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Side Mounting Float Switch



INTRODUCTION

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.

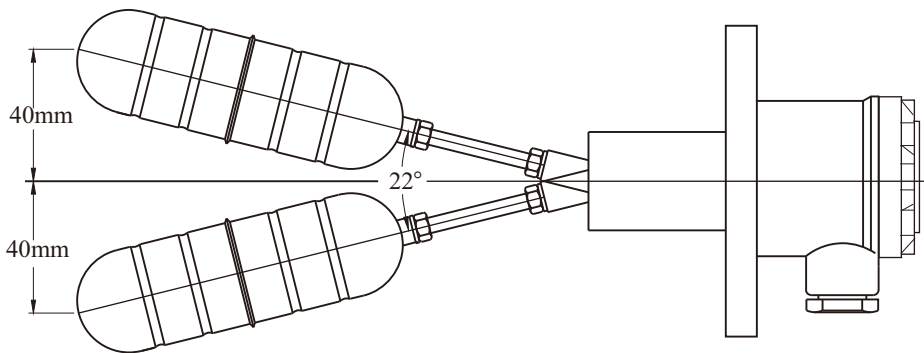
A change in liquid levels raises or lowers the float up or down. The end of the pivot arm (non float side) contains a permanent magnet that can repel the switch magnet (inside the stationary 'stem' of the entire structure).

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.

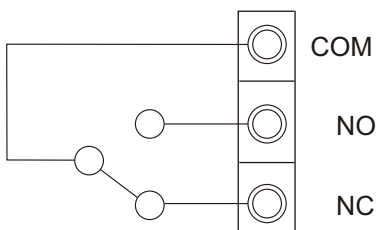
FEATURES

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.

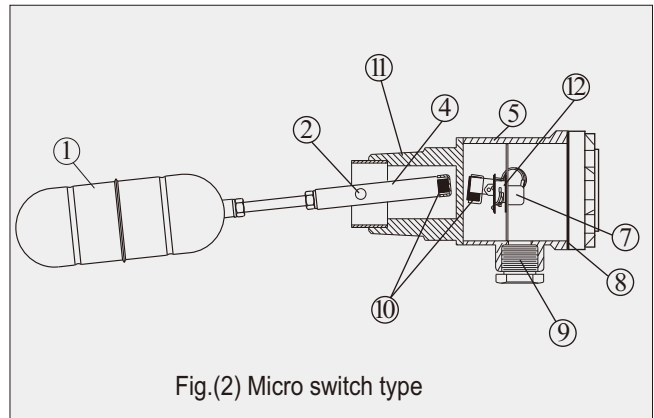
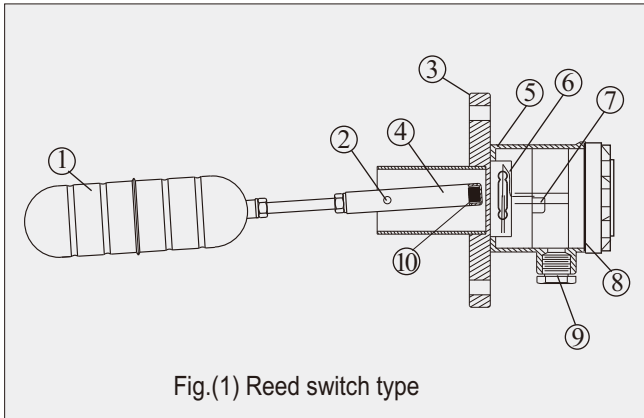


WIRING



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

CONFIGURATION DIAGRAMS

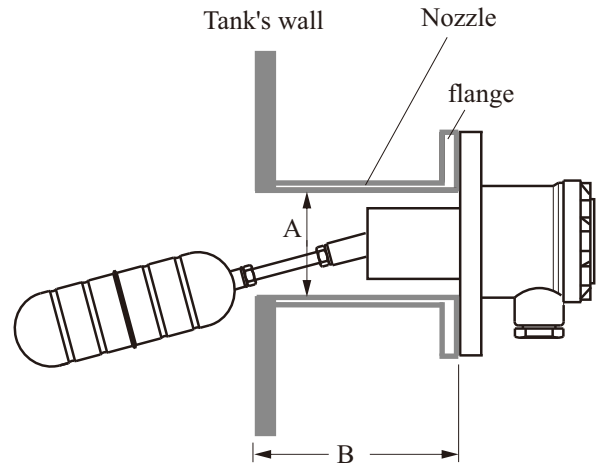


- | | | | |
|-----------|----------------|-------------|-----------------|
| 1. Float | 4. Pivot | 7. Terminal | 10. Magnet |
| 2. Shaft | 5. Housing | 8. O-ring | 11. Screw |
| 3. Flange | 6. Reed Switch | 9. Conduit | 12. Microswitch |
- Conduit/Connection

► 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, 60W 220Vac/200Vdc	Reed Switch	Aluminum Alloy IP65	0.65
FF20CEQ		-40°C~200°C	SPDT(1C)	1A, 60W 220Vac/200Vdc	Reed Switch	Aluminum Alloy IP65	0.65
FF20DFM		-40°C~200°C	SPDT(1C)	1A, 60W 220Vac/200Vdc	Reed Switch	Aluminum Alloy IP65	0.55
FF20DFQ		-40°C~200°C	SPDT(1C)	1A, 60W 220Vac/200Vdc	Reed Switch	Aluminum Alloy IP65	0.55
FF20DLO		-40°C~200°C	SPDT(1C)	1A, 60W 220Vac/200Vdc	Reed Switch	Aluminum Alloy IP65	0.55

