2 | S3 | S4 | S5 | S6 | P1 | P2 | P3 | F4 |
|---|---|---|---|---|---|---|---|---|---|---|
| A(mm) | 25 | 32 | 40 | 39 | 50 | 70 | 23 | 27 | 47 | 55 |
| B(mm) | 50 | 64 | 82 | 78 | 99 | 136 | 44 | 55 | 85 | 98 |
| C(mm) | 25 | 32 | 40 | 39 | 50 | 70 | 23 | 31 | 43 | 50 |
| D(mm) | 30 | 40 | 55 | 50 | 65 | 70 | 30 | 30 | 45 | 65 |

| SCREW | 1/2" | 3/4" | 1" | 1-1/4" | 1-1/2" | 2" | 2-1/2" | 3" |
|---|---|---|---|---|---|---|---|---|
| (E) (mm) | 14 | 16 | 19 | 22 | 22 | 25 | 28 | 32 |



# HOW TO MAKE YOUR ORDER

**F D B (H M) 7 S 6 3 0 5 0 0 A (T)**

T: Test Rog
P: Pipe Shield

**Contact Form**

**A:** SPST **C:** SPDT **F:** 1 float 2 points
**G:**1 float 3 points **–:** No contact

**Length: mm (total)**

**0500:** 50cm (01~50) ※ 50cm per Unit
**1000:** 100cm (51~100)
**1500:** 150cm (101~150)

**Quantity of float**

**Float Type (see page 7)**

P1,P2, P3, P4
F2, F3, F4
S1, S2, S3, S4, S5, S6, S7, S0(S10)
Q7, N1, N2, N3, N4, N5

**Stem**

| Code size | Material | Code size | Material | Code size | Material |
|---|---|---|---|---|---|
| 0: $\phi$8 | PP | 6: $\phi$16 | PVDF | A: $\phi$8 | SUS316 |
| 1: $\phi$8 | SUS304 | 7: $\phi$17.2 | SUS304 | B: $\phi$9.5 | SUS316 |
| 2: $\phi$8 | PVC | 8: $\phi$12.7 | P.P. | C: $\phi$12.7 | SUS316 |
| 3: $\phi$9.5 | SUS304 | 9: $\phi$12.7 | PVC | D: $\phi$17.2 | SUS316 |
| 4: $\phi$12.7 | SUS304 | | | E: $\phi$8 | PFA |
| 5: $\phi$17.2 | P.P. | | | S: Other Materials | |

**Connection Type**

**Housing Type**

B: AL. (Big space) IP65
C: PP (Anti-acidity) IP65
D: Aluminum Ex d IIC T4
E: AL. (Small space) IP65
G: PC (Anti-acidity) IP65
K: AL. (Explosion-proof) EEx d IIC T6
H: Aluminum(IP65)
N: SUS304 or SUS316 Ex d IIC T4
–: Without housing
2 : Side Mounting

**C: Plastic (Stem)**
**D: Metal (Stem)**

※Certified by GL, ABS Marine grade are available. (Please see page 17)

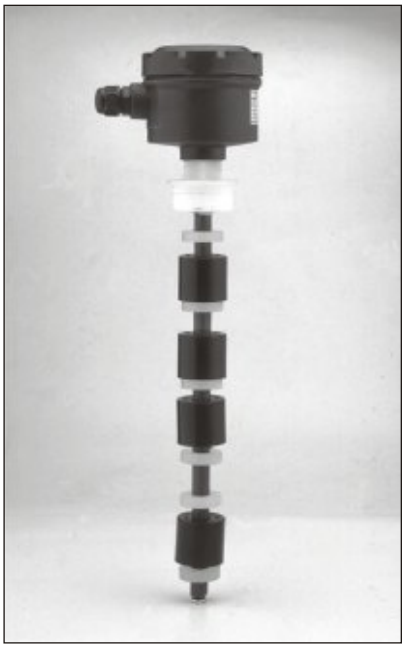
| Size for flange or screw |
|---|
| A: 3/8" (10A) |
| B: 1/2" (15A) |
| C: 3/4" (20A) |
| D: 1" (25A) |
| E: 1-1/2"(40A) |
| F: 2" (50A) |
| G: 2-1/2"(65A) |
| H: 3" (80A) |
| I: 4"(100A) |
| J: 5"(125A) |
| K: 6"(150A) |
| S: Others |
| 1: 1/8" |
| 2: 1/4" |
| 3: 1-1/4"(32A) |

| Pressure range or other |
|---|
| M: 5kg/cm² JIS |
| N: 10kg/cm² JIS |
| O: 150Lbs ANSI |
| P: 300Lbs ANSI |
| Q: PT |
| R: PF (G) |
| T: BSP (DIN) |
| U: NPT |
| S: Others |
| W: PN10(10Bar) |
| X: PN16 (16Bar) |
| Y: PN25 (25Bar) |
| Z: PN40 (40Bar) |
| J : Adjustment screw |
| K: Adjustment flange |
| A: PT (nut type) |
| B: PF (nut type) |
| C: BSP (nut type) |
| U: NPT(nut type) |

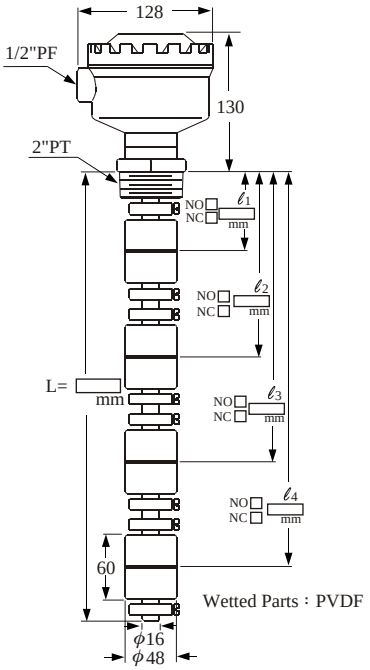
※Tri-Clamp (Screw Size+S) ex. 1-1/2"=ES;2"=FS

# ANTI-CORROSION SCREW TYPE / FLANGE TYPE

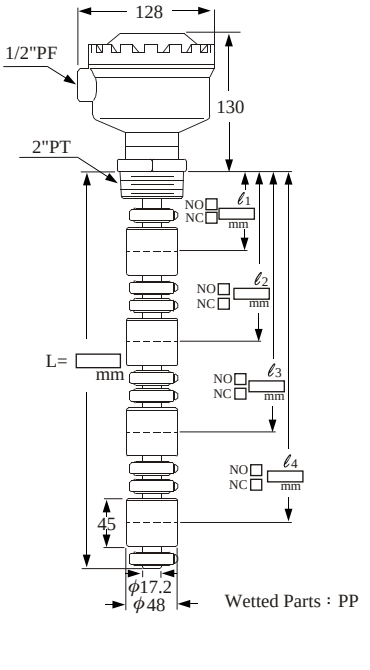
Housing material apply by PP, wet portion material options in PP, PVDF, specially applicable for chemical applications against corrosive environments.



