## F61 Series

## Flow Switch (Standard Flow Rate - SPDT)



## Action on Increase of Flow

## Description

The F61 Series Flow Switches are SinglePole, 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 de-energize 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.


F61MB-1

## 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 lowvoltage and low-current circuits


F61KB-11

## Applications

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


## To Order

Specify the code number from the following selection chart.

## Selection Chart

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

(a) 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 F61LB-1 |

## Electrical Ratings for

F61KB, F61LB, and F61MB Models

| Electrical Ratings | 120 VAC | 208 VAC | 240 VAC | 277 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 | 120 VAC |
| :--- | :---: |
| Full Load Amperes | 1 |
| Locked Rotor Amperes | 6 |
| Non-inductive Amperes | 2 |
| Pilot Duty | 125 VA at 24/277 VAC |

## F61 Series Flow Switch (Standard Flow Rate - SPDT) (Continued)

## Typical Flow Rates

F61KB, F61LB, and F61MB Models, 1-3 in. paddles

|  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Pipe Size (in.) |  | 1 | $\begin{gathered} 1-1 / 4 \\ \text { (a) } \end{gathered}$ | $\begin{gathered} 1-1 / 2 \\ \text { (a) } \end{gathered}$ | 2 | $\underset{(\mathrm{b})}{2-1 / 2}$ | 3 | $4{ }^{\text {(c) }}$ | $5{ }^{\text {(c) }}$ | $6{ }^{\text {(c) }}$ | $8{ }^{(c)}$ |
|  | $\begin{array}{\|l} \text { Flow Increase } \\ \text { (R to Y Closes) } \end{array}$ | $\begin{aligned} & \hline 4.2 \\ & (0.95) \end{aligned}$ | $\begin{aligned} & \hline 5.8 \\ & (1.32) \end{aligned}$ | $\begin{aligned} & \hline \begin{array}{l} 7.5 \\ (1.70) \end{array} \end{aligned}$ | $\begin{aligned} & \hline 13.7 \\ & (3.11) \end{aligned}$ | $\begin{aligned} & \hline 18.0 \\ & (4.09) \end{aligned}$ | $\begin{aligned} & \hline 27.5 \\ & (6.24) \end{aligned}$ | $\begin{array}{\|l\|} \hline 65.0 \\ (14.8) \end{array}$ | $\begin{aligned} & \hline 125.0 \\ & (28.4) \end{aligned}$ | $\begin{aligned} & \hline 190.0 \\ & (43.2) \end{aligned}$ | $\begin{aligned} & 375.0 \\ & (85.2) \end{aligned}$ |
|  | Flow Decrease (R to B Closes) | $\begin{array}{\|l} 2.5 \\ (0.57) \end{array}$ | $\begin{array}{\|l\|} \hline 3.7 \\ (0.84) \end{array}$ | $\begin{aligned} & 5.0 \\ & (1.14) \end{aligned}$ | $\begin{aligned} & 9.5 \\ & (2.16) \end{aligned}$ | $\begin{aligned} & 12.5 \\ & (2.84) \end{aligned}$ | $\begin{aligned} & 19.0 \\ & (4.32) \end{aligned}$ | $\begin{aligned} & 50.0 \\ & (11.4) \end{aligned}$ | $\begin{array}{\|l\|} \hline 101.0 \\ (22.9) \end{array}$ | $\begin{aligned} & 158.0 \\ & (35.9) \end{aligned}$ | $\begin{aligned} & 320.0 \\ & (72.7) \end{aligned}$ |
|  | Flow Increase (R to Y Closes) | $\begin{aligned} & 8.8 \\ & \text { (2.0) } \end{aligned}$ | $\begin{array}{\|l\|} \hline 13.3 \\ (3.02) \end{array}$ | $\begin{aligned} & 19.2 \\ & (4.36) \end{aligned}$ | $\begin{aligned} & 29.0 \\ & (6.6) \end{aligned}$ | $\begin{aligned} & 34.5 \\ & (7.84) \end{aligned}$ | $\begin{array}{\|l\|} \hline 53.0 \\ \text { (12.0) } \end{array}$ | $\begin{array}{\|l\|l\|} \hline 128.0 \\ (29.1) \end{array}$ | $\begin{aligned} & 245.0 \\ & (55.6) \end{aligned}$ | $\begin{aligned} & 375.0 \\ & (85.2) \end{aligned}$ | $\begin{array}{\|l} \hline 760.0 \\ (172.6) \end{array}$ |
|  | Flow Decrease (R to B Closes) | $\begin{array}{\|l\|} \hline 8.5 \\ (1.93) \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 12.5 \\ (2.84) \\ \hline \end{array}$ | $\begin{aligned} & 18.0 \\ & (4.09) \end{aligned}$ | $\begin{array}{\|l} \hline 27.0 \\ (6.13) \\ \hline \end{array}$ | $\begin{array}{\|l} 32.0 \\ (7.27) \end{array}$ | $\begin{aligned} & 50.0 \\ & (11.4) \end{aligned}$ | $\begin{aligned} & 122.0 \\ & (27.7) \end{aligned}$ | $\begin{aligned} & 235 \\ & (53.4) \end{aligned}$ | $\begin{array}{\|l\|} \hline 360.0 \\ (81.8) \end{array}$ | $\begin{aligned} & \hline 730.0 \\ & (165.8) \end{aligned}$ |

(a) Flow rates for two inch paddle trimmed to fit pipe.
(b) Flow rates for three inch paddle trimmed to fit pipe.
(c) Flow rates are calculated for factory-installed set of one, two, and three inch paddles.

