

MODEL Q-4

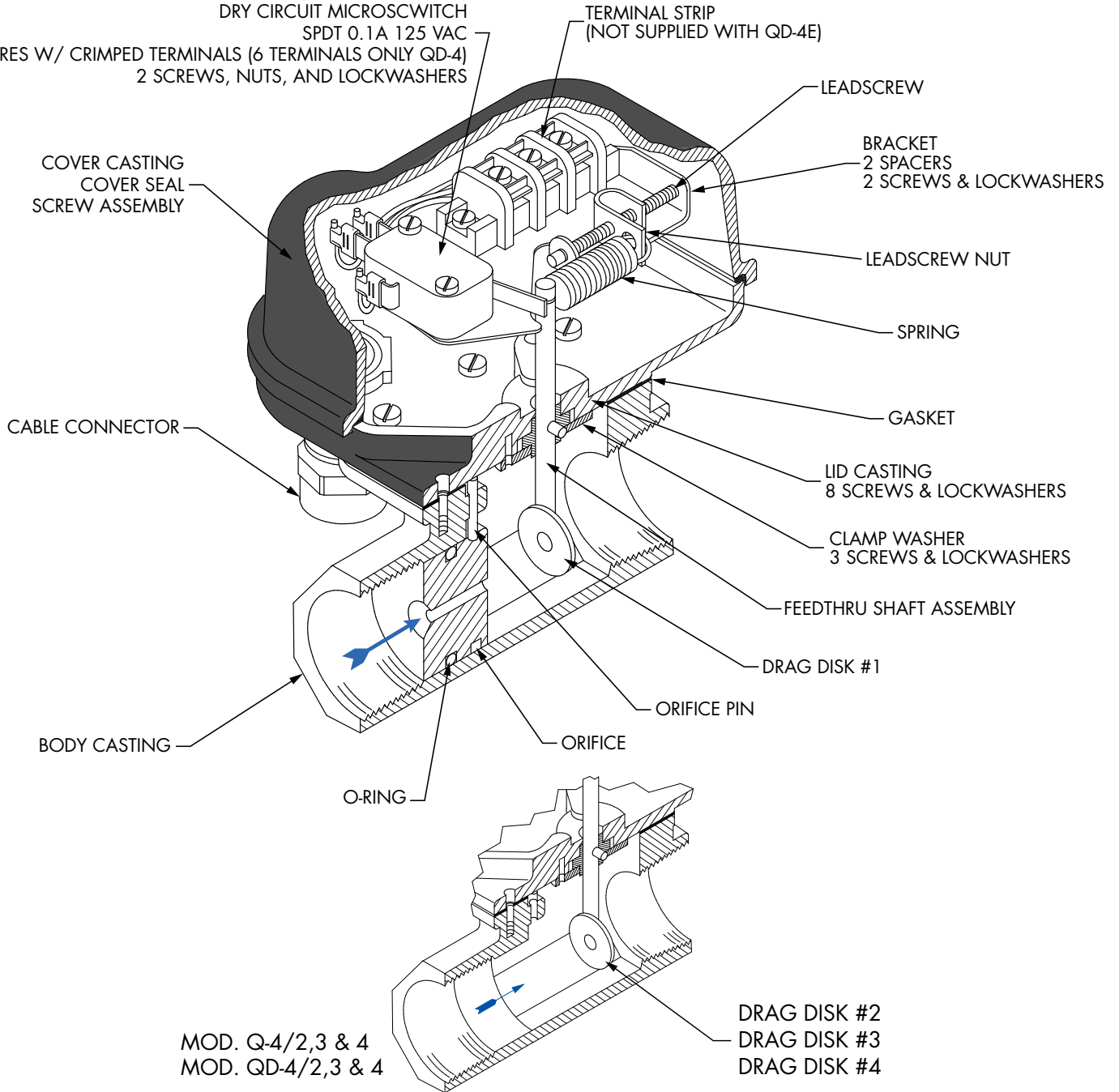
Q-4E, QD-4E

HARWIL CORPORATION

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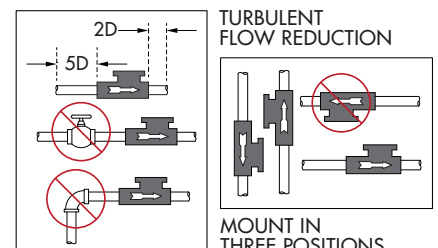
INSTALLATION INSTRUCTIONS

