Form Number: F-1031 Issue Date: 2/21/20
Section: 3007 Revision Date: 12/12/24

Discharge Valves

Installation, Operation, and Maintenance Instructions

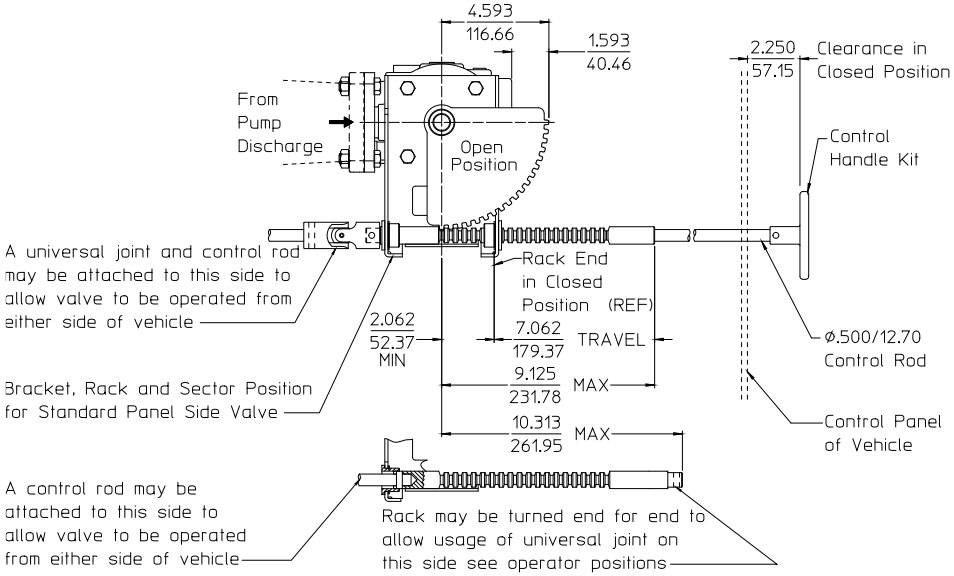
Index

Notes:

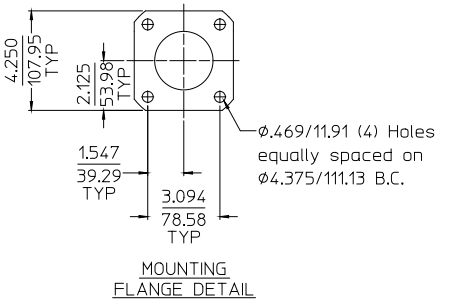
1) Push-Pull and Remote Locking Actuators are not available with 3-1/2 in. valves.
2) A valve actuation remote locking mechanism must be installed that meets the requirements of NFPA 1900 *Standard for Aircraft Rescue and Firefighting Vehicles, Automotive Fire Apparatus, Wildland Fire Apparatus, and Automotive Ambulances*.

Valve Dimensions

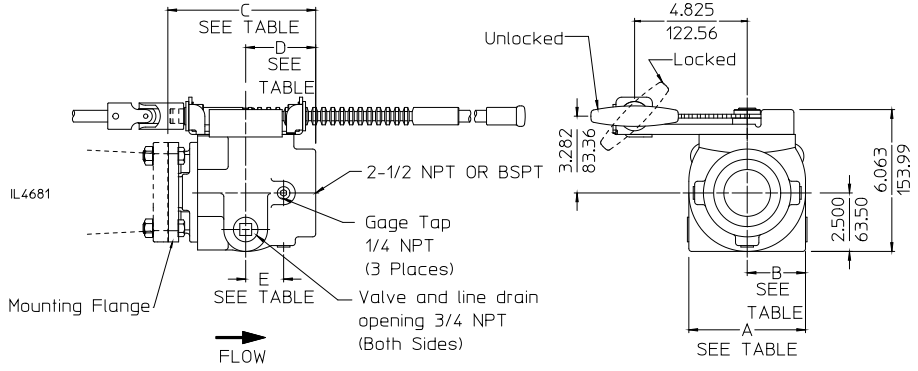
Manual Push-Pull Actuator
Without Flowmeter Provision



	A	B	C	D	E
2-1/2 STANDARD DISCHARGE	5.000 127.00	2.500 63.50	6.312 160.32	3.000 76.20	1.625 41.28
2-1/2 FULL FLOW DISCHARGE	4.500 114.30	2.250 57.15	6.000 152.40	2.688 68.28	1.438 36.53



