

# INTRODUCTION

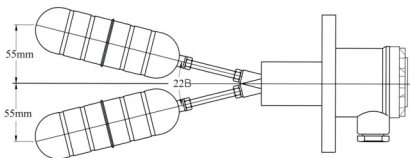
## Principle

Simple theory as liquid buoyancy is utilized for the main principle of this "LF" series. A change of liquid level correspondingly travels the float to extreme levels up and down. The reed switch is thus "NC" and "NO" exchanged as well as the permanent magnet on pivot will have mutual repulsion to the other one inside the housing for like poles, which the micro switch is button-pushed by magnet to states "NO" and "NC" exchanging likewise.

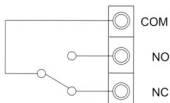
## Features

The side mounted float level sensor ( LF series) are manufactured specifically for horizontal mounting in a tank or vessel. They work well as high or low level control.

1. Both Micro-Switch type and Reed Switch are available. The Micro-Switch type is useable at ambient temp. of 100 C max.
2. Mounting flanges are custom-specifiable. (JIS, DIN, ANSI).
3. A rich variety of floats can suit different specific gravity (S.G.) of liquid. (Custom-made)
4. Liquid-wetted material can be selected for SUS304 or SUS316 as well as explosion proof model..

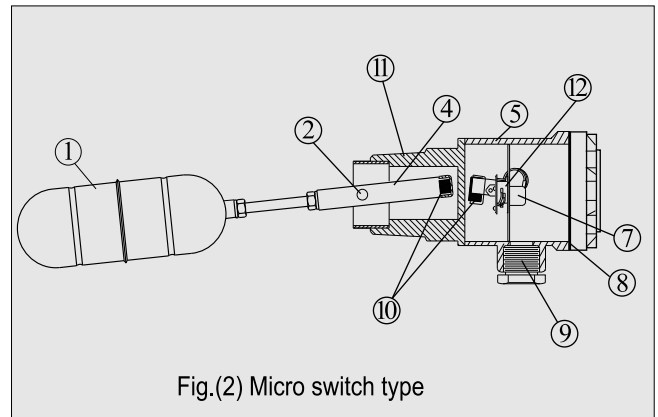
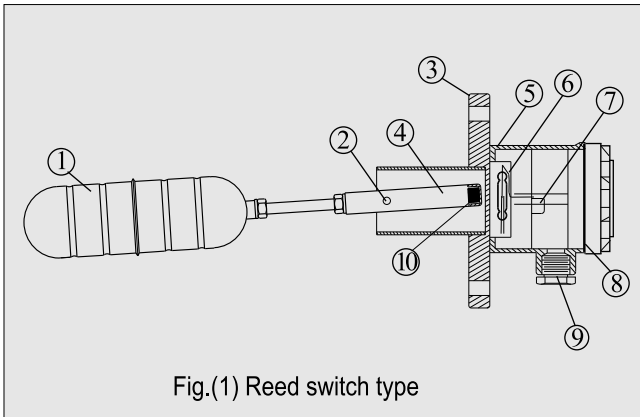


## Wiring



REED SWITCH -- 30W/200VDC  
MICRO SWITCH ---- 5A/250VAC

# CONFIGURATION CUTTING DRAWINGS

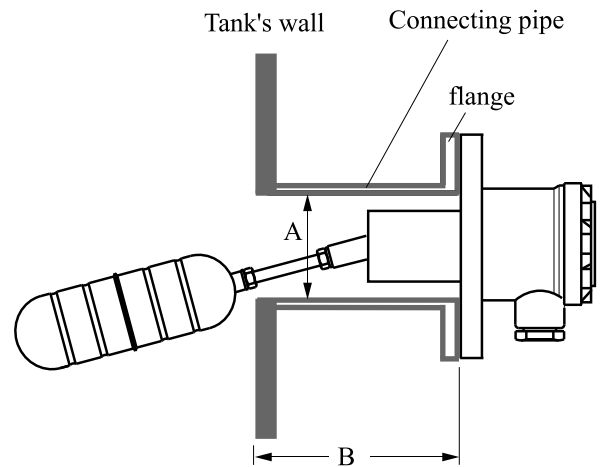


- |           |                |             |                  |
|-----------|----------------|-------------|------------------|
| 1. Float  | 4. Pivot       | 7. Terminal | 10. Magnet       |
| 2. Shaft  | 5. Housing     | 8. O-ring   | 11. Screw        |
| 3. Flange | 6. Reed Switch | 9. Conduit  | 12. Micro Switch |

- The diameter and length of the connecting pipe (of a tank) are in a direct ratio.

UNIT:mm

|                         |       |       |       |       |       |
|-------------------------|-------|-------|-------|-------|-------|
| Pipe dia.<br>(A)        | 45-50 | 50-55 | 55-60 | 60-65 | 65-70 |
| Length<br>(B)<br>(Max.) | 130   | 140   | 150   | 160   | 170   |



