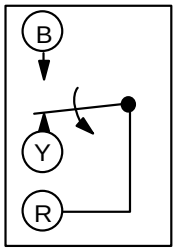
JOHNSON CONTROLS

Controls Group 507 E. Michigan Street
P.O. Box 423, Milwaukee, WI 53202
Code No. LIT-1922335

F61 Series

Flow Switch (Standard Flow Rate – SPDT)

Series F61



Action on Increase of Flow

F61MB-1

F61KB-11

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 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.

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

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

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F61 Series Flow Switch (Standard Flow Rate – SPDT) (Continued)

Typical Flow Rates

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

GPM (m^3/hr) Required to Actuate Switch											
Pipe Size (in.)		1	1-1/4 (a)	1-1/2 (a)	2	2-1/2 (b)	3	4 (c)	5 (c)	6 (c)	8 (c)
Minimum Adjustment	Flow Increase (R to Y Closes)	4.2 (0.95)	5.8 (1.32)	7.5 (1.70)	13.7 (3.11)	18.0 (4.09)	27.5 (6.24)	65.0 (14.8)	125.0 (28.4)	190.0 (43.2)	375.0 (85.2)
	Flow Decrease (R to B Closes)	2.5 (0.57)	3.7 (0.84)	5.0 (1.14)	9.5 (2.16)	12.5 (2.84)	19.0 (4.32)	50.0 (11.4)	101.0 (22.9)	158.0 (35.9)	320.0 (72.7)
Maximum Adjustment	Flow Increase (R to Y Closes)	8.8 (2.0)	13.3 (3.02)	19.2 (4.36)	29.0 (6.6)	34.5 (7.84)	53.0 (12.0)	128.0 (29.1)	245.0 (55.6)	375.0 (85.2)	760.0 (172.6)
	Flow Decrease (R to B Closes)	8.5 (1.93)	12.5 (2.84)	18.0 (4.09)	27.0 (6.13)	32.0 (7.27)	50.0 (11.4)	122.0 (27.7)	235 (53.4)	360.0 (81.8)	730.0 (165.8)

(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 (m^3/hr) Required to Actuate Switch					
Pipe Size (in.)		4	5	6	8
Minimum Adjustment	Flow Increase (R to Y Closes)	37.0 (8.40)	57.0 (12.9)	74.0 (16.81)	205.0 (46.56)
	Flow Decrease (R to B Closes)	27.0 (6.13)	41.0 (9.31)	54.0 (12.26)	170.0 (38.61)
Maximum Adjustment	Flow Increase (R to Y Closes)	81.0 (13.4)	118.0 (26.80)	144.0 (32.70)	415.0 (94.26)
	Flow Decrease (R to B Closes)	76.0 (17.3)	111.0 (25.21)	135.0 (30.66)	400.0 (90.85)

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, 1 to 3 in. paddles

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

(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, 6 in. paddles

GPM (m^3/hr) Required to Actuate Switch					
Pipe Size (in.)		4	5	6	8
Minimum Adjustment	Flow Increase (R to Y Closes)	35.0 (7.95)	53.0 (12.0)	69.0 (15.7)	197.0 (44.74)
	Flow Decrease (R to B Closes)	27.0 (6.13)	41.0 (9.31)	54.0 (12.3)	170.0 (38.61)
Maximum Adjustment	Flow Increase (R to Y Closes)	80.0 (18.2)	116.0 (26.34)	142.0 (32.25)	412.0 (93.58)
	Flow Decrease (R to B Closes)	76.0 (17.3)	111.0 (25.21)	135.0 (30.66)	400.0 (90.85)

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)			
		F61KB, F61LB		**F61MB, F61MG**
Fluid Temperature	Minimum	32°F (0°C)		-20°F (-29°C)
	Maximum	250°F (121°C) 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			
		F61KB	**F61LB, F61MB, F61MG**	
Conduit Connection		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	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, F61MG**
Enclosure	**Case**	0.062 in. (1.57 mm) Steel	0.062 in. (1.57 mm) Cold Drawn Steel	0.062 in. (1.57 mm) Cold Drawn Steel
	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 Listings	**UL Listed**	E5368, CCN NMFT	E5368, CCN NMFT	E5368, CCN NMFT
	CSA Certified	LR948, Class 3211 06,Class 4813 02, Class 1222 01	Not CSA Certified	LR948, Class 3211 06
Shipping Weight	2.8 lb (1.3 kg)			