



## Side Mounting Float Switch



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# INTRODUCTION

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## WORKING PRINCIPLE

The reed switch relies on two basic scientific principles namely: buoyancy and magnetism.

Buoyancy causes the float (which contains a magnet) to rise with the liquid and magnetism helps open and close the switch.

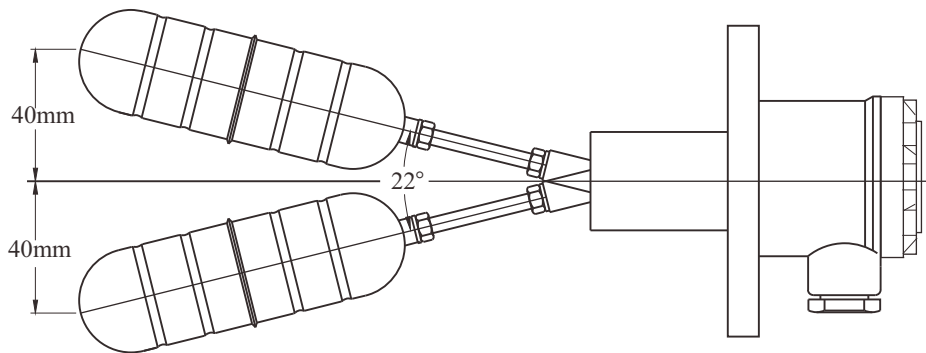
A change in liquid levels raises or lowers the float up or down. The end of the pivot arm (non float side) contains a permanent magnet that can repel the switch magnet (inside the stationary 'stem' of the entire structure).

When the float magnet moves close to the switch's stationary stem, the float magnet repel the switch magnet which either opens or closes the Electrical circuit.

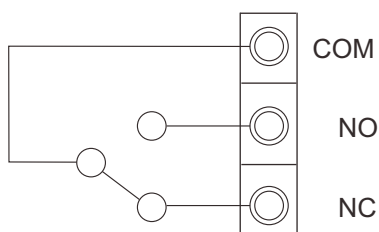
## FEATURES

The side mounted float level sensor (FF series) are manufactured specifically for horizontal mounting on tanks or vessels. They work well as high or low level controls.

1. Both Micro-Switch types and Reed Switches are available. The MicroSwitch type is usable even at ambient temperatures of 100° C maximum.
2. Mounting flanges are custom-made. (JIS, DIN,ANSI).
3. A wide variety of floats for different solution's specific gravities (S.G.) are available.
4. Wetted parts material ranges from plastics, stainless steel, anti-corrosive and explosion proof types.

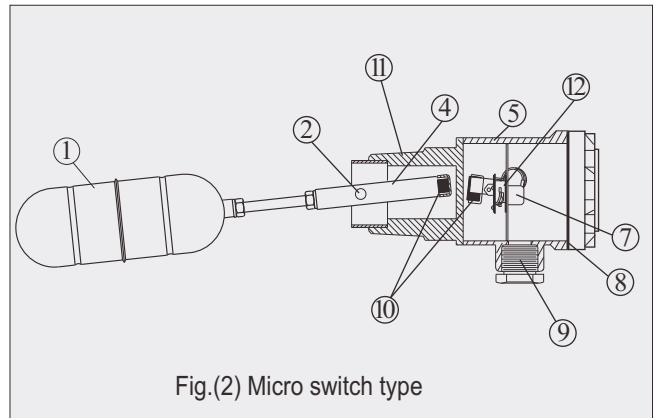
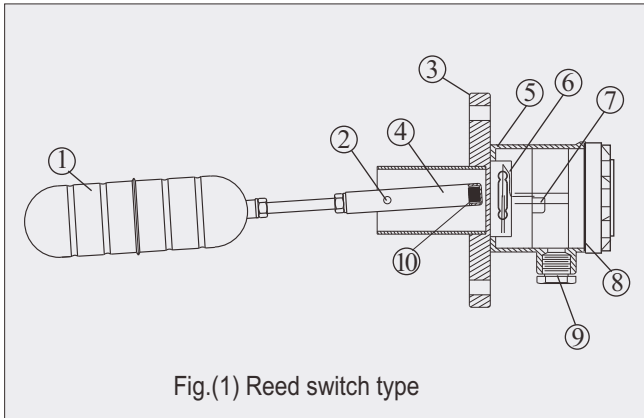


## WIRING



REED SWITCH ---- 1A, 30W 220Vac/200Vdc (FF20, 45, 55, 8□ )  
MICRO SWITCH ---- 5A/250Vac

# CONFIGURATION DIAGRAMS

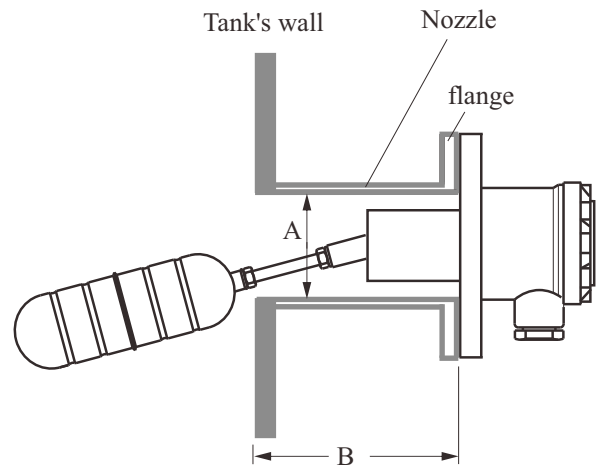


- |           |                |                       |                 |
|-----------|----------------|-----------------------|-----------------|
| 1. Float  | 4. Pivot       | 7. Terminal           | 10. Magnet      |
| 2. Shaft  | 5. Housing     | 8. O-ring             | 11. Screw       |
| 3. Flange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

