

221416-00 FLOW SWITCH

INSTALLATION DATA

PLEASE READ INSTRUCTIONS CAREFULLY BEFORE STARTING WORK.

ALL WORK MUST BE PERFORMED BY QUALIFIED PERSONNEL IN ACCORDANCE WITH ALL APPLICABLE CODES AND ORDINANCES.

CAUTION: Make sure the correct flow switch model has been specified for this installation.

OPERATION DUTY:

Maximum Pressure - 150 psi

Temperature range: 32°F to 225°F (NEMA 4X enclosure)

MECHANICAL INSTALLATION:

LOCATION: The Flow Switch must be located in a horizontal section of pipe where there is a straight horizontal run of at least 5 pipe diameters on each side of the Flow Switch.

With the increasing usage of spring-load check valves and other close-coupled accessories in the pump discharge piping, it is suggested that Flow Switches be located in the suction piping where less turbulent water flow conditions may exist.

MOUNTING: The Flow Switch should be installed vertical and upright as shown, with paddle at right angle to flow and arrow mark on side of casting in same direction as flow.

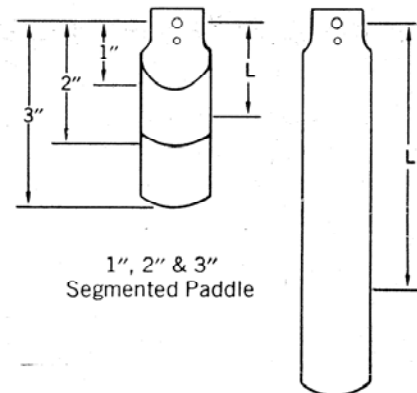
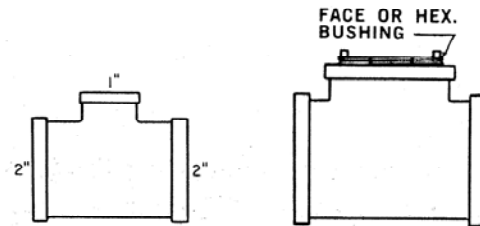
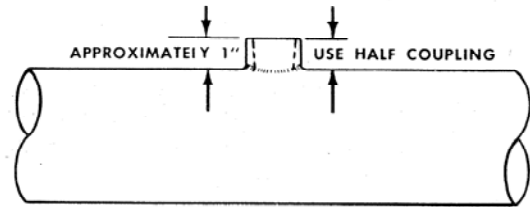
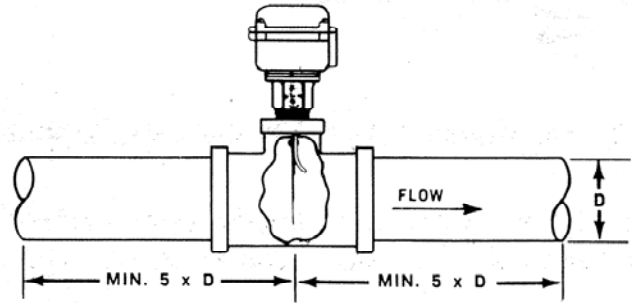
If the Flow Switch is connected to the pipe by a welding fitting, select a welding fitting of minimum length, such as a half coupling. When inserting in 1" pipe, use standard 1" x 1" x 1" tee. For larger pipe sizes, use a reducing tee, or standard tee with face or hex bushing to keep flow switch as close to pipe as possible.

INSTALLATION: From the four paddles shipped in the carton, select the paddle to be used according to pipe size in which the control will be mounted. For most installations, the table below can be followed.

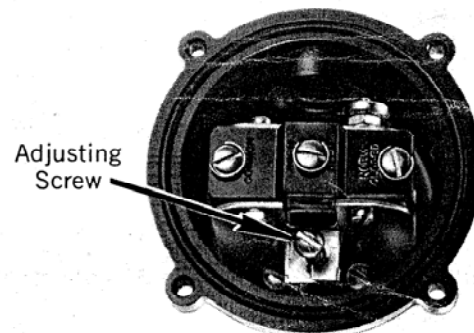
If necessary, trim the paddle as indicated in the table. Place paddle on the outside curve of the paddle arm, then align the large hole in the paddle with the threaded hole in the paddle arm and the small hole in the paddle with the protrusion in the paddle arm. Slip the lockwasher over the screw packaged in the carton and attach the paddle to the paddle arm with the screw head on the paddle side. Tighten to 12 to 16 in. lb. torque. Trim the Flow Switch paddle to the size of the pipe in which it is to be used as indicated in the chart below. For maximum sensitivity the paddle should extend as far as possible into the pipe without striking the inside pipe surface.

Pipe Size	Installation Using Tee		Installation Using Welding Fitting Paddle	Trim Dimension "L"
	Tee Size	Paddle		
1"	1"x1"x1"	1" Segment		
1¼"	1¼"x1¼"x1"	2" Segment Trimmed		1¼"
1½"	1½"x1½"x1"	2" Segment Trimmed		1½"
2"	2"x2"x1"	2" Segment	2" Segment Trimmed	1⅝"
2½"	2½"x2½"x1"	3" Segment Trimmed	3" Segment Trimmed	2¼"
3"	3"x3"x1"	3" Segment	3" Segment Trimmed	2⅝"
4"			Extended Paddle Trimmed	3⅝"
5"			Extended Paddle Trimmed	4⅝"
6"			Extended Paddle Trimmed	5⅝"
8" and larger			Extended Paddle	

ADJUSTMENT: The Flow Switch is factory adjusted to operate at minimum flow velocities. To obtain higher flow rate activation, remove housing cover and turn adjusting screw in clockwise direction to desired flow. Test flow rate actuation several times to make sure flow switch performs as desired. Replace cover. See instructions on reverse side for proper cover replacement.



