## F61 Series

## Flow Switch (Standard Flow Rate - SPDT)

## Description

The F61 Series Flow Switches are Single-Pole, Double-Throw (SPDT) flow switches used on fluid lines carrying water, ethylene glycol, or other fluids not classified as hazardous. They can be wired to energize one device and deenergize another device powered from the same source when fluid flow either exceeds or drops below the set flow rate.
The F61MG type flow switches are used for low-energy loads to operate small relays, solenoid valves, and electronic control circuits, These flow switches have gold-plated contacts for improved electrical performance in low voltage, low current circuits.


Action on Increase of Flow

## F61 Series Action Diagram

## Features

- stainless steel paddle has three segments for use in pipes from 1 in. to 3 in . ( 25 mm to 75 mm ) diameter
- paddle segments can be removed or trimmed as needed
- F61KB-11 and F61MB-1 include a 6 in . ( 152 mm ) paddle for pipes 4 in . to 6 in . ( 102 mm to 152 mm )
- gold-plated contacts on F61MG-1 reduce intermittent contact problems in low-voltage and low-current circuits


F61KB-11


F61MB-1

## Applications

- use on lines carrying water or ethylene glycol
- not for use with hazardous fluids or in hazardous atmospheres


## Selection Charts

F61 Series Flow Switch (Standard Flow Rate - SPDT)

| Code Number | Enclosure | Bellows | Paddle |
| :--- | :--- | :--- | :--- |
| F61KB-11C | NEMA 1 | Phosphor Bronze | Stainless Steel; 3-piece Paddle (3 in., 2 in., and 1 in. Segments) Installed; 6 in. Paddle Supplied Uninstalled |
| F61LB-1C | NEMA 3R | Phosphor Bronze | Stainless Steel; 3-piece Paddle (3 in., 2 in., and 1 in. Segments) Installed |
| F61MB-1C | NEMA 3R | Phosphor Bronze | Stainless Steel; 3-piece Paddle (3 in., 2 in., and 1 in. Segments) Installed; 6 in. Paddle Supplied Uninstalled |
| F61MB-5C | NEMA 3R | Stainless Steel | Stainless Steel; 3-piece Paddle (3 in., 2 in., and 1 in. Segments) Installed; 6 in. Paddle Supplied Uninstalled |
| F61MG-1C ${ }^{\mathbf{1}}$ | NEMA 3R | Phosphor Bronze | Stainless Steel; 3-piece Paddle (3 in., 2 in., and 1 in. Segments) Installed; 6 in. Paddle Supplied Uninstalled |

1. Gold-Plated Contacts

Replacement Kits

| Code Number | Description |
| :--- | :--- |
| KIT21A-600 | Stainless Steel 3-piece Paddle (3 in., 2 in., and 1 in. Segments) |
| KIT21A-601 | Stainless Steel 6 in. Paddle |
| PLT52A-600R | Stainless Steel 3-piece Paddle (3 in., 2 in., and 1 in. Segments) and 6 in. Paddle |
| CVR62A-600R | Replacement Cover Assembly for F61MB-1, F61MB-5, and F61MG-1 |

## Technical Specifications

| F61 Series Standard Flow Rate Switch (Part 1 of 2) |  |  |
| :--- | :--- | :--- |
| Maximum Fluid Pressure | $160 \mathrm{psig}(1103 \mathrm{kPa})$ |  |
| Fluid <br> Temperature | Minimum | F61KB, F61LB: $32^{\circ} \mathrm{F}\left(0^{\circ} \mathrm{C}\right)$ <br> F61MB, F61MG: $-20^{\circ} \mathrm{F}\left(-29^{\circ} \mathrm{C}\right)$ |
|  | Maximum | $250^{\circ} \mathrm{F}\left(121^{\circ} \mathrm{C}\right)$ for all models |
| Wiring Connections | F61KB, F61LB: Screw Type Terminal <br> F61MB, F61MG: Four Color-coded No. 14 AWG Solid Conductor Wire Leads, $7 \mathrm{in}. \mathrm{(178} \mathrm{mm)} \mathrm{Long}$ |  |
| Pipe Connector | 1 in. 11-1/2 NPT Threads |  |
| Conduit Connection | F61KB: One 7/8 in. (22 mm) Hole for 1/2 in. Conduit with 1-3/32 in. (28 mm) Knockout Ring for 3/4 in. Conduit <br> F61LB, F61MB, F61MG: Female Hub for 1/2 in. Conduit, 1/2-14 NPSM Threads |  |
| Paddle | Installed Stainless Steel 3-piece Paddle (3 in., 2 in., and 1 in. Segments); <br> Stainless Steel 6 in. Paddle Supplied w/ F61MB and F61KB |  |
| Switch | SPDT Snap-acting Pennswitch |  |