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

UNIT: mm

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



# SPECIFICATIONS



MODEL	SPEC.	Operating Temp.	Electrical Contact	Contact Capacity	Contact Element	Housing Spec.	Applicable S.G.
FF10BHM		-20°C~100°C	SPDT(1C)	5A/250Vac	Microswitch	Aluminum Alloy IP65	0.25
FF10CEM		-20°C~100°C	SPDT(1C)	5A/250Vac	Microswitch	Aluminum Alloy IP65	0.65
FF10CEQ		-20°C~100°C	SPDT(1C)	5A/250Vac	Microswitch	Aluminum Alloy IP65	0.65
FF10CLO		-20°C~100°C	SPDT(1C)	5A/250Vac	Microswitch	Aluminum Alloy IP65	0.65
FF10DFM		-20°C~100°C	SPDT(1C)	5A/250Vac	Microswitch	Aluminum Alloy IP65	0.55
FF10DFQ		-20°C~100°C	SPDT(1C)	5A/250Vac	Microswitch	Aluminum Alloy IP65	0.55
FF15HEQ		-20°C~100°C	SPDT(1C)	5A/250Vac	Microswitch	SUS304 IP65	0.8
FF12CEM		-40°C~100°C	SPDT(1C)X2	5A/250Vac	Microswitch	Aluminum Alloy IP65	0.65
FF20BHM		-40°C~200°C	SPDT(1C)	1A, 60W 220Vac/200Vdc	Reed Switch	Aluminum Alloy IP65	0.25
FF20CEM		-40°C~200°C	SPDT(1C)	1A, 30W 220Vac/200Vdc	Reed Switch	Aluminum Alloy IP65	0.65
FF20CEQ		-40°C~200°C	SPDT(1C)	1A, 30W 220Vac/200Vdc	Reed Switch	Aluminum Alloy IP65	0.65
FF20DFM		-40°C~200°C	SPDT(1C)	1A, 30W 220Vac/200Vdc	Reed Switch	Aluminum Alloy IP65	0.55
FF20DFQ		-40°C~200°C	SPDT(1C)	1A, 30W 220Vac/200Vdc	Reed Switch	Aluminum Alloy IP65	0.55
FF20DLO		-40°C~200°C	SPDT(1C)	1A, 30W 220Vac/200Vdc	Reed Switch	Aluminum Alloy IP65	0.55

※ Above-mentioned models are approved by marine standards : DNV 、 LR 、 GL 、 BV 、 ABS 。

# SPECIFICATIONS



MODEL	SPEC.	Operating Temp.	Electrical Contact	Contact Capacity	Contact Element	Housing Spec.	Applicable S.G.
FF30A3Q		-20°C~100°C	SPST(1A)	1A, 50W 240Vac/200Vdc	Reed Switch	SUS304 IP65	0.65
FF40DFM		-20°C~100°C	SPDT(1C)	5A/250Vac	Microswitch	Aluminum Alloy IP65	0.55
FF45DFM		-40°C~200°C	SPDT(1C)	1A, 60W 220Vac/200Vdc	Reed Switch	Aluminum Alloy IP65	0.55
FF50DFM		-20°C~100°C	SPDT(1C)	5A/250Vac	Microswitch	Aluminum Alloy IP65	0.55
FF55DFM		-40°C~200°C	SPDT(1C)	1A, 60W 220Vac/200Vdc	Reed switch	Aluminum Alloy IP65	0.55
FF62DFM		-40°C~350°C	SPDT(1C)	5A/250Vac	Microswitch	Aluminum Alloy IP65	0.55
FF70/71BHM		-20°C~100°C	SPDT(1C)	3A/250Vac	Microswitch	SUS316 Ex d IIC T3~T6	0.25
FF70/71CFM		-20°C~100°C	SPDT(1C)	3A/250Vac	Microswitch	SUS316 Ex d IIC T3~T6	0.65
FF70/71DFM		-20°C~100°C	SPDT(1C)	3A/250Vac	Microswitch	SUS316 Ex d IIC T3~T6	0.55
FF73GLO		-20°C~100°C	SPDT(1C)	3A/250Vac	Microswitch	SUS316 Ex d IIC T3~T6	0.7
FF75DFM		-20°C~100°C	SPDT(1C)	3A/250Vac	Microswitch	SUS316 Ex d IIC T3~T6	0.55
FF80EFM		-20°C~80°C	SPDT(1C)	1A, 30W 220Vac/200Vdc	Reed switch	PC IP65	0.60
FF81E		-20°C~80°C	SPDT(1C)	1A, 30W 220Vac/200Vdc	Reed switch	—	0.60
FF90CLO		-20°C~100°C	SPDT(1C)	5A/250Vac	Microswitch	Aluminum Alloy IP65	0.65

※ Above-mentioned models are approved by marine grade : DNV 、 LR 、 GL 、 BV 、 ABS 。