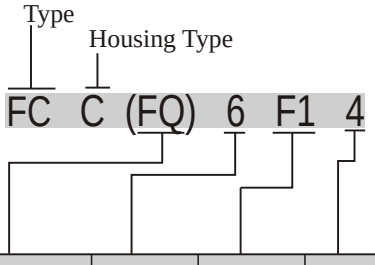
Type FC C (FQ) 6 F4 4




Type FC C (FQ) 5 P3 4



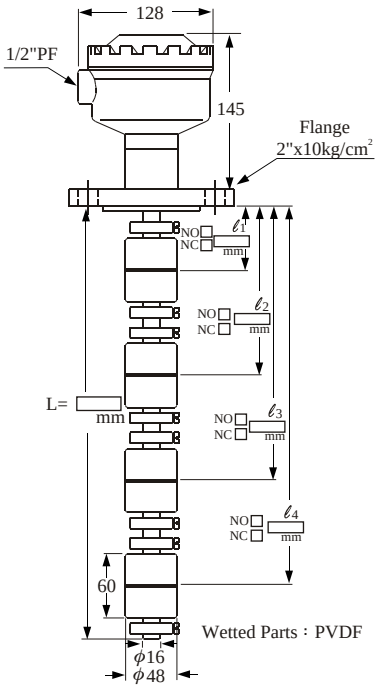

## Order information



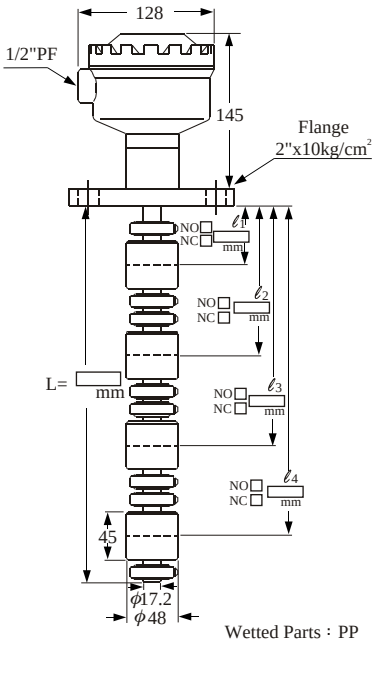

| Connection Flanges | Pipe Diameter | Float Type | Float Quantity |
|---|---|---|---|
| FQ=2" PT | 6= $\phi$16 | F4=PVDF $\phi$48x60 | 1~ 4 |
| FQ=2" PT | 5= $\phi$17.2 | P3=PP $\phi$48x45 | 1~ 4 |
| FN=2" 10kg/cm$^2$ | 6= $\phi$16 | F4=PVDF $\phi$48x60 | 1~ 4 |
| FN=2" 10kg/cm$^2$ | 5= $\phi$17.2 | P3=PP $\phi$48x45 | 1~ 4 |

※FCC(FQ) & (FN)2" flange/thread are available,too.

Type FC C (FN) 6 F4 4




Type FC C (FN) 5 P3 4



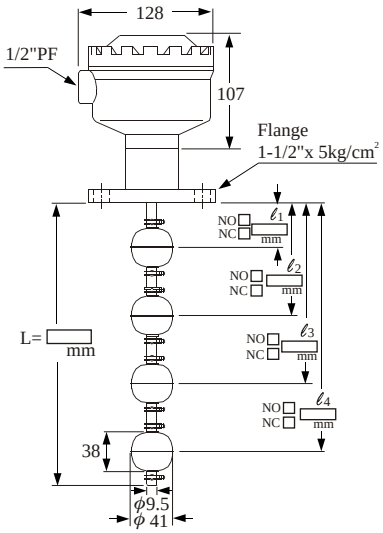



FineTek

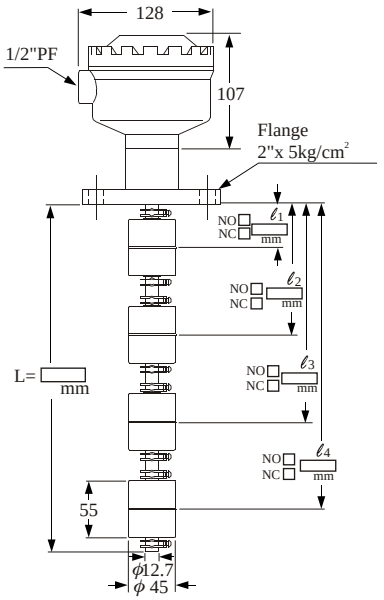
# STANDARD FLANGE TYPE

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

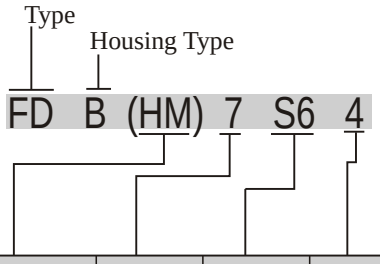
Type FD B (EM) 3 S2 4




Type FD B (FM) 4 S3 4

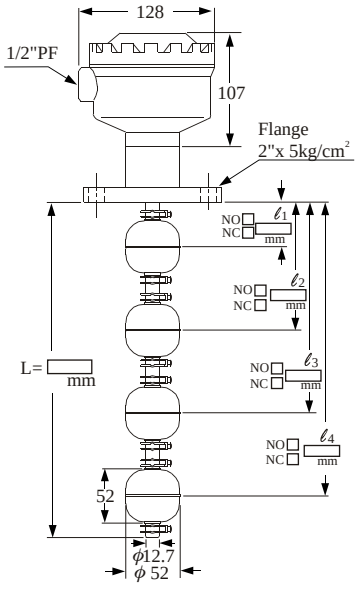



## Order information

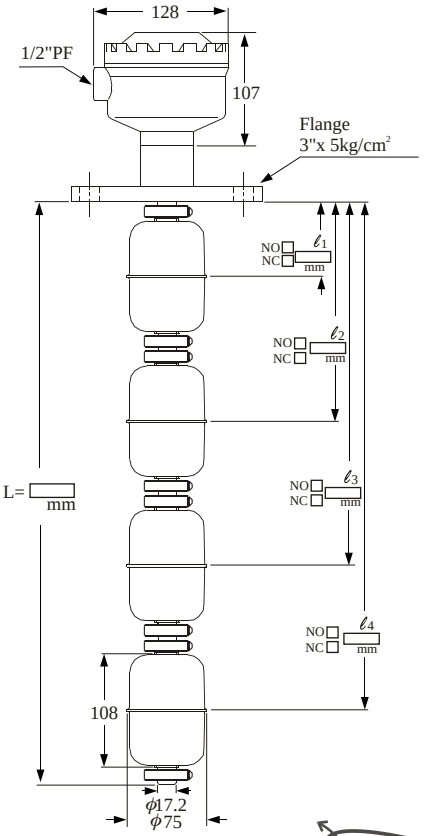



| Connection Flanges | Pipe Diameter | Float Type | Float Quantity |
|---|---|---|---|
| EM=1-1/2" 5kg/cm² | 3= ϕ9.5 | S2= ϕ41x38 | 1~ 4 |
| FM=2" 5kg/cm² | 4= ϕ12.7 | S3= ϕ45x55 | 1~ 4 |
| FM=2" 5kg/cm² | 4= ϕ12.7 | S4= ϕ52x52 | 1~ 4 |
| HM=3" 5kg/cm² | 7= ϕ17.2 | S6= ϕ75x108 | 1~ 4 |