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## Flow Switch (Standard Flow Rate - SPDT) (Continued)

## Technical Specifications (Continued)

|  |  | F61 Series Standard Flow Rate Switch (Part 2 of 2) |
| :---: | :---: | :---: |
| Enclosure | Case | F61KB: 0.062 in. ( 1.57 mm ) Steel F61LB, F61MB, F61MG: 0.062 in. ( 1.57 mm ) Cold Drawn Steel |
|  | Cover | $\begin{aligned} & \text { F61KB: } 0.028 \mathrm{in.}(0.7 \mathrm{~mm}) \text { Steel (NEMA 1) } \\ & \text { F61LB: } 0.062 \mathrm{in.} \mathrm{(1.57} \mathrm{mm)} \mathrm{Cold} \mathrm{Drawn} \mathrm{Steel,} \mathrm{(NEMA} \mathrm{3R)} \\ & \text { F61MB, F61MG: } 0.062 \mathrm{in.} \mathrm{(1.57} \mathrm{mm);} \mathrm{Cold} \mathrm{Drawn} \mathrm{Steel,} \mathrm{Gasketed} \mathrm{(NEMA} \mathrm{3R} \mathrm{Rain-tight)} \end{aligned}$ |
| Agency | UL Listed | All models: E5368, CCN NMFT |
| Listings | CSA Certified | F61KB: LR948, Class 3211 06,Class 4813 02, Class 122201 F61LB: Not CSA Certified <br> F61MB, F61MG: LR948, Class 321106 |
| Shipping Weight |  | $2.8 \mathrm{lb}(1.3 \mathrm{~kg})$ |

Electrical Ratings for F61KB, F61LB, and F61MB Models

| Electrical Ratings | $\mathbf{1 2 0}$ VAC | $\mathbf{2 0 8}$ VAC | $\mathbf{2 4 0}$ VAC | $\mathbf{2 7 7}$ VAC |
| :--- | :--- | :--- | :--- | :--- |
| Horsepower | 1 | 1 | 1 | - |
| Full Load Amperes | 16.0 | 8.8 | 8.0 | - |
| Locked Rotor Amperes | 96.0 | 52.8 | 48.0 | - |
| Non-inductive Amperes | 16.0 | 16.0 | 16.0 | 16.0 |
| Pilot Duty | 125 VA at 24/277 VAC |  |  |  |

Electrical Ratings for F61MG Models

| Electrical Ratings | $\mathbf{1 2 0}$ VAC |
| :--- | :--- |
| Full Load Amperes | 1 |
| Locked Rotor Amperes | 6 |
| Non-inductive Amperes | 2 |
| Pilot Duty | 125 VA at $24 / 277$ VAC |