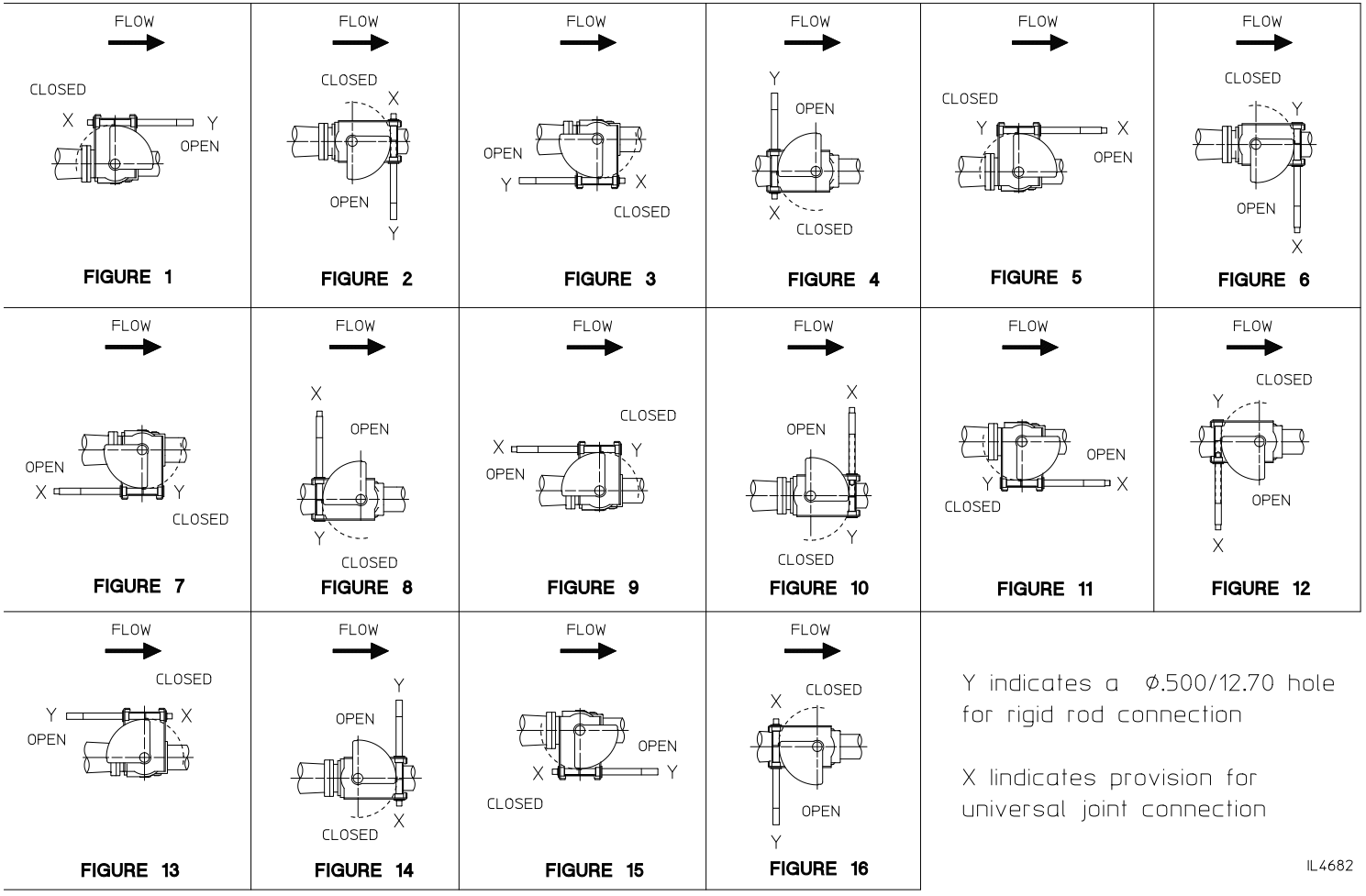
All dimensions shown as inch/millimeter



2-1/2 Push-Pull Discharge
Valve Dimensions

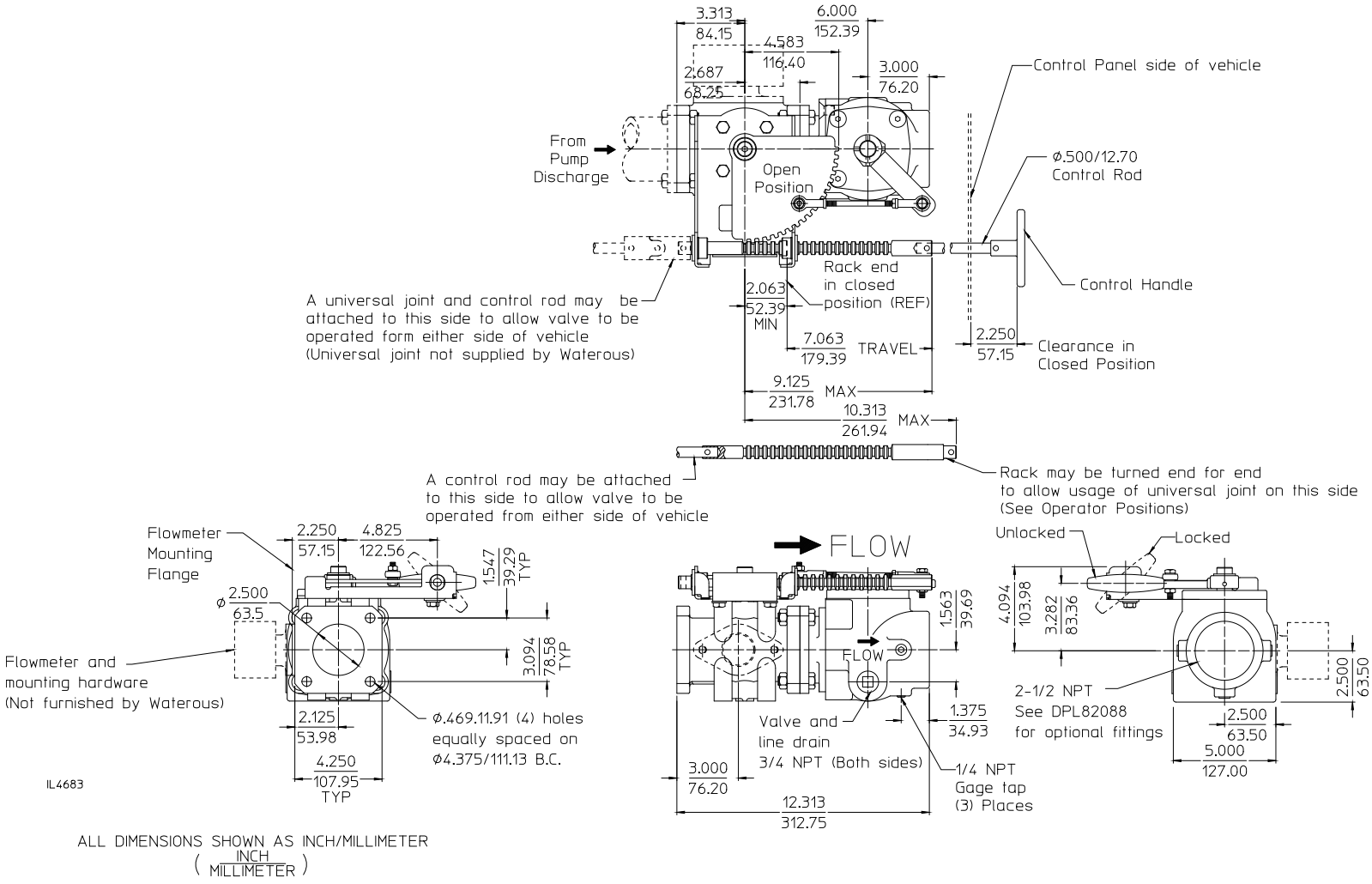
Available Operator Positions

Manual Push-Pull Actuator
Without Flowmeter Provision



Valve Dimensions

Manual Push-Pull Actuator
With Flowmeter Provision



ALL DIMENSIONS SHOWN AS INCH/MILLIMETER
(INCH / MILLIMETER)

Valve Dimensions

Manual Push-Pull Actuator
With Flowmeter Provision

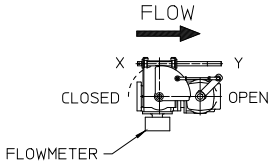


FIGURE 1A

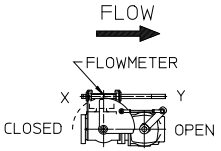


FIGURE 1B

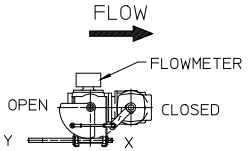


FIGURE 3A

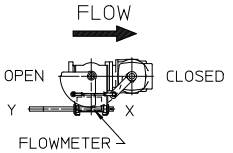


FIGURE 3B

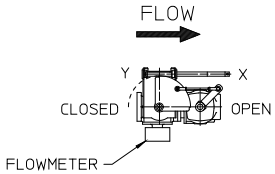


FIGURE 5A

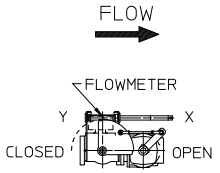


FIGURE 5B

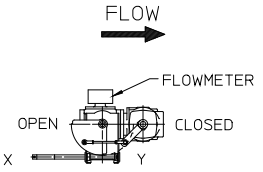


FIGURE 7A

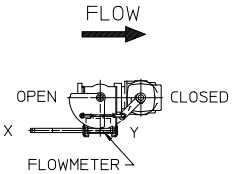


FIGURE 7B

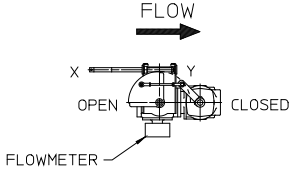


FIGURE 9A

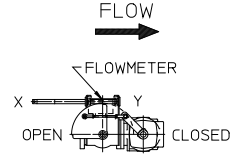


FIGURE 9B

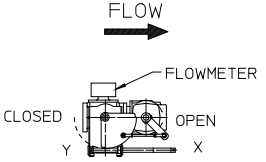


FIGURE 11A

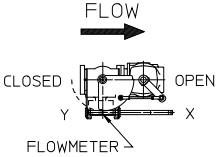


FIGURE 11B

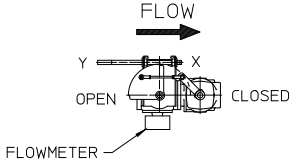


FIGURE 13A

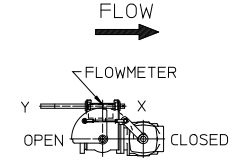


FIGURE 13B

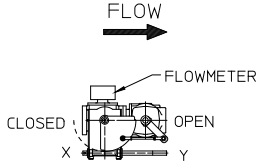


FIGURE 15A

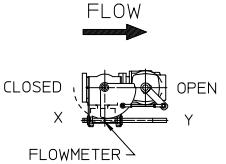


FIGURE 15B

X indicates provision for universal joint connection

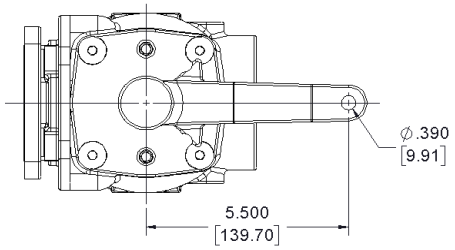
Y indicates a ø.500/12.70 hole for rigid rod connection

MANUAL PUSH-PULL W/ FLOWMETER
VALVE OPERATOR POSITIONS

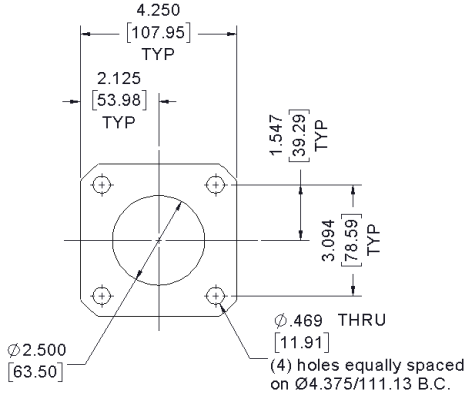
IL4684

Valve Dimensions

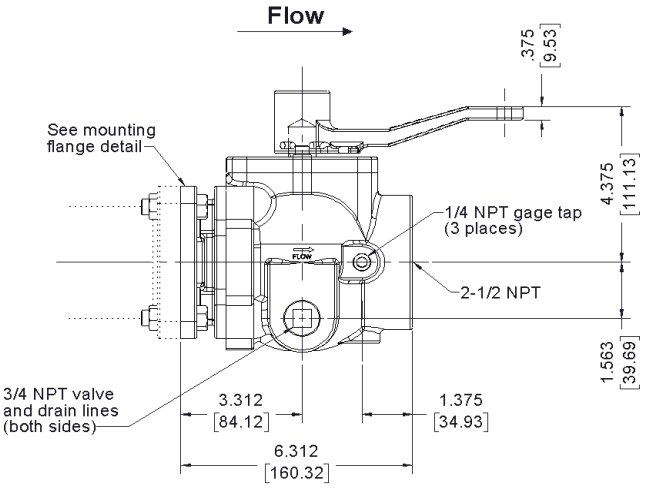
Manual Remote Locking Actuator
Drains 90° to Waterflow