Type FD B (FM) 4 S4 4




Type FD B (HM) 7 S6 4



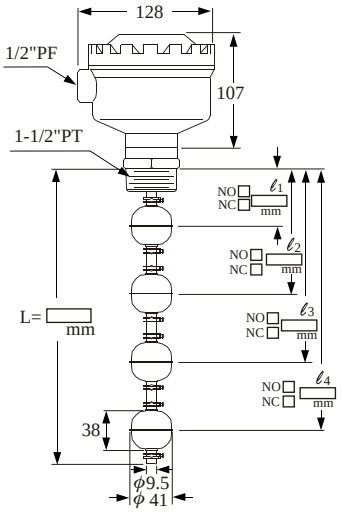



FineTek

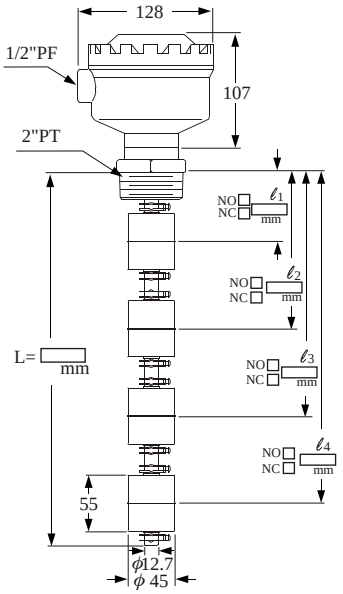
# STANDARD SCREW TYPE

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

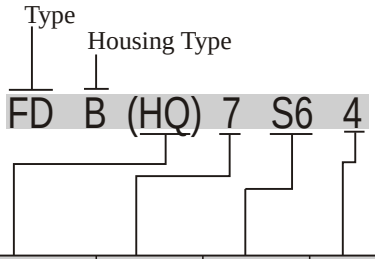
Type FD B (EQ) 3 S2 4




Type FD B (FQ) 4 S3 4

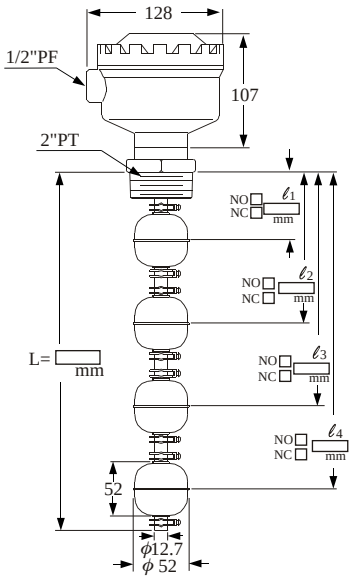



## Order information

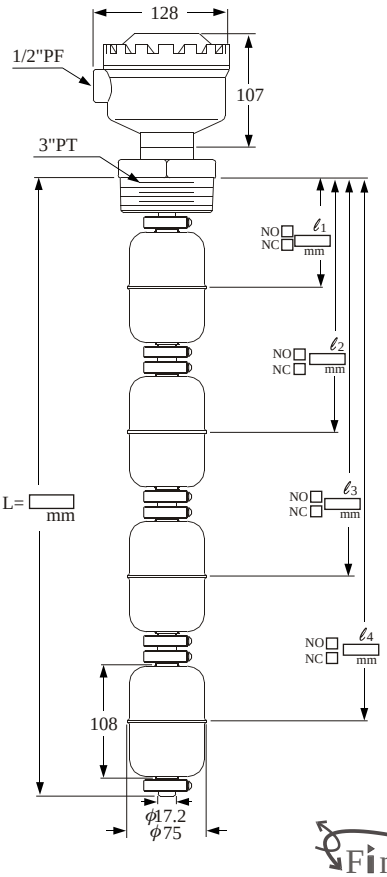



| Connection Flanges | Pipe Diameter | Float Type | Float Quantity |
|---|---|---|---|
| EQ=1-1/2" PT | 3= $\phi$9.5 | S2= $\phi$41x38 | 1~ 4 |
| FQ=2" PT | 4= $\phi$12.7 | S3= $\phi$45x55 | 1~ 4 |
| FQ=2" PT | 4= $\phi$12.7 | S4= $\phi$52x52 | 1~ 4 |
| HQ=3" PT | 7= $\phi$17.2 | S6= $\phi$75x108 | 1~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

Type FD B (FQ) 4 S4 4




Type FD B (HQ) 7 S6 4



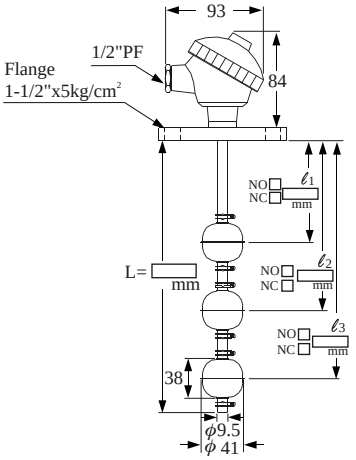



FineTek

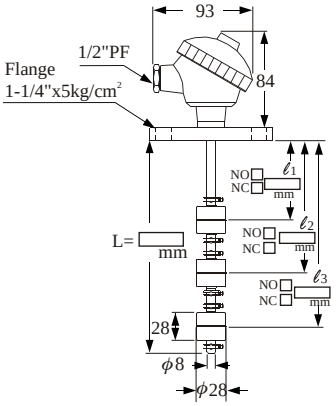
# SCREW TYPE / FLANGE TYPE

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

Type FD E (EM) 3 S2 3




Type FD E (3M) 1 S1 3




## Order information

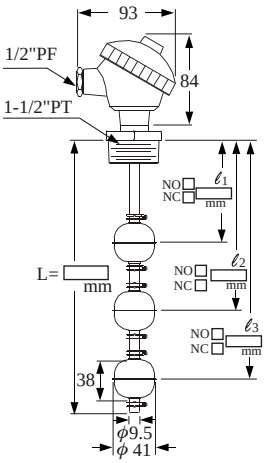
Type

Housing Type

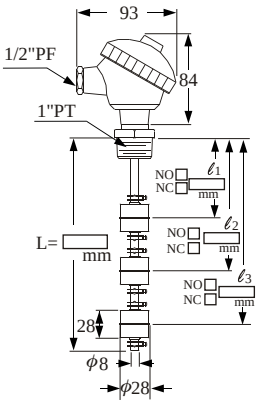
FD E (3Q) 1 S1 3

| Connection Flanges | Pipe Diameter | Float Type | Float Quantity |
|---|---|---|---|
| EM=1-1/2" 5kg/cm² | 3= ϕ9.5 | S2= ϕ41x38 | 1~ 3 |
| 3M=1-1/4" 5kg/cm² | 1= ϕ8 | S1= ϕ28x28 | 1~ 3 |
| EQ=1-1/2" PT | 3= ϕ9.5 | S2= ϕ41x38 | 1~ 3 |
| DQ=1"PT | 1= ϕ8 | S1= ϕ28x28 | 1~ 3 |