※ Above-mentioned models are approved by class societies : DNV 、 LR 、 GL 、 BV 、 ABS ◦

SPECIFICATIONS



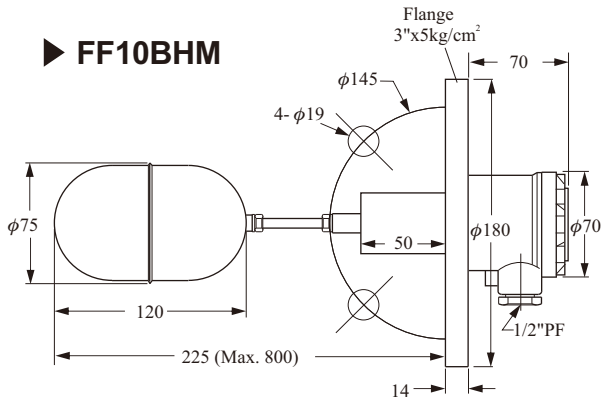
MODEL \ SPEC.	Operating Temp.	Electrical Contact	Contact Capacity	Contact Element	Housing Spec.	Applicable S.G.
FF40DFM	-20°C~100°C	SPDT(1C)	5A/250Vac	Microswitch	Aluminum Alloy IP65	0.55
FF45DFM	-40°C~200°C	SPDT(1C)	1A, 60W 220Vac/200Vdc	Reed Switch	Aluminum Alloy IP65	0.55
FF50DFM	-20°C~100°C	SPDT(1C)	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
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
FF90CLO	-20°C~100°C	SPDT(1C)	5A/250Vac	Microswitch	Aluminum Alloy IP65	0.65

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

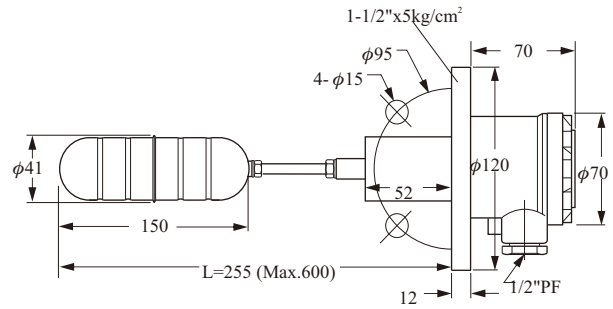
MODEL \ SPEC.	Operating Temp.	Electrical Contact	Contact Capacity	Contact Element	Housing Spec.	Applicable S.G.
FF30A3Q	-20°C~100°C	SPST(1A)	1A, 50W 240Vac/200Vdc	Reed Switch	SUS304 IP65	0.65
FF62DFM	-40°C~350°C	SPDT(1C)	5A/250Vac	Microswitch	Aluminum Alloy IP65	0.55
FF80EFM	-20°C~80°C	SPDT(1C)	1A, 30W 220Vac/200Vdc	Reed switch	PC IP65	0.60
FF81E	-20°C~80°C	SPDT(1C)	1A, 30W 220Vac/200Vdc	Reed switch	—	0.60

