

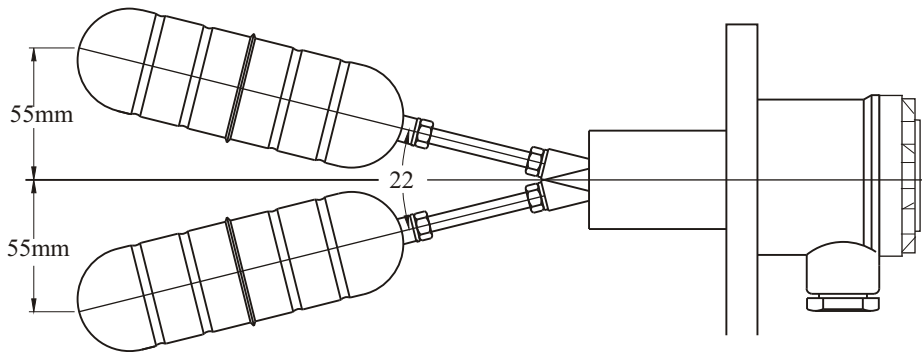
Principle

Simple theory as liquid buoyancy is utilized for the main principle of this "FF" 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 on the housing for like poles, which the Microswitch is button-pushed by magnet to states "NO" and "NC" exchanging likewise.

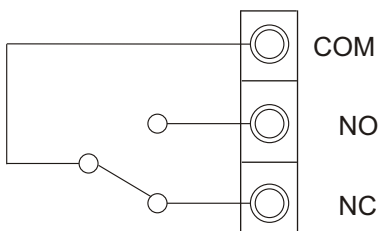
Features

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

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



Wiring



REED SWITCH ---- 1A, 30W 220Vac/200Vdc (FF20, 45, 55, 8)

MICRO SWITCH ---- 5A/250Vac

CONFIGURATION CUTTING DRAWINGS

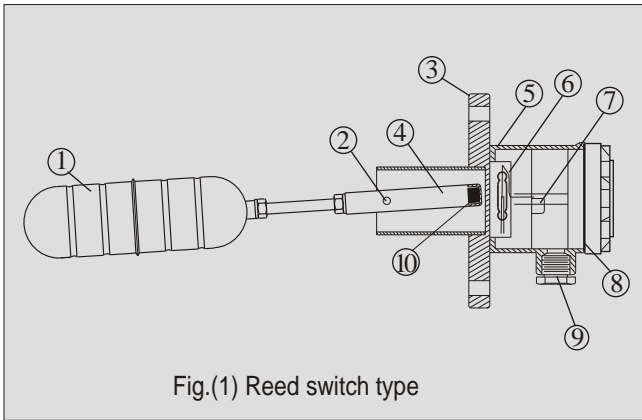


Fig.(1) Reed switch type

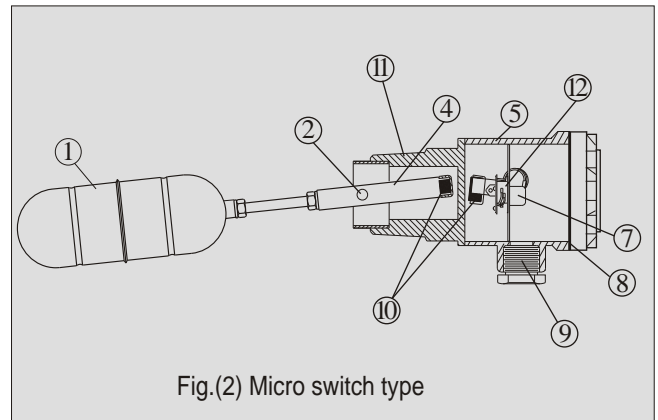


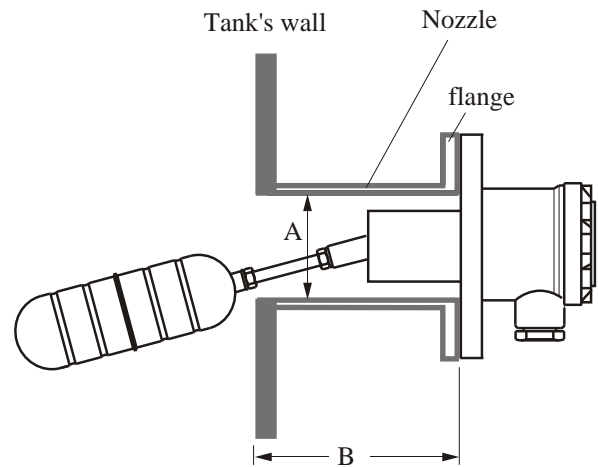
Fig.(2) Micro switch type

- | | | | |
|-----------|----------------|-------------|-----------------|
| 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. Microswitch |