Type FD E (EQ) 3 S2 3




Type FD E (DQ) 1 S1 3



# ENCLOSURE EXPLOSION PROOF

ATEX108 Ⓔx CESI 03 EX d ⅡB T3~T6

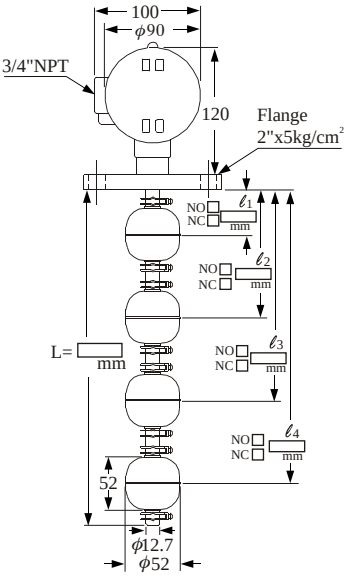
## FLANGE TYPE

### Order information

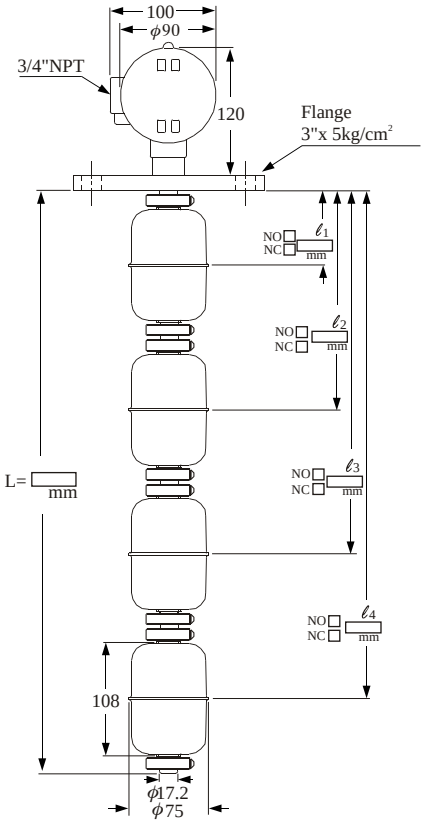
Type
Housing Type
FD - K - HM - 7 - S6 - 4

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

Type FD K (FM) 4 S4 4




Type FD K (HM) 7 S6 4



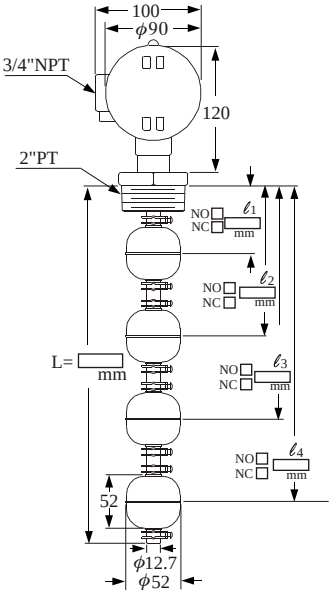

## SCREW TYPE

### Order information

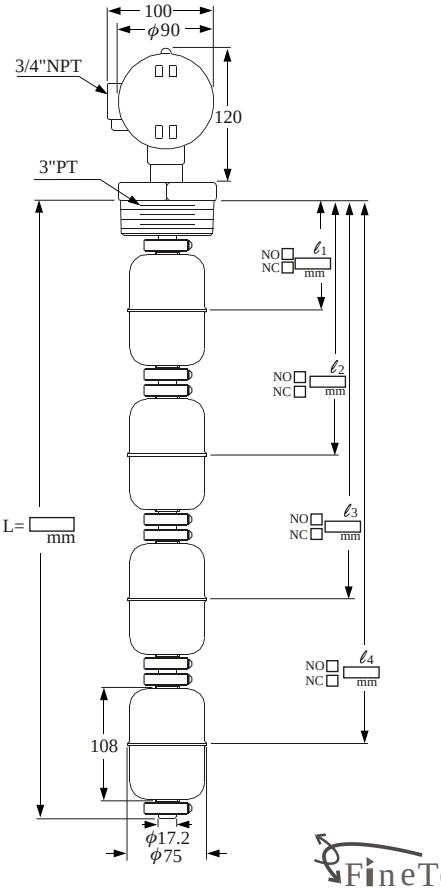
Type
Housing Type
FD - K - HQ - 7 - S6 - 4

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

Type FD K (FQ) 4 S4 4




Type FD K (HQ) 7 S6 4



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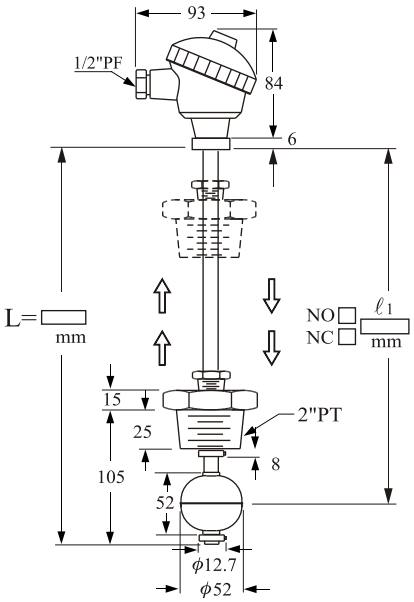
# VERTICAL ADJUSTMENT TYPE

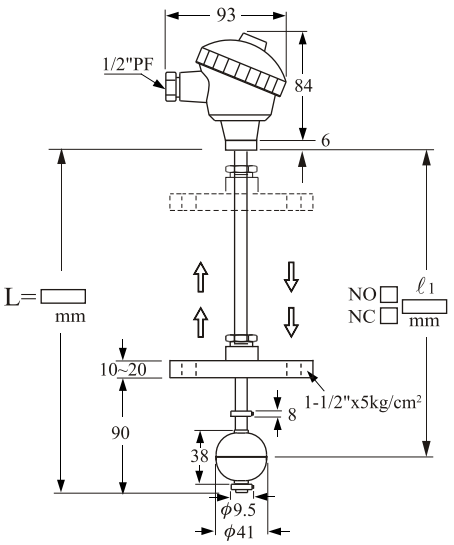
This is a special design for some liquid applications requiring monitoring different actuation levels frequently. The user needs only to loose the hexagon nut, then remove the mounted screw/ flange up or down to achieve the actuated level position adjustment.

- ✻ Applicable at tank interior pressure under 5 kg/cm$^2$.
- ✻ Standard specification 80°C, special order of max. 200°C available.
- ✻ Switch contact: 20W/150Vac/250Vdc SPDT
  50W/300Vac/350Vdc SPST
  60W/220Vac/500Vdc SPST
  60W/400Vac/1000Vdc SPDT
- ✻ Customer specified flange/ screw acceptable.