SPDT 15A MICROSWITCH 125/240 VAC (2 REQ'D FOR QD-4)
 DRY CIRCUIT MICROSWITCH
 SPDT 0.1A 125 VAC
 3 WIRES W/ CRIMPED TERMINALS (6 TERMINALS ONLY QD-4)
 2 SCREWS, NUTS, AND LOCKWASHERS



PARTS LIST FLUID FLOW SWITCH

ULTRA RELIABLE SINCE 1956



INSTALLATION AND OPERATING INSTRUCTIONS

The gasket seal located between the main body casting and the lid casting is a cork-rubber composition, which is subject to a slight creep for a short period after the application of the initial clamping load. All gaskets are properly clamped before shipment, however during shipping and storage, the gasket may compress; allowing the body-lid clamp bolts to become slightly loose. Tighten these bolts before assembling the flow switch in-system. No further creep of gasket will occur after the second tightening. The Q-4E fluid flow switch is supplied with tapped holes for standard 1 inch pipe. Insert in-line with the arrow on the side of the casting pointed in the direction of flow.

NOTE: Care should be exercised to prevent pipe thread sealant (putty, Teflon tape, etc.) from entering the flow switch and restricting flow through the calibrated orifice. (Model Q-4E/1 only.)

ELECTRICAL WIRING

FIGURE 1: Wiring schematic for power applied to load when flow is GREATER than the set point (power to load interrupted when flow is LESS than set point).

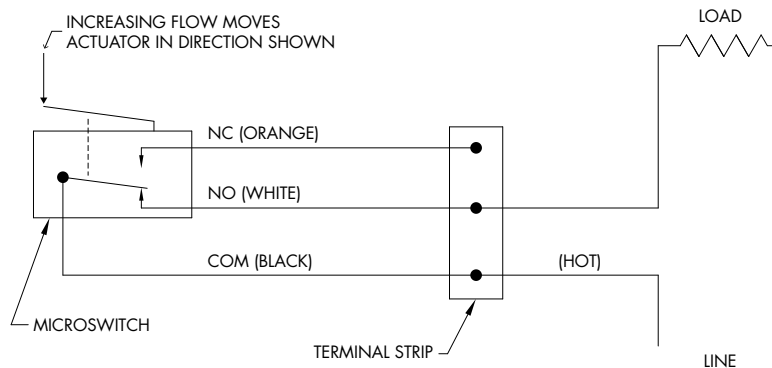
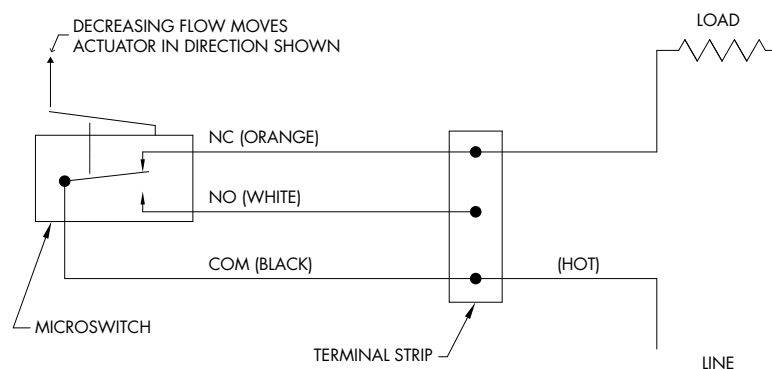


FIGURE 2: Wiring schematic for power applied to load when flow is LESS than the set point (power to load interrupted when flow is GREATER than set point).