MODELS

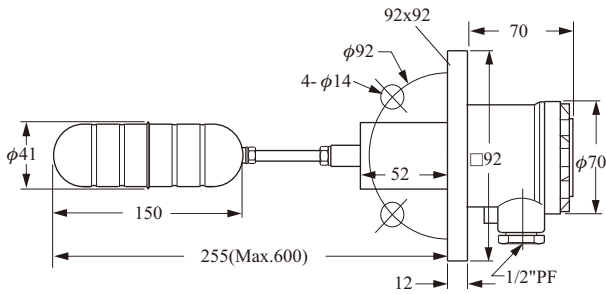
► FF10BHM



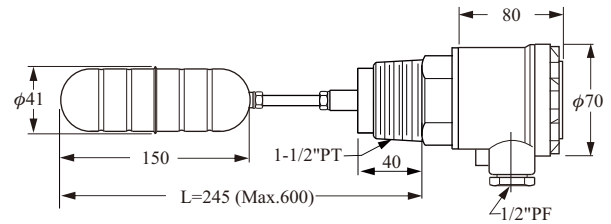
► FF10CEM



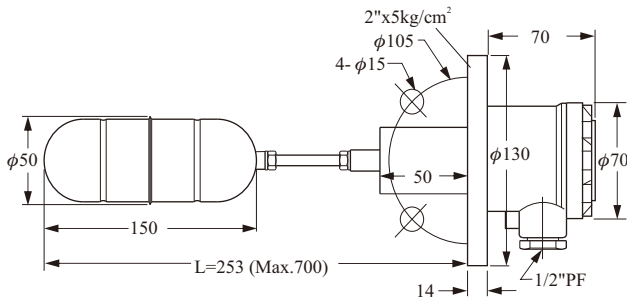
► FF10CLO



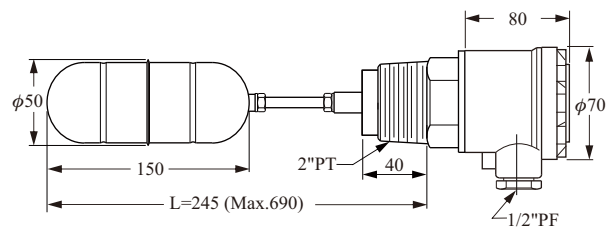
► FF10CEQ



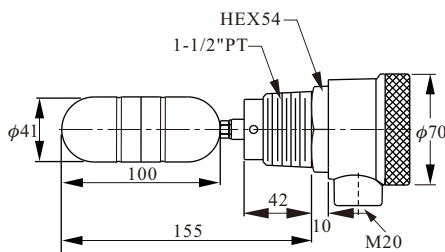
► FF10DFM



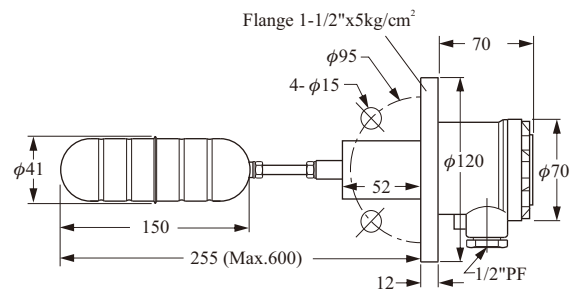
► FF10DFQ



► FF15HEQ

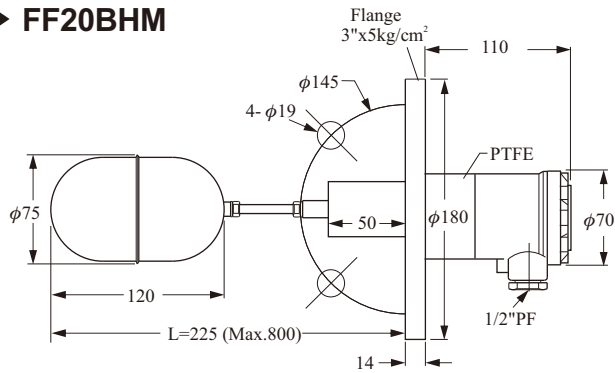


► FF12CEM

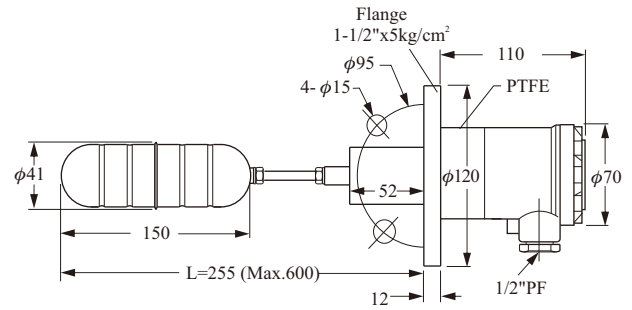


HIGH TEMPERATURE

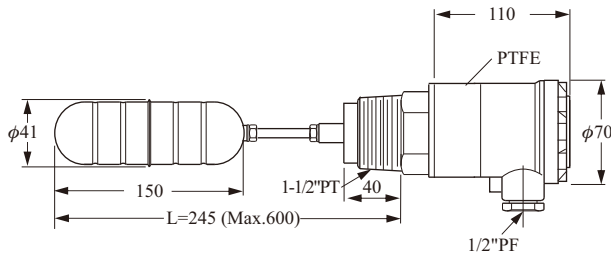
► **FF20BHM**



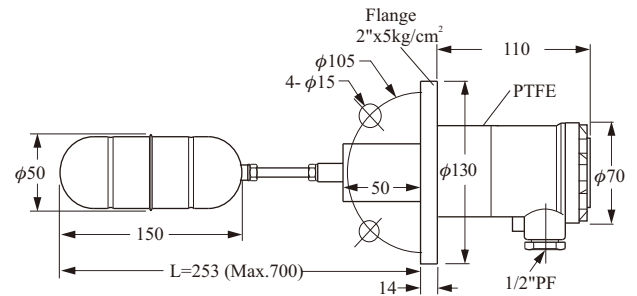
► **FF20CEM**



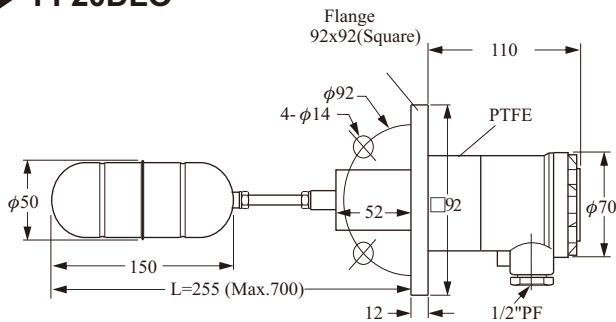
► **FF20CEQ**



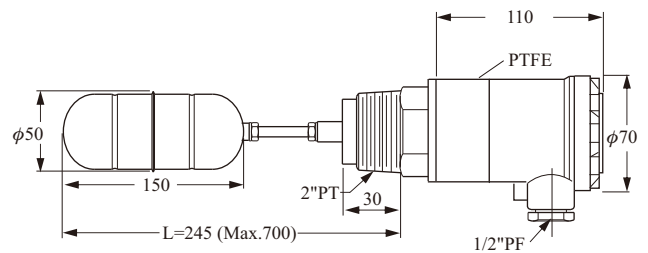