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

UNIT: mm

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



SPECIFICATION

| MODEL \ SPEC. | Operating Temp. | Electrical Contact | Contact Capacity | Contact Element | Housing Spec. | Applicable S.G. |
|---------------|-----------------|--------------------|--------------------------|-----------------|---------------------|-----------------|
| FF10BHM | -10°C~100°C | SPDT(1C) | 5A/250Vac | Microswitch | Aluminum Alloy IP65 | 0.25 |
| FF10CEM | -10°C~100°C | SPDT(1C) | 5A/250Vac | Microswitch | Aluminum Alloy IP65 | 0.65 |
| FF10CEM....SA | -10°C~100°C | SPDT(1C) | 5A/250Vac | Microswitch | Aluminum Alloy IP65 | 0.65 |
| FF10CEQ | -10°C~100°C | SPDT(1C) | 5A/250Vac | Microswitch | Aluminum Alloy IP65 | 0.65 |
| FF10CEQ....SA | -10°C~100°C | SPDT(1C) | 5A/250Vac | Microswitch | Aluminum Alloy IP65 | 0.65 |
| FF10CLO | -10°C~100°C | SPDT(1C) | 5A/250Vac | Microswitch | Aluminum Alloy IP65 | 0.65 |
| FF10CLO....SA | -10°C~100°C | SPDT(1C) | 5A/250Vac | Microswitch | Aluminum Alloy IP65 | 0.65 |
| FF10DFM | -10°C~100°C | SPDT(1C) | 5A/250Vac | Microswitch | Aluminum Alloy IP65 | 0.55 |
| FF10DFM....SA | -10°C~100°C | SPDT(1C) | 5A/250Vac | Microswitch | Aluminum Alloy IP65 | 0.55 |
| FF10DFQ | -10°C~100°C | SPDT(1C) | 5A/250Vac | Microswitch | Aluminum Alloy IP65 | 0.55 |
| FF10DFQ....SA | -10°C~100°C | SPDT(1C) | 5A/250Vac | Microswitch | Aluminum Alloy IP65 | 0.55 |
| FF10HEQ | -10°C~100°C | SPDT(1C) | 5A/250Vac | Microswitch | SUS304 IP65 | 0.8 |
| FF12CEM | -10°C~100°C | SPDT(1C)X2 | 5A/250Vac | Microswitch | SUS304 IP65 | 0.65 |
| FF20BHM | -25°C~200°C | SPDT(1C) | 1A, 60W 220Vac/200Vdc | Reed Switch | Aluminum Alloy IP65 | 0.25 |
| FF20CEM | -25°C~200°C | SPDT(1C) | 1A, 30W 220Vac/200Vdc | Reed Switch | Aluminum Alloy IP65 | 0.65 |
| FF20CEQ | -25°C~200°C | SPDT(1C) | 1A, 30W 220Vac/200Vdc | Reed Switch | Aluminum Alloy IP65 | 0.65 |
| FF20DFM | -25°C~200°C | SPDT(1C) | 1A, 30W 220Vac/200Vdc | Reed Switch | Aluminum Alloy IP65 | 0.55 |
| FF20DFQ | -25°C~200°C | SPDT(1C) | 1A, 30W 220Vac/200Vdc | Reed Switch | Aluminum Alloy IP65 | 0.55 |
| FF20DLO | -25°C~200°C | SPDT(1C) | 1A, 30W 220Vac/200Vdc | Reed Switch | Aluminum Alloy IP65 | 0.55 |
| FF30A3Q | -10°C~120°C | SPST(1A) | 1A, 50W 240Vac/200Vdc | Reed Switch | SUS304 IP65 | 0.7 |

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

SPECIFICATION

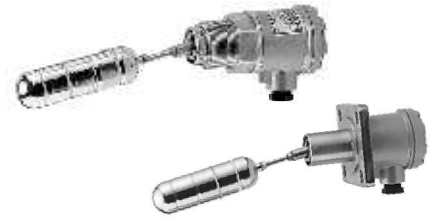
| MODEL \ SPEC. | Operating Temp. | Electrical Contact | Contact Capacity | Contact Element | Housing Spec. | Applicable S.G. |
|---------------|-----------------|--------------------|--------------------------|-----------------|--------------------------|-----------------|
| FF40DFM | -10°C~100°C | SPDT(1C) | 5A/250Vac | Microswitch | Aluminum Alloy IP65 | 0.55 |
| FF45DFM | -25°C~200°C | SPDT(1C) | 1A, 60W 220Vac/200Vdc | Reed switch | Aluminum Alloy IP65 | 0.55 |
| FF50DFM | -10°C~100°C | SPDT(1C) | 5A/250Vac | Microswitch | Aluminum Alloy IP65 | 0.55 |
| FF50DFM....SA | -10°C~100°C | SPDT(1C) | 5A/250Vac | Microswitch | Aluminum Alloy IP65 | 0.55 |
| FF55DFM | -25°C~200°C | SPDT(1C) | 1A, 60W 220Vac/200Vdc | Reed switch | Aluminum Alloy IP65 | 0.55 |
| FF62DFM | -10°C~350°C | SPDT(1C) | 5A/250Vac | Microswitch | Aluminum Alloy IP65 | 0.55 |
| FF70/71BHM | -10°C~100°C | SPDT(1C) | 3A/250Vac | Microswitch | SUS316 Ex d IIB T3~T6 | 0.25 |
| FF70/71CFM | -10°C~100°C | SPDT(1C) | 3A/250Vac | Microswitch | SUS316 Ex d IIB T3~T6 | 0.65 |
| FF70/71DFM | -10°C~100°C | SPDT(1C) | 3A/250Vac | Microswitch | SUS316 Ex d IIB T3~T6 | 0.55 |
| FF73GLO | -10°C~100°C | SPDT(1C) | 3A/250Vac | Microswitch | SUS316 Ex d IIB T3~T6 | 0.7 |
| FF75DFM | -10°C~100°C | SPDT(1C) | 3A/250Vac | Microswitch | SUS316 Ex d IIB T3~T6 | 0.55 |
| FF80EFM | 0°C~60°C | SPDT(1C) | 1A, 30W 220Vac/200Vdc | Reed switch | PC IP65 | 0.60 |
| FF81EFM | 0°C~60°C | SPDT(1C) | 1A, 30W 220Vac/200Vdc | Reed switch | — | 0.60 |
| FF90GLO | -10°C~100°C | SPDT(1C) | 5A/250Vac | Microswitch | Aluminum Alloy IP65 | 0.7 |