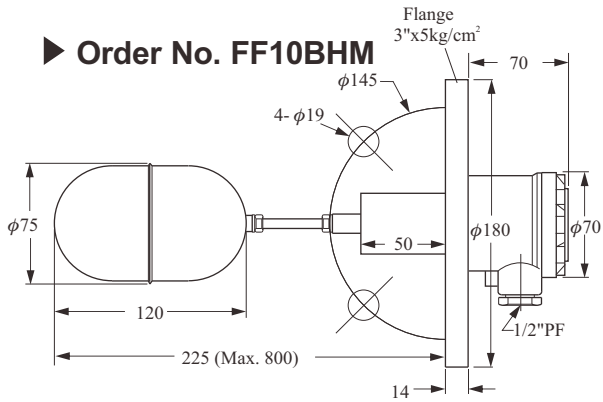
# MODELS

Order No. FF

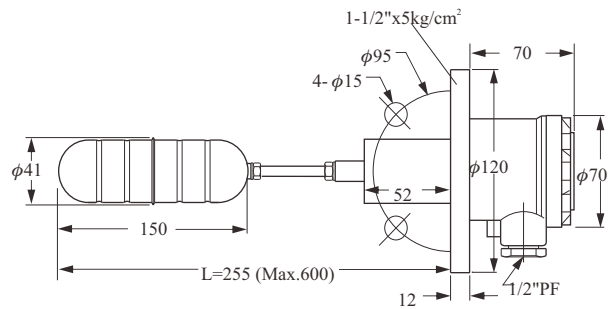
Connecting (Refer to p11)  
 Float  
 10: Single Switch  
 12: Dual Switch



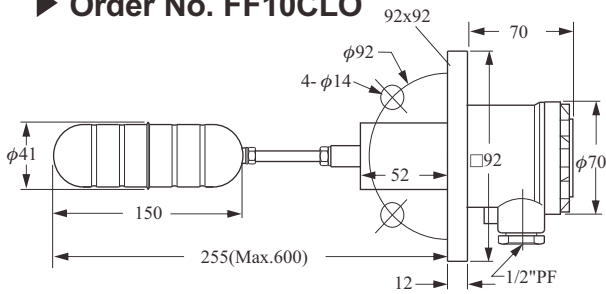
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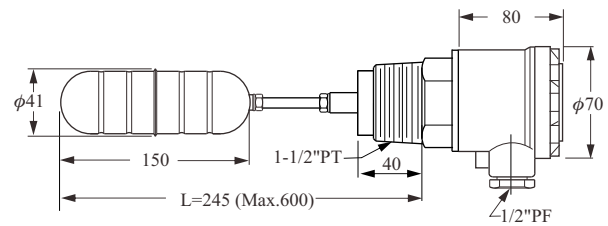
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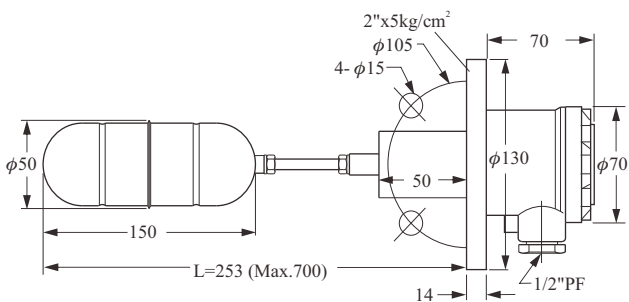
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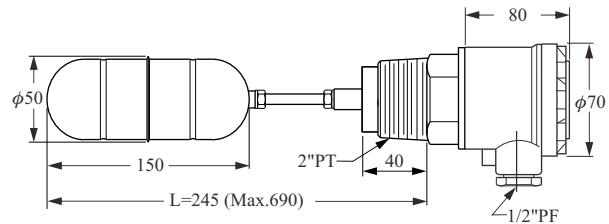
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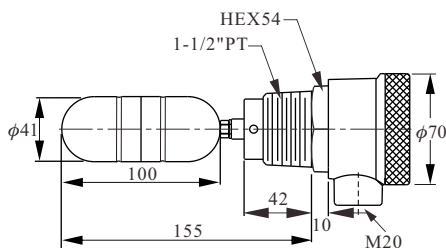
## ► Order No. FF10DFM



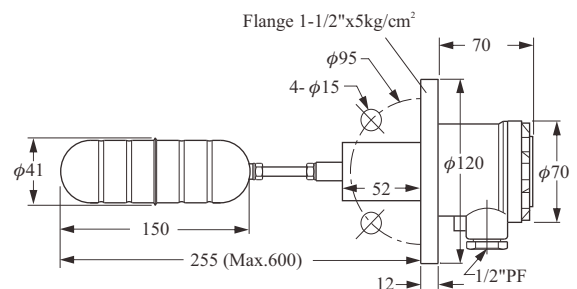
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## ► Order No. FF15HEQ