## STANDARD MODEL SPECIFICATION

| <b>SPEC.</b><br><b>MODEL</b> | <b>Operating Temp.</b> | <b>Electrical Contact</b> | <b>Contact Capacity</b> | <b>Contact Element</b> | <b>Housing Spec.</b>   | <b>Applicable S.G.</b> |
|------------------------------|------------------------|---------------------------|-------------------------|------------------------|------------------------|------------------------|
| <b>LF10BHM</b>               | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro Switch           | Aluminum Alloy<br>IP65 | 0.25                   |
| <b>LF10CEM</b>               | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro Switch           | Aluminum Alloy<br>IP65 | 0.65                   |
| <b>LF10CEM....SA</b>         | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro Switch           | Aluminum Alloy<br>IP65 | 0.65                   |
| <b>LF10CEQ</b>               | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro Switch           | Aluminum Alloy<br>IP65 | 0.65                   |
| <b>LF10CEQ....SA</b>         | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro Switch           | Aluminum Alloy<br>IP65 | 0.65                   |
| <b>LF10CLO</b>               | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro Switch           | Aluminum Alloy<br>IP65 | 0.65                   |
| <b>LF10CLO....SA</b>         | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro Switch           | Aluminum Alloy<br>IP65 | 0.65                   |
| <b>LF10DFM</b>               | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro Switch           | Aluminum Alloy<br>IP65 | 0.55                   |
| <b>LF10DFM....SA</b>         | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro Switch           | Aluminum Alloy<br>IP65 | 0.55                   |
| <b>LF10DFQ</b>               | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro Switch           | Aluminum Alloy<br>IP65 | 0.55                   |
| <b>LF10DFQ....SA</b>         | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro Switch           | Aluminum Alloy<br>IP65 | 0.55                   |
| <b>LF20BHM</b>               | -25°C~200°C            | SPDT(1C)                  | 30W/200VDC              | Reed Switch            | Aluminum Alloy<br>IP65 | 0.25                   |
| <b>LF20CEM</b>               | -25°C~200°C            | SPDT(1C)                  | 30W/200VDC              | Reed Switch            | Aluminum Alloy<br>IP65 | 0.65                   |
| <b>LF20CEQ</b>               | -25°C~200°C            | SPDT(1C)                  | 30W/200VDC              | Reed Switch            | Aluminum Alloy<br>IP65 | 0.65                   |
| <b>LF20DFM</b>               | -25°C~200°C            | SPDT(1C)                  | 30W/200VDC              | Reed Switch            | Aluminum Alloy<br>IP65 | 0.55                   |
| <b>LF20DFQ</b>               | -25°C~200°C            | SPDT(1C)                  | 30W/200VDC              | Reed Switch            | Aluminum Alloy<br>IP65 | 0.55                   |
| <b>LF20DLO</b>               | -25°C~200°C            | SPDT(1C)                  | 30W/200VDC              | Reed Switch            | Aluminum Alloy<br>IP65 | 0.55                   |
| <b>LF62DFM</b>               | -10°C~350°C            | SPDT(1C)                  | 5A/250VAC               | Micro Switch           | Aluminum Alloy<br>IP65 | 0.55                   |

※ Model no. with "...SA"certified by Germany GL, USA ABS, and Chinese CR marine grade, the prices are subject to be different. Please notify when placing an order if necessary.

## STANDARD MODEL SPECIFICATION

| <b>SPEC.</b><br><b>MODEL</b> | <b>Operating Temp.</b> | <b>Electrical Contact</b> | <b>Contact Capacity</b> | <b>Contact Element</b> | <b>Housing Spec.</b> | <b>Applicable S.G.</b> |
|------------------------------|------------------------|---------------------------|-------------------------|------------------------|----------------------|------------------------|
| <b>LF40DFM</b>               | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro switch           | Aluminum Alloy IP65  | 0.55                   |
| <b>LF45DFM</b>               | -25°C~200°C            | SPDT(1C)                  | 30W/200VDC              | Reed switch            | Aluminum Alloy IP65  | 0.55                   |
| <b>LF49DFM</b>               | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro switch           | SUS304 Ex d IIB T4   | 0.55                   |
| <b>LF50DFM</b>               | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro switch           | Aluminum Alloy IP65  | 0.55                   |
| <b>LF50DFM....SA</b>         | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro switch           | Aluminum Alloy IP65  | 0.55                   |
| <b>LF55DFM</b>               | -25°C~200°C            | SPDT(1C)                  | 30W/200VDC              | Reed switch            | Aluminum Alloy IP65  | 0.55                   |
| <b>LF59DFM</b>               | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro switch           | SUS304 Ex d IIB T4   | 0.55                   |
| <b>LF70BFM....SA</b>         | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro switch           | SUS304 Ex d IIB T4   | 0.65                   |
| <b>LF70CFM....SA</b>         | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro switch           | Aluminum Alloy IP65  | 0.65                   |
| <b>LF70DFM....SA</b>         | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro switch           | Aluminum Alloy IP65  | 0.65                   |
| <b>LF70/71BHM</b>            | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro switch           | Aluminum Alloy IP65  | 0.25                   |
| <b>LF70/71CFM</b>            | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro switch           | SUS304 Ex d IIB T4   | 0.65                   |
| <b>LF70/71DFM</b>            | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro switch           | SUS304 Ex d IIB T4   | 0.55                   |
| <b>LF72BHM</b>               | -10°C~100°C            | SPDT(1C)                  | 30W/200VDC              | Reed switch            | SUS304 Ex d IIB T4   | 0.25                   |
| <b>LF72CFM</b>               | -10°C~100°C            | SPDT(1C)                  | 30W/200VDC              | Reed switch            | SUS304 Ex d IIB T4   | 0.65                   |
| <b>LF72DFM</b>               | -10°C~100°C            | SPDT(1C)                  | 30W/200VDC              | Reed switch            | SUS304 Ex d IIB T4   | 0.55                   |
| <b>LF80EFM</b>               | 0°C~60°C               | SPDT(1C)                  | 30W/200VDC              | Reed switch            | PC IP65              | 0.60                   |
| <b>LF81EFM</b>               | 0°C~60°C               | SPDT(1C)                  | 30W/200VDC              | Reed switch            | —                    | 0.60                   |
| <b>LF90GLO</b>               | -10°C~100°C            | SPDT(1C)                  | 5A/250VAC               | Micro switch           | Aluminum Alloy IP65  | 0.7                    |

※ Model no. with "....SA"certified by Germany GL, USA ABS, and Chinese CR marine grade, the prices are subject to be different. Please notify when placing an order if necessary.