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

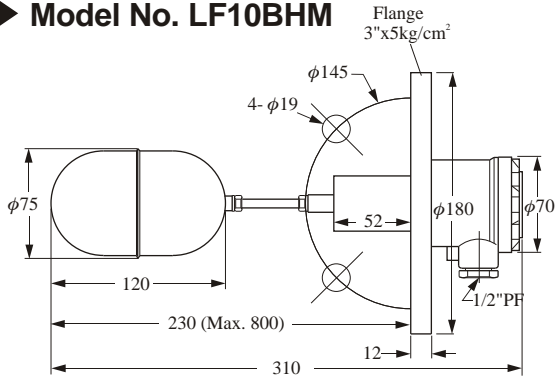
STANDARD

Order No. FF

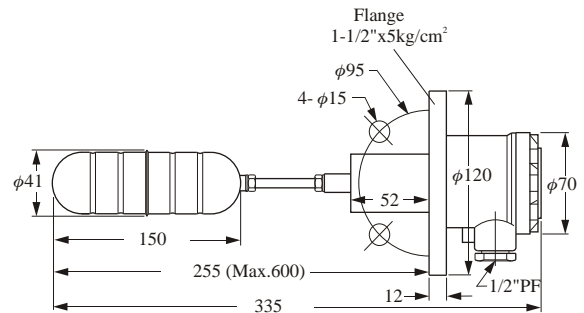
Connecting Type (Refer to page 12)
 Float Type
 10: Single Switch
 12: Dual Switch



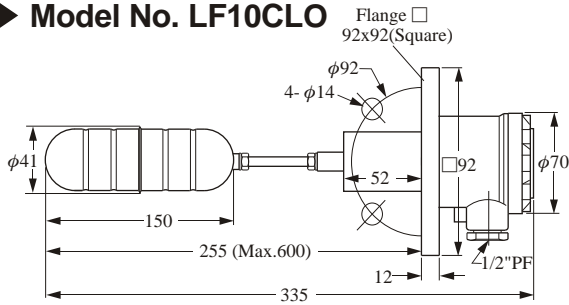
Order No. FF10BHM
 Model No. LF10BHM



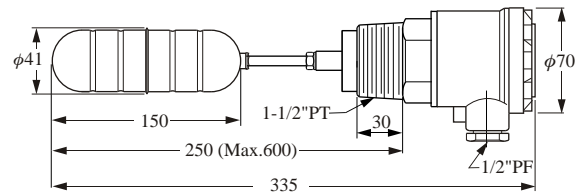
Order No. FF10CEM
 Model No. LF10CEM



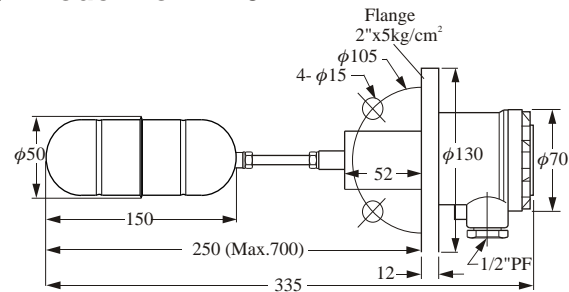
Order No. FF10CLO
 Model No. LF10CLO



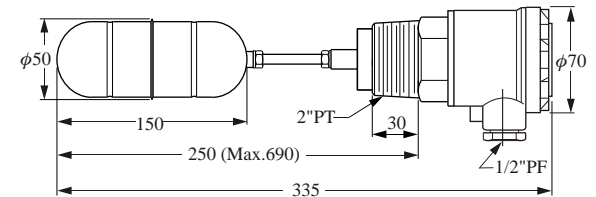
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 Model No. LF10CEQ



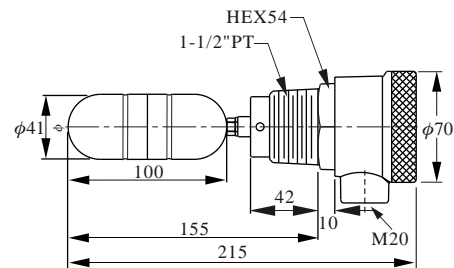
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 Model No. LF10DFM



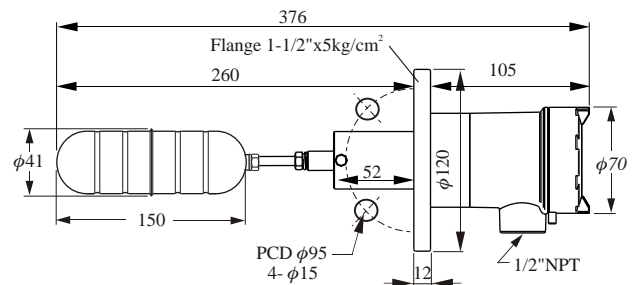
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 Model No. LF10DFQ