Typical Flow Rates for Switches with 1 to 3 in. paddles

| GPM (m³/hr) Required to Actuate Switch |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Pipe Size (i |  | 1 | 1-1/4 ${ }^{1}$ | 1-1/2 | 2 | $2-1 / 2^{2}$ | 3 | $4^{3}$ | $5^{3}$ | $6^{3}$ | $8^{3}$ |
| F61KB, F61LB, and F61MB Models, 1 to 3 in. Paddles |  |  |  |  |  |  |  |  |  |  |  |
| Minimum Adjustment | Flow Increase <br> ( R to Y Closes) | $\begin{aligned} & \hline 4.2 \\ & (0.95) \end{aligned}$ | $\begin{aligned} & \hline 5.8 \\ & (1.32) \end{aligned}$ | $\begin{aligned} & \hline 7.5 \\ & (1.70) \end{aligned}$ | $\begin{aligned} & \hline 13.7 \\ & (3.11) \end{aligned}$ | $\begin{array}{\|l\|} \hline 18.0 \\ (4.09) \end{array}$ | $\begin{array}{\|l\|} \hline 27.5 \\ (6.24) \end{array}$ | $\begin{aligned} & \hline 65.0 \\ & (14.8) \end{aligned}$ | $\begin{aligned} & \hline 125.0 \\ & (28.4) \end{aligned}$ | $\begin{aligned} & 190.0 \\ & (43.2) \end{aligned}$ | $\begin{array}{\|l\|} \hline 375.0 \\ (85.2) \end{array}$ |
|  | Flow Decrease (R to B Closes) | $\begin{aligned} & \hline 2.5 \\ & (0.57) \end{aligned}$ | $\begin{aligned} & \hline 3.7 \\ & (0.84) \end{aligned}$ | $\begin{aligned} & \hline 5.0 \\ & (1.14) \end{aligned}$ | $\begin{array}{\|l\|} \hline 9.5 \\ (2.16) \end{array}$ | $\begin{aligned} & \hline 12.5 \\ & (2.84) \end{aligned}$ | $\begin{aligned} & \hline 19.0 \\ & (4.32) \end{aligned}$ | $\begin{aligned} & \hline 50.0 \\ & (11.4) \end{aligned}$ | $\begin{aligned} & 101.0 \\ & (22.9) \end{aligned}$ | $\begin{aligned} & 158.0 \\ & (35.9) \end{aligned}$ | $\begin{aligned} & \hline 320.0 \\ & (72.7) \end{aligned}$ |
| Maximum Adjustment | Flow Increase (R to Y Closes) | $\begin{aligned} & \hline 8.8 \\ & (2.0) \end{aligned}$ | $\begin{aligned} & \hline 13.3 \\ & (3.02) \end{aligned}$ | $\begin{aligned} & \hline 19.2 \\ & (4.36) \end{aligned}$ | $\begin{aligned} & 29.0 \\ & (6.6) \end{aligned}$ | $\begin{aligned} & \hline 34.5 \\ & (7.84) \end{aligned}$ | $\begin{aligned} & \hline 53.0 \\ & (12.0) \end{aligned}$ | $\begin{aligned} & 128.0 \\ & (29.1) \end{aligned}$ | $\begin{aligned} & 245.0 \\ & (55.6) \end{aligned}$ | $\begin{aligned} & 375.0 \\ & (85.2) \end{aligned}$ | $\begin{aligned} & \hline 760.0 \\ & (172.6) \end{aligned}$ |
|  | Flow Decrease (R to B Closes) | $\begin{aligned} & \hline 8.5 \\ & (1.93) \end{aligned}$ | $\begin{aligned} & \hline 12.5 \\ & (2.84) \end{aligned}$ | $\begin{aligned} & 18.0 \\ & (4.09) \end{aligned}$ | $\begin{aligned} & \hline 27.0 \\ & (6.13) \end{aligned}$ | $\begin{aligned} & 32.0 \\ & (7.27) \end{aligned}$ | $\begin{array}{\|l\|} \hline 50.0 \\ (11.4) \end{array}$ | $\begin{aligned} & 122.0 \\ & (27.7) \end{aligned}$ | $\begin{aligned} & 235 \\ & (53.4) \end{aligned}$ | $\begin{aligned} & 360.0 \\ & (81.8) \end{aligned}$ | $\begin{array}{\|l\|} \hline 730.0 \\ (165.8) \end{array}$ |