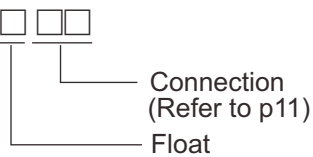


## ► Order No. FF12CEM

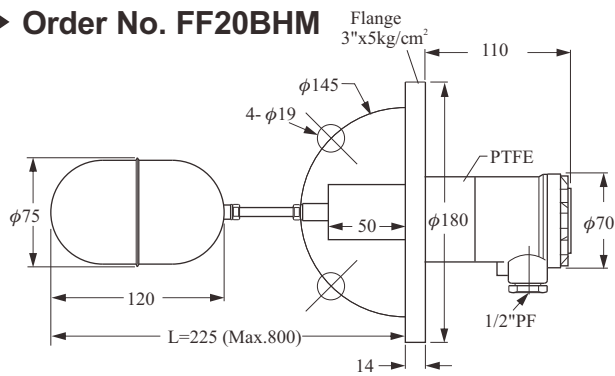


# HIGH TEMPERATURE

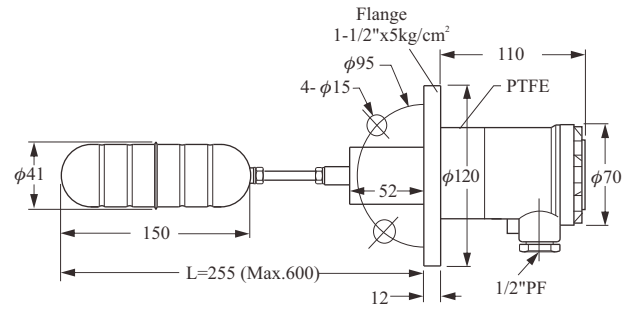
Order No. FF20



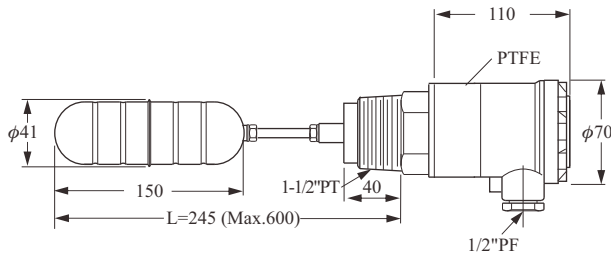
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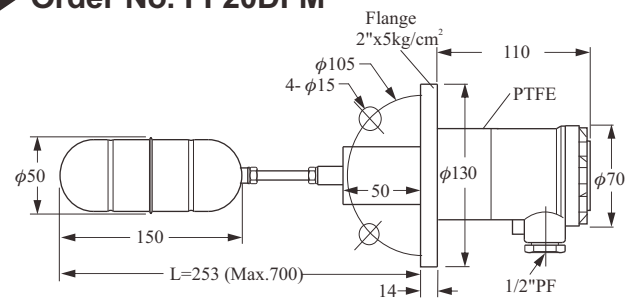
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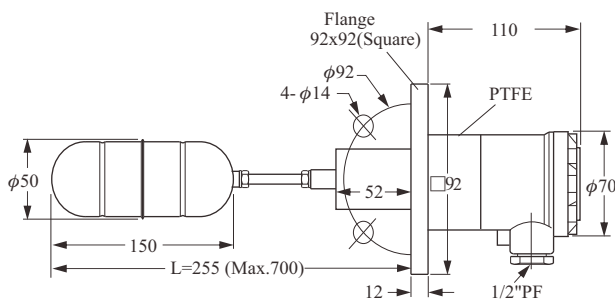
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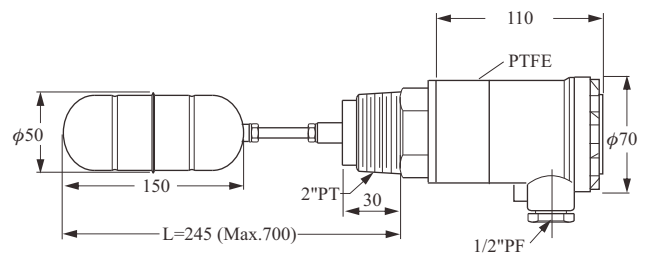
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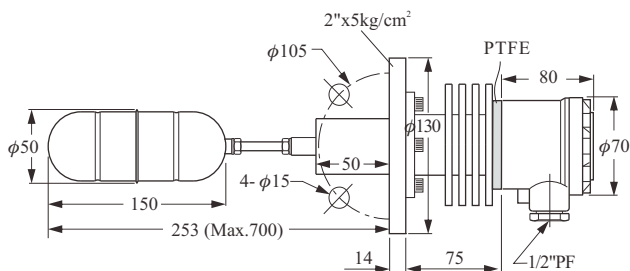
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## ► Order No. FF20DFQ



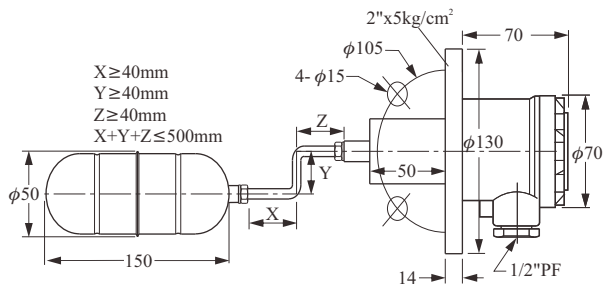
## ► Order No. FF62DFM



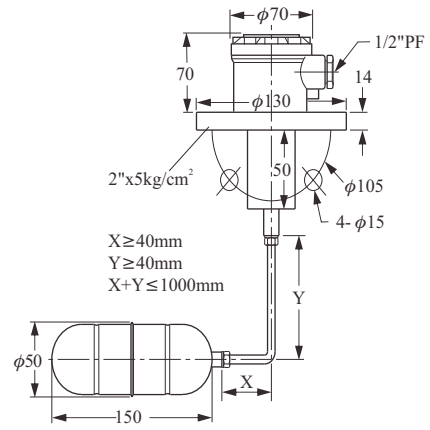
Order No. FF

- Connecting (Refer to page 11)
- Float
- 30: Mini Type
- 40: Double Angle Standard
- 45: Double Angle High Temperature
- 50: Vertical Standard
- 55: Vertical High Temperature

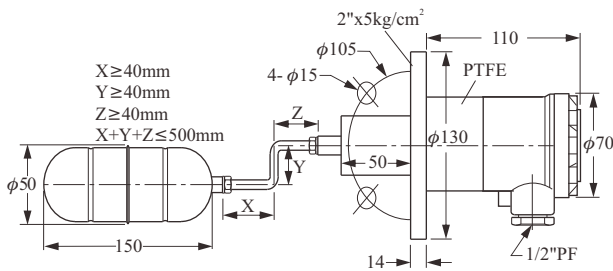
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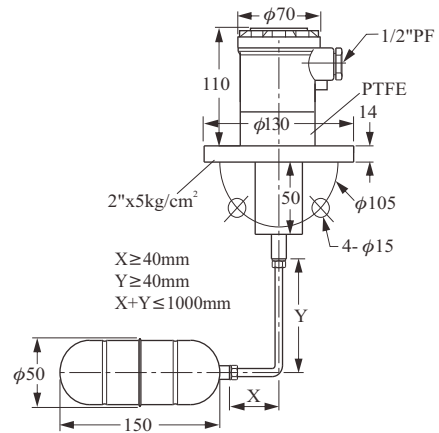
► Order No. FF50DFM