Order No. FF10HEQ
 Model No. LF10HEQ



Order No. FF12CEM
 Model No. LF12CEM



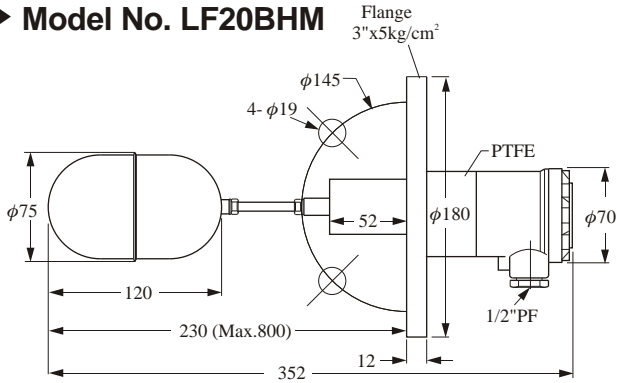
HIGH TEMP.

Order No. FF20

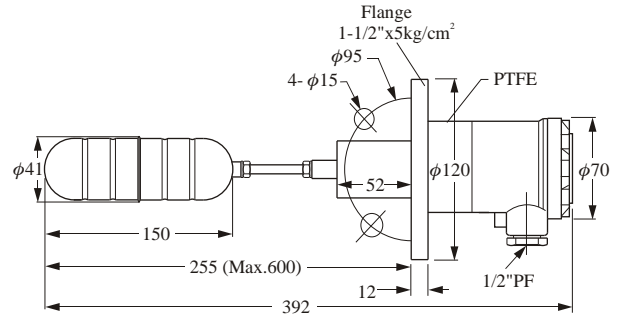
Connecting Type
(Refer to page 12)
Float Type



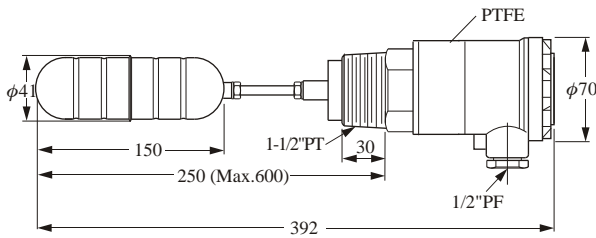
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Model No. LF20BHM



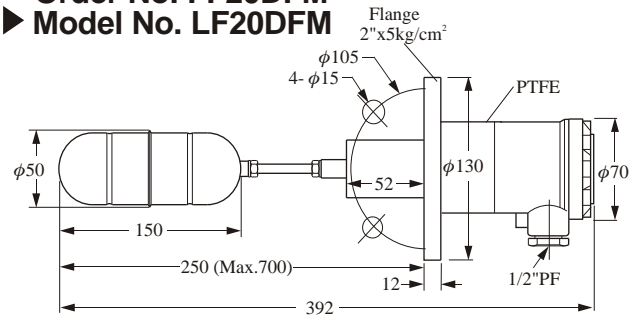
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Model No. LF20CEM



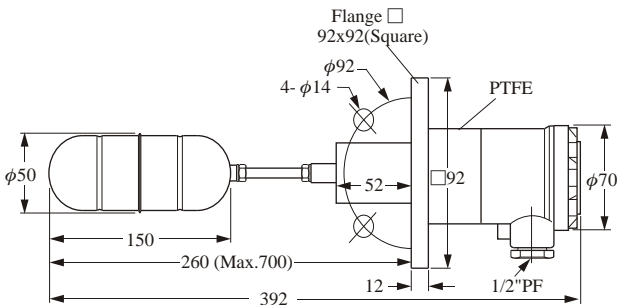
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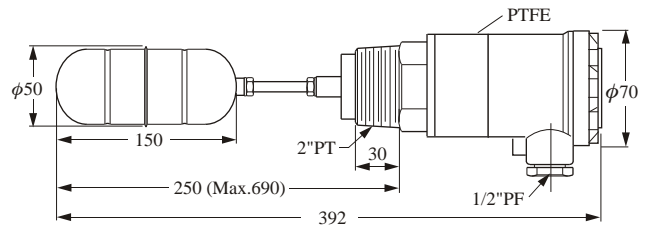
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Model No. LF20DFM



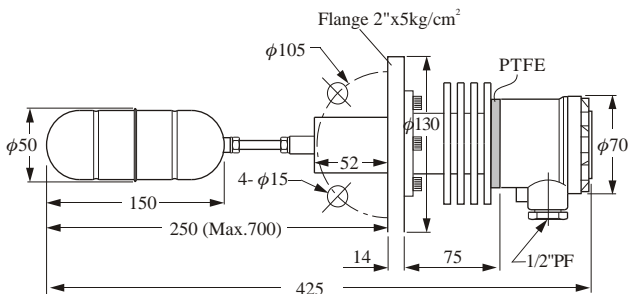
Order No. FF20DLO
Model No. LF20DLO



Order No. FF20DFQ
Model No. LF20DFQ



Order No. FF62DFM
Model No. LF62DFM



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.

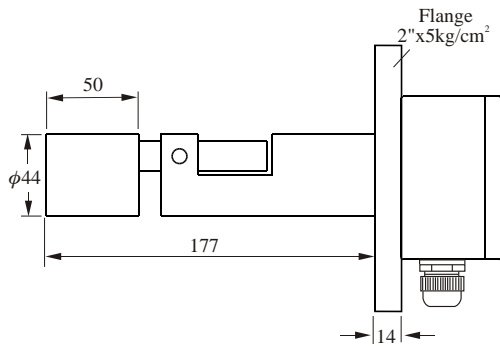
FF80EFM --- PC Housing
FF81E --- Without Housing

Wetted parts : P.P.