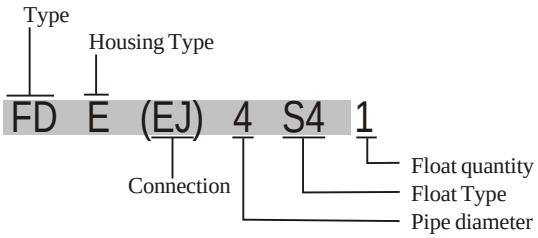
Type FD E (EJ) 4 S4 1




Type FD E (EK) 3 S2 1




## Order information




| Connection | Pipe Diameter | Float Type |
|---|---|---|
| EJ=1-1/2" PT | 3=φ9.5 | S2= φ41x38 |
| FJ=2" PT | 4=φ12.7 | S4= φ52x52 |
| EK=1-1/2" 5kg/cm$^2$ | 3=φ9.5 | S2= φ41x38 |

✻ Please specify the ℓ1 while placing an order.
(Length from lower end of housing to center line of float ball)

# TEST ROD

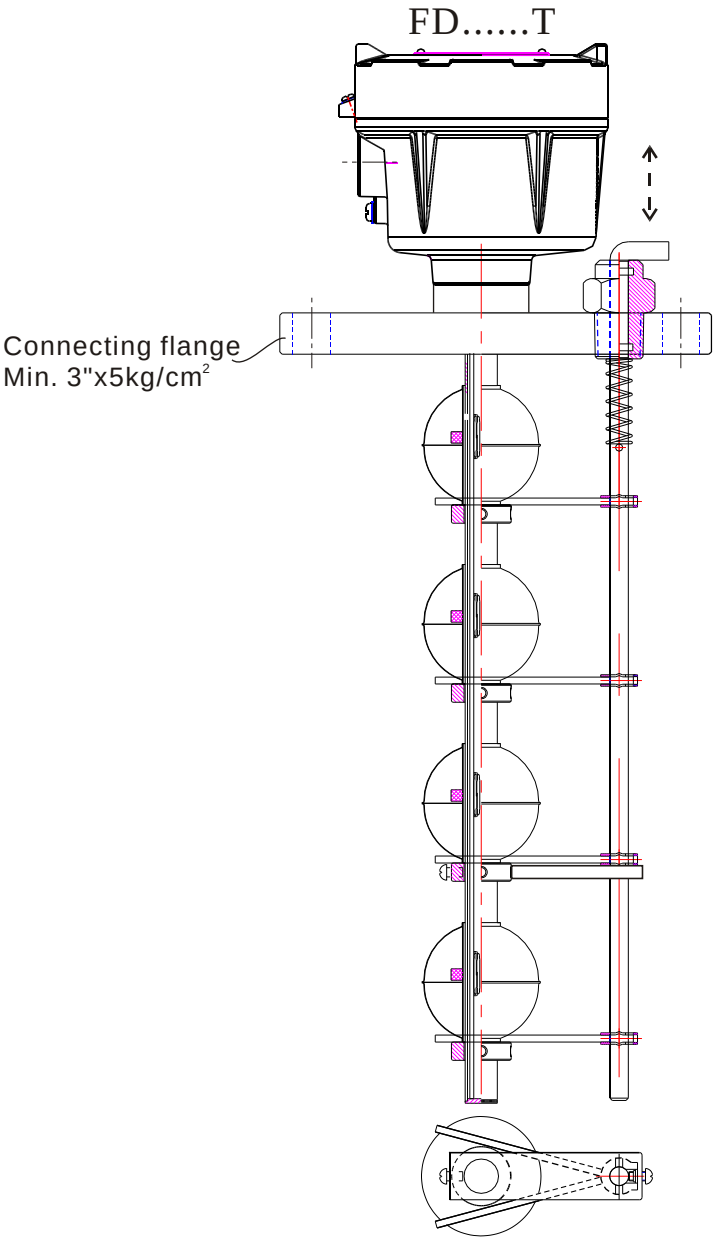
GL Marine Approval 50885-04HH

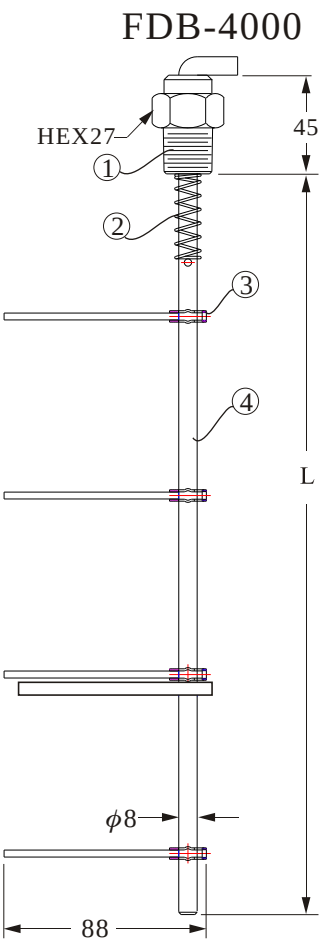
## Function:

When the Test Rod is attached to a magnetic float level switch, user could test the performance of the magnetic switch directly by pulling the handle of the test rod on the top of the switch.

## Material:

1. Rod Connection: Bronze
2. Compressed Spring: Stainless Steel
3. Positioning Clip: Stainless Steel
4. Test Rod Stem: Stainless Steel



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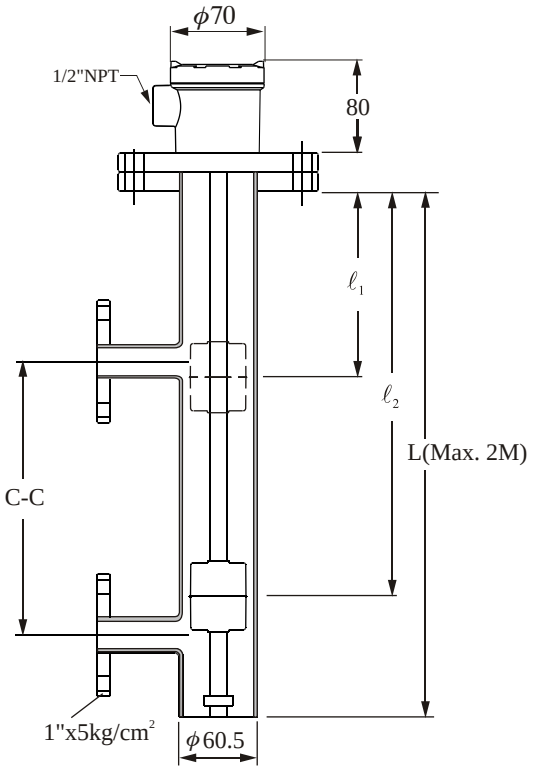
# MARINE GRADE APPROVAL