► **FF20DFM**



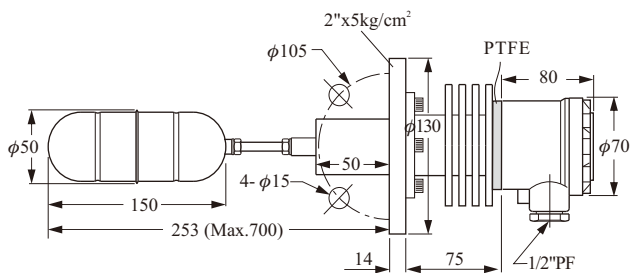
► **FF20DLO**



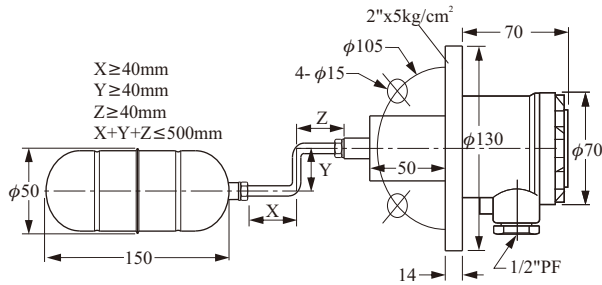
► **FF20DFQ**



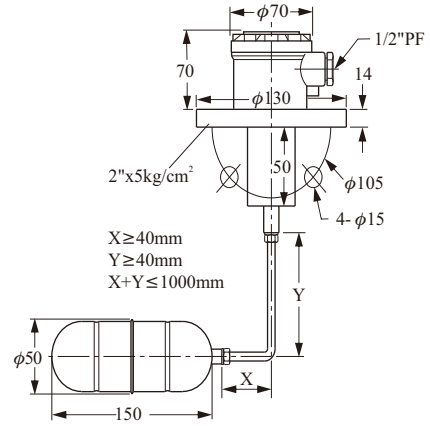
► **FF62DFM**



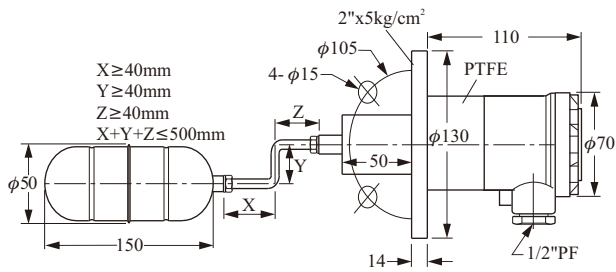
► FF40DFM



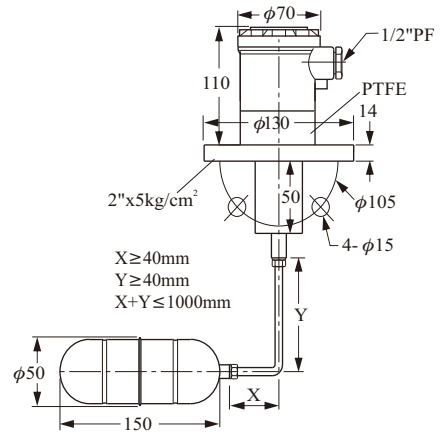
► FF50DFM



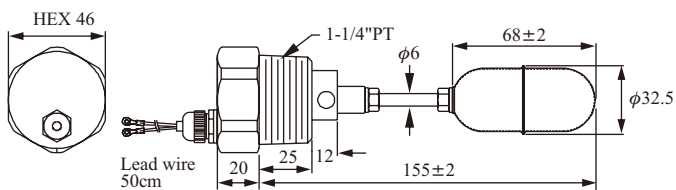
► FF45DFM



► FF55DFM



► FF30A3Q



ANTI-CORROSIVE MODELS

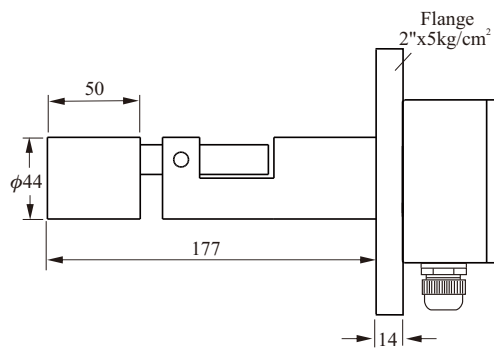
FF80EFM --- PC Housing

FF81E --- Without Housing

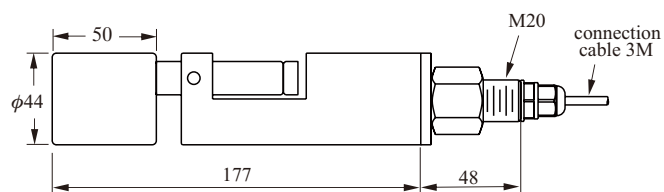
Wetted parts : P.P.

Cable spec. : PVC 3x0.75 mm²

► FF80EFM

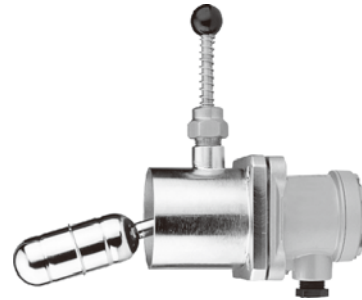
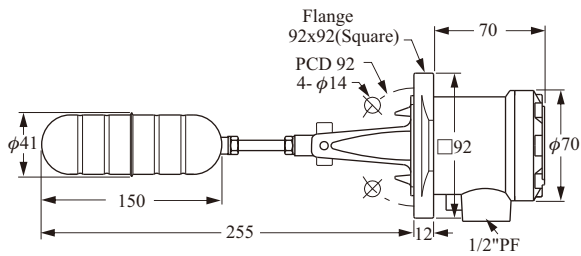