F61MG Models, 1 to 3 in. paddles

| GPM ( $\mathrm{m}^{3} / \mathrm{hr}$ ) Required to Actuate Switch |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Pipe Size (in.) |  | 1 | $1-1 / 4$ (a) | $1-1 / 2$ (a) | 2 | $\underset{(\mathrm{b})}{2-1 / 2}$ | 3 | $4^{\text {(c) }}$ | 5 (c) | 6 (c) | $8{ }^{\text {(c) }}$ |
|  | Flow Increase ( R to Y Closes) | $\begin{array}{\|l\|} \hline 3.8 \\ (0.9) \end{array}$ | $\begin{array}{\|l\|} \hline 5.3 \\ (1.2) \end{array}$ | $\begin{aligned} & \hline 6.9 \\ & (1.6) \end{aligned}$ | $\begin{array}{\|l\|} \hline 12.7 \\ (2.88) \end{array}$ | $\begin{aligned} & \hline 16.7 \\ & (3.79) \end{aligned}$ | $\begin{aligned} & \hline 24.3 \\ & (5.52) \end{aligned}$ | $\begin{aligned} & \hline 61.0 \\ & 13.8 \end{aligned}$ | $\begin{array}{\|l\|} \hline 118.0 \\ (26.80) \end{array}$ | $\begin{aligned} & \hline 183.0 \\ & (41.56) \end{aligned}$ | $\begin{array}{\|l\|} \hline 362.0 \\ (82.22) \end{array}$ |
|  | Flow Decrease (R to B Closes) | $\begin{aligned} & \hline 2.5 \\ & (0.6) \end{aligned}$ | $\begin{array}{\|l\|} \hline 3.7 \\ (0.8) \end{array}$ | $\begin{aligned} & \hline 5.0 \\ & (1.1) \end{aligned}$ | $\begin{aligned} & \hline 9.5 \\ & (2.2) \end{aligned}$ | $\begin{aligned} & \hline 12.5 \\ & (2.84) \end{aligned}$ | $\begin{array}{\|l\|} \hline 19.0 \\ (4.32) \end{array}$ | $\begin{aligned} & 50.0 \\ & (11.4) \end{aligned}$ | $\begin{aligned} & \hline 101.0 \\ & (22.94) \end{aligned}$ | $\begin{array}{\|l\|} \hline 158.0 \\ (35.88) \end{array}$ | $\begin{aligned} & \hline 320.0 \\ & (72.68) \end{aligned}$ |
|  | Flow Increase ( R to Y Closes) | $\begin{array}{\|l\|} \hline 8.7 \\ (2.0) \end{array}$ | $\begin{array}{\|l\|} \hline 13.1 \\ (2.98) \end{array}$ | $\begin{aligned} & \hline 18.8 \\ & (4.27) \end{aligned}$ | $\begin{aligned} & 28.9 \\ & (6.56) \end{aligned}$ | $\begin{aligned} & \hline 33.7 \\ & (7.65) \end{aligned}$ | $\begin{aligned} & \hline 52.1 \\ & (11.8) \end{aligned}$ | $\begin{aligned} & \hline 126.0 \\ & (28.62) \end{aligned}$ | $\begin{aligned} & \hline 243.0 \\ & (55.19) \end{aligned}$ | $\begin{array}{\|l\|} \hline 372.0 \\ (84.49) \end{array}$ | $\begin{aligned} & \hline 753.0 \\ & (171.0) \end{aligned}$ |
|  | Flow Decrease (R to B Closes) | $\begin{aligned} & \hline 8.5 \\ & (1.9) \end{aligned}$ | $\begin{array}{\|l\|} \hline 12.5 \\ (2.84) \end{array}$ | $\begin{aligned} & 18.0 \\ & (4.09) \end{aligned}$ | $\begin{aligned} & \hline 27.0 \\ & (6.13) \end{aligned}$ | $\begin{aligned} & \hline 32.0 \\ & (7.27) \end{aligned}$ | $\begin{array}{\|l\|} \hline 50.0 \\ (11.4) \end{array}$ | $\begin{aligned} & \hline 122.0 \\ & (27.71) \end{aligned}$ | $\begin{aligned} & \hline 235.0 \\ & (55.37) \end{aligned}$ | $\begin{aligned} & \hline 360.0 \\ & (81.76) \end{aligned}$ | $\begin{aligned} & \hline 730.0 \\ & (165.8) \end{aligned}$ |

(a) Flow rates for two inch paddle trimmed to fit pipe.
(b) Flow rates for three inch paddle trimmed to fit pipe.
(c) Flow rates are calculated for factory-installed set of one, two, and three inch paddles.