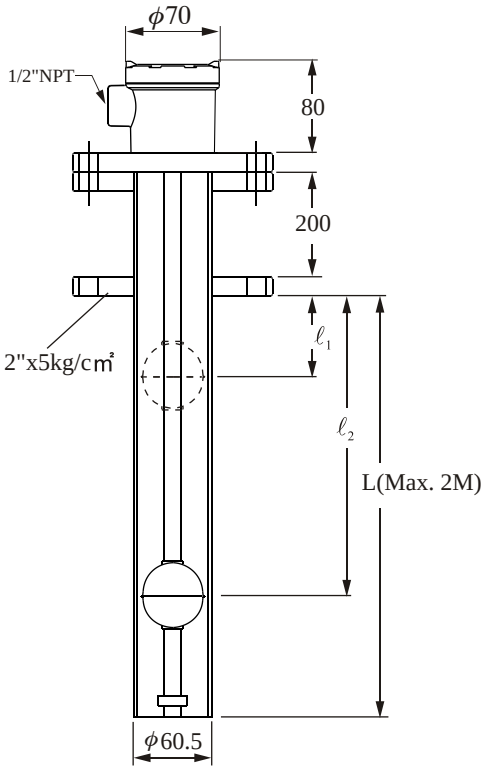
Germanischer Lloyd
(Germany)

American Bureau of
Shipping (USA)

## RHM DM 4 S3 1




## RSM FM 4 S3 1




**RHM DM 4 S3 1 0500 A**

- **Contact Form**
  A: SPST, C: SPDT
- **Length: mm (total)**
  0500: 50cm (01~50)
  1000: 100cm(51~100)
  1500: 150cm(101~150)
- Float quantity
- Float Type
- Pipe diameter
- Connection

**RSM DM 4 S3 1 0500 A**

- **Contact Form**
  A: SPST, C: SPDT
- **Length: mm (total)**
  0500: 50cm (01~50)
  1000: 100cm(51~100)
  1500: 150cm(101~150)
- Float quantity
- Float Type
- Pipe diameter
- Connection

| Connection | Pipe Diameter | Float Type |
|---|---|---|
| DM=1"x 5kg/cm² | 4=ϕ12.7 | S3=ϕ45x55 |
| FM=2"x 5kg/cm² | 4=ϕ12.7 | S4=ϕ52x52 |

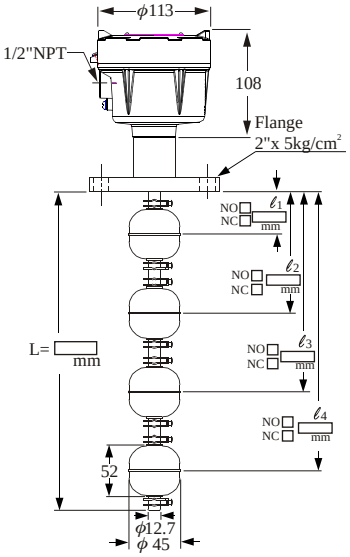
*Please specify the ℓ1, ℓ2, C-C and L while placing an order.
(Length from lower end of housing to center line
of float ball)

# ENCLOSURE EXPLOSION PROOF TYPE

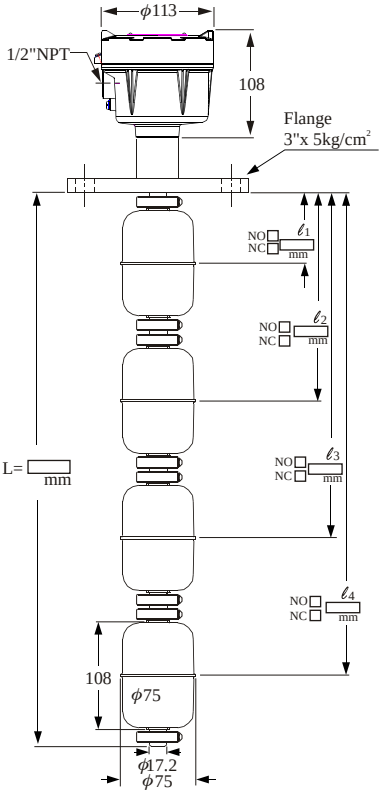
**NEPSI PROOF No.GYJ06239 Ex d IIB T3~T6**
**PTB PROOF No. 05 ATEX 1027 Ⓔx II 2G EEx d IIB T3~T6**
**Ⓔx II 2D IP65 T3~T6**

