F40EA Type
Pneumatic Liquid Flow Switch

Application

The F40EA pneumatic flow switch is used on liquid lines for water, ethylene glycol or any other fluid which is not harmful to phosphor bronze and is not classified as a hazardous fluid.

The switch cannot be used where internal freeze-ups may occur. The control port opens on "no flow" and closes on "liquid flow."

The F40EA acts as an automatic operating control in air conditioning, heating and cooling water systems and in processing work.

Fig. 1 -- F40EA Liquid Flow Switch

Specifications

Type Number	**F40EA**	Pneumatic Liquid Flow Switch
Ambient Temperature Limits	**Minimum**	32°F (0°C)
	Maximum	140°F (60°C)
Liquid Temperature	**Minimum**	32°F (0°C)
	Maximum	250°F (121°C)
Maximum Liquid Pressure		150 PSIG (1034 kPa)
Case		.062" (1.6 mm) Cold Rolled Steel
Cover		.028" (0.7 mm) Cold Rolled Steel
Finish		Gray Baked Enamel
Paddles		A 3-piece Paddle for 1", 2" or 3" Pipe Supplied. A 6" Paddle for Larger Pipe Sizes Available at Additional Cost
Pipe Connector		1" NPT Threads
Pneumatic Switch Action		Opens on No Flow and Closes on Liquid Flow
Shipping Weight	**Individual Pack**	2.8 lb (1.3 kg)
	Overpack of 15 Units	43.5 lb (19.7 kg)
Tubing Connector		Barb Fitting for ¼" O.D. Plastic Tubing

Typical Flow Rates

GPM (m^3/hr) Required to Actuate Switch

Line Pipe Size		1"	1¼"	1½"	2"	2½"	3"	4"*	5"*	6"*	8"*
Min. Adj.	Flow Increase R to Y Closes	5.0 (1.1)	7.2 (1.6)	9.7 (2.2)	15.8 (3.6)	23.0 (5.2)	30.2 (6.9)	65.0 (14.8) 37.0† (8.4)	125.0 (28.4) 57.0† (12.9)	190.0 (43.1) 74.0† (16.8)	375.0 (85.2) 205.0† (46.6)
	Flow Decrease R to B Closes	4.2 (1.0)	6.1 (1.4)	8.4 (1.9)	14.0 (3.2)	20.3 (4.6)	27.0 (6.1)	50.0 (11.4) 27.0† (6.1)	101.0 (22.9) 41.0† (9.3)	158.0 (35.9) 54.0† (12.3)	320.0 (72.7) 170.0† (38.6)
Max. Adj.	Flow Increase R to Y Closes	9.0 (2.0)	13.3 (3.0)	18.0 (4.1)	29.0 (6.6)	41.0 (9.3)	53.0 (12.0)	128.0 (29.1) 81.0† (13.4)	245.0 (55.6) 118.0† (26.8)	375.0 (85.2) 144.0† (32.7)	760.0 (172.6) 415.0† (94.2)
	Flow Decrease R to B Closes	8.5 (1.9)	12.5 (2.8)	16.8 (4.1)	27.3 (6.2)	38.5 (8.7)	50.0 (11.4)	122.0 (27.7) 76.0† (17.3)	235.0 (53.4) 111.0† (25.2)	360.0 (81.8) 135.0† (30.7)	730.0 (165.8) 400.0† (90.8)

*Flow rates for these sizes are calculated.
†These GPM figures are for switch with 6" paddle. For 4" and 5" line pipe the paddle is trimmed.

Typical applications include:

- Flow detection switch to start the refrigeration compressor on a liquid chiller system when flow has been established.
- Signal or alarm switch to indicate when the pump on a condenser cooling water system shuts down.
- Proving the flow of water before an electric immersion heater is turned on.

All Series F40 flow switches are designed for use *only* as operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add devices (safety, limit controls) or systems (alarm, supervisory systems) that protect against, or warn of, control failure.

Features

- Sturdy steel NEMA 1 enclosure.
- Dependable normally open pneumatic valve.