# STANDARD

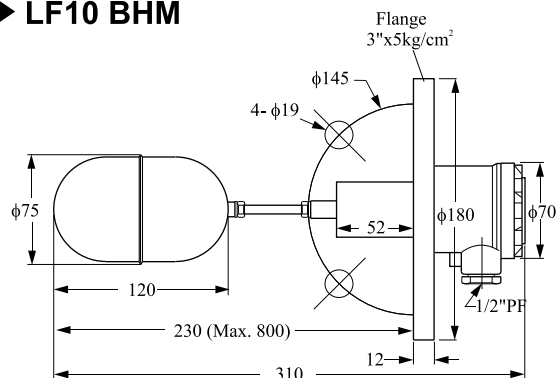
MODEL : LF10



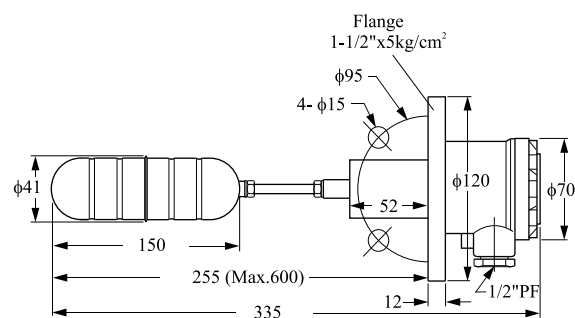
Connecting Type  
(Refer to page 14)  
Float Type



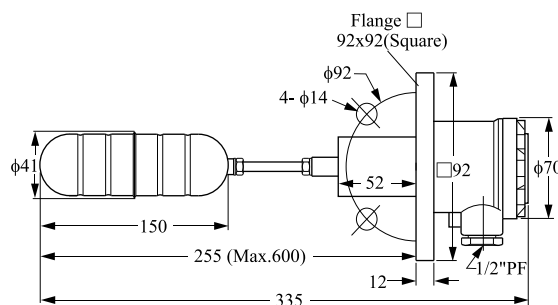
## ► LF10 BHM



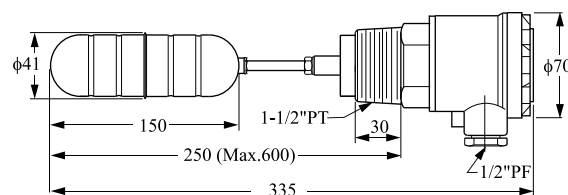
## ► LF10 CEM



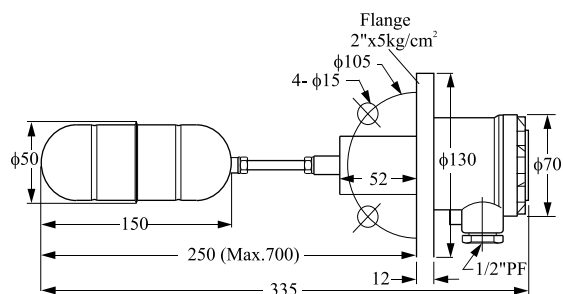
## ► LF10 CLO



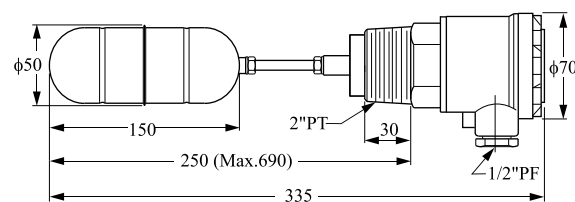
## ► LF10 CEQ



## ► LF10 DFM



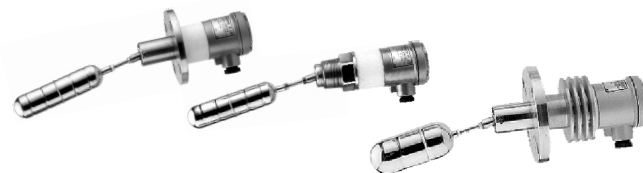
## ► LF10 DFQ



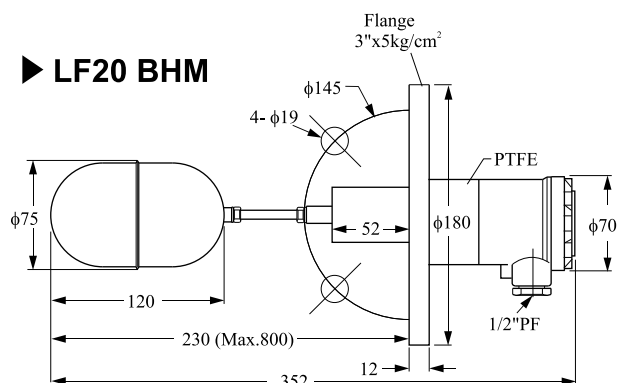
# HIGH TEMP.

MODEL : LF20 ☐ ☐

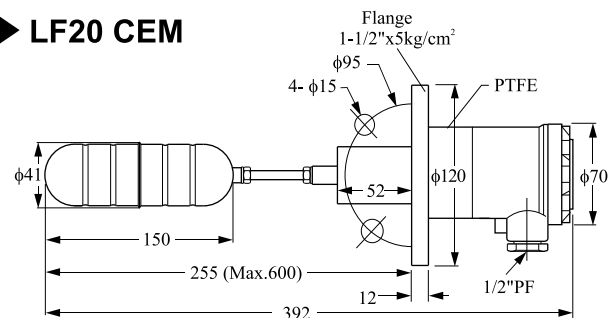
Connecting Type  
(Refer to page 14)  
Float Type