Cable spec. : PVC 3x0.75 mm²

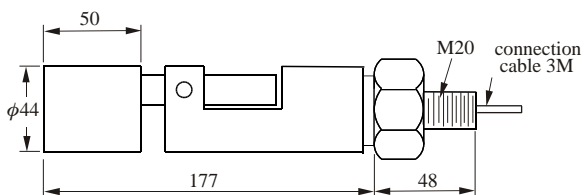
Order No. FF80EFM

► **Model No. LF80EFM**



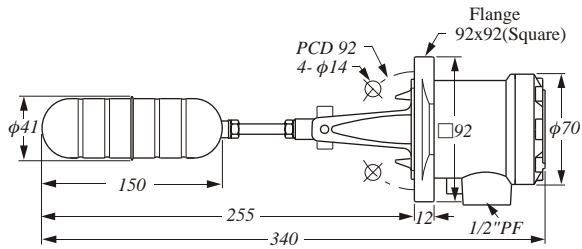
Order No. FF81E

► **Model No. LF81E**



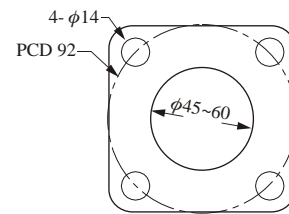
SQUARE FLANGE & TEST ACCESSORY

Order No. FF90CLO
 Model No. LF90CLO

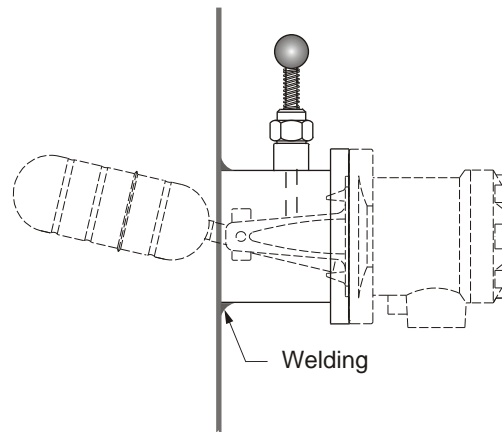
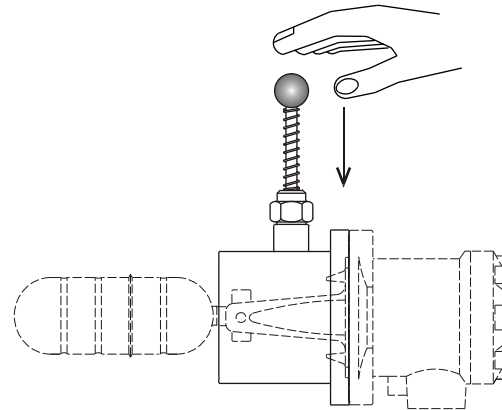
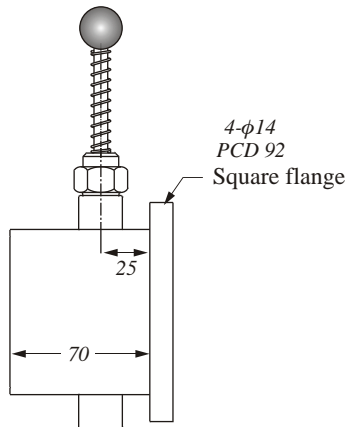


1. Housing material: Aluminum (IP65)
2. Suitable S.G.: >0.65
3. Operation temp.: -10~100°C
4. Contact form: SPDT(1C)
5. Contact rating: 5A/250Vac
6. Operation pressure: 15kg/cm²
7. Wetted parts: SUS304
8. Weight: approx. 1.2 kg

Drill Hole



Test Accessory (Optional)
 Order No. FFB-0300
 Material: SS41



MARINE ASSOCIATION APPROVALS

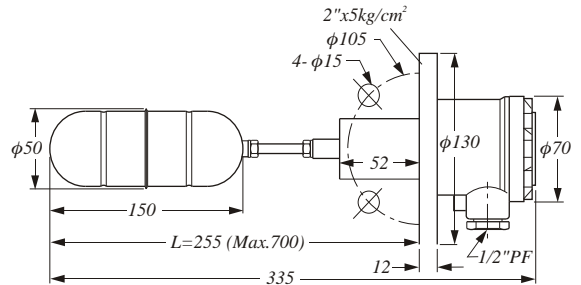


Germanischer Lloyd
(Germany)

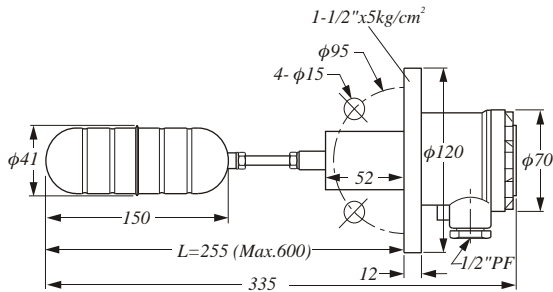


American Bureau of
Shipping (USA)

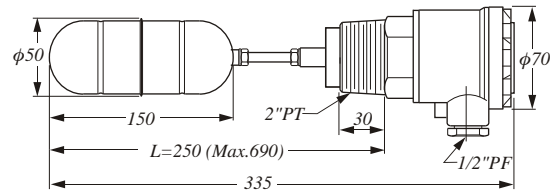
Order No. FF10DFM...SA
Model No. LF10DFM...SA