- Packless construction -- switch assembly is sealed from line by phosphor bronze bellows.
- Simple to install (convenient barbed fitting for 1/4 in. O.D. plastic tubing).
- Maximum liquid pressure of 150 psig (1034 kPa).

General Description

The F40EA has a NEMA 1 enclosure with a brass pipe connector. All parts that come in contact with the liquid are brass or phosphor bronze. The paddle has three segments designed for pipes 1 in. and larger. Segments of the paddle can be removed or trimmed as required for pipes under 3 inches. A 6 in. paddle that can be trimmed for 4 in. and 5 in. pipe is available. The switch compartment is completely sealed from the liquid in the line by a phosphor bronze bellows seal.

The pneumatic switch is factory set at approximately the minimum flow rate. (See Flow Rate table.) Values in the table are for 40 psig (275 kPa) line pressure. A higher flow rate setting may be obtained in the field by turning the adjusting screw clockwise. The F40EA is calibrated for a maximum pneumatic input pressure of 20 psig (138 kPa).

Ordering Information

To order, specify Product Number F40EA-1 for a switch with a three-piece paddle.

Repairs and Replacement

Field repairs must not be made except for replacement of the paddles and cover. For a replacement flow switch, paddle kit or cover, contact the nearest Johnson Controls distributor.

Replacement Kit Number	Material	Description
KIT21A-600	Phosphor Bronze	3-Piece Paddle
KIT21A-601	Phosphor Bronze	6" Paddle
PLT52A-600R	Stainless Steel	3-Piece Paddle and 6" Paddle

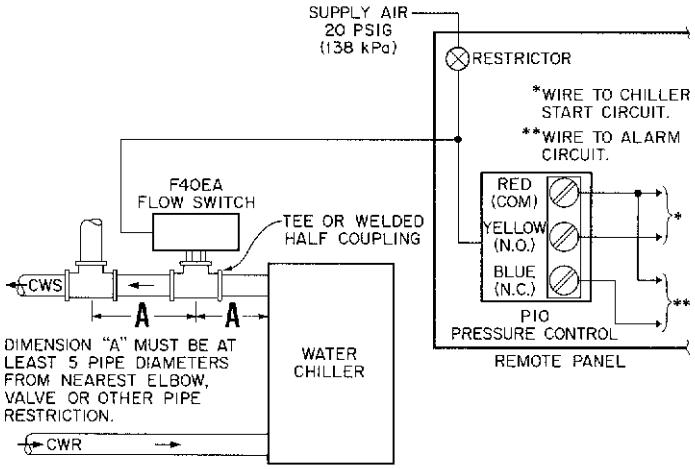
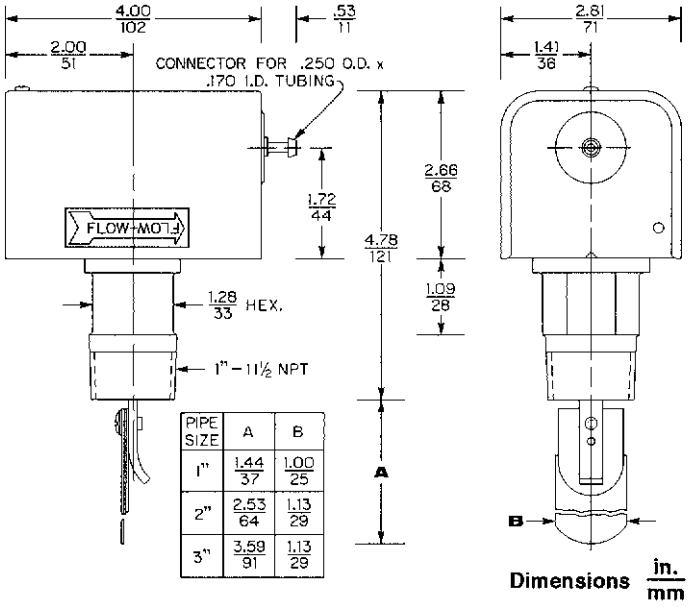


Fig. 2 — Typical installation of the F40EA for explosion proof applications, or where it is more practical to run a single pneumatic line in lieu of electrical wiring.



Performance specifications appearing herein are nominal and are subject to accepted manufacturing tolerances and application variables.

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