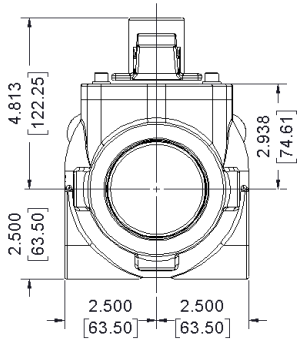


IL4685



Mounting Flange Detail

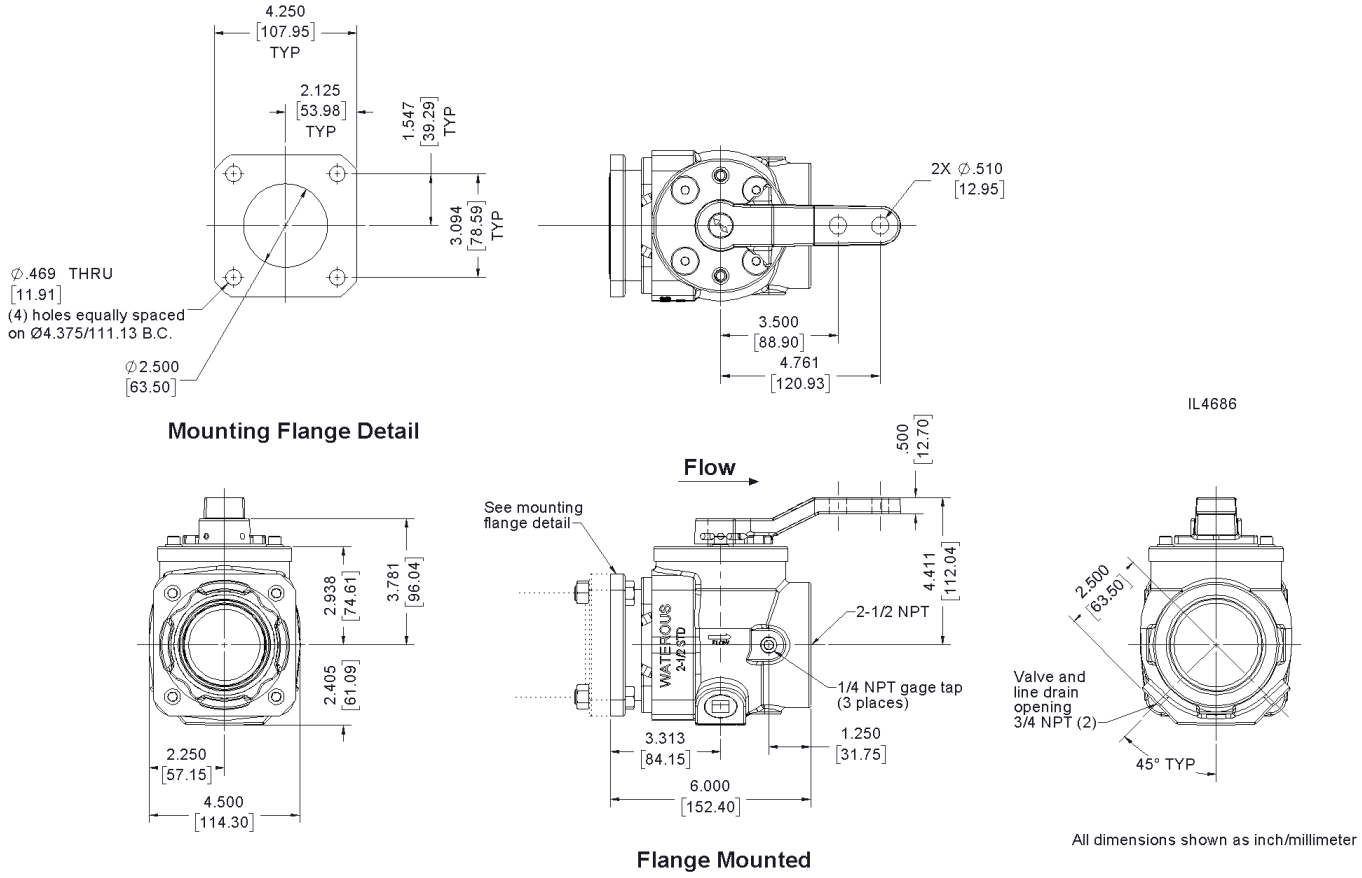




All dimensions shown as inch/millimeter

Valve Dimensions

Manual Remote Locking Actuator
Drains 45° to Waterflow

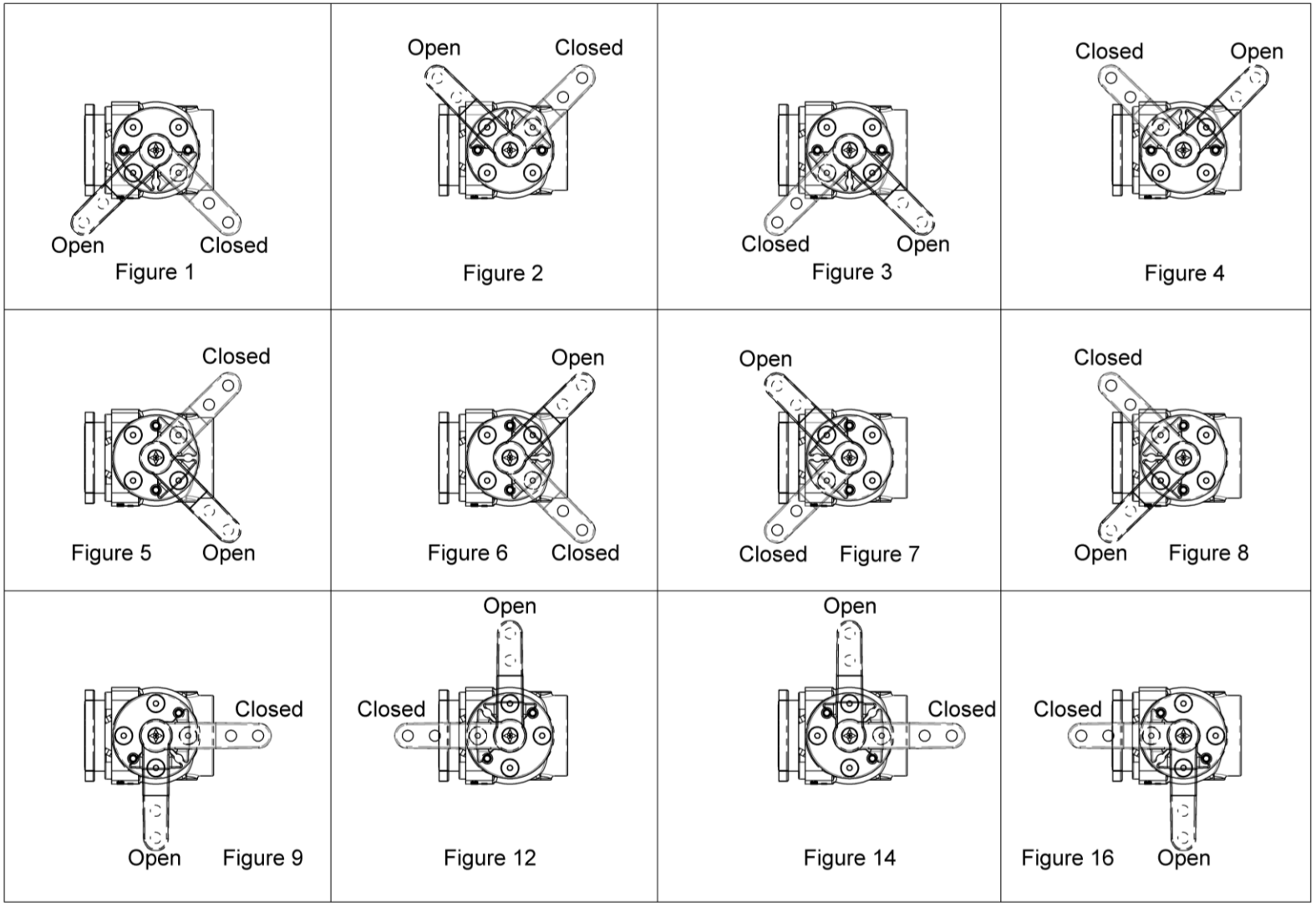


Available Operator Positions

Remote Locking Actuator

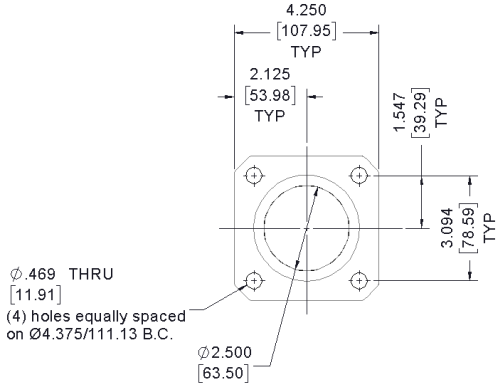
IL4687

Flow →



Valve Dimensions

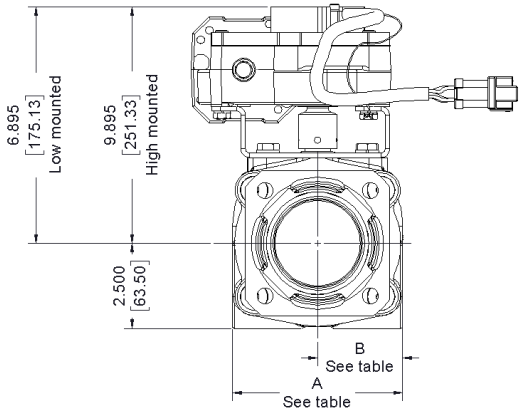
Manual Rotary Actuator
2-1/2 in. Valve

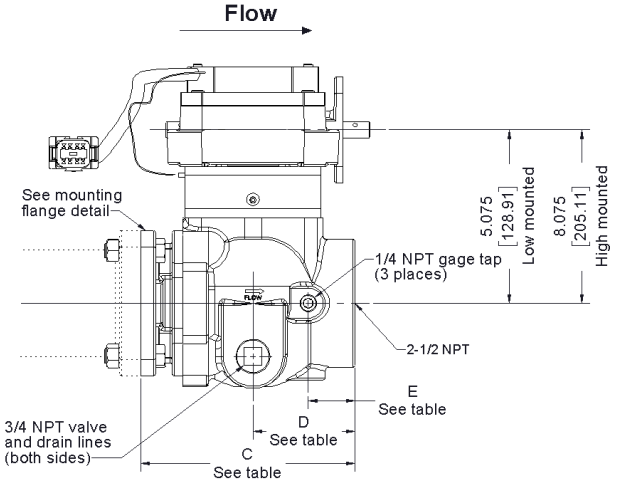


Mounting Flange Detail

TABLE	A	B	C	D	E
2-1/2 Standard Discharge	4.500/114.30	2.250/57.15	6.000/152.39	2.688/68.26	1.250/31.75
2-1/2 Full Flow Discharge	5.000/127.00	2.500/63.50	6.312/160.32	3.000/76.20	1.375/34.93

IL4688

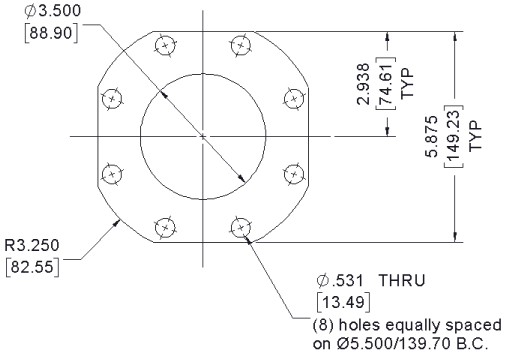