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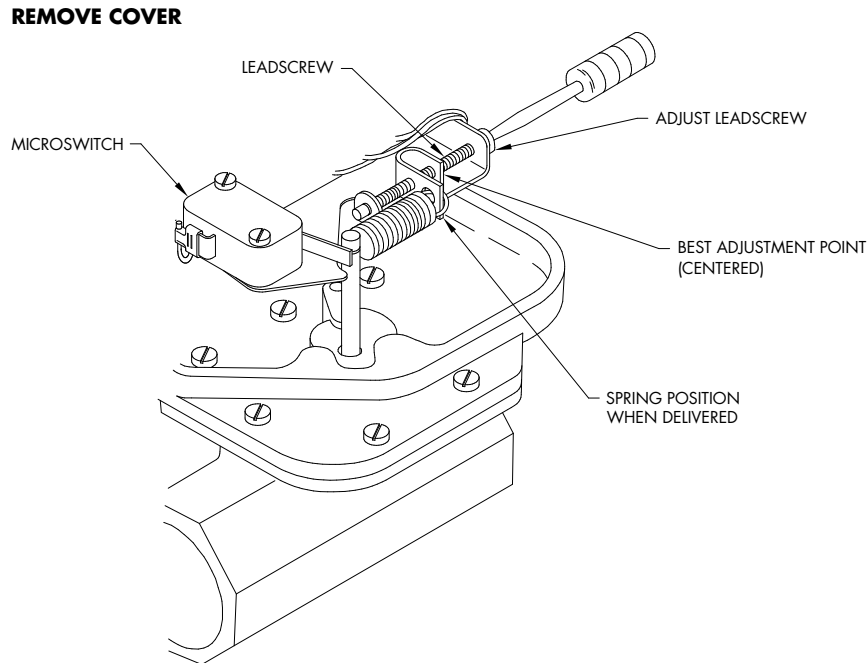
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Q-4 FLOW SWITCH OPERATIONAL ADJUSTMENT



SWITCH POINT ADJUSTMENT

1. Remove cover.
2. Adjust fluid flow in system to desired rate **WITHOUT** regard to Q-4E 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 Q-4E 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.

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 (2)** additional turns in the clockwise direction and then slowly back off in a counter-clockwise direction, until the microswitch is again actuated. The Q-4E flow switch is now set for maximum sensitivity for detecting small flow changes.
5. When set for 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

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and "noise" in the electrical circuit. This is eliminated by turning the adjusting screw in a counter-clockwise direction.

6. Microswitch actuation point may be monitored during the adjustment procedure detailed in steps 4 and 5 by an audible click or with an ohmmeter 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 Q-4E 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 4 and 5 above.