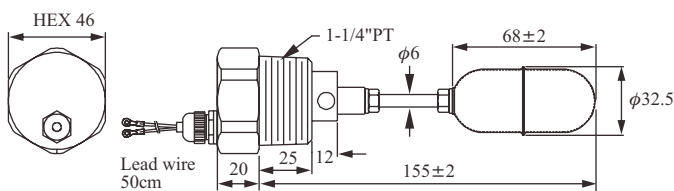
► Order No. FF45DFM



► Order No. FF55DFM



► Order No. FF30A3Q





# ANTI-CORROSIVE MODELS

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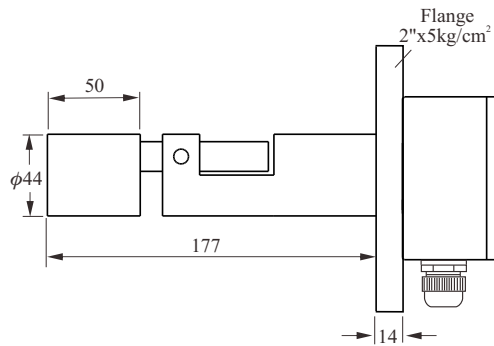
**FF80EFM --- PC Housing**

**FF81E --- Without Housing**

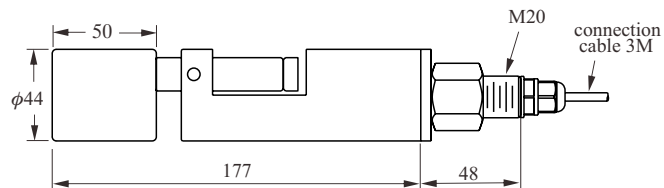
Wetted parts : P.P.

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

► **Order No. FF80EFM**

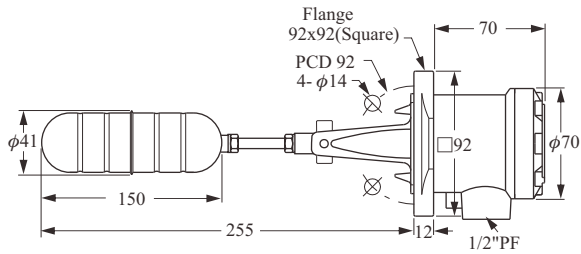


► **Order No. FF81E**



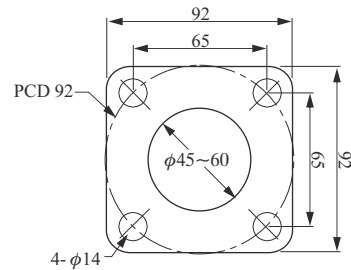
# SQUARE FLANGE & TEST ACCESSORIES

## ► Order No. FF90CLO



1. Housing material: Aluminum (IP65)
2. Suitable S.G.: >0.65
3. Operation temp.: -20~100°C
4. Contact mode: SPDT(1C)
5. Contact rating: 5A/250Vac
6. Operation pressure: 15kg/cm<sup>2</sup>
7. Wetted parts: SUS304
8. Weight: (approx.) 1.2 kg

### Drill Hole



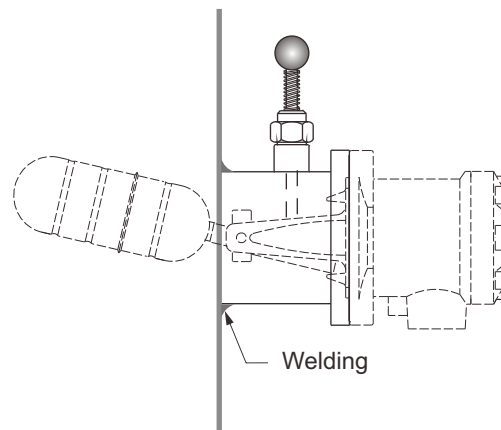
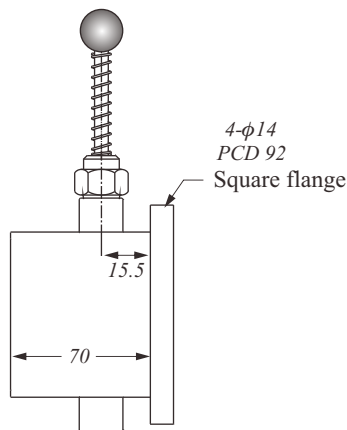
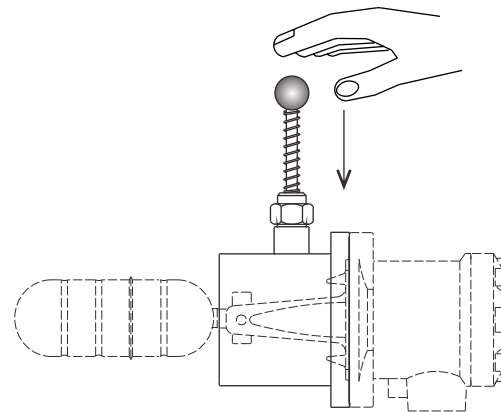
### Test Board (Optional)

#### Material: SS41

Please weld test board with level instrument. Without level dropping, level instrument can be checked regularly if functions well.