| F61MG Models, 1 to 3 in. Paddles |  |  |  |  |  |  |  |  |  |  |  |
| Minimum Adjustment | $\begin{aligned} & \text { Flow Increase } \\ & \text { (R to Y Closes) } \end{aligned}$ | $\begin{aligned} & \hline 3.8 \\ & (0.9) \end{aligned}$ | $\begin{aligned} & \hline 5.3 \\ & (1.2) \end{aligned}$ | $\begin{aligned} & \hline 6.9 \\ & (1.6) \end{aligned}$ | $\begin{array}{\|l\|} \hline 12.7 \\ (2.88) \end{array}$ | $\begin{aligned} & \hline 16.7 \\ & (3.79) \end{aligned}$ | $\begin{aligned} & \hline 24.3 \\ & (5.52) \end{aligned}$ | $\begin{aligned} & \hline 61.0 \\ & (13.8 \end{aligned}$ | $\begin{array}{\|l\|} \hline 118.0 \\ (26.80) \end{array}$ | $\begin{array}{\|l\|} \hline 183.0 \\ (41.56) \end{array}$ | $\begin{array}{\|l\|} \hline 362.0 \\ (82.22) \end{array}$ |
|  | Flow Decrease (R to B Closes) | $\begin{aligned} & \hline 2.5 \\ & (0.6) \end{aligned}$ | $\begin{aligned} & \hline 3.7 \\ & (0.8) \end{aligned}$ | $\begin{aligned} & \hline 5.0 \\ & (1.1) \end{aligned}$ | $\begin{aligned} & \hline 9.5 \\ & (2.2) \end{aligned}$ | $\begin{aligned} & \hline 12.5 \\ & (2.84) \end{aligned}$ | $\begin{aligned} & \hline 19.0 \\ & (4.32) \end{aligned}$ | $\begin{aligned} & \hline 50.0 \\ & (11.4) \end{aligned}$ | $\begin{aligned} & \hline 101.0 \\ & (22.94) \end{aligned}$ | $\begin{aligned} & \hline 158.0 \\ & (35.88) \end{aligned}$ | $\begin{array}{\|l\|} \hline 320.0 \\ (72.68) \end{array}$ |
| Maximum Adjustment | Flow Increase (R to Y Closes) | $\begin{aligned} & \hline 8.7 \\ & (2.0) \end{aligned}$ | $\begin{aligned} & 13.1 \\ & (2.98) \end{aligned}$ | $\begin{aligned} & \hline 18.8 \\ & (4.27) \end{aligned}$ | $\begin{array}{\|l\|} \hline 28.9 \\ (6.56) \end{array}$ | $\begin{aligned} & \hline 33.7 \\ & (7.65) \end{aligned}$ | $\begin{aligned} & 52.1 \\ & (11.8) \end{aligned}$ | $\begin{aligned} & \hline 126.0 \\ & (28.62) \end{aligned}$ | $\begin{aligned} & \hline 243.0 \\ & (55.19) \end{aligned}$ | $\begin{aligned} & \hline 372.0 \\ & (84.49) \end{aligned}$ | $\begin{aligned} & \hline 753.0 \\ & (171.0) \end{aligned}$ |
|  | Flow Decrease ( R to B Closes) | $\begin{array}{\|l\|} \hline 8.5 \\ (1.9) \\ \hline \end{array}$ | $\begin{aligned} & \hline 12.5 \\ & (2.84) \end{aligned}$ | $\begin{aligned} & 18.0 \\ & (4.09) \end{aligned}$ | $\begin{aligned} & 27.0 \\ & (6.13) \end{aligned}$ | $\begin{array}{\|l} \hline 32.0 \\ (7.27) \end{array}$ | $\begin{array}{\|l\|} \hline 50.0 \\ (11.4) \end{array}$ | $\begin{aligned} & \hline 122.0 \\ & (27.71) \end{aligned}$ | $\begin{array}{\|l\|} \hline 235.0 \\ (55.37) \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 360.0 \\ (81.76) \end{array}$ | $\begin{aligned} & \hline 730.0 \\ & (165.8) \end{aligned}$ |

1. Flow rates for two inch paddle trimmed to fit pipe.
2. Flow rates for three inch paddle trimmed to fit pipe.
3. Flow rates are calculated for factory-installed set of one, two, and three inch paddles.

Typical Flow Rates for Switches with 6 in. paddles (Part 1 of 2)

| GPM (m³/hr) Required to Actuate Switch |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Pipe Size (in.) |  | 4 | 5 | 6 | 8 |
| F61KB, F61LB, and F61MB Models, 6 in. Paddles |  |  |  |  |  |
| Minimum Adjustment | Flow Increase ( R to Y Closes) | $\begin{aligned} & \hline 37.0 \\ & (8.40) \end{aligned}$ | $\begin{aligned} & 57.0 \\ & (12.9) \end{aligned}$ | $\begin{aligned} & 74.0 \\ & (16.81) \end{aligned}$ | $\begin{aligned} & 205.0 \\ & (46.56) \end{aligned}$ |
|  | Flow Decrease ( R to B Closes) | $\begin{aligned} & 27.0 \\ & (6.13) \end{aligned}$ | $\begin{aligned} & \hline 41.0 \\ & (9.31) \end{aligned}$ | $\begin{aligned} & \hline 54.0 \\ & (12.26) \end{aligned}$ | $\begin{array}{\|l\|} \hline 170.0 \\ (38.61) \end{array}$ |
| Maximum Adjustment | Flow Increase ( R to Y Closes) | $\begin{aligned} & 81.0 \\ & (13.4) \end{aligned}$ | $\begin{array}{\|l\|} \hline 118.0 \\ (26.80) \end{array}$ | $\begin{array}{\|l\|} \hline 144.0 \\ (32.70) \end{array}$ | $\begin{aligned} & \hline 415.0 \\ & (94.26) \end{aligned}$ |
|  | Flow Decrease ( R to B Closes) | $\begin{aligned} & \hline 76.0 \\ & (17.3) \end{aligned}$ | $\begin{array}{\|l\|} \hline 111.0 \\ (25.21) \end{array}$ | $\begin{aligned} & 135.0 \\ & (30.66) \end{aligned}$ | $\begin{array}{\|l\|} \hline 400.0 \\ (90.85) \end{array}$ |

Typical Flow Rates for Switches with 6 in. paddles (Part 2 of 2)

| GPM (m³/hr) Required to Actuate Switch |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Pipe Size (in.) |  | 4 | 5 | 6 | 8 |
| F61MaaG Models, 6 in. Paddles |  |  |  |  |  |
| Minimum Adjustment | Flow Increase (R to Y Closes) | $\begin{aligned} & 35.0 \\ & (7.95) \end{aligned}$ | $\begin{array}{\|l\|} \hline 53.0 \\ (12.0) \end{array}$ | $\begin{aligned} & \hline 69.0 \\ & (15.7) \end{aligned}$ | $\begin{aligned} & \hline 197.0 \\ & (44.74) \end{aligned}$ |
|  | Flow Decrease ( R to B Closes) | $\begin{aligned} & 27.0 \\ & (6.13) \end{aligned}$ | $\begin{aligned} & \hline 41.0 \\ & (9.31) \end{aligned}$ | $\begin{aligned} & \hline 54.0 \\ & (12.3) \end{aligned}$ | $\begin{array}{\|l\|} \hline 170.0 \\ (38.61) \end{array}$ |
| Maximum Adjustment | Flow Increase ( R to Y Closes) | $\begin{aligned} & \hline 80.0 \\ & (18.2) \end{aligned}$ | $\begin{array}{\|l\|} \hline 116.0 \\ (26.34) \end{array}$ | $\begin{array}{\|l\|} \hline 142.0 \\ (32.25) \end{array}$ | $\begin{aligned} & \hline 412.0 \\ & (93.58) \end{aligned}$ |
|  | Flow Decrease (R to B Closes) | $\begin{aligned} & \hline 76.0 \\ & (17.3) \end{aligned}$ | $\begin{array}{\|l\|} \hline 111.0 \\ (25.21) \end{array}$ | $\begin{aligned} & \hline 135.0 \\ & (30.66) \end{aligned}$ | $\begin{array}{\|l\|} \hline 400.0 \\ (90.85) \end{array}$ |

Note: Flow rates for these sizes are calculated. Where paddle size is larger than pipe size, flow rates are for 6 in. paddle trimmed to fit pipe.

[^1]
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