"L" refers to trim length in table



FLOW RATES REQUIRED TO ACTUATE No. FLOW SWITCH IN HORIZONTAL PIPE

Flow rates shown in gallons per minute (GPM), velocity in feet per second (FPS).

* Equipped with extended paddle trimmed to pipe size.

Pipe Size in Which Flow Switch Installed			1"	1¼"	1½"	2"	2½"	3"	*4"	*5"	*6"
Factory or Minimum Adjustment	Flow	GPM	4.9	7.5	9.4	13.7	17.9	24.2	35.3	48.6	60.3
		FPS	1.82	1.60	1.48	1.31	1.20	1.05	0.89	0.78	0.67
	No Flow	GPM	3.4	5.3	6.7	9.4	12.1	16.4	27.0	37.4	46.8
		FPS	1.25	1.14	1.05	0.90	0.81	0.71	0.68	0.60	0.52
Maximum Adjustment	Flow	GPM	17.6	29.0	37.8	56.4	71.3	89.0	118	178	245
		FPS	6.53	6.23	5.95	5.39	4.78	3.87	2.98	2.86	2.72
	No Flow	GPM	15.0	24.6	32.2	47.4	59.2	72.5	105	160	225
		FPS	5.56	5.28	5.07	4.53	3.97	3.15	2.64	2.57	2.50

Flow rates are averages which may vary ± 10% from tabulated values.

IMPORTANT:

- Watertight and dust-tight installations require the use of rigid galvanized metal conduit and fittings.
- If liquid temperature exceeds 180°F, electrical wiring insulation must be rated at 75°C. (167°F).
- On higher velocity applications than shown in the table above or in 6" or larger pipe, contact factory for paddle trimming instructions.
- Avoid locations adjacent to elbow, orifices or valves.
- After mechanical and electrical installation, test system several times to make sure flow switch operates correctly.

ELECTRICAL INSTALLATION:

Wire flow switch in accordance with all local and national electrical codes and ordinances.

NEMA 4X Electrical Enclosure Models.

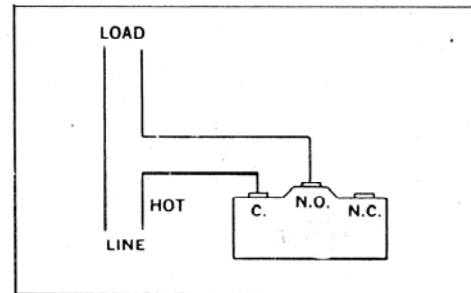
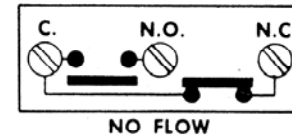
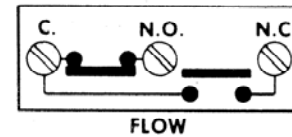
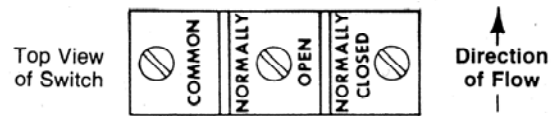
1. Remove four cover cap screws and remove cover. Be careful to avoid damaging the cover gasket affixed to the electrical enclosure base.
2. In all indoor or outdoor installations above + 32F, use standard conduit and fittings rated for water tight duty and securely tighten to 1/2" NPT enclosure connections and the installation conduit system.
3. Choose the mode of operation required, and electrically wire in accordance with the appropriate diagram.
4. Replace cover on gasketed base, replace cap screws and tighten all six cap screws to 10 inch pound torque creating a gas tight seal.
5. Test control to make sure it operates correctly.

VERTICAL PIPE INSTALLATIONS:

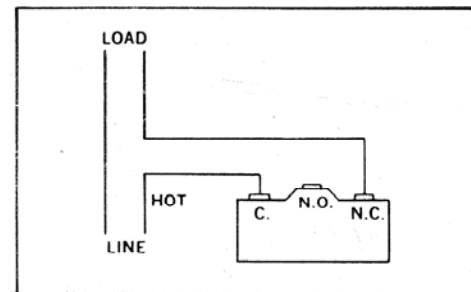
Because of space limitations, it is sometimes recognized that the only available installation may be in a vertical section of pipe. The switch will generally operate satisfactorily when installed in a vertical pipe with either upward or downward flow provided there is no unusual amount of dirt or sediment in the water.

Flow rates required to actuate the switch are not available for vertical pipe installation. A "factory adjusted" flow switch normally does not require any field adjustment for upward or downward flow. But to make sure, it is advisable to hold flow switch in position to be installed and check for "no flow" switch operation by hand operation of the paddle.

SCHEMATICS OF OPERATION



1. Used to actuate signal, alarm or other device when **flow** occurs.



2. Used to actuate signal, alarm or other device when **no flow** occurs.

ELECTRICAL RATINGS AMPERE RATING		
Motor Full Load	120 V.A.C. 7.4 Amps.	240 V.A.C. 3.7 Amps.
Locked Rotor	44.4 Amps.	22.2 Amps.
	120 V.D.C. 0.3 Amps.	240 V.D.C. 0.15 Amps.
PILOT DUTY: A.C. 125 V.A., 120-240 V		

ELECTRICAL RATING
300W @ 125VAC

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