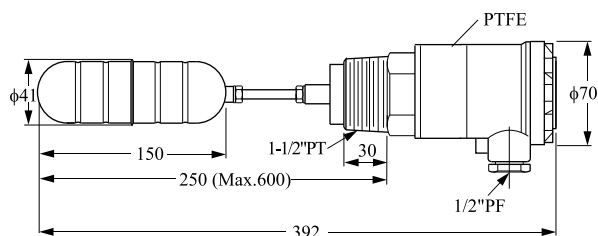
## ► LF20 BHM



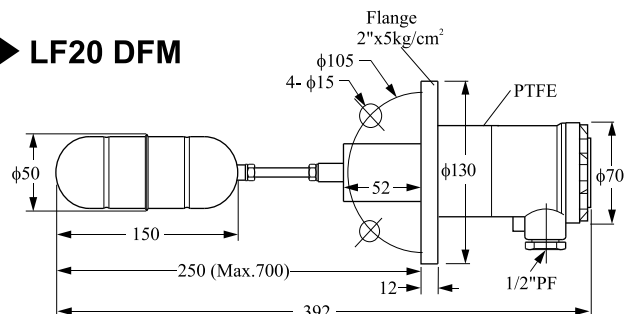
## ► LF20 CEM



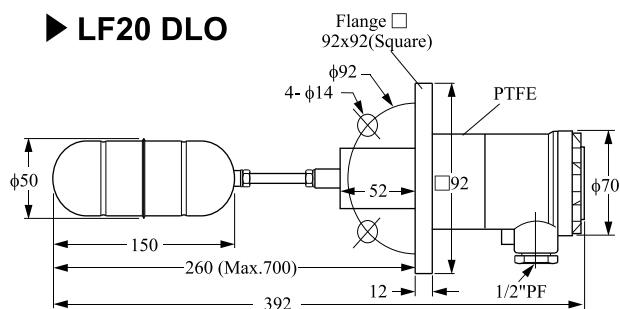
## ► LF20 CEQ



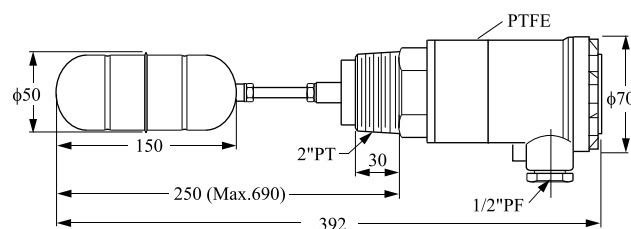
## ► LF20 DFM



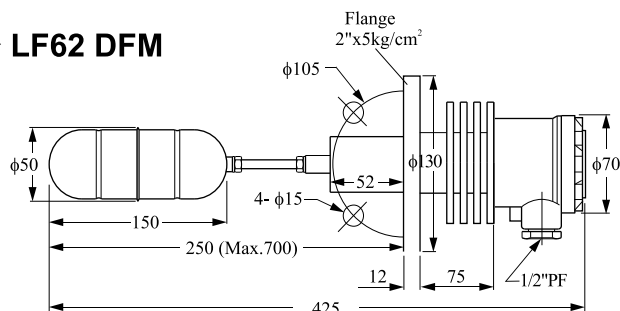
## ► LF20 DLO



## ► LF20 DFQ



## ► LF62 DFM



# DOUBLE ANGLE / VERTICAL

MODEL : LF

Connecting Type (Refer to page 14)

Float Type

40: Double Angle Standard

45: Double Angle High Temp.

49: Double Angle Explosion Proof (Ex d IIB T4)

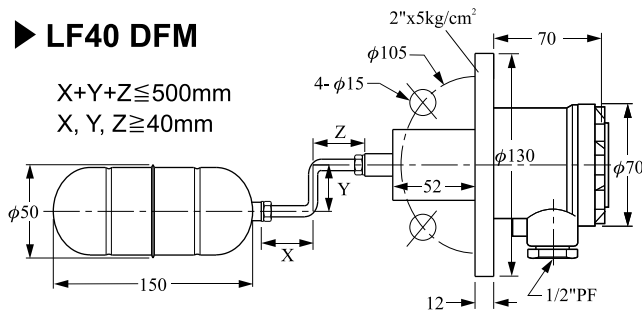
50: Vertical Standard

55: Vertical High Temp.

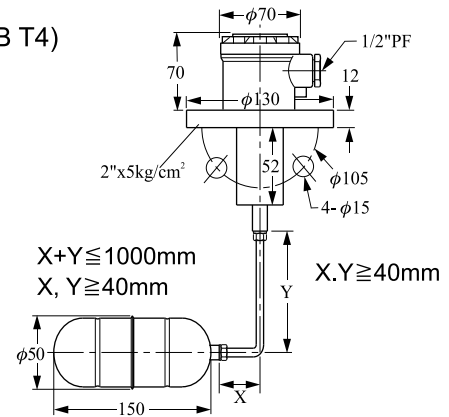
59: Vertical Explosion Proof (Ex d IIB T4)

## ► LF40 DFM

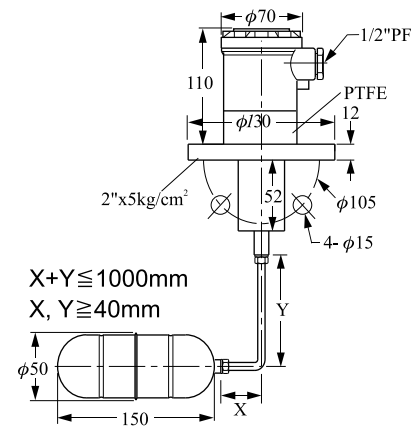
$X+Y+Z \leq 500\text{mm}$   
 $X, Y, Z \geq 40\text{mm}$