► FF81E



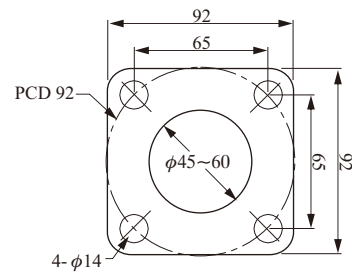
SQUARE FLANGE & TEST ACCESORIES

► 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/cm²
7. Wetted parts: SUS304
8. Weight: (approx.) 1.2 kg

Drill Hole



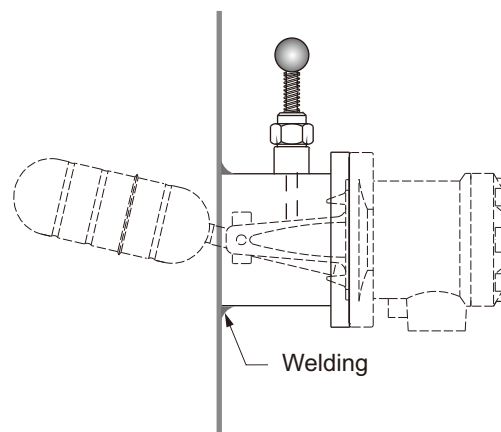
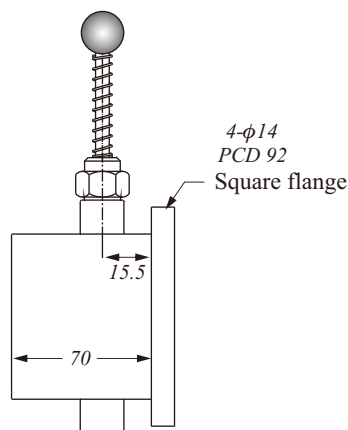
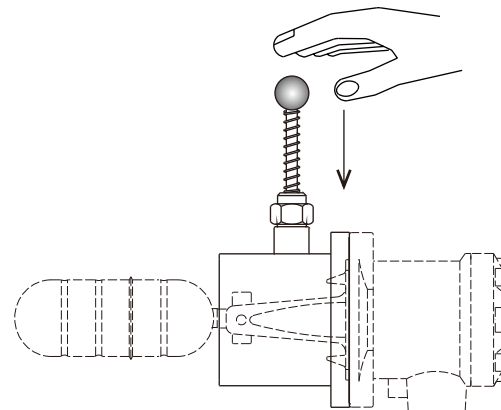
Test Board (Optional)

Material: SS41

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

Check list

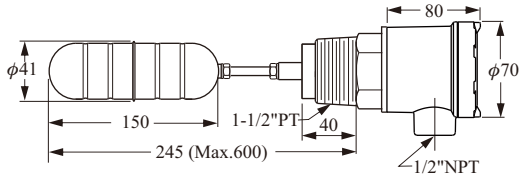
- Check if mechanical parts of level switch function well?
- Check if float functions well?



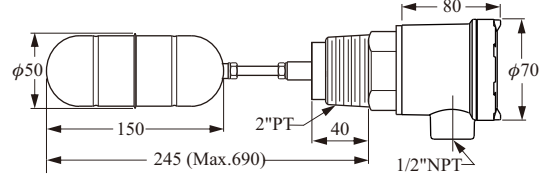
EXPLOSION PROOF

NEPSI PROOF No.GYB16.1272X Ex d IIC T3~T6
 PTB PROOF No. 05 ATEX 1025 Ex II 2G Ex d IIB T6~T4 Gb
 Ex II 2D Ex tb IIIC T85°C~T135°C
 Db IP65