## FLANGE TYPE

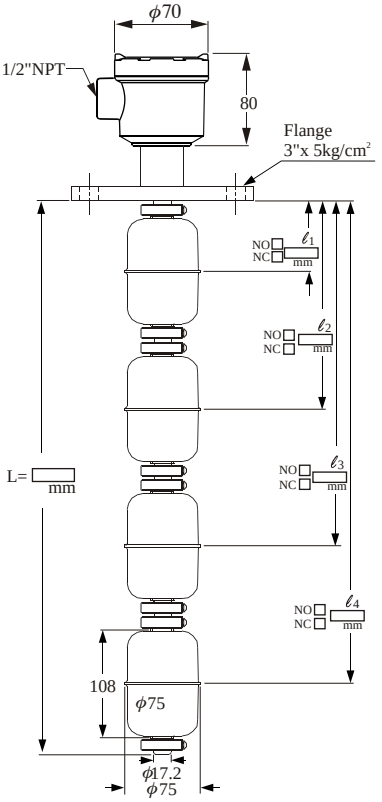
Type RF7 D FM 4 S4 4




Type RF7 D HM 7 S6 4

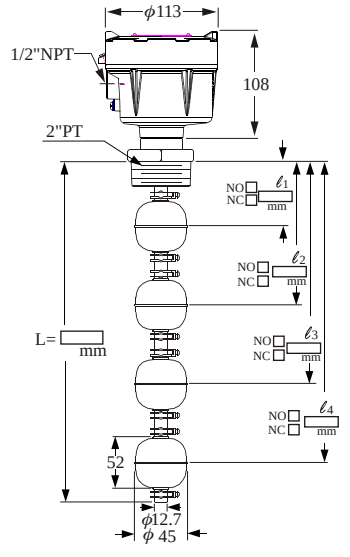



Type RF7 N HM 7 S6 4

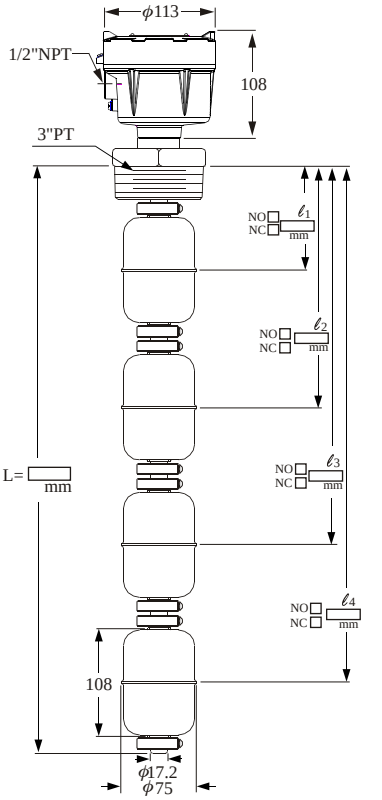



## SCREW TYPE

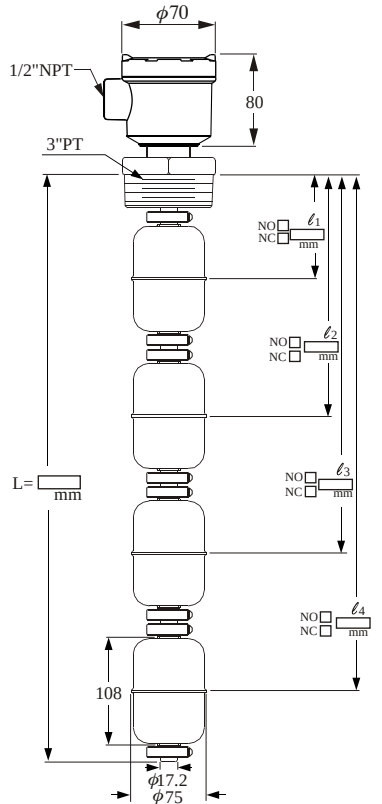
Type RF7 D FQ 4 S4 4




Type RF7 D HQ 7 S6 4




Type RF7 N HQ 7 S6 4



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# HOW TO MAKE YOUR ORDER

**F D 7 D HM 7 S6 3 0500 A (L T)**

T: Test Rog

**Tag**

**Contact Form**

**A:** SPST **C:** SPDT
**F:** 1 float 2 points **G:**1 float 3 points

**Length: mm (total)**

**0500:** 50cm (01~50) ※ 50cm per Unit
**1000:** 100cm (51~100)
**1500:** 150cm (101~150)

**Quantity of float**

**Float Type (see page 7)**

P1,P2, P3, P4
F2, F3, F4
S1, S2, S3, S4, S5, S6, S7

**Stem**

| Code size | Material | Code size | Material | Code size | Material |
|---|---|---|---|---|---|
| 0: $\phi$8 | PP | 6: $\phi$16 | PVDF | A: $\phi$8 | SUS316 |
| 1: $\phi$8 | SUS304 | 7: $\phi$17.2 | SUS304 | B: $\phi$9.5 | SUS316 |
| 2: $\phi$8 | PVC | 8: $\phi$12.7 | P.P. | C: $\phi$12.7 | SUS316 |
| 3: $\phi$9.5 | SUS304 | 9: $\phi$12.7 | PVC | D: $\phi$17.2 | SUS316 |
| 4: $\phi$12.7 | SUS304 | | | | |
| 5: $\phi$17.2 | P.P. | | | | |

**Connection Type**

**Housing Type**

D: Aluminum (Explosion-proof)
EEx IIC T3~T6

N: SUS304 or SUS316
(Explosion-proof)
EEx IIC T3~T6

| Size for flange or screw | |
|---|---|
| A: 3/8" (10A) | I: 4"(100A) |
| B: 1/2" (15A) | J: 5"(125A) |
| C: 3/4" (20A) | K: 6"(150A) |
| D: 1" (25A) | S: Others |
| E: 1-1/2"(40A) | 1: 1/8" |
| F: 2" (50A) | 2: 1/4" |
| G: 2-1/2"(65A) | 3: 1-1/4"(32A) |
| H: 3" (80A) | |

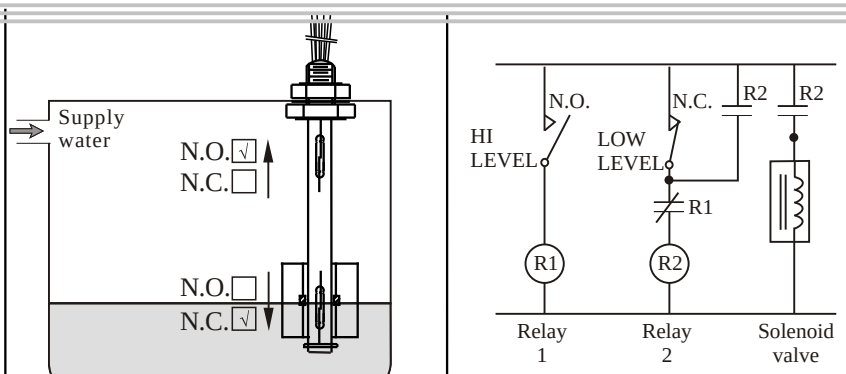
| Pressure range or other |
|---|
| M: 5kg/cm² JIS |
| N: 10kg/cm² JIS |
| O: 150Lbs ANSI |
| P : 300Lbs ANSI |
| Q: PT |
| R: PF (G) |
| T: BSP |
| U : NPT |
| S : Others |
| W: PN10 (10Bar) |
| X: PN16 (16Bar) |
| Y: PN25 (25Bar) |
| Z: PN40 (40Bar) |
| J : Adjustment screw |
| K: Adjustment flange |

FC: Plastic (Stem)
FD: Metal (Stem)

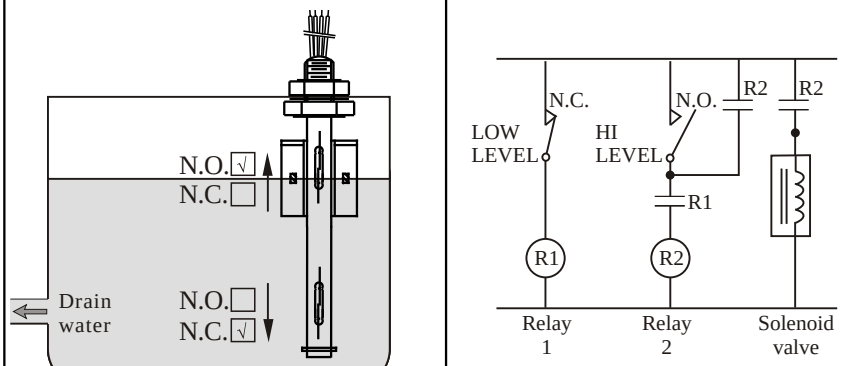
※Certified by GL, ABS Marine grade are available. (Please see page 17)