### Check list

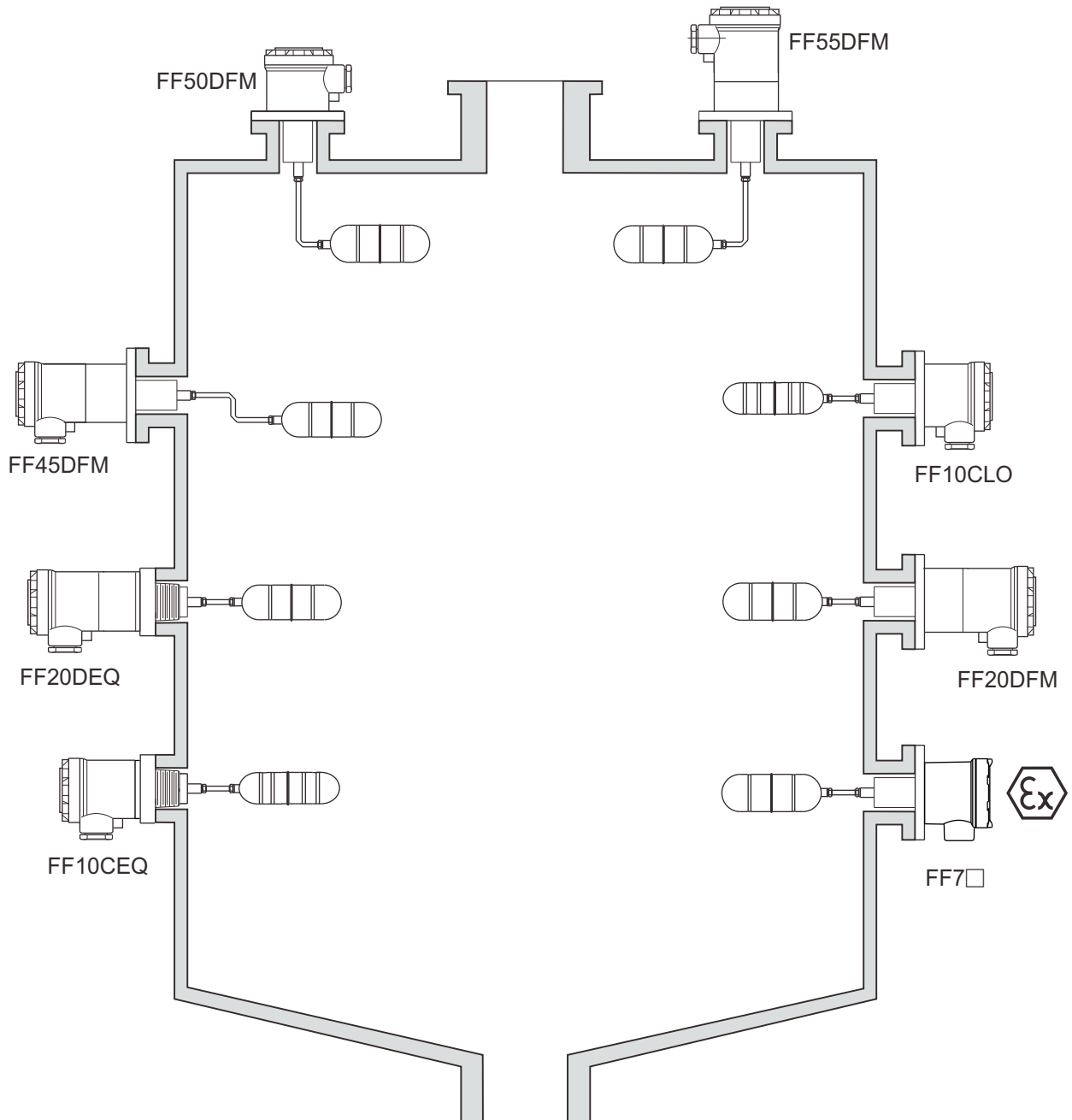
- Check if mechanical parts of level switch function well?
- Check if float functions well?



# IMPORTANCE FOR INSTALLATION

1. SUS304/SUS316 materials are not available for corrosive application.
2. The cable duct(s) must face downward to prevent moisture seeping in.
3. The float and extension rod must be inserted into the bin completely.
4. Check the liquid's S.G. level before installation.
5. The mounting hole must be larger than the external diameter of the float. (Please refer to p2)
6. Don't mount the devices near the bin's inlet or outlet.

## Typical Positioning



# ORDER INFORMATION

Order No. FF **10** **C** **EM** **(S)** **(T)**

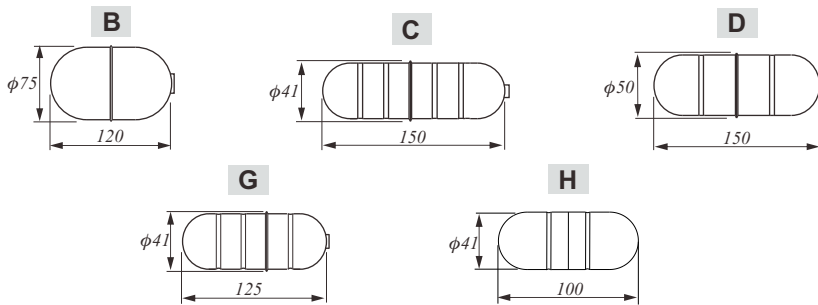
**ORDER NO.** \_\_\_\_\_

- |                             |                           |
|-----------------------------|---------------------------|
| 10/12: Standard             | 55: Vertical High Temp.   |
| 15: Mini                    | 62/66: High Temp Radiator |
| 20/26: High Temp.           | 80: Anti-acid/alkaline    |
| 40: Double Angle Standard   | 81: Without Housing       |
| 45: Double Angle High Temp. | Only FF81E                |
| 50: Vertical Standard       | 90/96: Square Flange      |

※ Mini type only available float type(C.G.H)

