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

<table>
<thead>
<tr>
<th>COM</th>
<th>NO</th>
<th>NC</th>
</tr>
</thead>
</table>

REED SWITCH ---- 1A, 30W 220Vac/200Vdc (FF20, 45, 55, 8□)
MICRO SWITCH ---- 5A/250Vac
The diameter and length of the connecting pipe (of a tank) are in direct proportion.

<table>
<thead>
<tr>
<th>Pipe dia. (A)</th>
<th>45-50</th>
<th>50-55</th>
<th>55-60</th>
<th>60-65</th>
<th>65-70</th>
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<tbody>
<tr>
<td>Length (B) (Max.)</td>
<td>130</td>
<td>140</td>
<td>150</td>
<td>160</td>
<td>170</td>
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### SPECIFICATIONS

<table>
<thead>
<tr>
<th>MODEL</th>
<th>SPEC.</th>
<th>Operating Temp.</th>
<th>Electrical Contact</th>
<th>Contact Capacity</th>
<th>Contact Element</th>
<th>Housing Spec.</th>
<th>Applicable S.G.</th>
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</thead>
<tbody>
<tr>
<td>FF10BHM</td>
<td></td>
<td>-20°C~100°C</td>
<td>SPDT(1C)</td>
<td>5A/250Vac</td>
<td>Microswitch</td>
<td>Aluminum Alloy IP65</td>
<td>0.25</td>
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<td>FF10CEM</td>
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<td>Aluminum Alloy IP65</td>
<td>0.65</td>
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<td>5A/250Vac</td>
<td>Microswitch</td>
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<td>SPDT(1C)</td>
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<td>FF20CEM</td>
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<td>SPDT(1C)</td>
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<td>FF20DFM</td>
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<td>SPDT(1C)</td>
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<td>1A, 60W 220Vac/200Vdc</td>
<td>Reed Switch</td>
<td>Aluminum Alloy IP65</td>
<td>0.55</td>
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</tbody>
</table>

※Above-mentioned models are approved by class societies: DNV、LR、GL、BV、ABS。
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<td>FF45DFM</td>
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<td>Reed Switch</td>
<td>Aluminum Alloy IP65</td>
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<td>Microswitch</td>
<td>Aluminum Alloy IP65</td>
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<td>-40°C~200°C</td>
<td>SPDT(1C)</td>
<td>1A, 60W 220Vac/200Vdc</td>
<td>Reed switch</td>
<td>Aluminum Alloy IP65</td>
<td>0.55</td>
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<td>FF70/71BHM</td>
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<td>SPDT(1C)</td>
<td>3A/250Vac</td>
<td>Microswitch</td>
<td>SUS316 Ex d IIC T3~T6</td>
<td>0.25</td>
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<tr>
<td>FF70/71CFM</td>
<td></td>
<td>-20°C~100°C</td>
<td>SPDT(1C)</td>
<td>3A/250Vac</td>
<td>Microswitch</td>
<td>SUS316 Ex d IIC T3~T6</td>
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<tr>
<td>FF70/71DFM</td>
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<td>-20°C~100°C</td>
<td>SPDT(1C)</td>
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<td>Microswitch</td>
<td>SUS316 Ex d IIC T3~T6</td>
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<td>FF73GLO</td>
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<td>SUS316 Ex d IIC T3~T6</td>
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<td>FF90CLO</td>
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<td>SPDT(1C)</td>
<td>5A/250Vac</td>
<td>Microswitch</td>
<td>Aluminum Alloy IP65</td>
<td>0.65</td>
</tr>
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<th>Housing Spec.</th>
<th>Applicable S.G.</th>
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<tbody>
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<td>FF30A3Q</td>
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<td>-20°C~100°C</td>
<td>SPST(1A)</td>
<td>1A, 50W 240Vac/200Vdc</td>
<td>Reed Switch</td>
<td>SUS304 IP65</td>
<td>0.65</td>
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<td>FF62DFM</td>
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<td>-40°C~350°C</td>
<td>SPDT(1C)</td>
<td>5A/250Vac</td>
<td>Microswitch</td>
<td>Aluminum Alloy IP65</td>
<td>0.55</td>
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<tr>
<td>FF80EFM</td>
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<td>-20°C~80°C</td>
<td>SPDT(1C)</td>
<td>1A, 30W 220Vac/200Vdc</td>
<td>Reed switch</td>
<td>PC IP65</td>
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<tr>
<td>FF81E</td>
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<td>-20°C~80°C</td>
<td>SPDT(1C)</td>
<td>1A, 30W 220Vac/200Vdc</td>
<td>Reed switch</td>
<td>——</td>
<td>0.60</td>
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</tbody>
</table>
MODELS