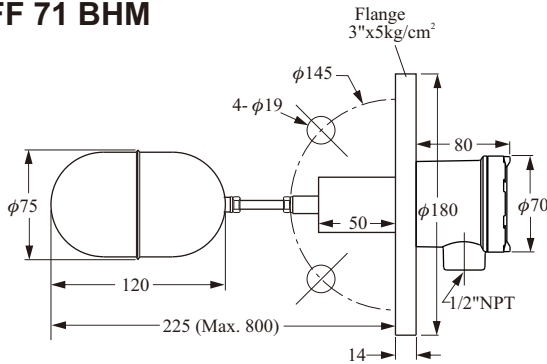
► FF 70 CEQ



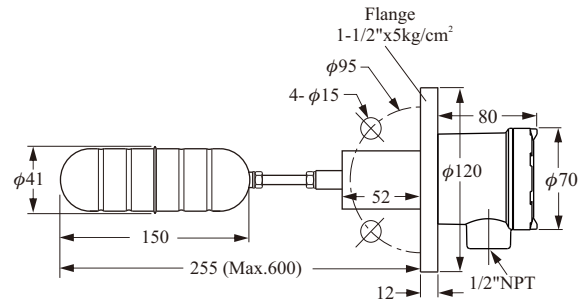
► FF 70 DFQ



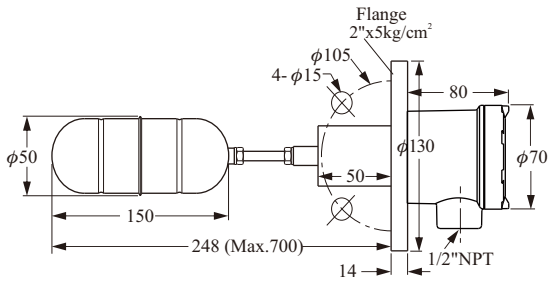
► FF 71 BHM



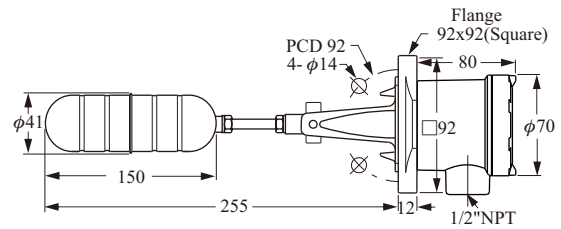
► FF 71 CEM



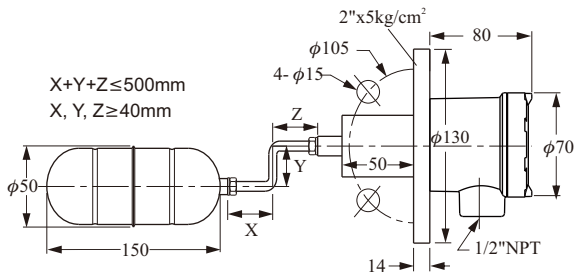
► FF 71 DFM



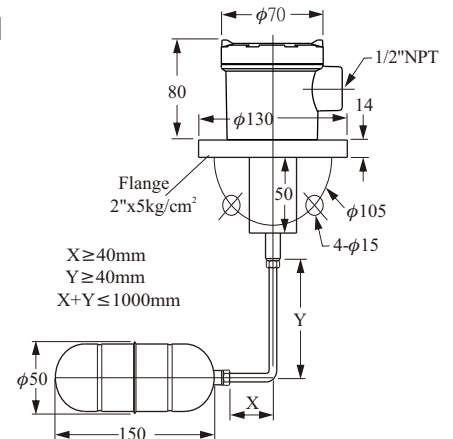
► FF 73 CLO



► FF 74 DFM



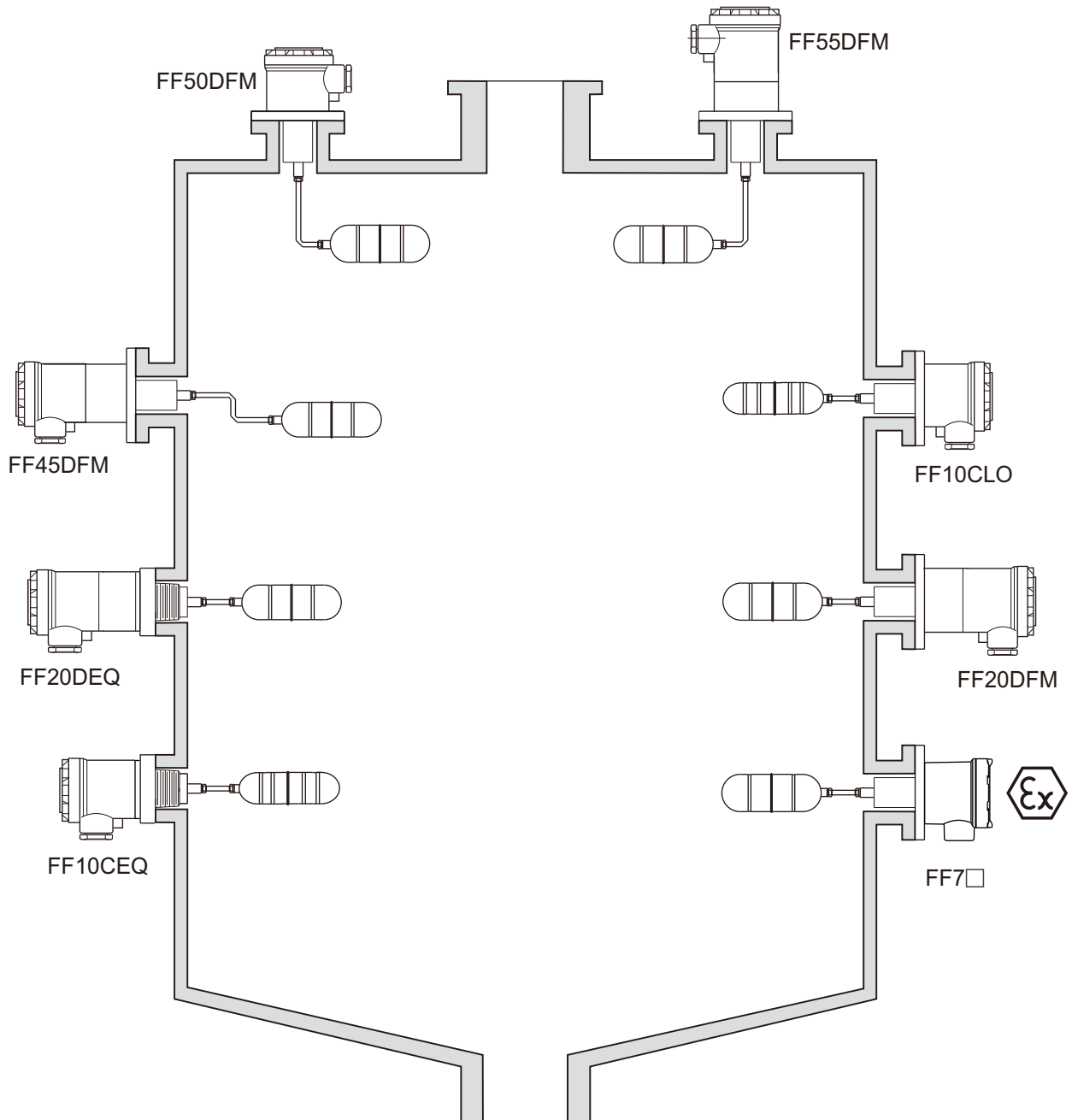
► FF 75 DFM



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



MODEL NUMBER / ORDER CODE COMPARISON TABLE

Model Number	Order Code
FF10BHM	FFX10000-A1HAKB540B
FF10CEM	FFX10000-A1HAKB140C
FF10CEQ	FFX10000-A1HAAB101C
FF10CLO	FFX10000-A1HAZ0000C
FF10DFM	FFX10000-A1HAKB240D
FF10DFQ	FFX10000-A1HAAB201D
FF15HEQ	FFX10000-A2ZAAB101F
FF12CEM	FFX10000-B1HAKB140C

Model Number	Order Code
FF70CEQ	FFX1001C-A1MAAB101C
FF70CFM	FFX1001C-A1MAAB240C
FF70DFM	FFX1001C-A1MAAB240D
FF70DFQ	FFX1001C-A1MAAB201D
FF71BHM	FFX1001C-A1MAKB540B
FF71CEM	FFX1001C-A1MAKB140C
FF71CFM	FFX1001C-A1MAKB240C
FF71DFM	FFX1001C-A1MAKB240D
FF73CLO	FFX1001C-A6MAZ0000C
FF73GLO	FFX1001C-A6MAZ0000G
FF74DFM	FFX1001C-A5MAKB240D
FF75DFM	FFX1001C-A4MAKB240D

FF20BHM	FFX10200-A1HAKB540B
FF20CEM	FFX10200-A1HAKB140C
FF20CEQ	FFX10200-A1HAAB101C
FF20DFM	FFX10200-A1HAKB240D
FF20DFQ	FFX10200-A1HAAB201D
FF20DLO	FFX10200-A1HAZ0000D

FF90CLO	FFX10000-A6HAZ0000C
FF30A3Q	FFX10100-A70AAA901A
FF62DFM	FFX10800-A1HAKB240D
FF80EFM	FFX10000-A3GAKB240E18
FF81E	FFX10000-A30ABJ282E18

FF40DFM	FFX10000-A5HAKB240D
FF45DFM	FFX10200-A5HAKB240D
FF50DFM	FFX10000-A4HAKB240D
FF55DFM	FFX10200-A4HAKB240D

ORDER INFORMATION

05 06 07 08 - 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FFX1 -

