

# MODEL Q-16

**HARWIL CORPORATION**

541 KINETIC DRIVE, OXNARD, CA 93030

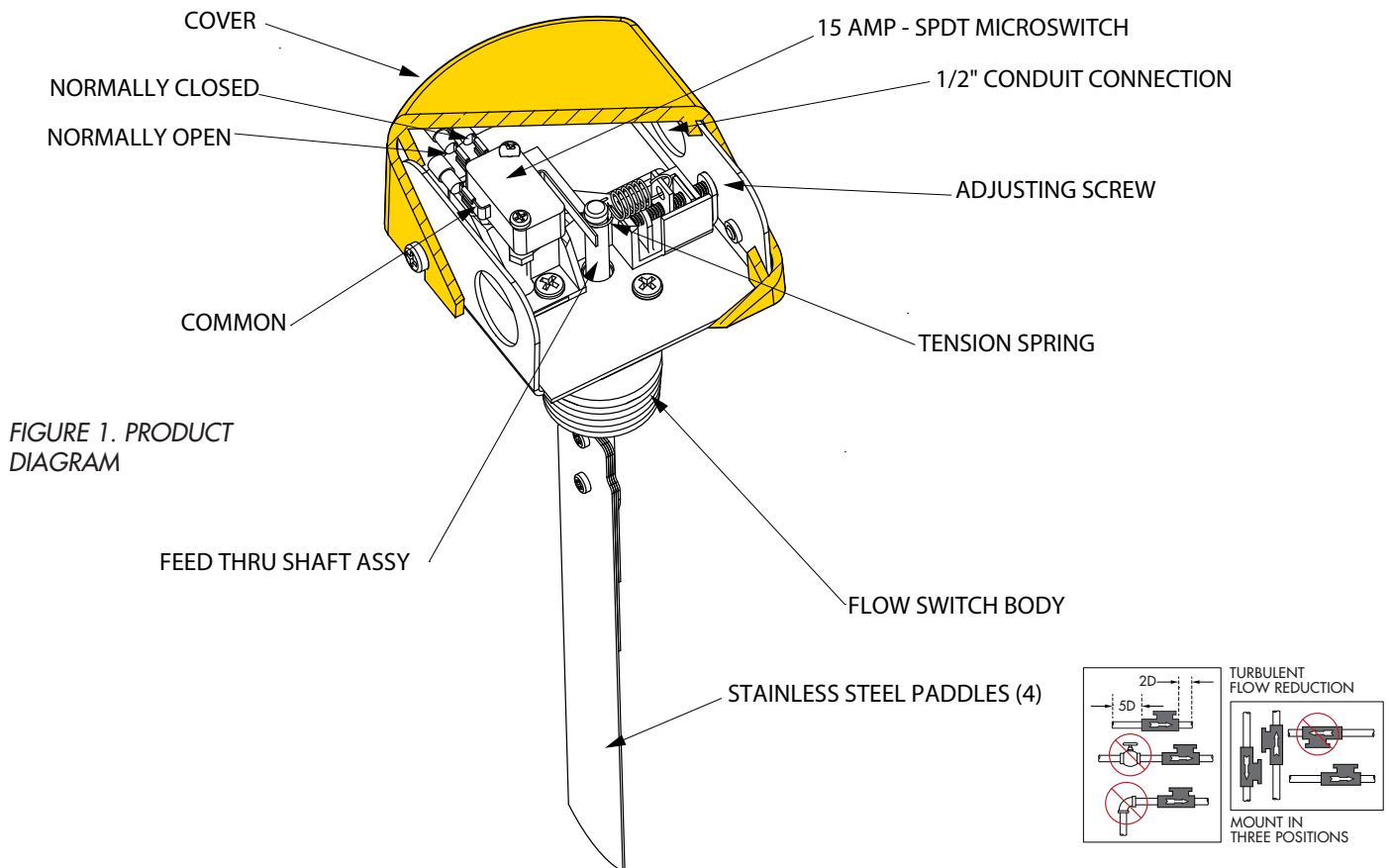
TEL: (805) 988-6800 FAX: (805) 988-6804

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## INSTALLATION INSTRUCTIONS

☺ Harwil Model Q-16 fluid flow switch is intended for use in flow lines with fluids not harmful to brass, stainless steel, and EPDM. The switch is used to signal, start, or stop electrically operated equipment when flow or no-flow conditions occur.

This device is designed for use only as an operating control. 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 that warn of, control failure.



### **WARNING**

- Before using product, read and understand instructions.
- Please save these instructions for future use.
- All work must be performed by qualified personnel trained in the proper applications, installation, and maintenance of plumbing and electrical equipment in accordance with all applicable codes and ordinances.
- To prevent electrocution **DO NOT TOUCH** the switch terminals when electrical power is connected to the flow switch.
- Make sure flow switch cover is secured before turning on electric power.

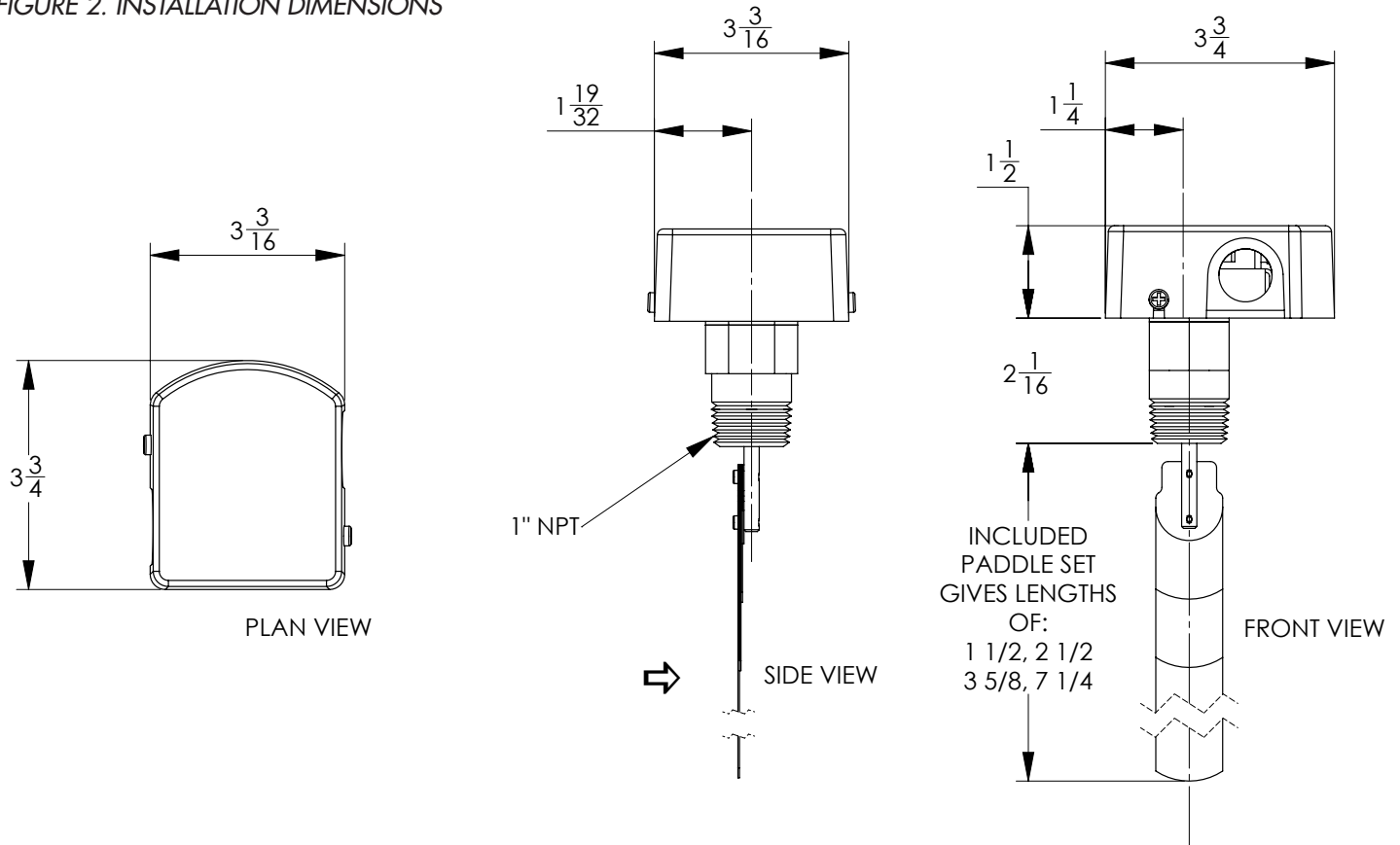
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## SPECIFICATIONS