F61KB, F61LB, and F61MB Models, 6 in. paddles

| GPM ( $\mathrm{m}^{3} / \mathrm{hr}$ ) Required to Actuate Switch |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Pipe Size (in.) |  | 4 | 5 | 6 | 8 |
|  | Flow Increase (R to Y Closes) |  | (12.9) |  |  |
|  | Flow Decrease (R to B Closes) | $\begin{aligned} & \hline 27.0 \\ & (6.13) \end{aligned}$ | $\begin{aligned} & \hline 41.0 \\ & (9.31) \end{aligned}$ | (12.26) |  |
|  | Flow Increase (R to Y Closes) | $\begin{aligned} & 81.0 \\ & (13.4) \end{aligned}$ | $\begin{aligned} & \hline 118.0 \\ & (26.80) \end{aligned}$ |  |  |
|  | Flow Decrease (R to B Closes) | $\begin{array}{\|l} \hline 76.0 \\ (17.3) \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 111.0 \\ (25.21) \\ \hline \end{array}$ | (30.66) | $\begin{array}{\|l\|} \hline 400.0 \\ (90.85) \\ \hline \end{array}$ |

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.
F61MG Models, 6 in. paddles

| (m/hr) |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Pipe Size (in.) |  | 4 | 5 | 6 | 8 |
|  | ( R to Y Closes) | $\begin{aligned} & 35.0 \\ & (7.95) \end{aligned}$ | $\begin{aligned} & \hline 53.0 \\ & (12.0) \end{aligned}$ |  |  |
|  | Flow Decrease (R to B Closes) | $\begin{aligned} & \hline 27.0 \\ & (6.13) \end{aligned}$ | $\begin{aligned} & \hline 41.0 \\ & (9.31) \end{aligned}$ | $\begin{aligned} & \hline 54.0 \\ & (12.3) \end{aligned}$ |  |
|  | Flow Increase ( R to Y Closes) | $\begin{aligned} & 80.0 \\ & (18.2) \end{aligned}$ | $\begin{array}{\|l\|} \hline 116.0 \\ (26.34) \end{array}$ | $\begin{aligned} & \hline 142.0 \\ & (32.25) \end{aligned}$ |  |
|  | Flow Decrease ( R to B Closes) | $\begin{aligned} & \hline 76.0 \\ & (17.3) \end{aligned}$ | $\begin{array}{\|l\|} \hline 111.0 \\ (25.21) \end{array}$ | $\begin{aligned} & 135.0 \\ & (30.66) \end{aligned}$ | $\begin{aligned} & 400.0 \\ & (90.85) \end{aligned}$ |

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.

## Specifications

| F61 Series Standard Flow Rate Switch |  |  |  |
| :---: | :---: | :---: | :---: |
| Maximum Fluid Pressure | 150 psig (1034 kPa) |  |  |
| Fluid  <br> Temperature Minimum <br>  Maximum | F61KB, F61LB |  | F61MB, F61MG |
|  | $32^{\circ} \mathrm{F}\left(0^{\circ} \mathrm{C}\right)$ |  | $-20^{\circ} \mathrm{F}\left(-29^{\circ} \mathrm{C}\right)$ |
|  | $250{ }^{\circ} \mathrm{F}\left(121^{\circ} \mathrm{C}\right)$ for all models |  |  |
| Wiring Connections | Screw Type Terminals |  | Four Color-coded No. 14 AWG Solid Conductor Wire Leads, 7 in . ( 178 mm ) Long |
| Pipe Connector | 1 in. 11-1/2 NPT Threads |  |  |
| Conduit Connection | F61KB | F61LB, F61MB, F61MG |  |
|  | One 7/8 in. (22 mm) Hole for $1 / 2 \mathrm{in}$. Conduit with $1-3 / 32$ in. ( 28 mm ) Knockout Ring for $3 / 4 \mathrm{in}$. Conduit | 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); Stainless Steel 6 in. Paddle Supplied w/ F61MB and F61KB |  |  |
| Switch | SPDT Snap-acting Pennswitch |  |  |
|  | F61KB | F61LB | F61MB, F61MG0.062 in. ( 1.57 mm )Cold Drawn Steel |
| Enclosure Case | $0.062 \mathrm{in} .(1.57 \mathrm{~mm})$ Steel | 0.062 in. ( 1.57 mm ) Cold Drawn Steel |  |
| Enclosure Cover | 0.028 in . ( 0.7 mm ) Steel (NEMA 1) | 0.062 in. ( 1.57 mm ) Cold Drawn Steel, (NEMA 1) | 0.062 in. ( 1.57 mm ); Cold Drawn Steel, Gasketed (NEMA 3R Rain-tight) |
| Agency UL Listed | E5368, CCN NMFT | E5368, CCN NMFT | E5368, CCN NMFT |
| Agency Listings | LR948, Class 3211 06,Class 4813 02, Class 122201 | Not CSA Certified | LR948, Class 321106 |
| Shipping Weight | $2.8 \mathrm{lb}(1.3 \mathrm{~kg})$ |  |  |