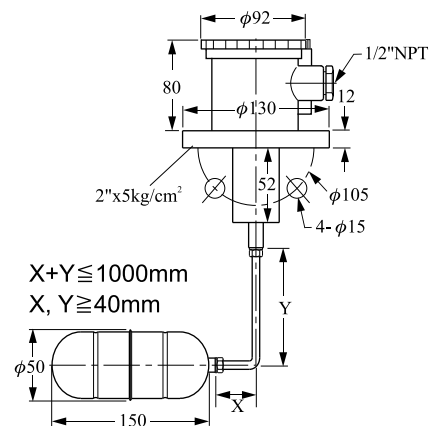
## ► LF50 DFM



## ► LF55 DFM

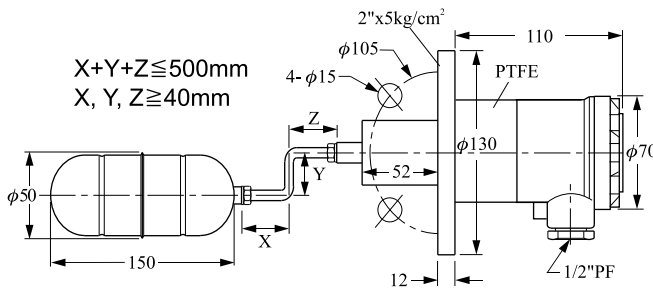


## ► LF59 DFM



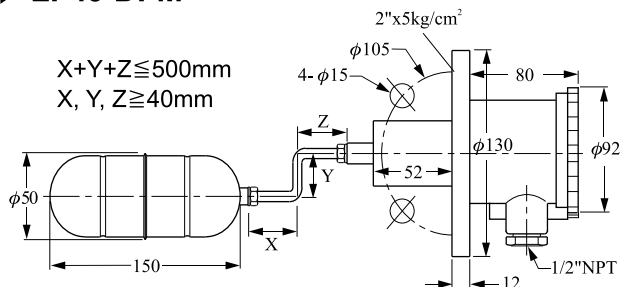
## ► LF45 DFM

$X+Y+Z \leq 500\text{mm}$   
 $X, Y, Z \geq 40\text{mm}$



## ► LF49 DFM

$X+Y+Z \leq 500\text{mm}$   
 $X, Y, Z \geq 40\text{mm}$



# EXPLOSION PROOF

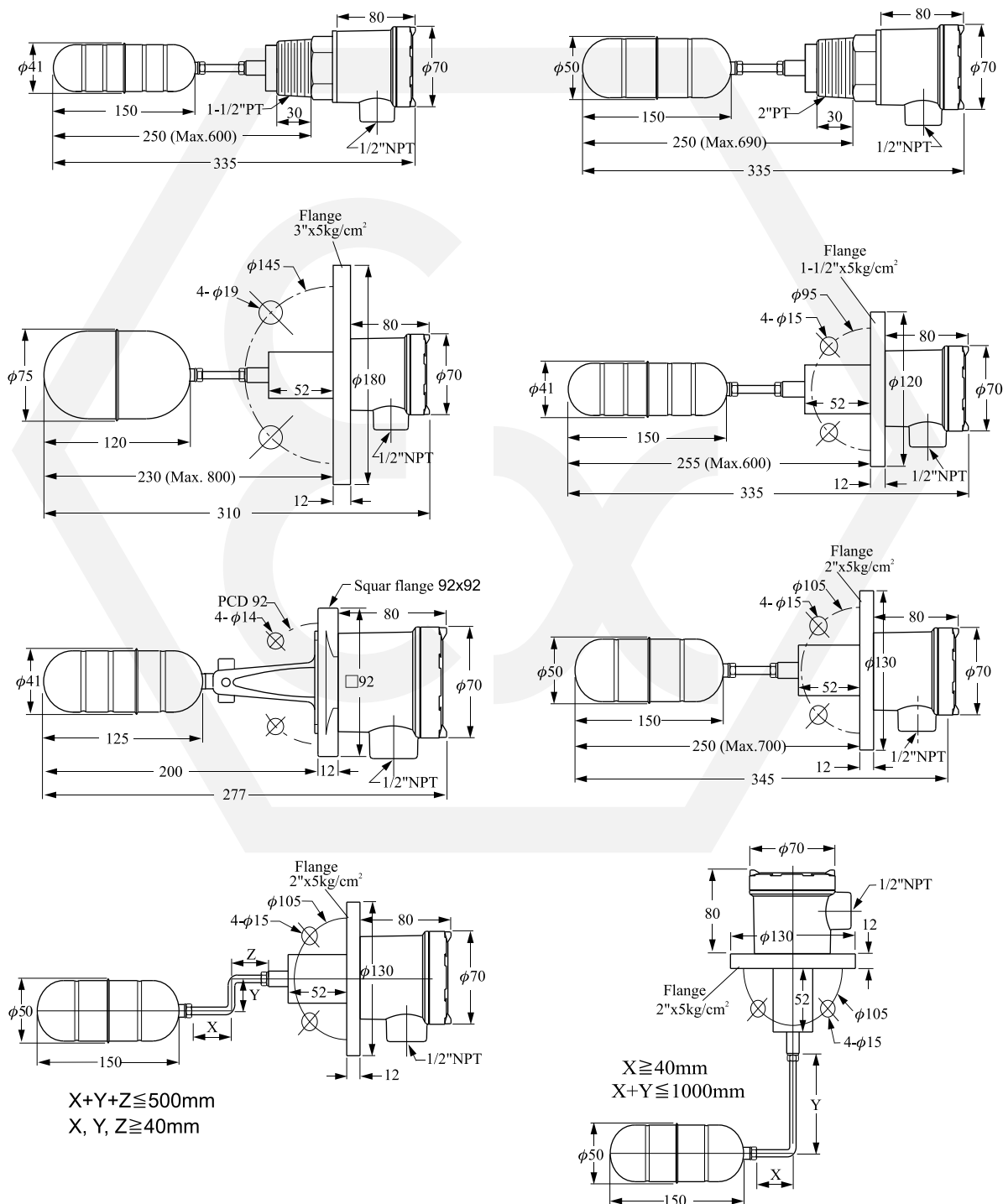
MODEL : LF ☐ ☐ ☐ ☐

Connecting Type  
(Refer to page 14)

Float Type

7 ☐ : Explosion Proof (EX d IIB T4)

## ► LF 7 ☐



# ANTI-ACID / ALKALINE

---

## Principle

When the solid polypropylene float is flooded by a liquid, its weight is reduced by the buoyancy of the liquid and the float moves upward. Thus, a permanent magnet that built in the float actuates the reed switch in the sensor body to work the "NO" and "NC" exchanges.