**FLOAT TYPE** \_\_\_\_\_

- B:  $\phi 75 \times 120$  (Operation Pressure 10kg/cm<sup>2</sup> S.G. 0.25)
- C:  $\phi 41 \times 150$  (Operation Pressure 15kg/cm<sup>2</sup> S.G. 0.65)
- D:  $\phi 50 \times 150$  (Operation Pressure 30kg/cm<sup>2</sup> S.G. 0.55)
- G:  $\phi 41 \times 125$  (Operation Pressure 15kg/cm<sup>2</sup> S.G. 0.7)
- H:  $\phi 41 \times 100$  (Operation Pressure 15kg/cm<sup>2</sup> S.G. 0.8)



**CONNECTING TYPE** \_\_\_\_\_

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

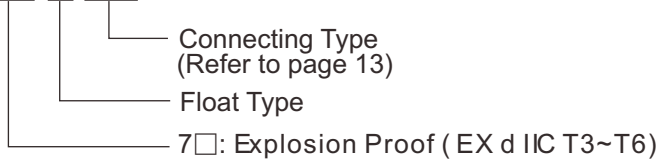
**CUSTOM LENGTH(L)** (UNIT: mm) \_\_\_\_\_

**TEST BOARD** \_\_\_\_\_

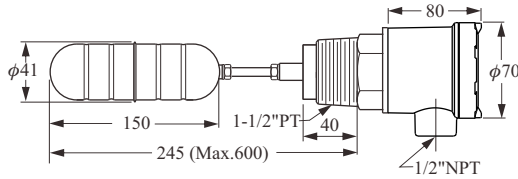
- ※ Total product length margin of error is  $\pm 5$ mm
- ※ Characteristics, specifications and dimensions are subject to change without notice.
- ※ Please contact your nearest distributor for further information.

# EXPLOSION PROOF

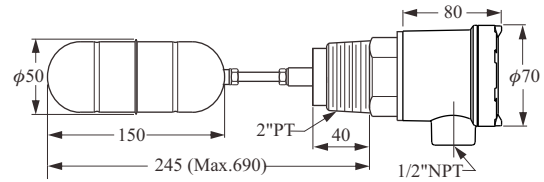
Order No. FF



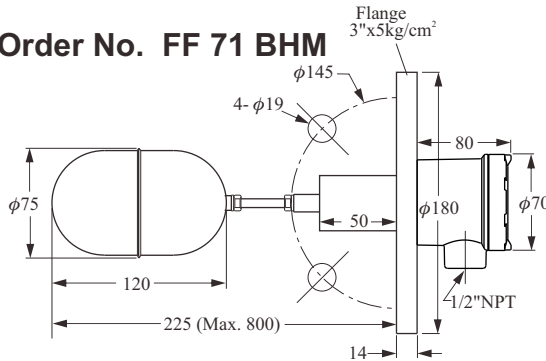
## ► Order No. FF 70 CEQ



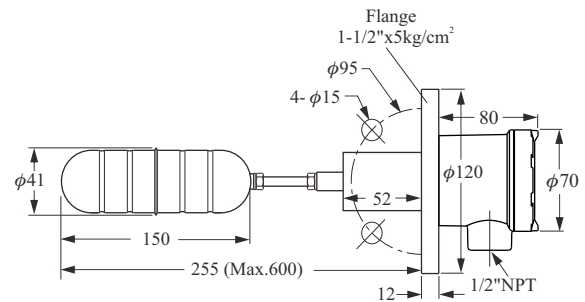
## ► Order No. FF 70 DFQ



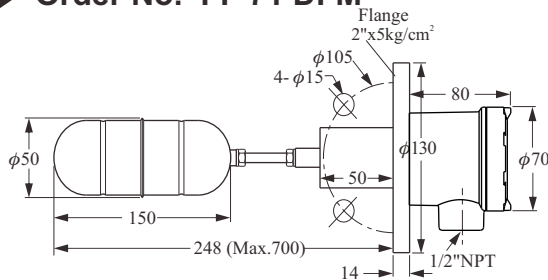
## ► Order No. FF 71 BHM



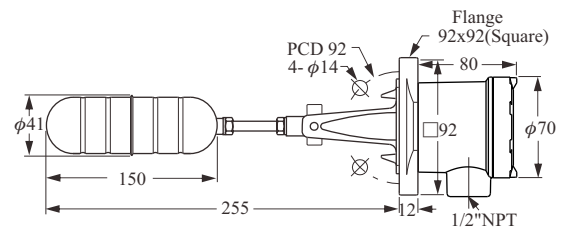
## ► Order No. FF 71 CEM



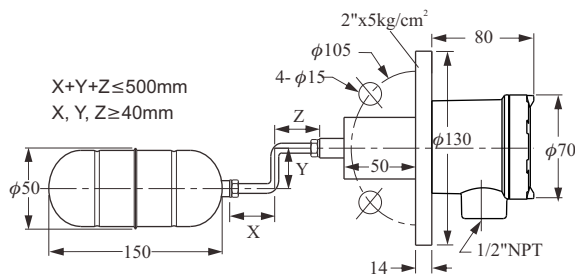
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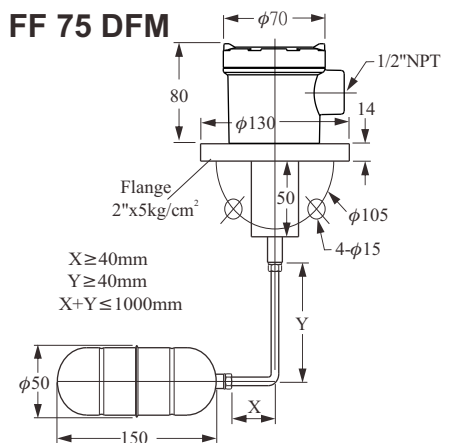
## ► Order No. FF 73 CLO