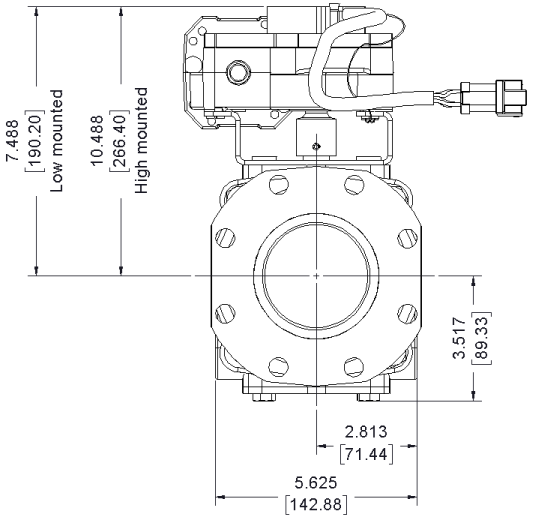
All dimensions shown as inch/millimeter

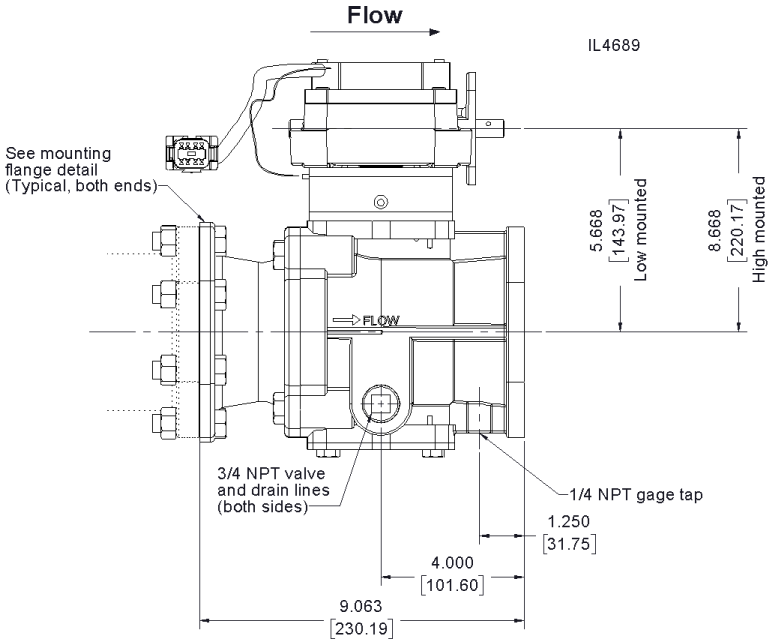
Valve Dimensions

Manual Rotary Actuator
3-1/2 in. Valve



Mounting Flange Detail





All dimensions shown as inch/millimeter

Available Operator Positions

Manual Rotary Actuator

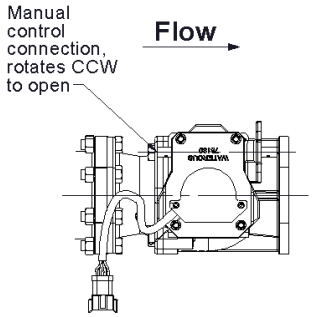


Figure 1

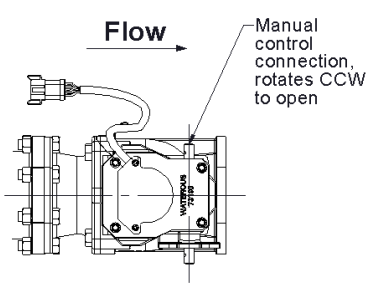


Figure 2

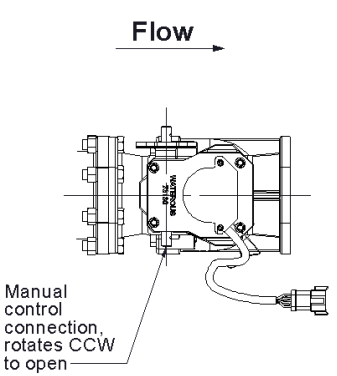


Figure 3

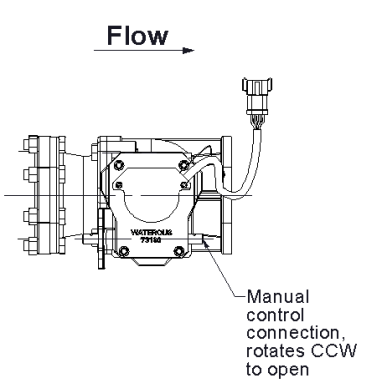
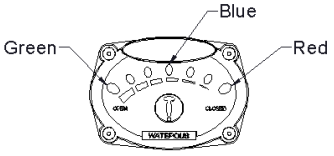
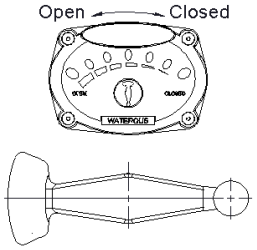


Figure 4



Panel LED Colors



Control Handle and Panel

IL4690

Valve Dimensions

Electric Rotary Actuator
2-1/2 in. Valve

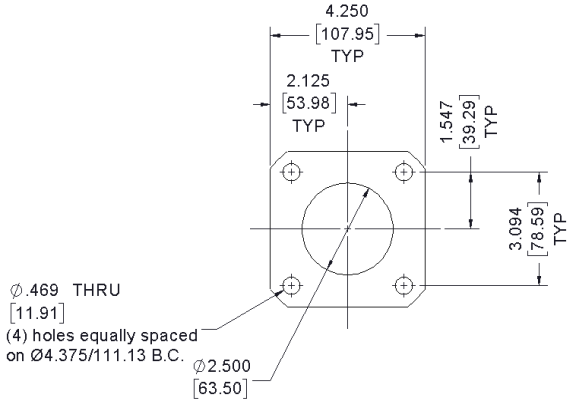
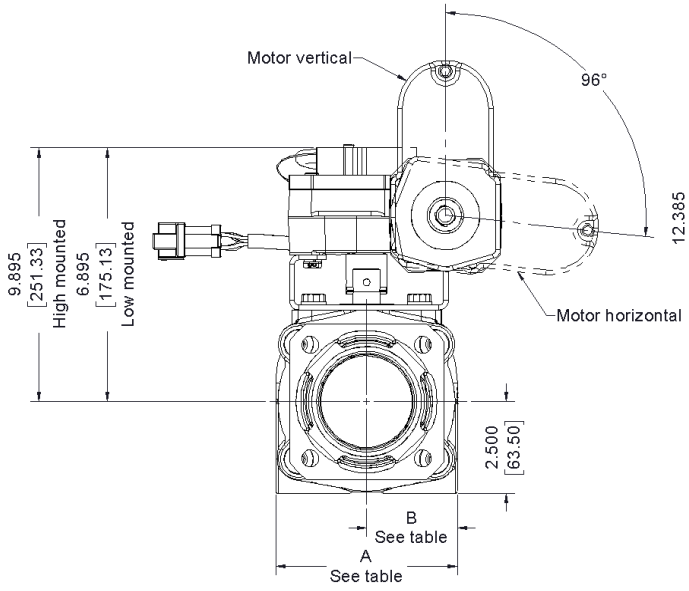