05 06 Model

00: Standard
 01: Economy
 02: Hi-temperature
 08: Super Hi-temperature

07 08 Certification

00: None	E0: BV	F1: LR+ATEX
70: NEPSI	F0: LR	B7: DNV+NEPSI
1C: ATEX	B1: DNV+ATEX	C7: ABS+NEPSI
B0: DNV	C1: ABS+ATEX	D7: GL+NEPSI
C0: ABS	D1: GL+ATEX	E7: BV+NEPSI
D0: GL	E1: BV+ATEX	F7: LR+NEPSI

09 10 Construction

A1: Standard	B1: Standard with dual switch
A2: Mini	B4: Vertical with dual switch
A3: Anti-Corrosive	B5: Double angle with dual switch
A4: Vertical	B6: Square flang & test accessories with dual switch
A5: Double angle	
A6: Square flang & test accessories	
A7: Small	

11 Housing

0: None
 H: H type(Aluminum) 1/2"PF-φ70*70
 M: M type(For Certification only)
 G: G type(For Anti-corrosive only)
 Z: SUS type(For Mini only)

Connection

12 13	14 15	16 17	
Flange item	00: None	00: None	42: 10kg/cm ²
AK: JIS-FF	A9: 1-1/4"	01: PT male	48: 150Lbs
AN: ANS-RF	B1: 1-1/2"	03: PF male	49: 300Lbs
AS: DIN-FF	B2: 2"	05: BSP male	57: PN 10
AZ: Square flange 92x92	B4: 2-1/2"	07: NPT male	58: PN 16
	B5: 3"	13: GAS male	82: P1.5 male
Thread item	E1: DN40	40: 5kg/cm ²	
AA: JIS	E2: DN50		
AB: ISO	E3: DN65		
AC: ANSI	E4: DN80		
AD: DIN	J2: M20		

(Next page)

ORDER INFORMATION

FFX1 ⁰⁵ ⁰⁶ ⁰⁷ ⁰⁸ - ⁰⁹ ¹⁰ ¹¹ ¹² ¹³ ¹⁴ ¹⁵ ¹⁶ ¹⁷ ¹⁸ ¹⁹ ²⁰ ²¹ ²² ²³ ²⁴

¹⁸ **Float type**

- A: $\phi 32.5 \times 68$, 15kg/cm² 0.65S.G.
- B: $\phi 75 \times 120$, 10kg/cm² 0.25S.G.
- C: $\phi 41 \times 150$, 15kg/cm² 0.65S.G.
- D: $\phi 50 \times 150$, 30kg/cm² 0.55S.G.
- E: $\phi 44 \times 50$ (PP), 5kg/cm² 0.6S.G.
- F: $\phi 41 \times 100$, 15kg/cm² 0.8S.G.
- G: $\phi 41 \times 125$, 15kg/cm² 0.7S.G.