Order No. FF10BHM
Connecting (Refer to p11)
Float
10: Single Switch
12: Dual Switch

Order No. FF10CLO

Order No. FF10CEQ

Order No. FF10DFM

Order No. FF10DFQ

Order No. FF15HEQ

Order No. FF12CEM
HIGH TEMPERATURE

Order No. FF20

Connection (Refer to p11)
Float

Order No. FF20BHM

Order No. FF20CEM

Order No. FF20CEQ

Order No. FF20DFM

Order No. FF20DLO

Order No. FF20DFQ

Order No. FF62DFM
Order No. FF40DFM

Order No. FF50DFM

Order No. FF45DFM

Order No. FF55DFM

Order No. FF30A3Q
ANTI-CORROSIVE MODELS

FF80EFM --- PC Housing
FF81E --- Without Housing
Wetted parts : P.P.
Cable spec. : PVC 3x0.75 mm²

Order No. FF80EFM

Order No. FF81E

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

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?

Drill Hole
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 E M (S) (T) - 6

<table>
<thead>
<tr>
<th>ORDER NO.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15: Mini</td>
<td>62: High Temp Radiator</td>
</tr>
<tr>
<td>20: High Temp.</td>
<td>80: Anti-acid/alkaline</td>
</tr>
<tr>
<td>40: Double Angle Standard</td>
<td>81: Without Housing</td>
</tr>
<tr>
<td>45: Double Angle High Temp.</td>
<td>Only FF81E</td>
</tr>
<tr>
<td>50: Vertical Standard</td>
<td>90: Square Flange</td>
</tr>
</tbody>
</table>

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

### FLOAT TYPE

- **B:** φ75x120 (Operation Pressure 10kg/cm² S.G. 0.25)
- **C:** φ41x150 (Operation Pressure 15kg/cm² S.G. 0.65)
- **D:** φ50x150 (Operation Pressure 30kg/cm² S.G. 0.55)
- **G:** φ41x125 (Operation Pressure 15kg/cm² S.G. 0.7)
- **H:** φ41x100 (Operation Pressure 15kg/cm² S.G. 0.8)

### CONNECTING TYPE

- **E:** 1-1/2" (40A)  **M:** 5 kg/cm²  **W:** PN 10 (10Bar)
- **F:** 2" (50A)     **N:** 10 kg/cm²  **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)    **T:** BSP
- **K:** 6" (150A)    **U:** NPT
- **L:** 92x92

### CUSTOM LENGTH (L) (UNIT: mm)

- **10**: Standard
- **15**: Mini
- **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**: Without Housing
- **90**: Square Flange

### TEST BOARD

**MATERIAL**

- Without:SUS304
- -6:SUS316
- -9:SUS316L

※ Total product length margin of error is ±5mm
※ Characteristics, specifications and dimensions are subject to change without notice.
※ Please contact your nearest distributor for further information.
Order No. FF 70 CEQ

Order No. FF 70 DFQ

Order No. FF 71 BHM

Order No. FF 71 CEM

Order No. FF 71 DFM

Order No. FF 73 CLO

Order No. FF 74 DFM

Order No. FF 75 DFM

Connecting Type (Refer to page 13)

Float Type

7: Explosion Proof (EX d IIC T3~T6)
ORDER INFORMATION

Order No. FF 70 C EM S T - 6

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: φ75x120 (Operation Pressure 10kg/cm² S.G. 0.25)
C: φ41x150 (Operation Pressure 15kg/cm² S.G. 0.65)
D: φ50x150 (Operation Pressure 30kg/cm² S.G. 0.55)
G: φ41x125 (Operation Pressure 15kg/cm² S.G. 0.7)
H: φ41x100 (Operation Pressure 15kg/cm² S.G. 0.8)

CONNECTING TYPE
E: 1-1/2” (40A) M: 5 kg/cm² W: PN10 (10Bar)
F: 2” (50A) N: 10kg/cm² 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

MATERIAL
Without:SUS304 -6:SUS316 -9:SUS316L

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※ Please contact your nearest distributor for further information.