Side Mounting Float Switch

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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

Fig. (1) Reed switch type
- The diameter and length of the connecting pipe (of a tank) are in direct proportion.

UNIT: mm

<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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</table>

Fig. (2) Micro switch type
## SPECIFICATIONS

<table>
<thead>
<tr>
<th>MODEL</th>
<th>SPEC.</th>
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<th>Contact Capacity</th>
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<th>Housing Spec.</th>
<th>Applicable S.G.</th>
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<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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<tr>
<td>FF10CEM</td>
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<td>-20°C~100°C</td>
<td>SPDT(1C)</td>
<td>5A/250Vac</td>
<td>Microswitch</td>
<td>Aluminum Alloy IP65</td>
<td>0.65</td>
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<td>-20°C~100°C</td>
<td>SPDT(1C)</td>
<td>5A/250Vac</td>
<td>Microswitch</td>
<td>Aluminum Alloy IP65</td>
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<td>Microswitch</td>
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<tr>
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<td>SPDT(1C)</td>
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<td>SUS304 IP65</td>
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<td>FF12CEM</td>
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<td>-40°C~100°C</td>
<td>SPDT(1C)X2</td>
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<td>Aluminum Alloy IP65</td>
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<tr>
<td>FF20BHM</td>
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<td>SPDT(1C)</td>
<td>1A, 60W 220Vac200Vdc</td>
<td>Reed Switch</td>
<td>Aluminum Alloy IP65</td>
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<tr>
<td>FF20CEM</td>
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<td>SPDT(1C)</td>
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<td>FF20CEQ</td>
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<td>FF20DFM</td>
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<td>SPDT(1C)</td>
<td>1A, 60W 220Vac200Vdc</td>
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<td>SPDT(1C)</td>
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<td>FF20DLO</td>
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<td>1A, 60W 220Vac200Vdc</td>
<td>Reed Switch</td>
<td>Aluminum Alloy IP65</td>
<td>0.55</td>
</tr>
</tbody>
</table>

※Above-mentioned models are approved by class societies: DNV、LR、GL、BV、ABS。
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<tbody>
<tr>
<td>F30A3Q</td>
<td>FF40DFM</td>
<td>-20°C～100°C</td>
<td>SPDT(1C)</td>
<td>5A/250Vac</td>
<td>Microswitch</td>
<td>Aluminum Alloy IP65</td>
<td>0.55</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>
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<td>SPDT(1C)</td>
<td>5A/250Vac</td>
<td>Microswitch</td>
<td>Aluminum Alloy IP65</td>
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<td>SPDT(1C)</td>
<td>3A/250Vac</td>
<td>Microswitch</td>
<td>SUS316 Ex d IIC T3～T6</td>
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<td></td>
<td>FF70/71CFM</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>
<td>0.65</td>
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<tr>
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<td>FF70/71DFM</td>
<td>-20°C～100°C</td>
<td>SPDT(1C)</td>
<td>3A/250Vac</td>
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<td>SUS316 Ex d IIC T3～T6</td>
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<td>SPDT(1C)</td>
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<td>SUS316 Ex d IIC T3～T6</td>
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<td>FF90CLO</td>
<td>-20°C～100°C</td>
<td>SPDT(1C)</td>
<td>5A/250Vac</td>
<td>Microswitch</td>
<td>Aluminum Alloy IP65</td>
<td>0.65</td>
</tr>
</tbody>
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<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>F30A3Q</td>
<td>FF30A3Q</td>
<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></td>
<td>FF62DFM</td>
<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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<td>SPDT(1C)</td>
<td>1A, 30W 220Vac/200Vdc</td>
<td>Reed switch</td>
<td>PC IP65</td>
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<td>FF81E</td>
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<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>
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

- [Image of diagrams for each order number]
Order No. FF40DFM

Order No. FF50DFM

Order No. FF45DFM

Order No. FF55DFM

Order No. FF30A3Q

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
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?
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 CEM(S)(T) - 6

ORDER NO.

10/12: Standard  
15: Mini  
20/26: High Temp.  
40: Double Angle Standard  
45: Double Angle High Temp.  
50: Vertical Standard  

55: Vertical High Temp.  
62/66: High Temp Radiator  
80: Anti-acid/alkaline  
81: Without Housing  
Only FF81E  
90/96: Square Flange

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

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)
H: \( \phi 41 \times 100 \) (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)
K: 6” (150A) T: BSP
L: 92x92 U: NPT

CUSTOM LENGTH(L) (UNIT: mm)

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.
EXPLOSION PROOF

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 E M 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

※ 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.