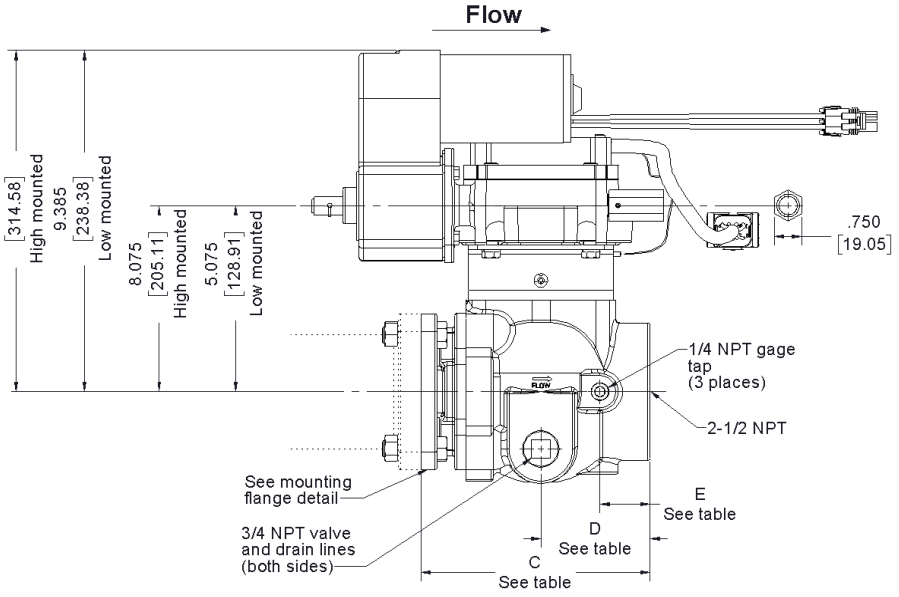
TABLE	A	B	C	D	E
2-1/2 Standard Discharge	4.500/114.30	2.250/57.15	6.000/152.39	2.688/68.26	1.250/31.75
2-1/2 Full Flow Discharge	5.000/127.00	2.500/63.50	6.312/160.32	3.000/76.20	1.375/34.93

All dimensions shown as inch/millimeter

IL4691

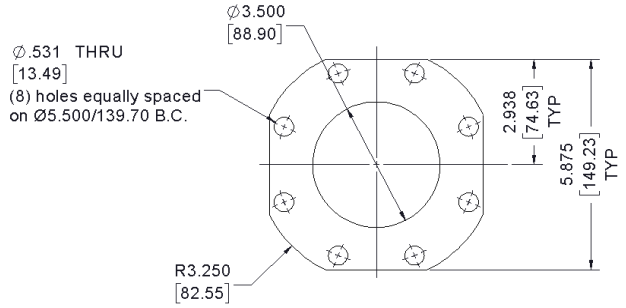
Mounting Flange Detail





Valve Dimensions

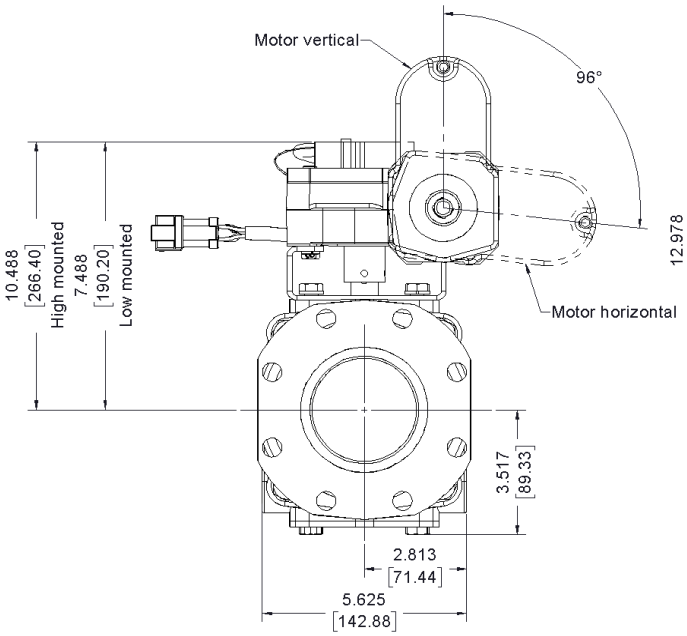
Electric Rotary Actuator
3-1/2 in. Valve