FIGURE 2. INSTALLATION DIMENSIONS



<b>Liquid Temperature Range</b>	32° - 250°F (0° - 121°C)
<b>Ambient Temperature Range</b>	32° - 150°F (0° - 66°C)
<b>Maximum Service Pressure</b>	250 psi
<b>Electrical Enclosure Rating</b>	NEMA Type 1 (Not for use in hazardous locations.)
<b>Process Connection</b>	1" NPT
<b>Conduit</b>	One opening for ½" conduit
<b>Usage</b>	1" Pipe and Larger

### ELECTRICAL RATING

Single-Pole-Double-Throw (SPDT)

Contact Rating: 15A, ½ hp; 125, 250, 277VAC  
 ½A, 125VDC; ¼A, 250VDC

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FIGURE 3. FLOW RANGE TABLE

Pipe Size NPT	Switchpoint Range (GPM)				Paddle Size (inches)
	Min. Adjust.		Max. Adjust.		
	ON	OFF	ON	OFF	
1"	4	2	8	7	1.30"
1½"	7	5	13	11	1.85"
2"	12	7	27	26	2.30"
2½"	18	12	35	32	2.83"
3"	27	19	52	49	3.40"
4"	63	50	123	120	4.50"
5"	125	100	238	232	5.50"
6"	190	158	350	338	6.50"