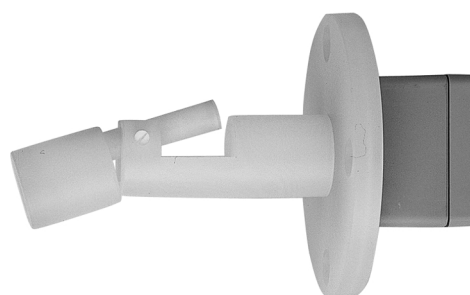
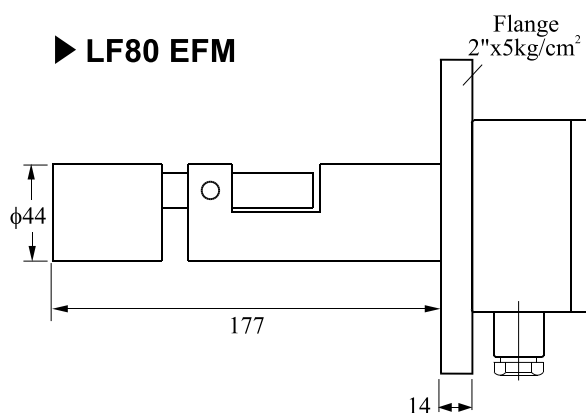
**LF80EFM --- PC Housing**

**LF81EFM --- Without Housing**

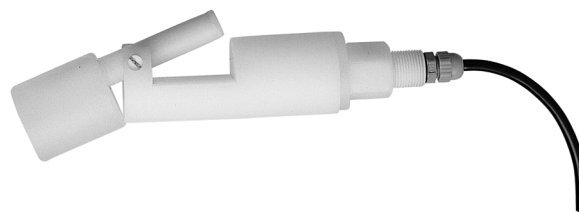
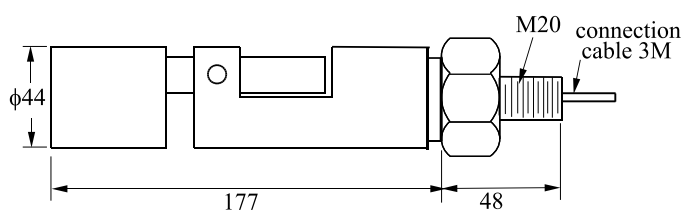
Wetted parts : P.P.

Cable spec. : PVC 3x0.75 mm<sup>2</sup>

### ► LF80 EFM

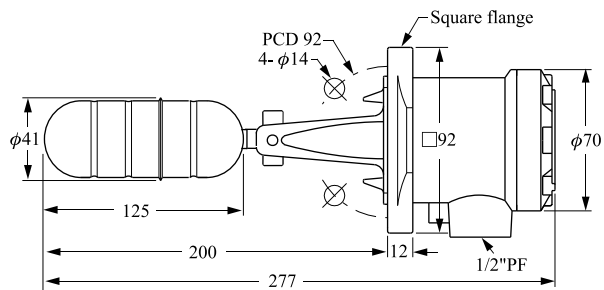


### ► LF81 EFM

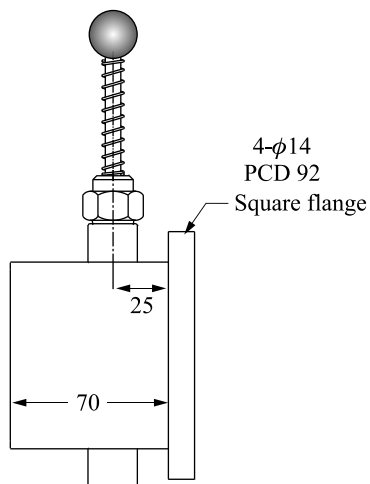


# SQUARE FLANGE & TEST ACCESSORY

## ► LF90GLO

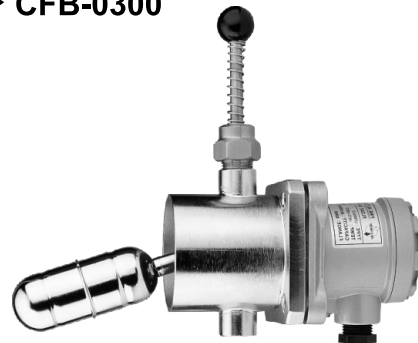


1. Housing material: Aluminum (IP65)
2. Suitable S.G.:  $>0.7$
3. Operation temp.:  $-10\sim 100^{\circ}\text{C}$
4. Contact form: SPDT(1C)
5. Contact rating: 5A/250VAC
6. Operation pressure:  $15\text{kg/cm}^2$
7. Wetted parts: SUS304
8. Weight: approx. 1.2 kg