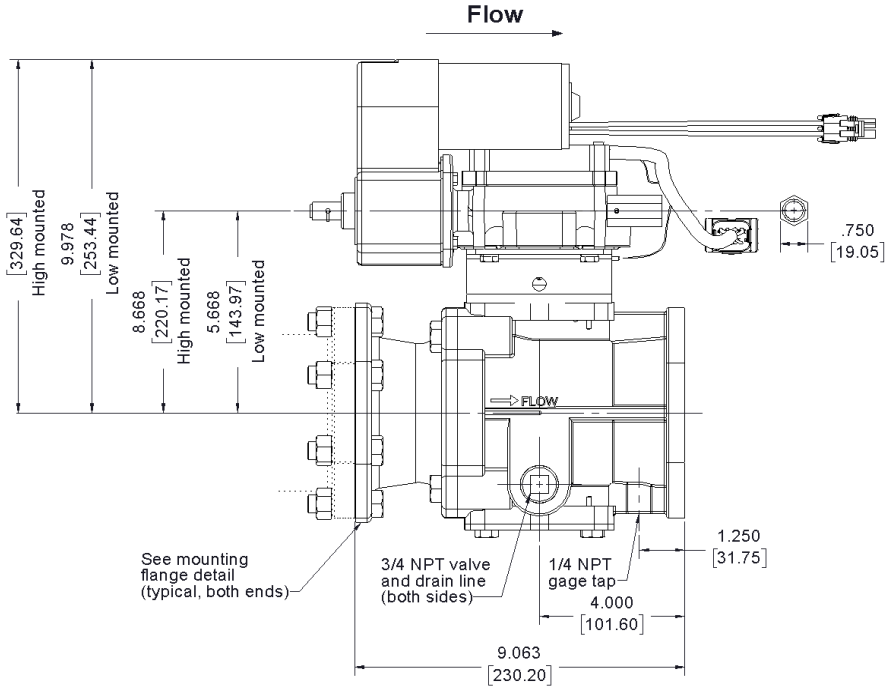


Mounting Flange Detail

IL4692

All dimensions shown as inch/millimeter





Available Operator Positions

Electric Rotary Actuator

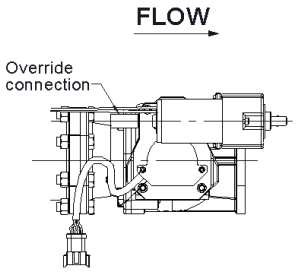


Figure 1
Motor vertical

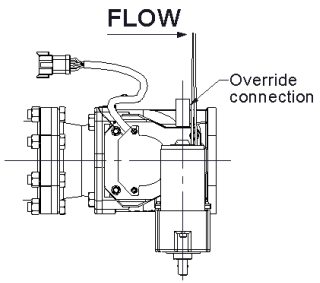


Figure 2
Motor vertical

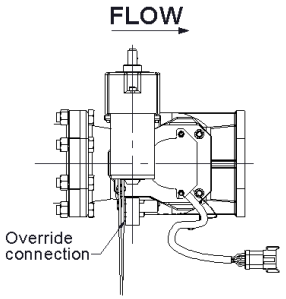


Figure 3
Motor vertical

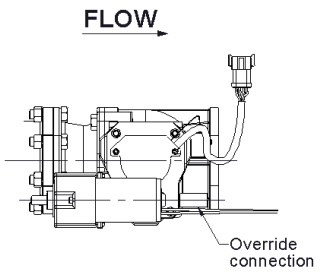


Figure 7
Motor vertical

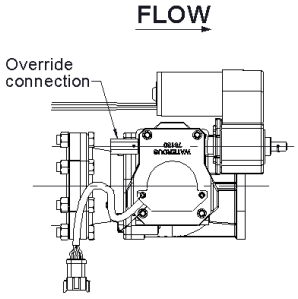


Figure 4
Motor horizontal

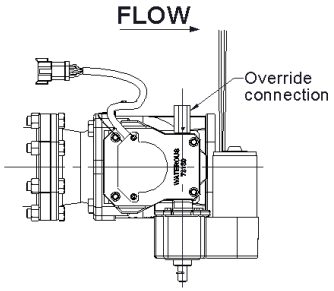


Figure 5
Motor horizontal

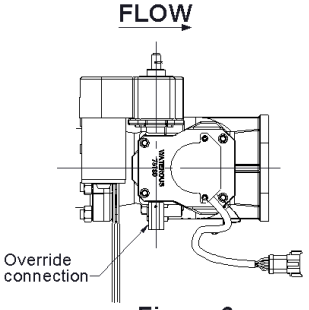


Figure 6
Motor horizontal

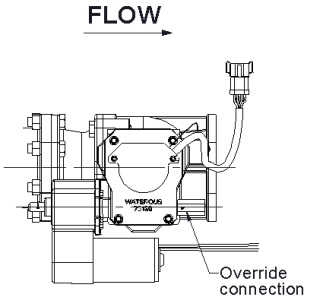
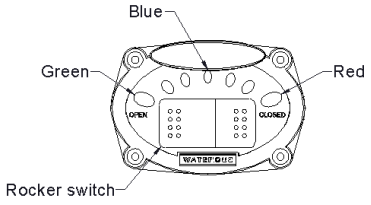


Figure 8
Motor horizontal



Control Panel

Override nut rotates counter-clockwise to open valve

IL4693

Panel Connection - Description

Push-Pull Operation:

The valve is operated by a .50 in. diameter control rod which can be locked in position by twisting the panel handle. The valve may be located immediately behind the operator's panel which Waterous calls "Panel" mounting. If the valve is to be operated from the panel opposite where the valve is located, a universal joint is provided with the valve for connection of the operating rod. Waterous calls this "Remote Mounting". Installation requires a .50 in. diameter control rod and handle which the OEM furnishes. Note that 11.00 in. and 61.375 in. long rods and tee handle kit are available from Waterous as optional items, see pages 2 and 4.

Note that Waterous offers numerous actuator positions relative to waterflow and push or pull open operation to satisfy necessary rod operations, see page 3 for Push-Pull without Flowmeter and page 5 for Push-Pull with Flowmeter provision.

Remote Locking Operation:

The valve is operated by a separate OEM provided locking cable, rod or bell crank connected to the valve control arm. The valve may be located anywhere behind the panel.

Note that Waterous offers eight control arm positions relative to waterflow and push or pull open operation to satisfy necessary rod operations, see page 8.

Manual Rotary Actuator Operation:

See pages 16 and 17 for panel components. The valve is operated by a crank handle located on the operator's panel which is connected to the valve by a .50 in. diameter control rod. An indicating panel is also furnished which indicates the open-closed position of the valve.

Note that Waterous offers four actuator positions relative to waterflow and control rod connection location, see page 11.

Electric Rotary Actuator Operation:

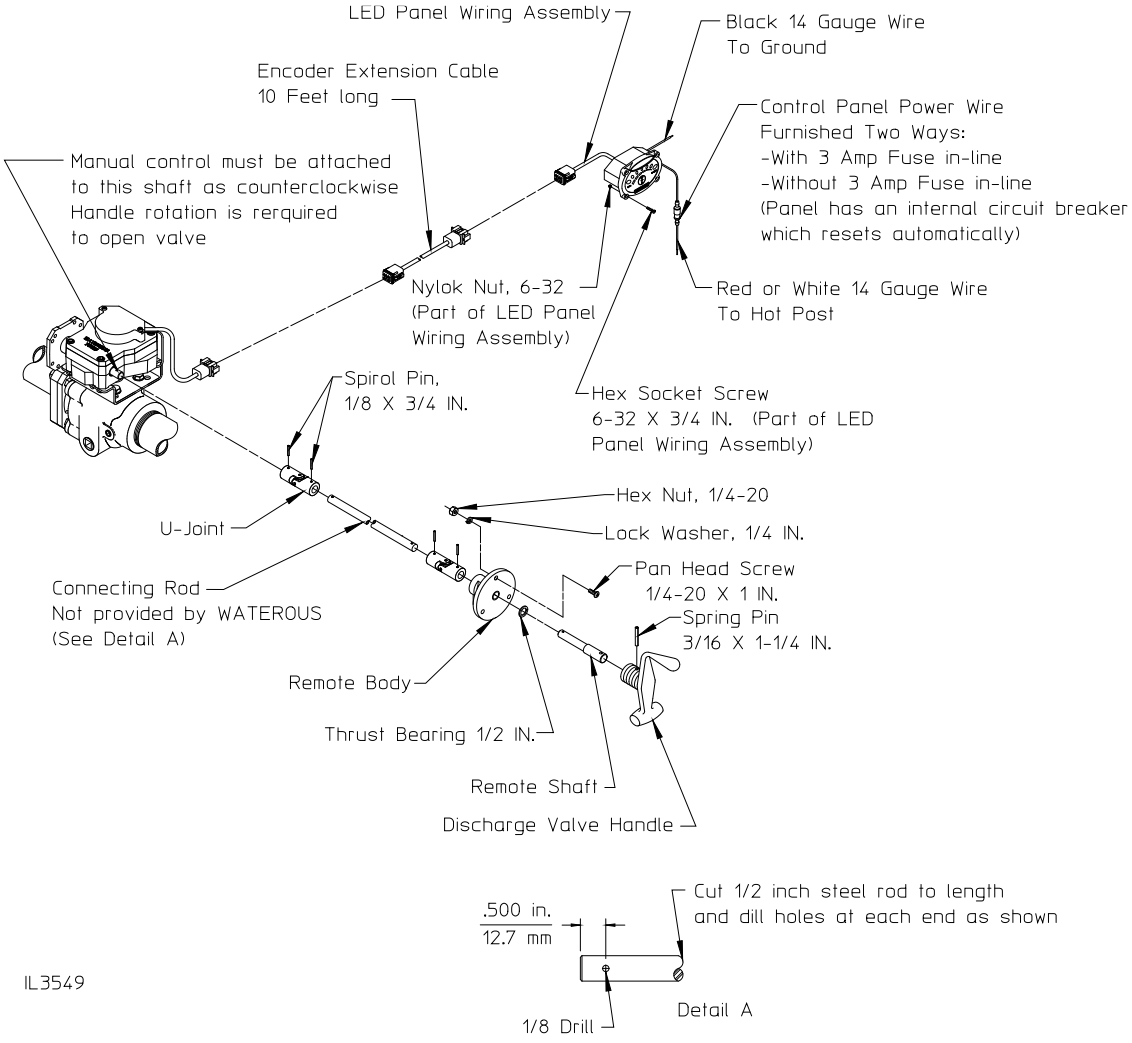
See page 18 for panel components and page 19 for manual override. The valve is operated by an electric motor on the valve. A control panel is furnished for opening and closing the valve which also indicates the open-closed position. The valve may be manually operated via a hex nut on the valve's electric motor.

Note that Waterous offers eight actuator positions relative to waterflow and manual override location, see page 14.

Note that it is normal for the valve to produce a ratcheting sound upon reaching the full open or completely closed position.

Manual Rotary Actuator

Panel Connection – Components

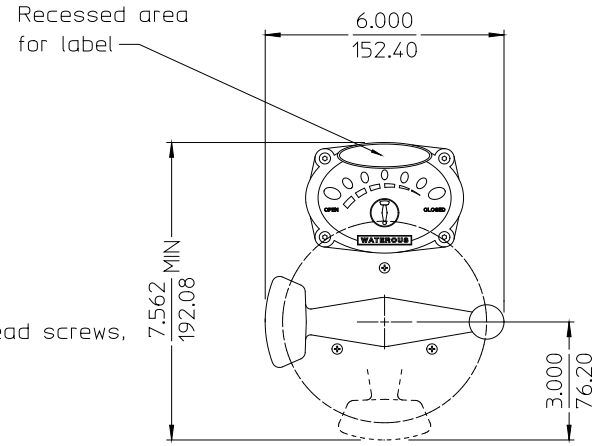


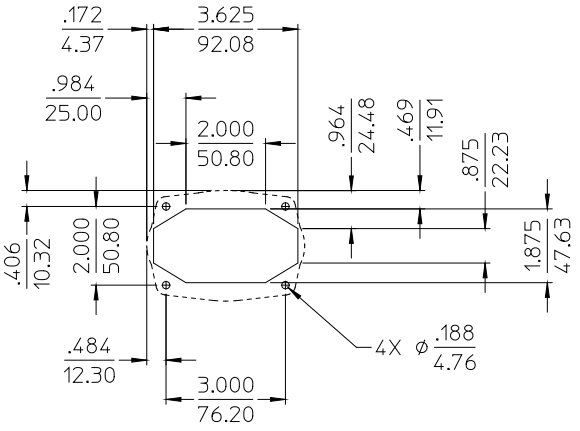
Manual Rotary Actuator

Panel Connection – Components

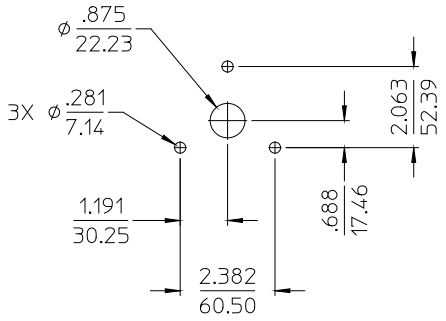
Control Panel is secured with (4) flat head socket screws & hex nuts. Furnished by Waterous.