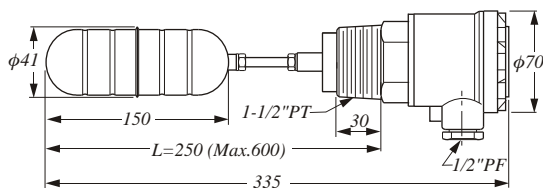
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Model No. LF10CEM...SA



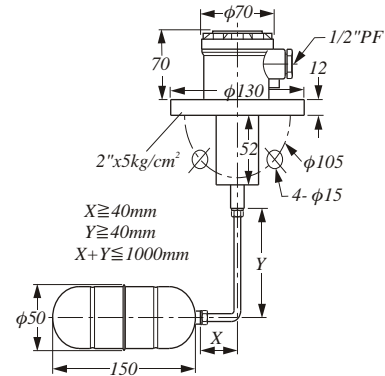
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Model No. LF10DFQ...SA



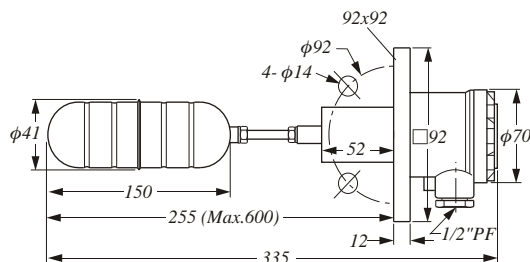
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Model No. LF10CEQ...SA



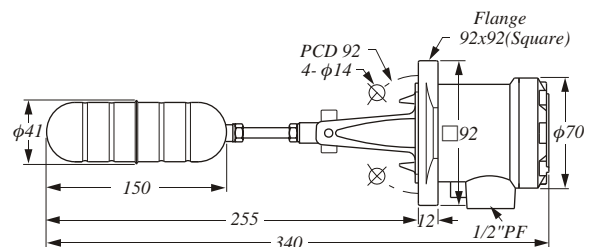
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Model No. LF50DFM...SA



Order No. FF10CLO...SA
Model No. LF10CLO...SA



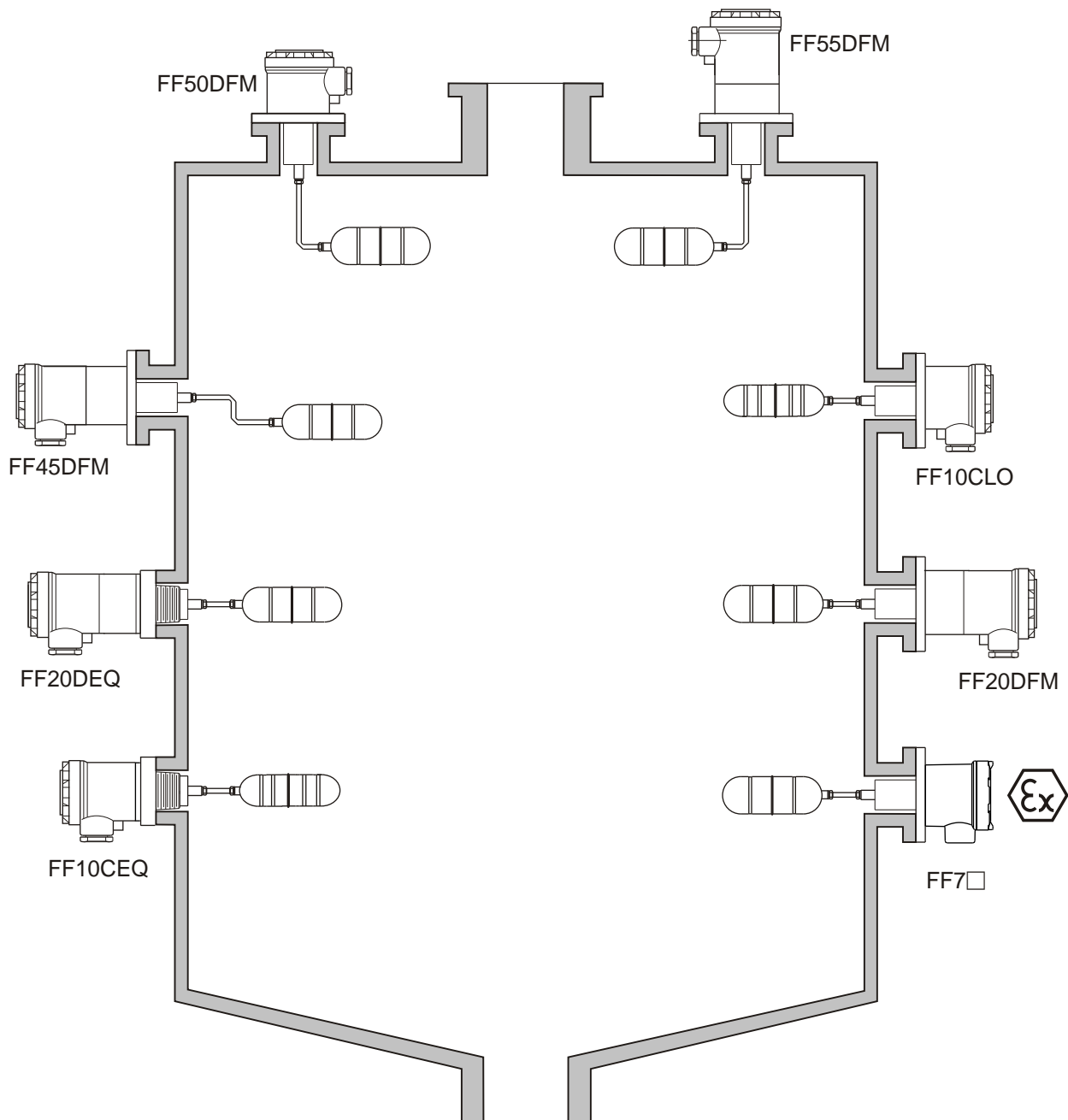
Order No. FF90CLO...SA
Model No. LF90CLO...SA



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

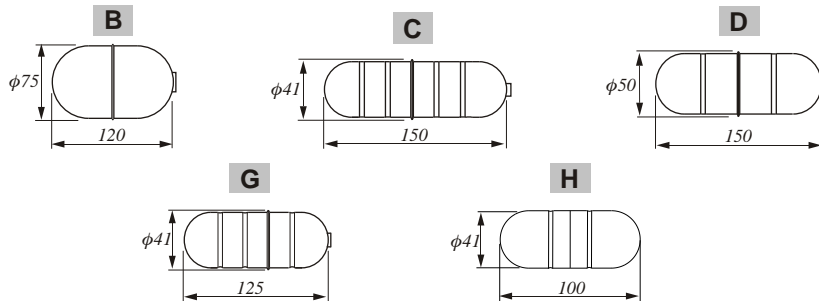
Order No. **FF 10 C EM 0270**
 Model No. **LF 10 C EM 0270**

ORDER NO. _____

- 10: STANDARD
- 20: HIGH TEMP.
- 40: DOUBLE ANGLE STANDARD
- 45: DOUBLE ANGLE HIGH TEMP.
- 50: VERTICAL STANDARD
- 55: VERTICAL HIGH TEMP.
- 62: HIGH TEMP RADIATOR
- 80: ANTI-ACID/ALKALINE
- 81: ANTI-ACID/ALKALINE
- 90: SQUARE FLANGE

FLOAT TYPE _____

- B: $\phi 75 \times 120$ (OPERATION PRESSURE 10kg/cm² S.G. 0.25)
- C: $\phi 41 \times 150$ (OPERATION PRESSURE 15kg/cm² S.G. 0.65)
- D: $\phi 50 \times 150$ (OPERATION PRESSURE 30kg/cm² S.G. 0.55)
- G: $\phi 41 \times 125$ (OPERATION PRESSURE 15kg/cm² S.G. 0.7)
- Q: $\phi 41 \times 100$ (OPERATION PRESSURE 15kg/cm² S.G. 0.8)



CONNECTING TYPE _____

- | | | |
|-----------------|-------------------------|-----------------|
| E: 1-1/2" (40A) | M: 5 kg/cm ² | W: PN10 (10Bar) |
| F: 2" (50A) | N: 10kg/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) | T: BSP | |
| K: 6" (150A) | U: NPT | |
| L: 92x92 | S: Others | |

※ Flanges are in thickness of factory standard 12mm.

LENGTH(L) (UNIT: mm) _____

EX: FF 10C EM 0270

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

ENCLOSURE EXPLOSION PROOF

NEPSI PROOF No. GYJ03349 Ex d IIB T3~T6

PTB PROOF No. 05 ATEX 1025 Ex II 2G EEx d IIB T3~T6

Ex II 2D IP65 T3~T6

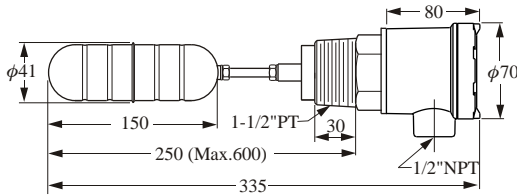
Order No. FF

Connecting Type
(Refer to page 14)

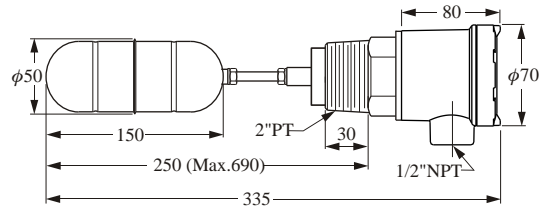
Float Type

7 : Explosion Proof (EX d IIB T4)

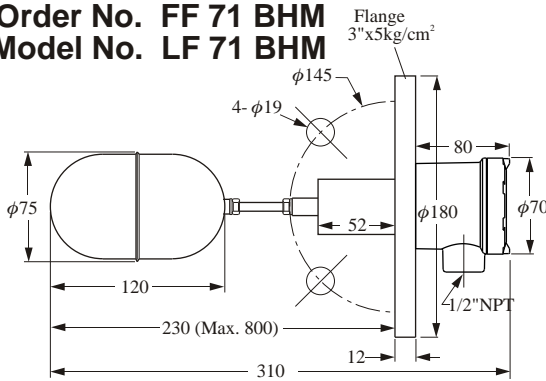
▶ Order No. FF 70 CEQ
Model No. LF 70 CEQ