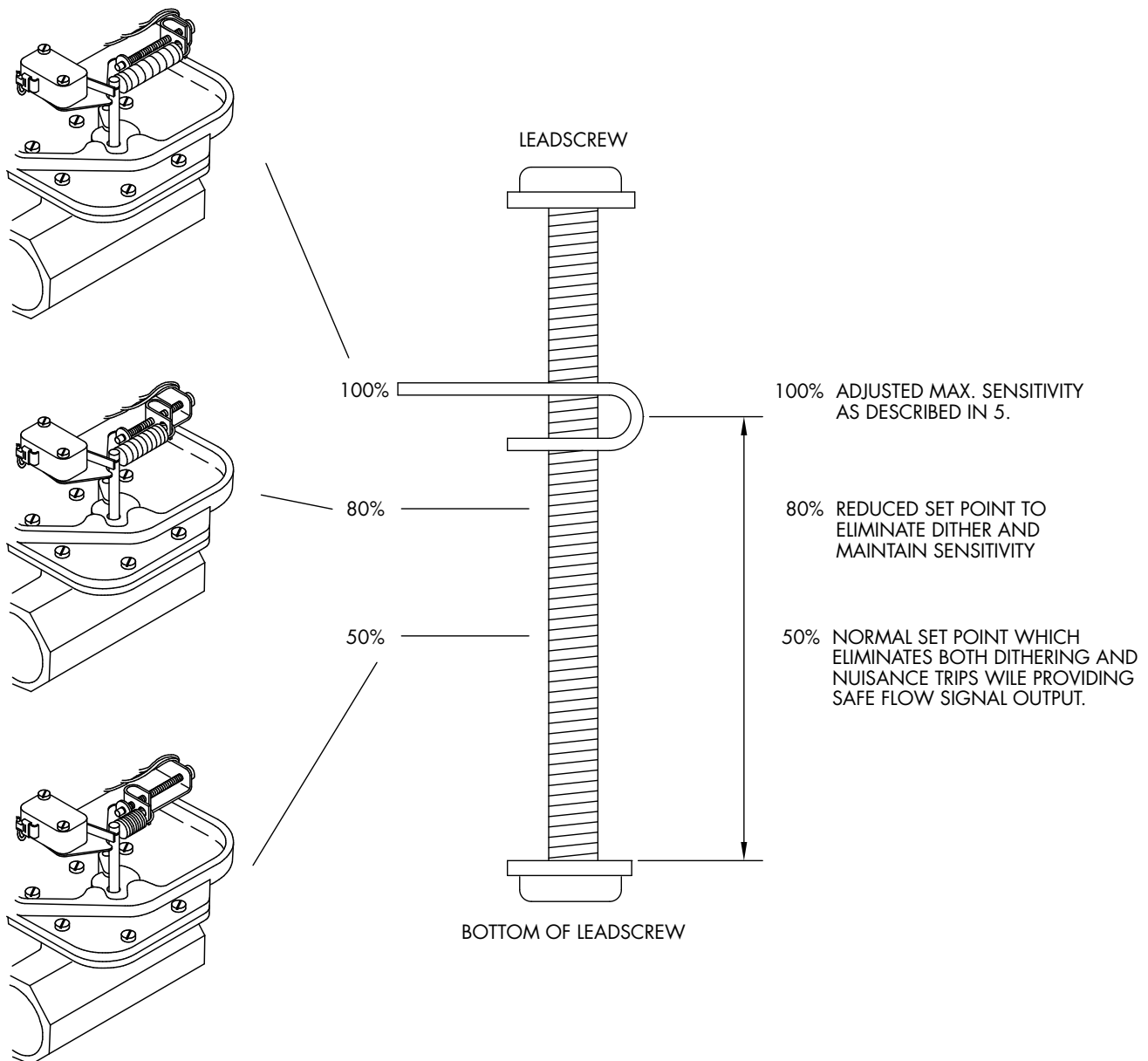


FIG. 4

RANGE CHANGE

If the system flow rate is changed to a rate that is within the orifice or drag disk range presently installed in the unit, then the unit may be adjusted to monitor the new flow rate. Turn the adjusting lead screw in a counter-clockwise direction until the spring is fully relaxed to the minimum flow position and proceed as in step 4.

SWITCH POINT ADJUSTMENT

MODEL Q-4E/1 (ORIFICE TYPE 4-8 GPM)

If procedure 4 has been followed and the micro-switch has not been actuated (even though the spring is completely relaxed), then the flow rate is too low and another model series must be used. If the adjusting lead screw has been turned clockwise until the lead screw nut is at the extreme end of the bracket with the spring fully extended and the microswitch still has not been actuated, then the flow rate is greater than 8 GPM and the orifice and the #1 drag disk must be discarded. Models without orifices have a different dash number (2, 3, or 4). Proceed as follows:

TO REMOVE ORIFICE, CHANGE DRAG DISK AND CONVERT TO MODELS Q-4E/2, 3, OR 4 OR QD-4/2, 3, OR 4:

NOTE: It is not necessary to remove the main body of the switch from the line to remove the orifice or change the drag disk.