**Consult the factory for larger pipes and additional switch points.**

FIGURE 4. PADDLE SIZES

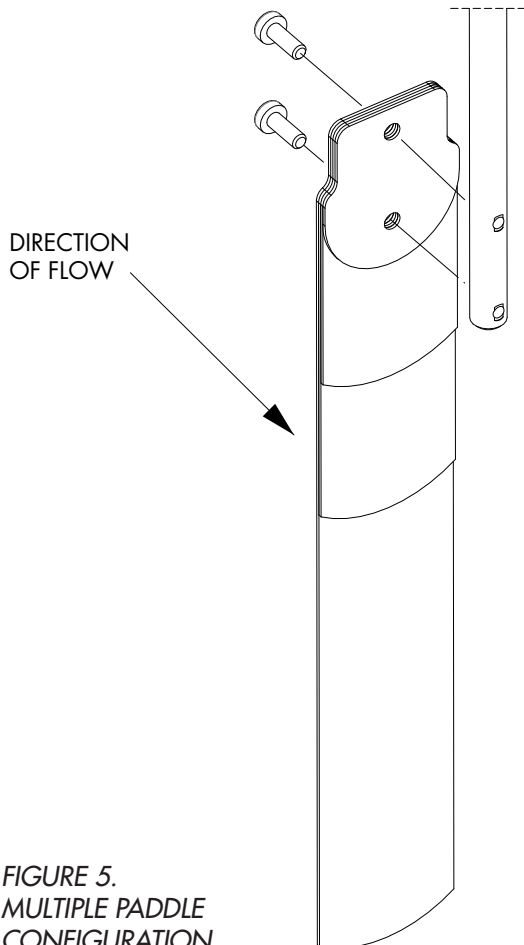
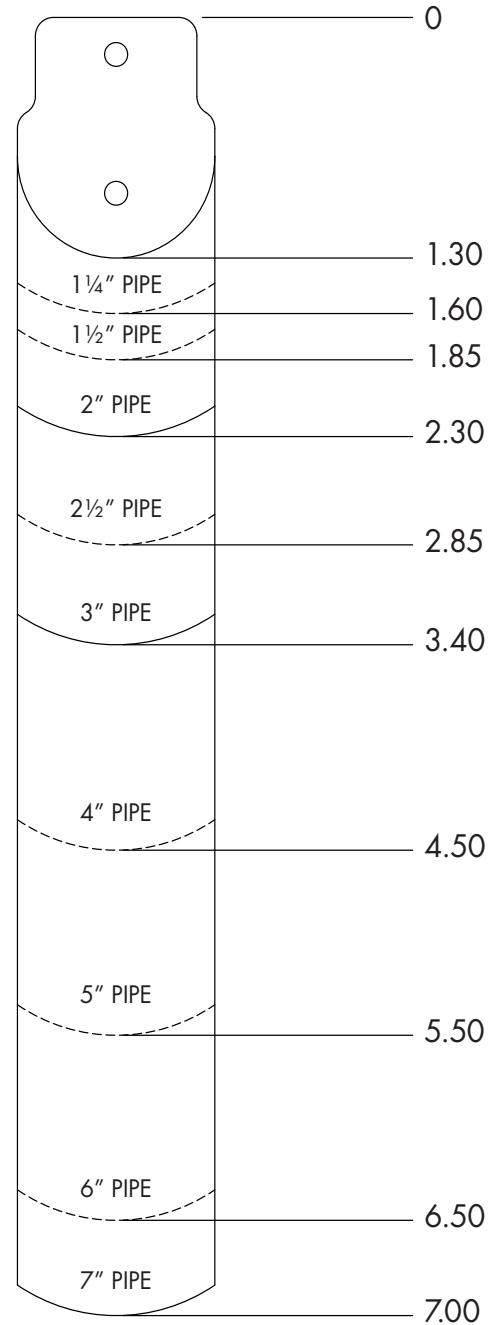
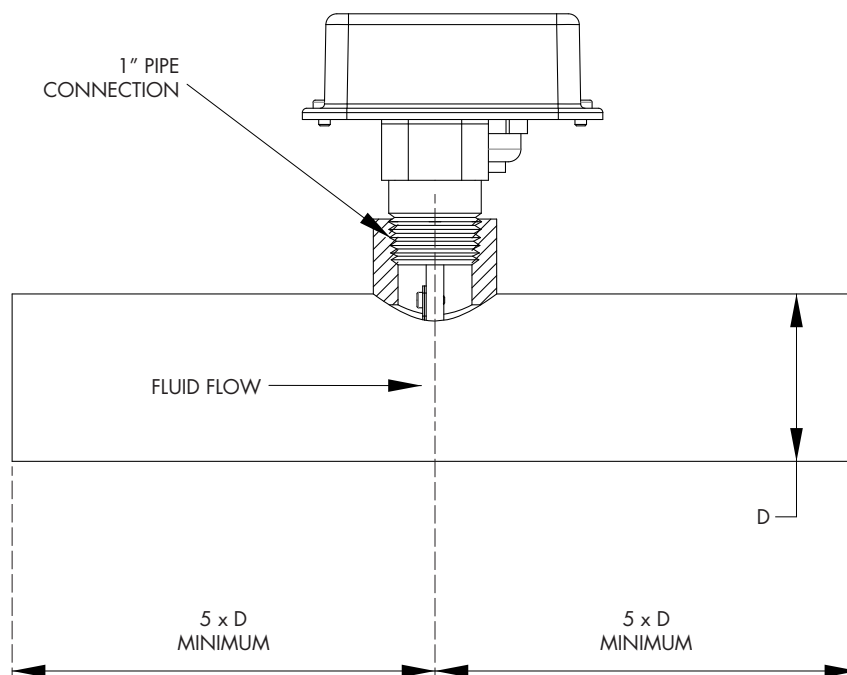


FIGURE 5.  
 MULTIPLE PADDLE  
 CONFIGURATION

## INSTALLATION INSTRUCTIONS

The Model Q-16 should be mounted on the top of a horizontal section of pipe. If it is mounted in a vertical pipe, the switch points will deviate from those published. If the flow is **DOWNWARD**, switch points will be **LOWER** than published. If flow is **UPWARD**, switch points will be **HIGHER** than published.

FIGURE 6. Q-16 IN PIPE



D = PIPE DIAMETER

The flow switch should be located in a straight run of at least 5 pipe diameters.