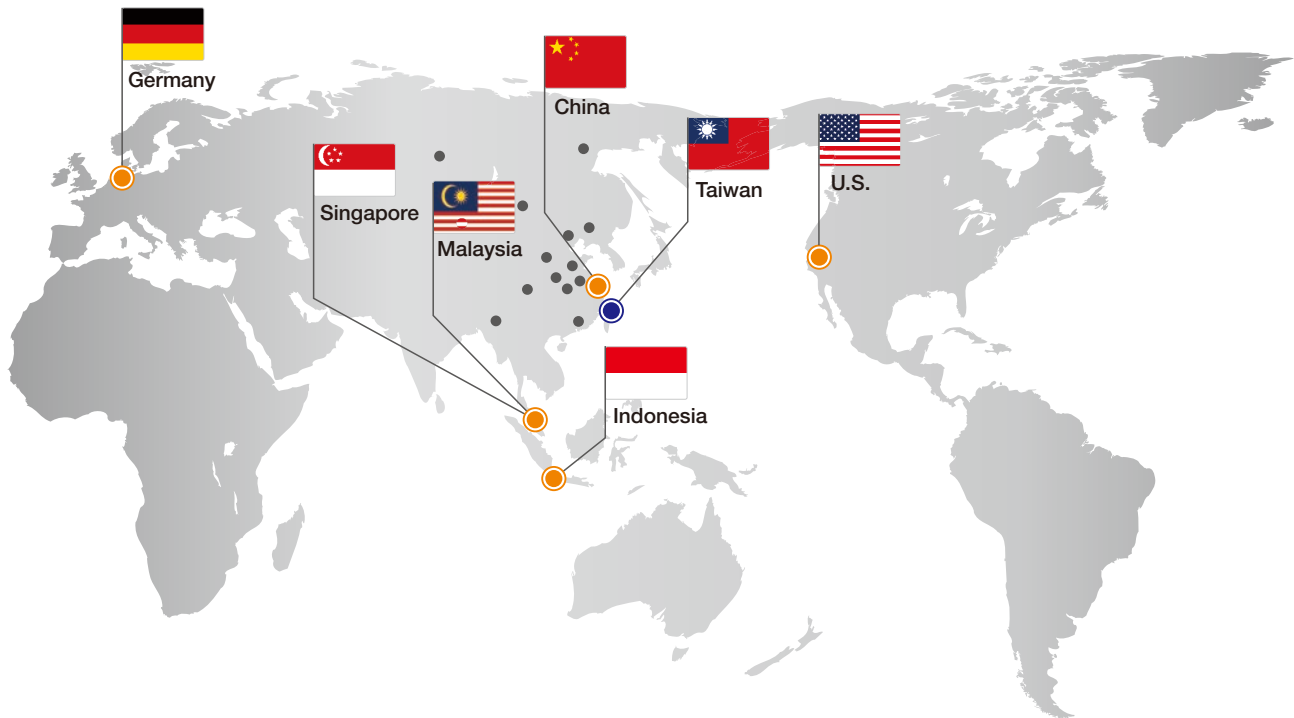
¹⁹ ²⁰ **Wetted parts**

- MA: SUS304
- MB: SUS316
- MC: SUS316L
- 18: PP

²¹ ²² ²³ ²⁴ **Length**

Code	Probe Length
0000	Standard
0250~0800	250~800mm
0270~1000	270~1000mm
0155~0600	155~600mm

Global Network



■ Asia

● Taiwan

FineTek Co., Ltd. - Taipei Head Quarter
No.16, Tzuchiang St., Tucheng Industrial Park
New Taipei City 236, Taiwan
TEL: 886-2-2269-6789
FAX: 886-2-2268-6682
EMAIL: info@fine-tek.com

● China

Fine automation Co., Ltd. - Shanghai Factory
No.451 DuHui Rd, MinHang District, Shanghai,
China 201109
TEL: 86-21-6490-7260
EMAIL: info.sh@fine-tek.com

● Singapore

FineTek Pte Ltd. - Singapore Office
No. 60 Kaki Bukit Place, #07-06 Eunos
Techpark 2 Lobby B, Singapore 415979
TEL: 65-6452-6340
EMAIL: info.sg@fine-tek.com

● Indonesia

FineTek Co., Ltd. - Indonesia Office
Ruko Golden 8 Blok H No.38
Gading Serpong, Tangerang, Indonesia
TEL: 62 (021)-2923-1688
EMAIL: info.id@fine-tek.com

● Malaysia

FineTek Co., Ltd. - Malaysia Office
8-05, Plaza Azalea, Persiaran Bandaraya,
Seksyen 14, 40000 Shah Alam, Selangor, Malaysia
TEL: 603-5524-7168
EMAIL: info.my@fine-tek.com

■ North America

● California, U.S.

Aplus Finetek Sensor Inc. - US Office
355 S. Lemon Ave, Suite D, Walnut,
CA 91789
TEL: 1 909 598 2488
FAX: 1 909 598 3188
EMAIL: info@aplusfine.com

■ Europe

● Germany

FineTek GmbH - Germany Office
Bei den Kämpen 26
21220 Seevetal-Ramelsloh, Germany
TEL: +49-(0)4185-8083-12
FAX: +49-(0)4185-8083-80
EMAIL: info@fine-tek.de

● Mütec Instruments GmbH - Germany Office

Bei den Kämpen 26
21220 Seevetal-Ramelsloh, Germany
TEL: +49-(0)4185-8083-0
FAX: +49-(0)4185-8083-80
EMAIL: muetec@muetec.de



Distributor: