MODEL FSA FLUID FLOW SWITCH
INSTALLATION AND OPERATING INSTRUCTIONS

BASIKS INSTRUCTIONS

Installation:

The FSA fluid flow switch is supplied with a 1 ¼" x 1" PVC TT bushing threaded in a place with 2 to 3 wraps of Teflon tape, which must be intact or renewed if bushing and switch are separated before assembly in tank. Care must be exercised when threading the PVC bushing into plastic or metal fittings. Apply a minimum of 2 to a maximum of 3 wraps of Teflon tape to threads of bushing – this is especially important if unit is to be used in metal fittings where coarse METAL THREADS could gall plastic if not lubricated. The plastic bushing CAN BE CRACKED if the main body of the flow switch is tightened into it FIRST. Cracking will not occur if the bushing is FIRST tightened into the pipe or tank fitting and THEN the FSA is tightened into the bushing.

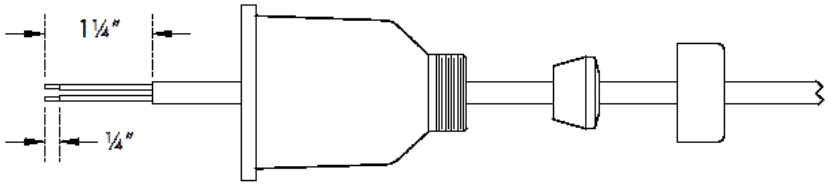
Thus:

1) Teflon tape thread and tighten plastic bushing into pipe or tank fitting.
2) Teflon tape thread and tighten FSA switch into PLASTIC bushing by applying wrench to hexagon section.
   Repeat steps 1 and 2 until ARROW on body points in DIRECTION OF FLOW and threads are leak tight.

WARNING: Do not use a pipe wrench or any metal device. Use strap wrench ONLY.

Electrical Wiring

1) Remove gland nut, grommet and switch cover, by removing (4) Phillips head screws.
2) Strip outer jacket of electrical cord back approximately 1 ¼". Strip insulation from individual conductors back approximately ¼".
3) Slip on terminals are supplied with each switch. Remove from switch terminals and crimp on or solder to electrical leads.
4) Feed electrical cable through gland nut, grommet and switch cover as shown.



5) Apply slip on terminals to appropriate contact of micro switch. Slide cover down cable and fasten to body of switch with four screws provided. Slide grommet down cable until outer jacket is level with small end of grommet per illustration page 2. Push grommet into tapered end of cover. Hold cable jacket to prevent rotation and thread gland nut firmly on to cover.

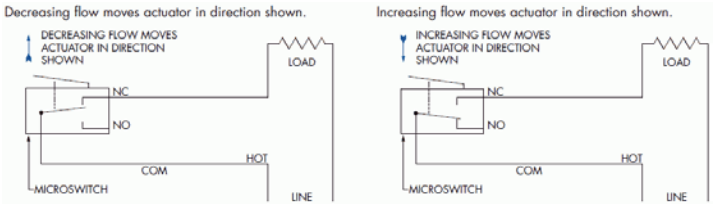


Fig. 1 Wiring schematic for power applied to load when flow level is less than set point (power to load is interrupted when flow increases to above set point

Fig. 2 Wiring schematic for power applied to load when flow level is greater than set point (power to load is interrupted when flow decreases to below set point.

Switch Point Adjustment

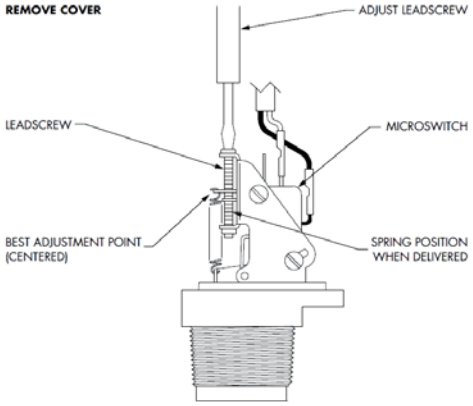
1) Thread unit into line while observing the following precautions
   A). Use appropriate adapters to keep body of switch from projecting into flow stream.
   B). Inspect to make sure drag disk does not touch opposite wall of small diameter pipe.
   C). Use Teflon tape to seal threads and lubricate to allow arrow on body to be aligned with flow.
2) After aligning arrow with flow, adjust flow in system to desired rate WITHOUT regard to FSA switch point setting.
3) The option #1 switch point adjusting mechanism consists of a lead screw, a lead screw nut and a helical spring. CLOCKWISE rotation of the adjusting lead screw changes the microswitch actuation point toward HIGHER flow rates.
   NOTES: All FSA units are factory set at the lower end of the flow range, i.e. the adjusting lead screw is set at the low flow COUNTERCLOCKWISE position. The lead screw nut locks the adjusting lead screw in position, maintaining the flow switch set point under all environmental conditions.
4) Turn the adjusting screw in a clockwise direction until the microswitch is actuated while maintaining the desired fluid flow rate in the system. Turn the adjusting lead screw TWO additional turns in the clockwise direction and then slowly back off in a counterclockwise direction until microswitch is again actuated. The FSA flow switch is now set for maximum sensitivity for detecting small flow changes.
5) Microswitch actuation point may be monitored during adjustment procedure detailed in 4) above by an audible click or with an OHM meter before connecting line power or by monitoring the voltage supplied to the load through the microswitch.
6) If the system flow rate is changed, the FSA can be adjusted to monitor the new flow rate by turning the adjusting screw in a counterclockwise direction to the minimum flow position and then proceeding as in 4) above.
7) In the event that the system flow is at the desired rate and the adjustment mechanism runs out of travel, i.e. the lead screw nut is at either end of the support bracket before the microswitch is actuated, then the drag disk must be changed to shift the flow range so that it straddles the system flow rate, i.e. employ switch point adjustment option No.2.

Example: If the FSA is fitted with a No.1 drag disk and procedure 4) has been followed, the adjusting lead screw has been turned counterclockwise until the lead screw nut is at the extreme end of the support bracket (spring fully relaxed) and the microswitch still has not been actuated then the flow is too low and a larger drag disk will have to be substituted for the No. 1 disk and procedure 4) repeated. If No. 2 disk will not allow switch actuation via procedure 4) substitute disk No. 3.

The opposite procedure is used if the flow is so high that full extension of the spring cannot counterbalance the fluid forces on the drag disk and the switch remains actuated. Proceed by using a smaller drag disk, e.g. replace No. 3 with a No. 2, or a No. 2 with a No. 1 until procedure 4) can be accomplished.

Adjustment option No. 3 can be employed after options 1 and 2 have been exhausted. Option No. 3 consists of moving the drag disk along the arm thereby changing the force-balance movement arm. Moving a drag disk to the far end of the arm lowers the flow rate required to activate the switch. Moving a drag disk towards the top of the arm increases the flow rate required to activate the switch.

NOTE: It is necessary throughout all installation and adjustment procedures to check to ensure the drag disk is perpendicular to the flow and does not touch any interior surface throughout its complete fore and aft travel.



FSA FLOW SWITCH OPERATIONAL ADJUSTMENT

SWITCH FLOW ADJUSTMENT

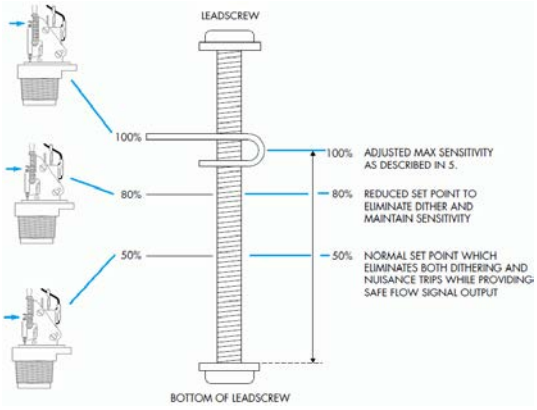
1) Remove cover

2) Adjust fluid flow in system to desired rate WITHOUT regard to FSA switch point setting.

3) The switch point adjusting mechanism consists of an adjusting screw, a "U" shaped lead screw nut, and a helical spring.
CLOCKWISE rotation of the adjusting screw changes the microswitch actuation point toward HIGHER flow rates.
NOTES: All FSA units are factory set at the lower end of the flow range, i.e., the adjusting screw is set at the low flow counterclockwise position.
The lead screw nut locks the adjusting screw in position, maintaining the flow switch setpoint under all environmental conditions.

4) Turn the adjusting screw in a clockwise direction until the microswitch is actuated, while maintaining the desired fluid flow rate in the system. Turn the adjusting screw TWO additional turns in the clockwise direction and then slowly back off in a counterclockwise direction until microswitch is again actuated. The FSA flow switch is now set for maximum sensitivity for detecting small flow changes.

5) When set for maximum sensitivity (100% point) as described in step 4 above, flow turbulence may cause rapid on/off switching (dithering) of the microswitch contacts, resulting in reduced switch contact life and "noise" in the electrical circuit. This is eliminated by tuning the adjusting screw in a counterclockwise direction.



6) Microswitch actuation point may be monitored during the adjustment procedure detailed in 4) and 5) above by an audible click or with an ohm meter before connecting line power to the terminal strip, or by monitoring the voltage supplied to the load through the microswitch.

7) If the system flow rate is changed, the FSA can be adjusted to monitor the new flow rate by turning the adjusting screw in a counterclockwise direction to the minimum flow position and then proceeding as in 4) and 5) above.