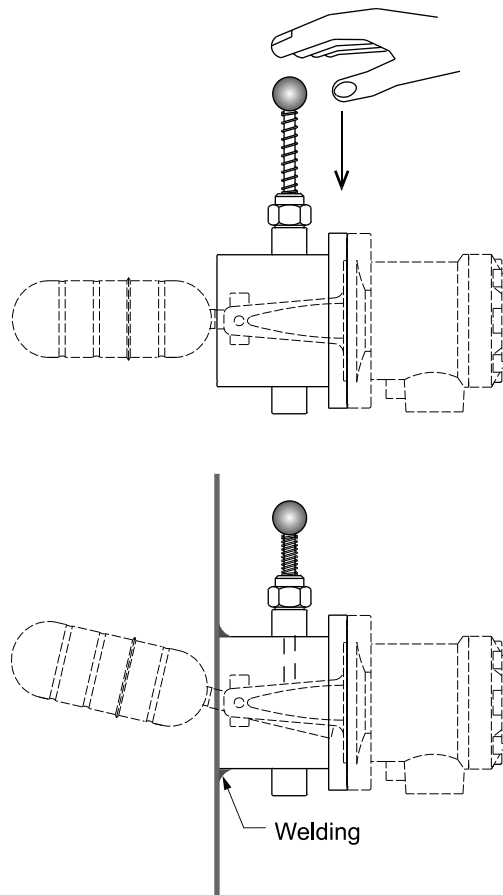
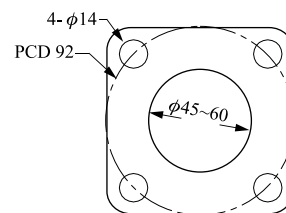


## Test Accessory

## ► CFB-0300



### Drill Hole



# STANDARD APPROVALS



Germanischer Lloyd  
(Germany)

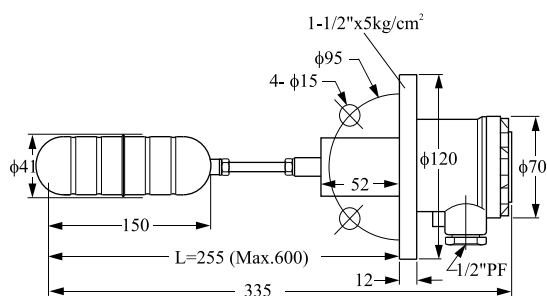


American Bureau of  
Shipping (USA)