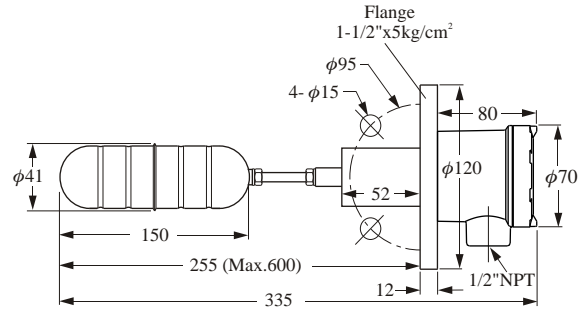
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Model No. LF 70 DFQ



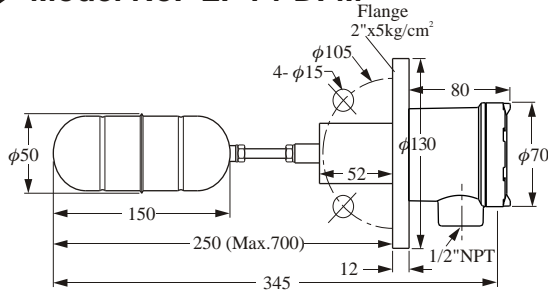
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Model No. LF 71 BHM



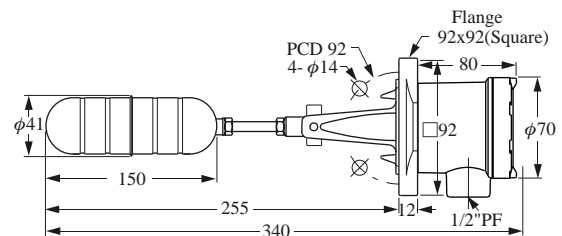
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Model No. LF 71 CEM



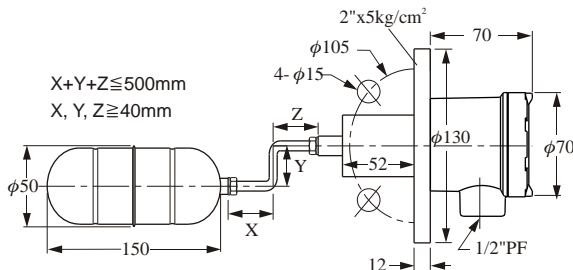
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Model No. LF 71 DFM



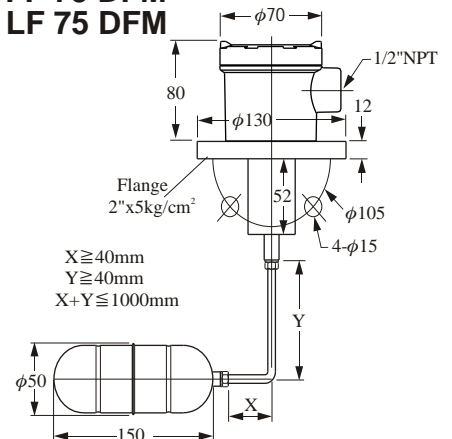
▶ Order No. FF 73 CLO
Model No. LF 73 CLO



▶ Order No. FF 74 DFM
Model No. LF 74 DFM



▶ Order No. FF 75 DFM
Model No. LF 75 DFM



HOW TO MAKE YOUR ORDER

Order No. FF 70 C EM 0270

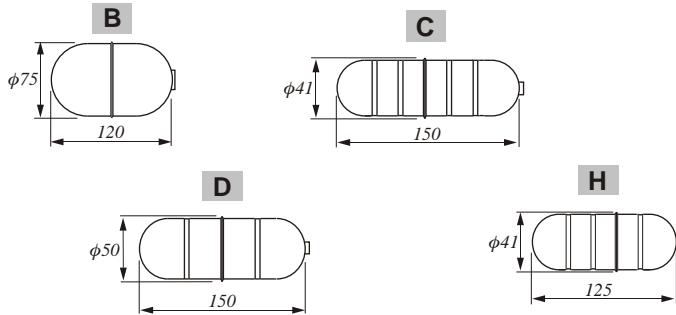
Model No. LF 70 C EM 0270

ORDER NO. _____

- 70: LF70 ENCLOSURE EXPLOSION PROOF (Ex d IIB T3~T6)
- 71: LF71 ENCLOSURE EXPLOSION PROOF (Ex d IIB T3~T6)
- 73: LF73 ENCLOSURE EXPLOSION PROOF (Ex d IIB T3~T6)
- 75: LF75 ENCLOSURE EXPLOSION PROOF (Ex d IIB T3~T6)

FLOAT TYPE _____

- B: $\phi 75 \times 120$ (OPERATION PRESSURE 10kg/cm² S.G. 0.25)
- C: $\phi 41 \times 150$ (OPERATION PRESSURE 15kg/cm² S.G. 0.65)
- D: $\phi 50 \times 150$ (OPERATION PRESSURE 30kg/cm² S.G. 0.55)
- G: $\phi 41 \times 125$ (OPERATION PRESSURE 15kg/cm² S.G. 0.7)



CONNECTING TYPE _____

- | | | |
|-----------------|-------------------------|-----------------|
| E: 1-1/2" (40A) | M: 5 kg/cm ² | W: PN10 (10Bar) |
| F: 2" (50A) | N: 10kg/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) | T: BSP | |
| K: 6" (150A) | U: NPT | |
| L: 92x92 | S: Others | |

※ Flanges are in thickness of factory standard 12mm.

LENGTH(L) (UNIT: mm) _____

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