- a. Remove the cover.
- b. Remove the lid casting from the main body casting.
- c. Remove the orifice pin and discard it.
- d. Insert a small screw driver blade in the groove located in the exposed end of the orifice and pry the orifice toward the body cavity. Discard the orifice and attach drag disk #2.
- e. Reassemble and proceed as below:

SWITCH POINT ADJUSTMENT, MODELS Q-4E/2, 3, OR 4 OR QD-4/2, 3, OR 4

Proceed as in 4 through 6 on pages 3 and 4. If microswitch action is not obtainable even though

the adjusting spring is fully extended, then the flow is too great for the drag disk size and the next smallest must be substituted.

NOTE: If the flow switch is to be converted from a Model Q-4E/2, 3, or 4 to a lower flow range unit (e.g. Q-4E/1 or QD-4/1) :

- a. Remove the cover.
- b. Remove the lid casting from the main body casting.
- c. Remove the drag-disk from the end of the feed thru shaft and replace it with drag disk #1 (1 1/4" diameter).
- d. Insert the orifice in the body casting with the O-ring toward the upstream hole and press into place.
- e. Insert the orifice retaining pin. Be sure to check that the pin is properly inserted in the groove in the orifice.
- f. Reassemble and proceed as in step 4.

TERMINAL STRIP WIRING

1. Loosen the round gland nut located on the electrical cable fitting.
2. Insert the cable through the grommet in the electrical cable fitting and tighten the gland nut sufficiently to seal the cable in place.
3. Strip the conductor ends approximately 3/16"
4. Loosen the appropriate terminal strip screw and remove the empty terminal. Insert bare wire in the terminal barrel and crimp it. Place the terminal on the strip in the SAME orientation as it was received. This is IMPORTANT, since terminals and wires may interfere with the cover if the orientation is changed.

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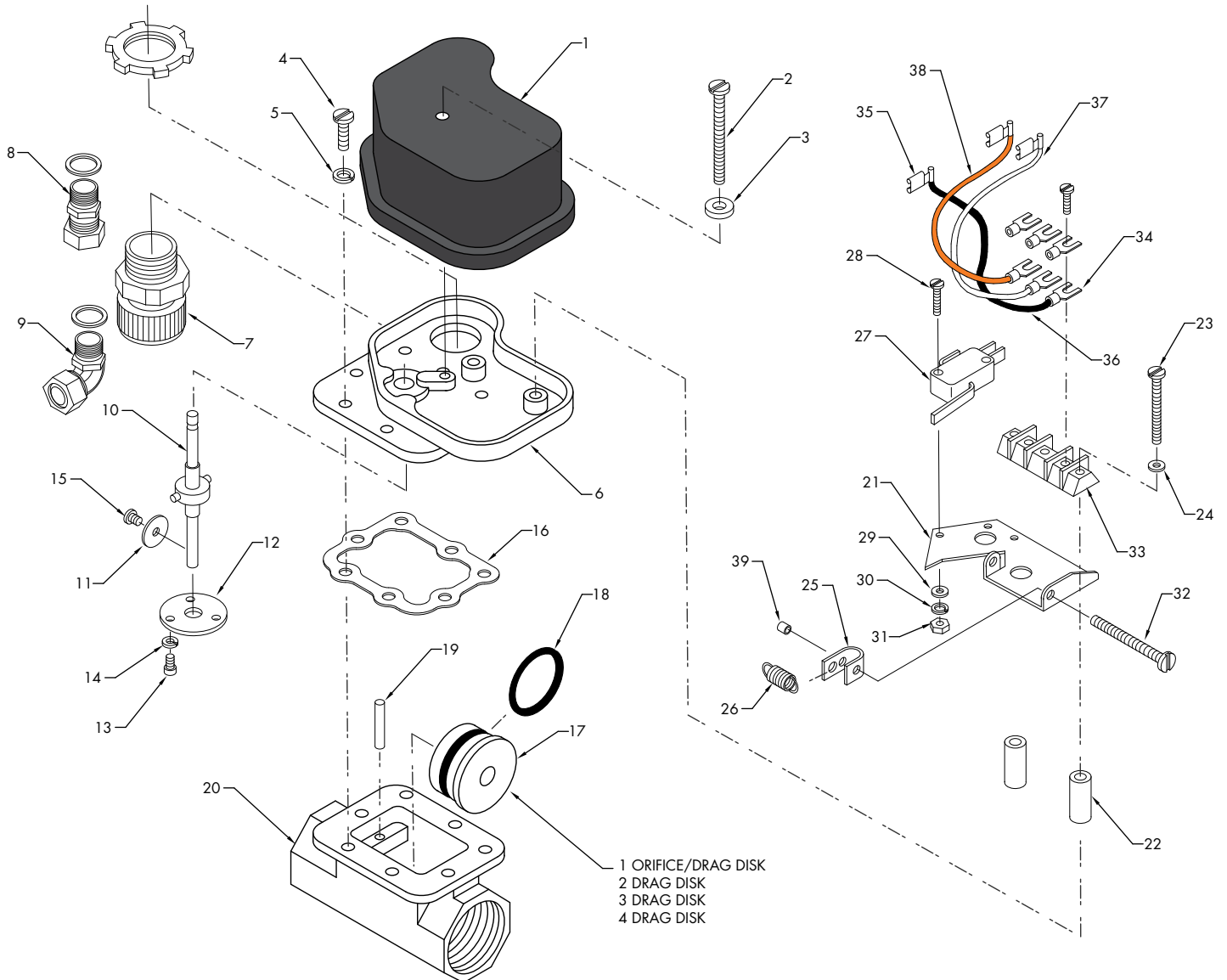
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				Q-4E (OR QD-4)					
#	PART NAME	QTY	PART #	#	PART NAME	QTY	PART #	#	PART #
1	COVER CASTING	(1)	20300	16	GASKET	(1)	20307		
2	SCREW	(1)	112-S	17	ORIFICE (OPTIONAL)	(1)	20308		
3	LOCK WASHER	(1)	321-W			(1)	20309		
4	SCREW	(7)	107-S			(1)	20310		
5	WASHER	(7)	319-W	18	O-RING	(1)	20311		
6	LID CASTING	(1)	20301	19	PIN - ORIFICE	(1)	20312		
7	CONNECTOR CABLE (OPTIONAL)	(1)	60116	20	BODY CASTING	(1)	20313		
	BODY	(1)	10429	21	BRACKET	(1)	20314		
	NUT	(1)	10430	22	SPACER	(2)	20315		
	GROMMET #A (OPTIONAL)	(1)	10440	23	SCREW	(2)	117-S		
	GROMMET #AA (OPTIONAL)	(1)	10441	24	WASHER	(2)	313-W		
	GROMMET #B (OPTIONAL)	(1)	10442	25	LEAD SCREW	(1)	20107		
	GROMMET #C (OPTIONAL)	(1)	10443	26	SPRING	(1)	20316		
	LOCK NUT	(1)	101-DC	27	MICROSWITCH	(1 OR 2)	20103		
	O-RING	(1)	20117	28	SCREW	(2)	116-S		
8	CONNECTOR CABLE (OPTIONAL)	(1)	20115	29	WASHER	(1)	300-W		
9	CONNECTOR CABLE (OPTIONAL)	(1)	20116	30	WASHER	(2)	311-W		
10	FEED THRU SHAFT (ASSEMBLY ONLY)	(1)	20302	31	NUT	(2)	201-N		
	RUBBER MOLDED	(1)	20134	32	SCREW	(1)	132-S		
	PIN	(1)	20135	33	TERMINAL SWITCH	(1)	20102		
11	DRAG DISK #1 (OPTIONAL)	(1)	20303	34	TERMINAL	(3)	706-T		
	DRAG DISK #2 (OPTIONAL)	(1)	20304	35	TERMINAL	(3)	708-T		
	DRAG DISK #3 (OPTIONAL)	(1)	20305	36	WIRE	(1)	20317		
12	WASHER	(1)	324-W	37	WIRE	(1)	20318		
13	SCREW	(4)	118-S	38	WIRE	(1)	20319		
14	WASHER	(3)	311-LO	39	SHRINK WRAP	(1)	901-F		
15	SCREW	(1)	152-S	40	LABEL	(1)	20320		



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.