1. Determine the proper paddle length from the chart next to the "Flow Range" Table [FIGURE 3]. For intermediate sizes, trim the next largest paddle to the correct length. The paddle must not touch the inside of the pipe. If more than one paddle is being installed, stack one on top of the other with the larger ones first in line with the flow. [FIGURE 5.]
2. Use a reducing tee for pipe sizes larger than 1" to provide adequate paddle length in the liquid flow. A weldolet or half coupling may also be used. If a reducing tee is not available, use a bushing to reduce the tee outlet to 1" pipe thread.
3. Be sure the flow switch is mounted such that the flow direction is perpendicular to the paddle and that it activates the flow switch when there is flow and de-activates at rest when there is no flow.

**CAUTION: DO NOT TIGHTEN BY GRASPING THE SWITCH ENCLOSURE. USE THE HEX FLATS AND WRENCH.**

## ELECTRICAL WIRING

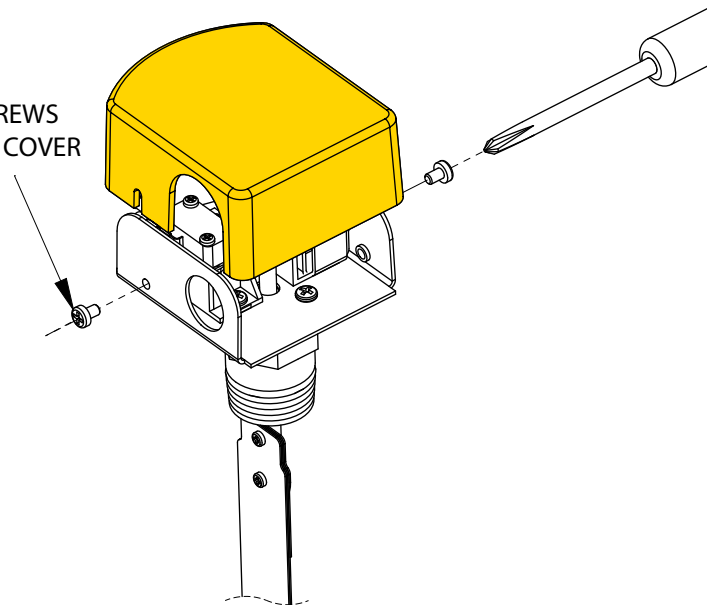
### **WARNING**

- To prevent electrical shock, turn off the electrical power before making electrical connections.
- To prevent electrocution, do not touch the terminals when electrical power is connected to the flow switch.
- To prevent an electrical fire or equipment damage, use properly temperature-rated supply wire for the anticipated temperature.
- Make all electrical connections in accordance with the National Electrical Code and local regulations.

FIGURE 7.

1. Using a Phillips screwdriver, remove the two (2) cover screws and remove the cover.
2. Connect electrical conduit connector to the flow switch enclosure. Follow accepted electrical practices when installing fittings and making connections. Refer to, and follow, local codes and standards when selecting the types of electrical fittings and conduit to connect to flow switch.
3. Determine which switch action is required for the flow switch.
4. Using a scissor-style crimping tool (3M TH-450 or equivalent), crimp 14 gage wire to the female flag disconnect terminals (3M 752-187) included with the switch.  
\*Note: Use copper wire only
5. Attach ground wire to green grounding screw on flow switch base.

LOOSEN OR  
REMOVE SCREWS  
TO REMOVE COVER



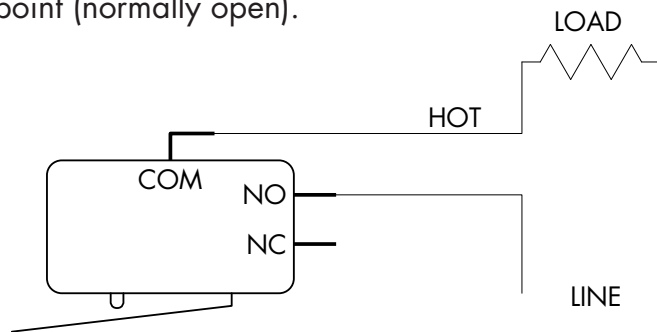
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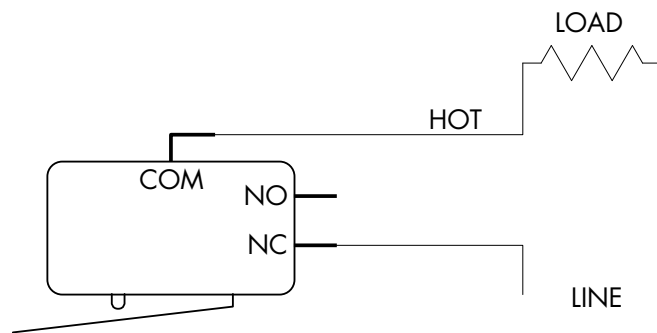
Power applied to load when flow is GREATER than set point, interrupted when flow is LESS than set point (normally open).