## ► Order No. FF 74 DFM



## ► Order No. FF 75 DFM



# ORDER INFORMATION

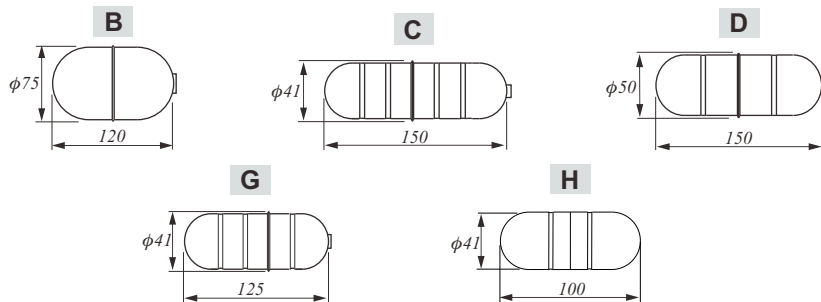
Order No. FF **70** **C** **EM** **S** **T**

**ORDER NO.** \_\_\_\_\_

- 70: LF70 Explosion Proof
- 71: LF71 Explosion Proof
- 73: LF73 Explosion Proof
- 74: LF74 Explosion Proof
- 75: LF75 Explosion Proof

**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)
- H:  $\phi 41 \times 100$  (Operation Pressure  $15 \text{ kg/cm}^2$  S.G. 0.8)



**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                   | S: Others       |
| J: 5" (125A)    | R: PF(G)                |                 |
| K: 6" (150A)    | T: BSP                  |                 |
| L: 92x92        | U: NPT                  |                 |

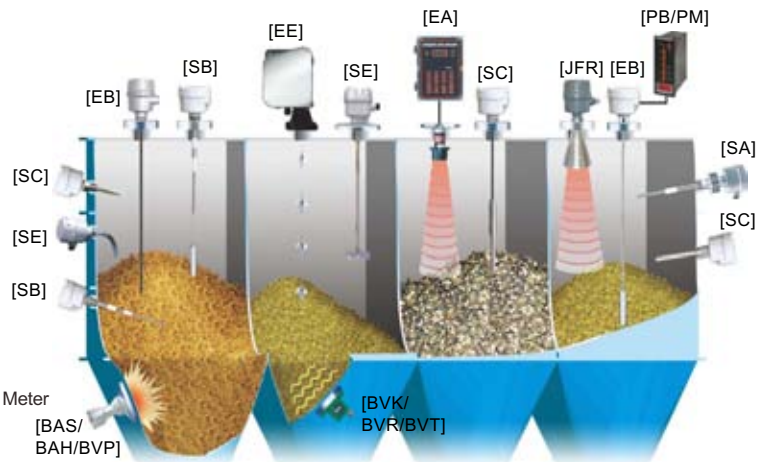
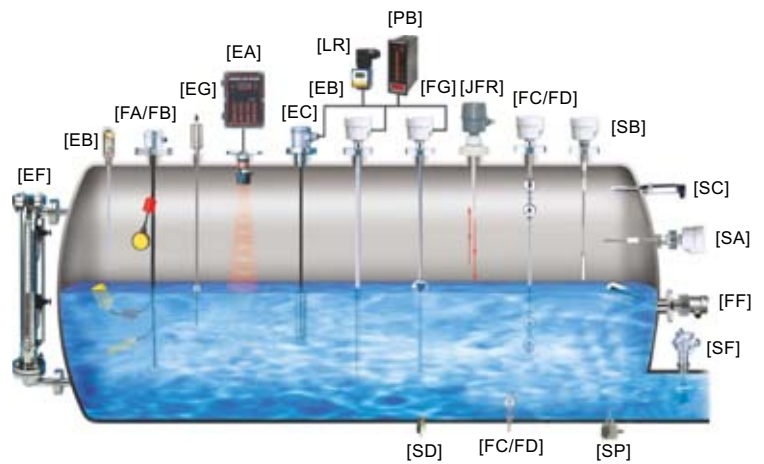
**CUSTOM LENGTH(L)** (UNIT: mm) \_\_\_\_\_

**TEST ACCESORY** \_\_\_\_\_

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

# EXAMPLES-OF-TANK-MOUNTING

- [FC/FD] Mini Float/Magnetic Float Level Switch
- [FG] Magnetic Float Level Transmitter
- [FF] Side Mounting Float Switch
- [FA/FB] Cable Float Level Switch
- [SP] Thermal Dispersion Flow Switch
- [SF] Paddle Flow Switch
- [SD] Optical Level Switch
- [SE] Rotary Paddle Level Switch
- [SA] Capacitance Level Switch
- [EC] Pressure Level Transmitter
- [LR] Loop Power Indicator
- [SC] Vibrating Probe Level Switch
- [SC] Tuning Fork Level Switch
- [EB] RF-Capacitance Level Transmitter
- [SB] RF-Capacitance / Admittance Level Switch
- [EG] Magnetostrictive Level Transmitter
- [EF] By-Pass Level Transmitter
- [MEF] Mini By-Pass Level Transmitter
- [EA] Ultrasonic Level Transmitter
- [JFR] FMCW Radar Level Transmitter
- [EE] Electromechanical Level Measuring System
- [ED] Speed Monitor
- [SRT/SRS] Conveyor Belt Misalignment Switch & Safety Cable Pull Switch
- [PB/PM] Microprocessor Based Bargraphic Display Scaling Meter
- [BRD/AE] Valve and Controller for Dust Collector System
- [BAS/BAH/BVP] Air Hammer
- [BVK/BVR/BVT] Pneumatic Vibrator



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