# TYPICAL WIRING DIAGRAMS

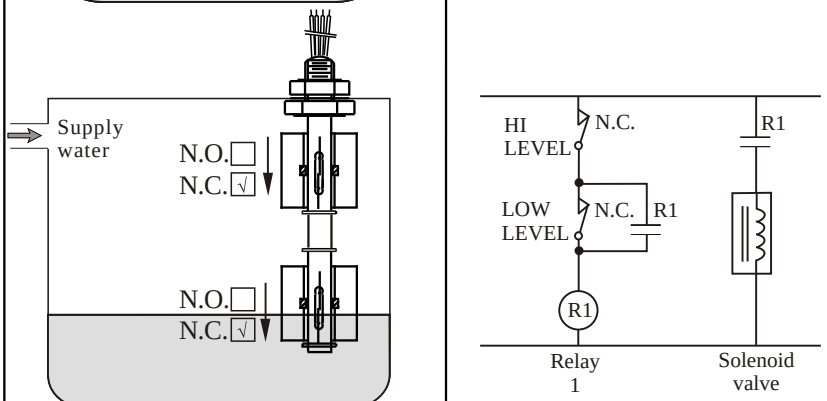
- AUTO SUPPLY CASE:
  SINGLE FLOAT
  DUAL SWITCHES



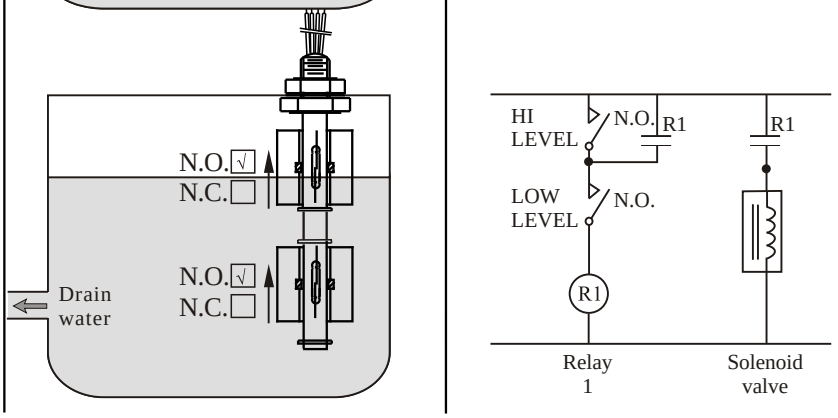

- AUTO DRAIN CASE:
  SINGLE FLOAT
  DUAL SWITCHES




- AUTO SUPPLY CASE:
  DUAL FLOATS
  DUAL SWITCHES




- AUTO DRAIN CASE:
  DUAL FLOATS
  DUAL SWITCHES

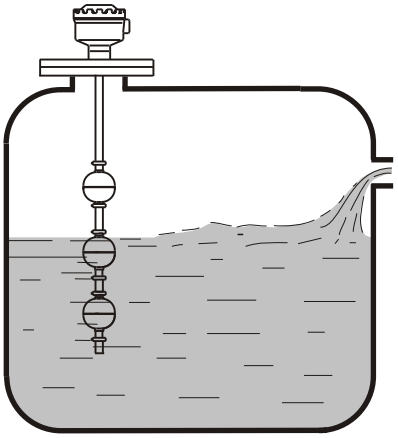



**Note**: The "N.O." Means normally opened circuit of the reed switch (off) in lower liquid level. As the float moves up to the specified higher level, the circuit closed (on).

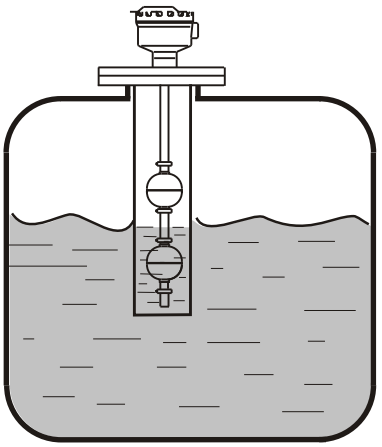
The "N.C." Means normally closed circuit of the reed switch (on) in lower liquid level. As the float moves up to the specified higher level, the circuit closed (off).

# INSTALLATION

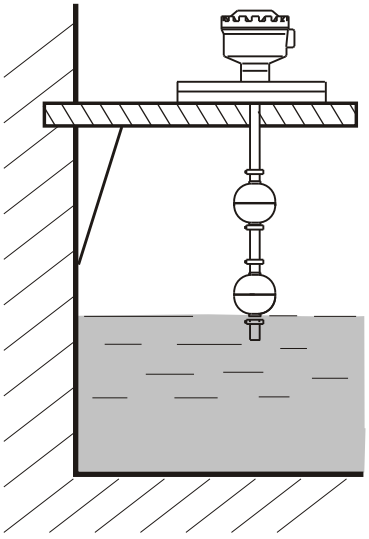
- The float level switch should be mounted far away from liquid inlet, any strong liquid fluctuation will produce error output signals.



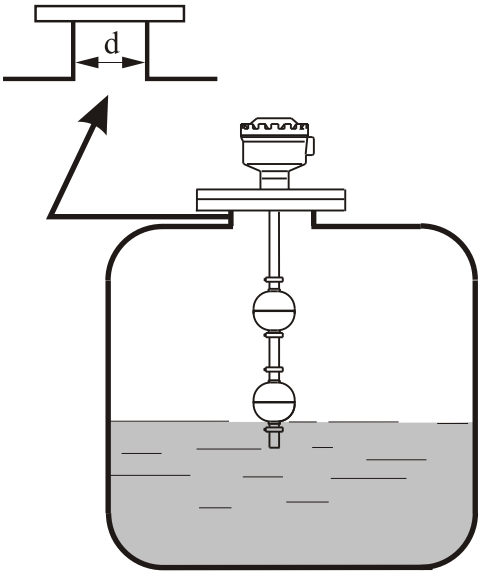
- It is requested a pipe shield or equivalent device to normalize the switch actuation if the switch is used with any agitator application.



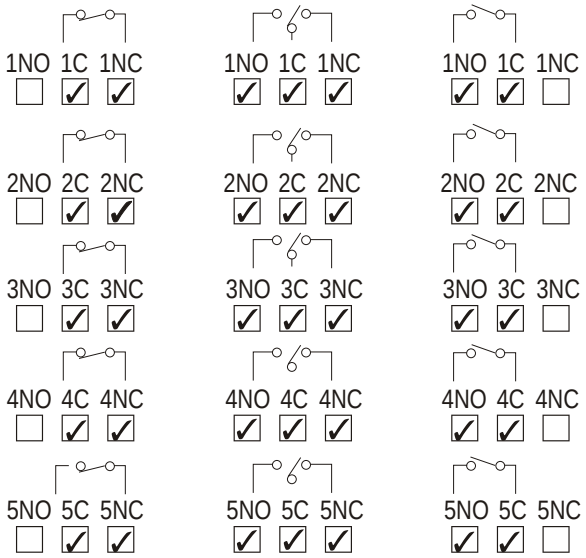
- It had better require an L type supporter, when the switch is mounted in concrete wall tank as figure below.

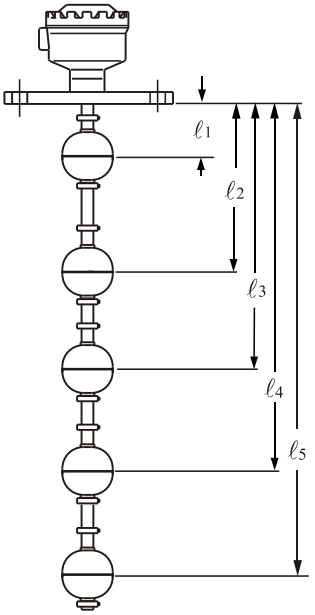


- It is recommended to select the standpipe with diameter larger than the float ball for installation process.



# CONNECTION DIAGRAMS




NO C NC
※ ☐ ☑ ☑ Means that the NC-C circuit will be close while liquid level lower than the float ball, by mark of "↓ ON".

NO C NC
※ ☑ ☑ ☐ Means that the NO-C circuit will be close while liquid level higher than the float ball, by mark of "↑ ON".

NO C NC
※ ☑ ☑ ☑ Means that the NO-C circuit will be close while liquid level higher than the float ball, and NC-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$8mm 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.