FIGURE 8.

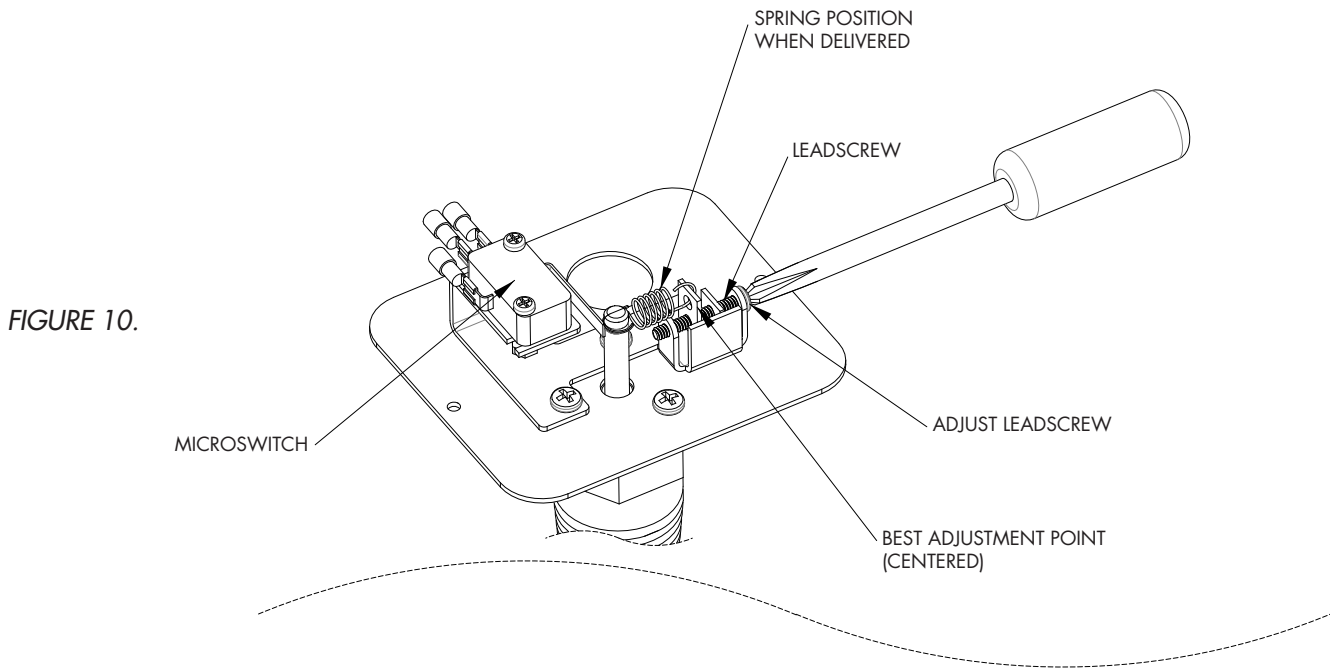


Power applied to load when flow is LESS than set point, interrupted when flow is GREATER than set point (normally closed).

FIGURE 9.



## SWITCH POINT ADJUSTMENT



1. TURN OFF POWER.
2. Remove cover.
3. Adjust fluid flow in system to desired rate WITHOUT regard to Q-16 switch point setting.
4. The switch point adjusting mechanism consists of an adjusting screw, a "U" shaped nut, and a helical spring.

CLOCKWISE rotation of the adjusting screw changes the microswitch actuation point toward HIGHER flow rates.

NOTES: All Q-16 units are factory set at the lower end of the flow range, e.g. the adjusting screw is set at the low flow counter-clockwise position.

The lead screw nut locks the adjusting screw in position, maintaining the flow switch set point under all environmental conditions.