Crank Handle Aseembly is secured with (3) round head screws, lock washers and nuts. Furnished by Waterous.





Panel Hole Layout



Crank Handle Hole Layout

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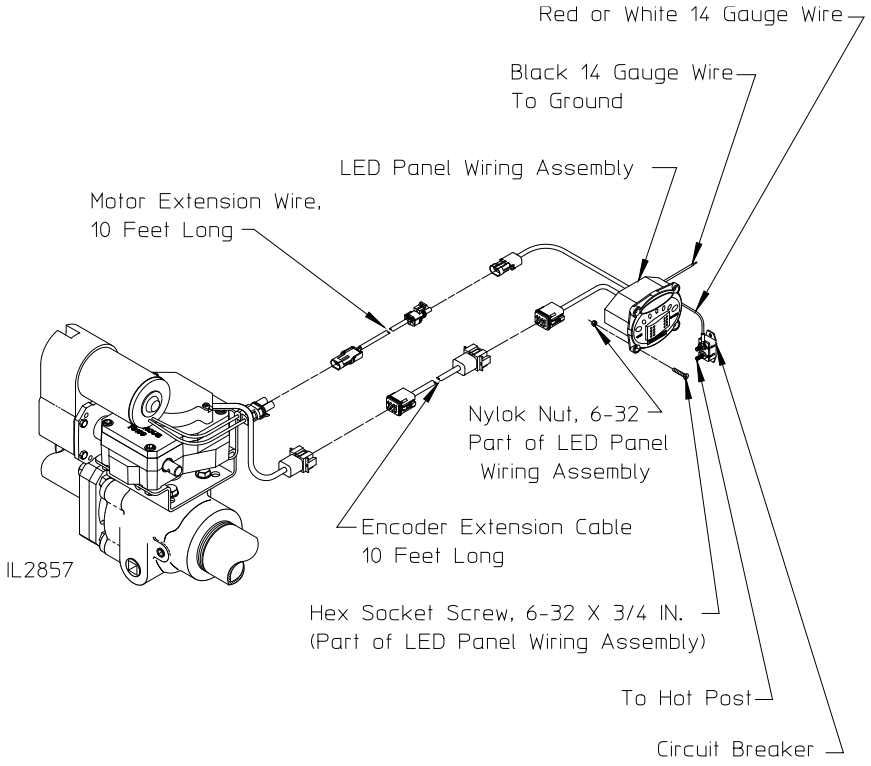
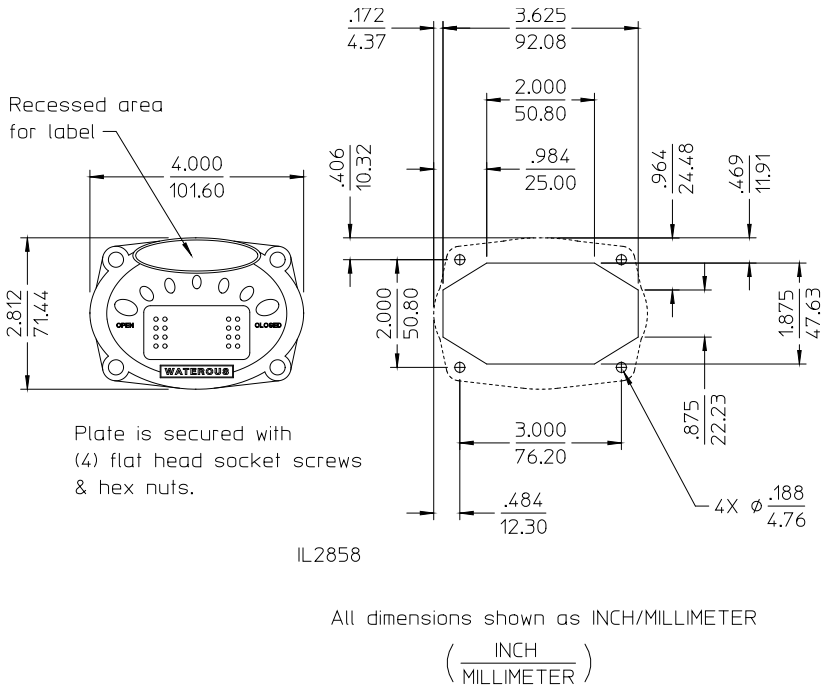
Panel Connection – Components

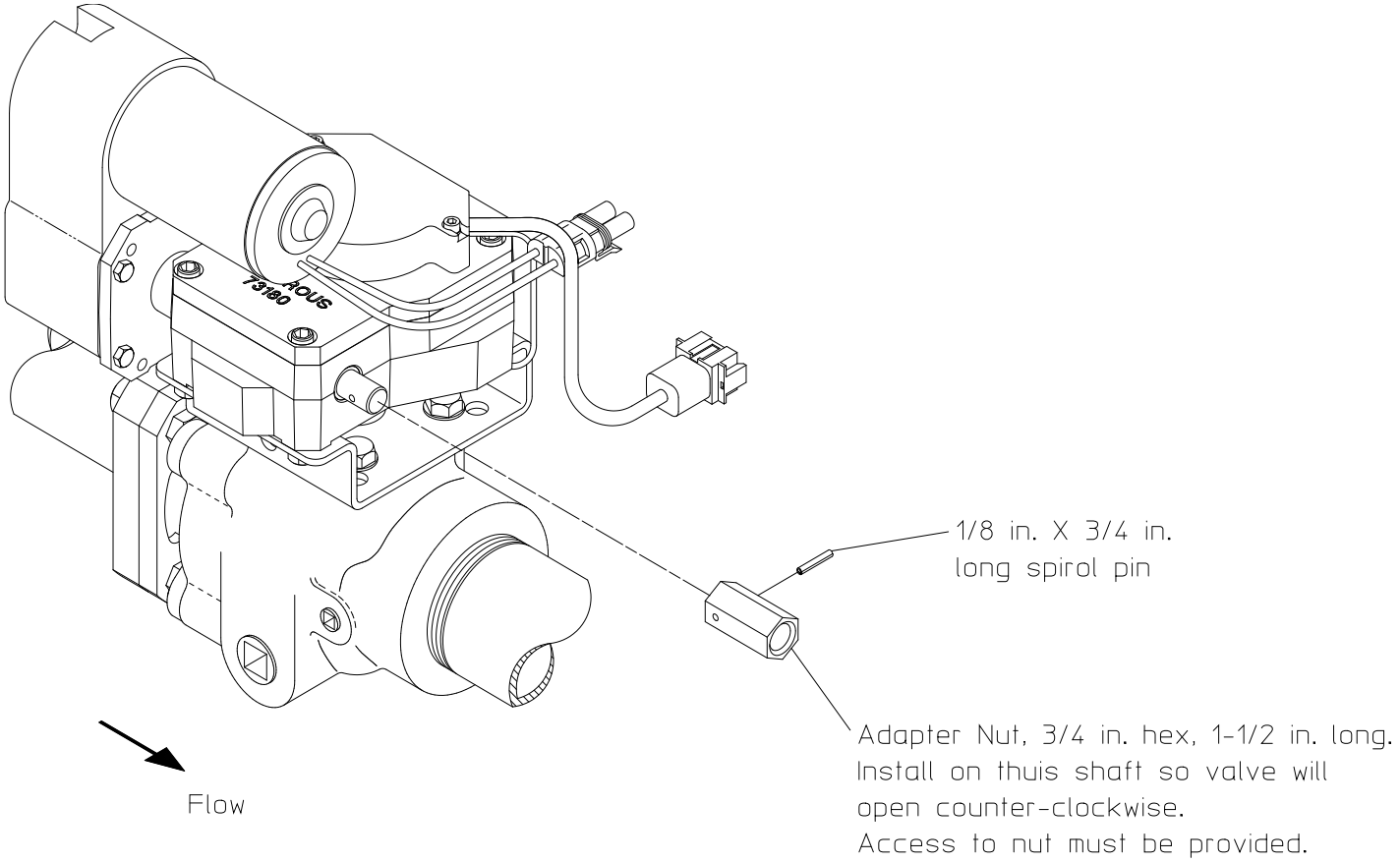




All dimensions shown as INCH/MILLIMETER

(INCH / MILLIMETER)

Electric Rotary Actuator
Manual Override



IL2807

Electric Discharge Valve

Valve Mounting

If the valves were not installed on the pump at the factory, follow the instruction below.