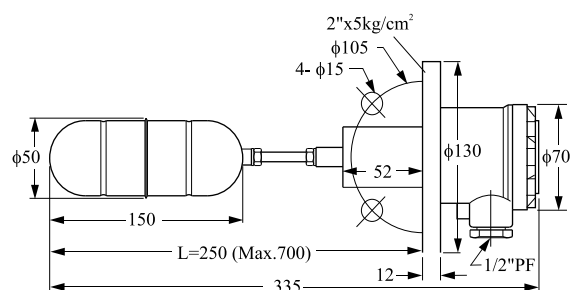


China Corporation  
Register of Shipping

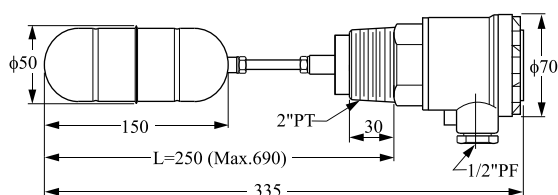
## ► LF10CEM....SA



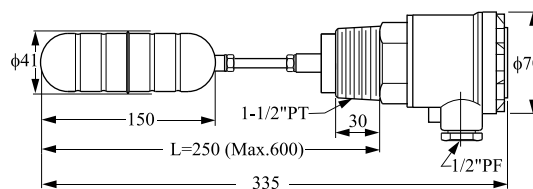
## ► LF10DFM....SA



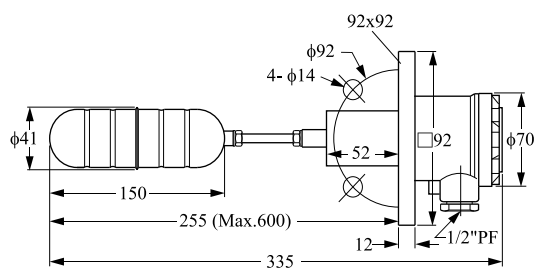
## ► LF10DFQ....SA



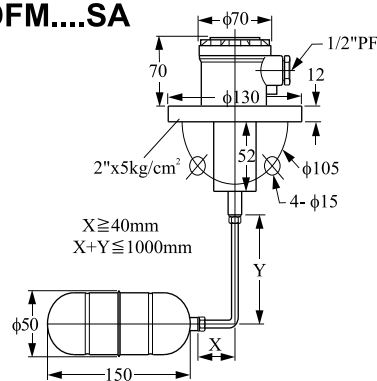
## ► LF10CEQ....SA



## ► LF10CLO....SA



## ► LF50DFM....SA

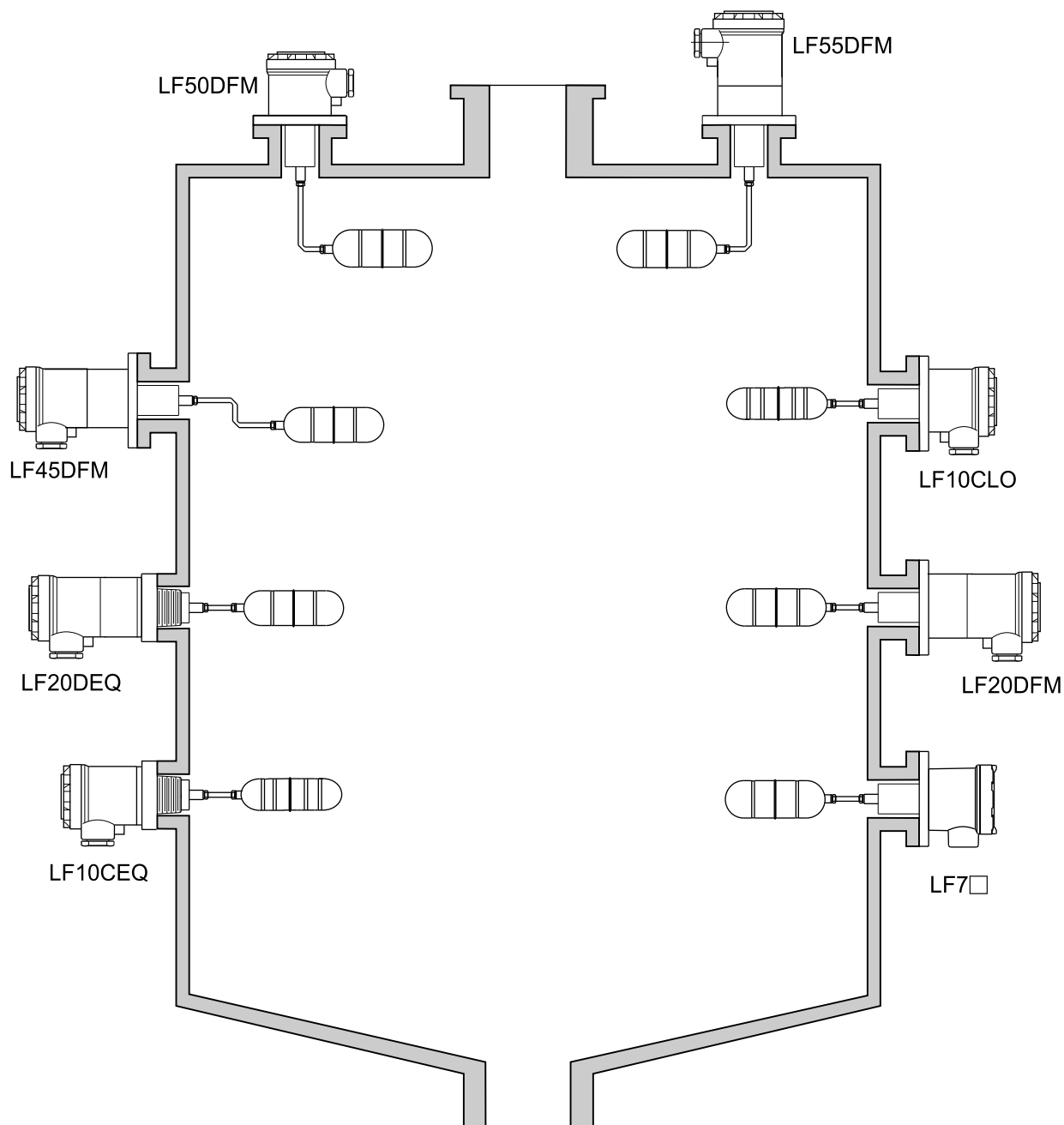


## IMPORTANCE FOR INSTALLATION

---

1. SUS304/SUS316 materials is not available for corrosive application.
2. The cable duct(s) must face downward to prevent moisture sipping in.
3. The float and extension rod must be inserted into a bin completely.
4. Be sure the liquid object's S.G. before installation.
5. The mounting hole must be larger than the external diameter of float.
6. Don't mount the devices near the bin's inlet or outlet.

### Typical Positioning



# HOW TO MAKE YOUR ORDER

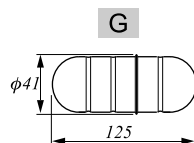
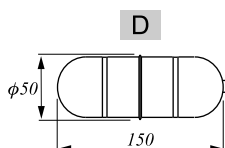
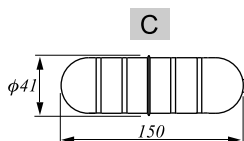
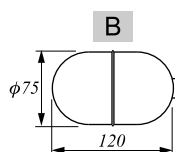
LF

## MODEL

10: STANDARD  
 20: HIGH TEMP.  
 40: DOUBLE ANGLE STANDARD  
 45: DOUBLE ANGLE HIGH TEMP.  
 49: DOUBLE ANGLE EXPLOSION PROOF  
 50: VERTICAL STANDARD  
 55: VERTICAL HIGH TEMP.  
 59: VERTICAL EXPLOSION PROOF  
 62: HIGH TEMP RADIATOR  
 7□: EXPLOSION PROOF (Ex d IIB T4)  
 80: ANTI-ACID/ALKALINE  
 81: ANTI-ACID/ALKALINE  
 90: SQUARE FLANGE

## FLOAT TYPE

B:  $\phi 75 \times 120$  (OPERATION PRESSURE  $10 \text{ kg/cm}^2$  S.G. 0.25)  
 C:  $\phi 41 \times 150$  (OPERATION PRESSURE  $15 \text{ kg/cm}^2$  S.G. 0.65)  
 D:  $\phi 50 \times 150$  (OPERATION PRESSURE  $30 \text{ kg/cm}^2$  S.G. 0.55)  
 G:  $\phi 41 \times 125$  (OPERATION PRESSURE  $15 \text{ kg/cm}^2$  S.G. 0.7)



## CONNECTING TYPE

|                 |                         |                 |
|-----------------|-------------------------|-----------------|
| E: 1-1/2" (40A) | M: $5 \text{ kg/cm}^2$  | W: PN10 (10Bar) |
| F: 2" (50A)     | N: $10 \text{ kg/cm}^2$ | X: PN16 (16Bar) |
| G: 2-1/2" (65A) | O: 150 Lbs              | Y: PN25 (25Bar) |
| H: 3" (80A)     | P: 300 Lbs              | Z: PN40 (40Bar) |
| I: 4" (100A)    | Q: PT                   |                 |
| J: 5" (125A)    | R: PF                   |                 |
| K: 6" (150A)    | T: BSP                  |                 |
| L: 92x92        | U: NPT                  |                 |
|                 | S: Others               |                 |

※ Flanges are in thickness of factory standard 12~14mm.

**LENGTH(L) (UNIT: mm)**

**EX: LF 10 C EM 0270**

- ※ Tolerance of the total product length is  $\pm 5 \text{ mm}$
- ※ Characteristics, specifications and dimensions are subject to change without notice.
- ※ Please contact your nearest distributor office for further information.