5. Starting with the nut in low-flow position (tension spring relaxed), 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 (2) additional turns in the clockwise direction and then slowly back off in a counter-clockwise direction, until the microswitch is de-actuated. The Q-16 flow switch is now set at maximum sensitivity for detecting small flow changes.
6. When set at maximum sensitivity (100% point) as described 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 turning the adjusting screw in a counter-clockwise direction.
7. Microswitch actuation point may be monitored during the adjustment procedure detail in steps 5 and 6

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by an audible click, with an ohmmeter, or with other continuity tester before connecting line power to the microswitch.

8. If the system flow rate is changed, the Q-16 can be adjusted to monitor the new flow rate by turning the adjusting screw in a counter-clockwise direction to the minimum flow position and then proceeding as in 5 and 6 above.
9. Place cover on the flow switch and turn on power.
10. Test the operation of the flow switch after each adjustment.

## TESTING

Place cover on flow switch and turn on power. Observe whether the flow switch is being activated by the flow. Turn off fluid flow to determine if the device is operating as required.

Repeat initiating and turning off fluid flow several times. If operating as required, put system into service. If not operating as required, flow switch may need to be adjusted.



# CERTIFICATE OF CONFORMANCE

All Harwil Corporation ("HARWIL") products are manufactured using new materials and components. Our products meet the applicable performance and materials specifications indicated in our current Specifications Sheets and Parts List. HARWIL endeavors to obtain its materials and components from American Companies.

## **DOMINANCE OF HARWIL LIMITED EXPRESS WARRANTY**

Each user **MUST** make appropriate analysis and tests to determine the suitability of the HARWIL product for the intended use prior to purchase.

HARWIL warrants that all HARWIL products will be free from defects in material and workmanship for a period of one year from the date of original shipment. This Warranty shall be LIMITED to the replacement and reconditioning of our products and parts. HARWIL reserves the right and sole discretion to modify or change the composition, design and appearance of its products at anytime.

THIS WARRANTY SHALL BE IN LIEU OF ALL WARRANTIES OF MERCHANTABILITY AND OF ALL WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE RELATING TO HARWIL PRODUCTS AND PARTS. BUYER'S SOLE REMEDY SHALL BE REPLACEMENT OR RECONDITIONING AS SET FORTH HEREIN.

HARWIL SHALL INCUR NO OBLIGATIONS HEREUNDER AND NO LIABILITY IN THE EVENT OF (1) BUYER NOT FULFILLING ITS RESPONSIBILITIES; INCLUDING AS SET FORTH HEREIN; (2) NEGLIGENCE, ALTERATION OR IMPROPER PRODUCT USE, INCLUDING USE WITH NON-COMPATIBLE DEVICES OR CHEMICALS; OR (3) REPAIR BY ANOTHER COMPANY OR PERSON THAN HARWIL.

ANY LAWSUIT RELATING TO THIS LIMITED EXPRESS WARRANTY MUST BE COMMENCED WITHIN ONE YEAR OF THE DATE THE LAWSUIT ACCRUES.

HARWIL provides NO WARRANTY and ASSUMES NO RESPONSIBILITY for corrosive attack on any material, component or design features associated with any of its products.

Corrosion resistance information listed in HARWIL specification sheets, information sheets and product brochures is solely for general background information. This information table has been compiled from literature published by various material suppliers and by equipment manufacturers who use these materials in their products. Inasmuch as these data are based on tests by entities over which HARWIL has no control, HARWIL DOES NOT GUARANTEE AND DOES NOT ACCEPT ANY RESPONSIBILITY FOR THE ACCURACY OF SUCH THIRD PARTY TESTING. When using the table, please remember that in any given case several factors such as concentration, temperature, degrees of agitation and presence of impurities influence the rate of corrosion. The information table is intended, in a general way, to rate materials for resistance to chemicals which contain their usual impurities and for types of equipment in common use. Ratings should be used only as a general tool to first approximation of your material requirements rather than as the final answer.

WHEN IN DOUBT, TEST MATERIALS BEFORE INSTALLATION.

AFTER INSTALLATION, FOLLOW UP WITH SCHEDULED PREVENTATIVE MAINTENANCE AND PERIODIC INSPECTION.