Stem Direction and Flow Direction:

All valves may be mounted with the stem up or at either side. This will allow for proper drainage of the valve. Mounting the stem down is not recommended as the valve will not drain properly. All valves have a hydraulically balanced self-adjusting seal which should be on the pump side of the installation.

Connection to Pump:

2-1/2 in. Valves:

1) Attach the separate flange furnished with the valve loosely to the pump flange using four bolts.
2) Coat the O-ring on the end of the valve with light grease or mineral oil.
3) Insert the discharge valve into the mounted flange and rotate enough to engage the lugs on the valve with slots in the flange. Tighten the flange bolts to secure the valve.
4) Connect a drain line into the lowest tap on the valve body.

3-1/2 in. Valves:

1) Attach the valve directly to the pump flange using the gasket provided and eight bolts.
2) Connect a drain line to the lowest tap on the valve body.

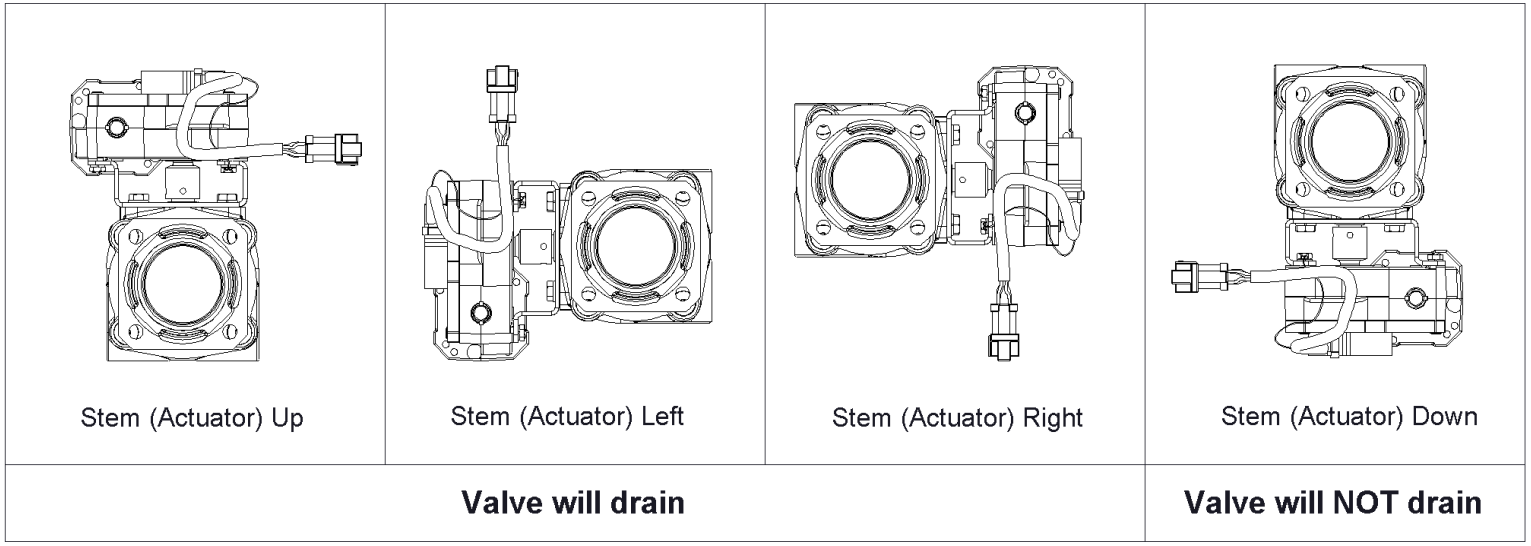
In-line Valve Mounting (Threaded tap on each end of the valve):

If in-line mounting of the valve (threaded piping on each side of the valve) is required, contact Waterous Company for available tapped flanges which can be installed on the valve.

Drain and Pressure Gauge Connections

Valve Drain Connection:

Each valve has two 3/4 in. FNPT taps on the sides of the valve body which are to be used for draining the valve. The valve is to be mounted with the stem (actuator) pointing up or to the side in order for the valve to drain. The valve should not be mounted with the stem (actuator) pointing down as the valve will not drain.



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Valve Pressure Gauge Connections:

Each valve has a pressure gauge tap as follows:

2-1/2 in. valves have three 1/4 in. FNPT taps on the outlet side of the valve body.

3-1/2 in. valves have one 1/4 in. FNPT tap on the outlet side of the valve body.

These taps can be used for panel discharge gauges.

Maximum Pressure Capability Rating (PSI)

Discharge Valve			
Size	Material		
	Grey Iron		Ductile Iron
	Along Flow Direction	Reverse Direction	
2-1/2 in. Standard	600	390	--
2-1/2 in. Full-Flow	600	225	--
3-1/2 in. Standard	600	215	700*

***Note: Ductile iron valves used on CMCGV/CMUCGV High Rise pump Extra Pressure Stage.**

All Valves

The effectiveness of a ball-type valve depends greatly upon the tightness of its seal, as a leaking seal allows air to enter the pump during priming or water to escape when operating. Sand or other abrasive material in the water being pumped can score and roughen the surfaces of the valve parts. These rough surfaces may gradually cut the seal and cause leakage.

If valve leakage is detected, rotate the valve ball 180° so the seal contacts the opposite side of the ball. If turning the ball does not stop the leakage, replace the ball, If valve still leaks, replace the seal.

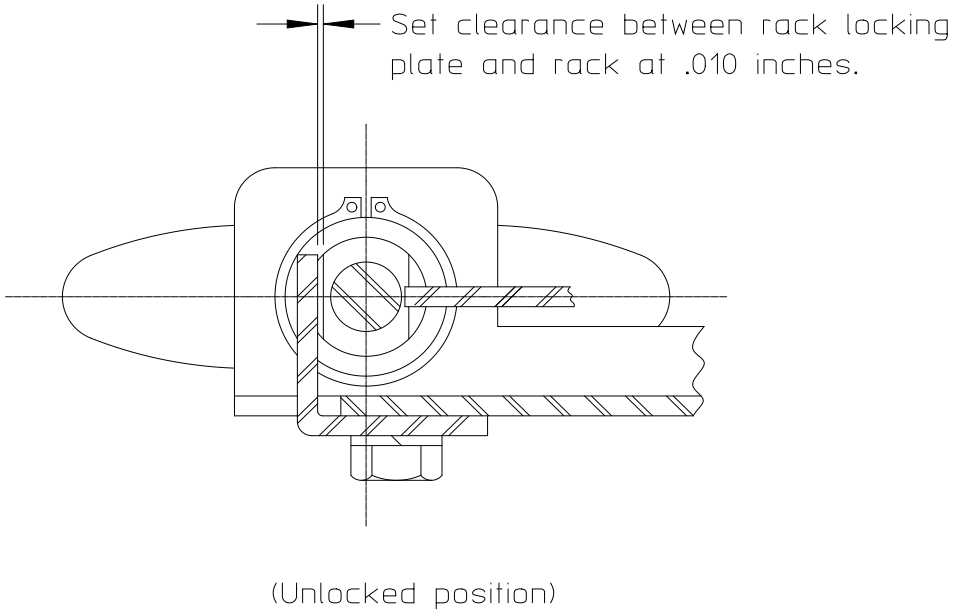
3-1/2 inch valve stems are supported by ball bearings which are factory sealed and require no maintenance.

Operating linkages should be kept free of grease and dirt. No lubrication is required. Operate the valves at least monthly (with water flowing) to flush and lubricate the seals.

Push-Pull Operated Valves Only

Adjustment of Twist to Lock Feature

Whenever the locking plate is loosened or removed, use a .010 in. feeler gage during reassembly to provide .010 inch clearance between the plate and rack when unlocked. See the diagram below.



IL1170

Troubleshooting

PROBLEM	POSSIBLE CAUSE	SOLUTION
Valve leaking	Compression set into valve seal	Replace seal with appropriate seal kit
	Defective seal	Replace seal with appropriate seal kit
	Scored / Corroded valve ball	Clean with emery cloth, rotate ball 180°, or replace
Panel LED's all illuminated constantly	Encoder not grounded	Check for ground on encoder assembly
	Defective encoder	Unplug encoder from panel – if LED's turn off, replace encoder
Valve Position LED's NOT illuminated	No power to panel	Check for power supply to panel
	Encoder not grounded	Check for ground on encoder assembly
	Defective encoder	Unplug encoder from panel – if all LED's turn off, replace encoder
	Defective panel	Connect jumper wire from 12V red wire deutsch connector to each other pin of the connector – should light the individual LED's on the panel
Electric Valve doesn't open or close	Defective switch	Check for proper connections
	Motor to switch connection	Check wiring from motor to switch
	Defective motor	Unplug connection at motor and measure motor continuity with an Ohm meter – should be less than 5 Ohms
	No power to panel	Check for power supply to panel
Motor runs constantly	Defective switch / short circuit across switch	Check for circuit across switch – replace in necessary