

PRATT®

a **MUELLER** brand

OPERATION/MAINTENANCE MANUAL

Rectangular Butterfly Valve

TABLE OF CONTENTS	PAGE
General Information	2
Installation and Operating Instructions	3
Maintenance and Troubleshooting	4
Parts Information	5



WARNING:

1. Read all applicable directions and instructions prior to any maintenance, troubleshooting or installation.
2. Personnel involved in the installation or maintenance of valves should be constantly alert to potential emission of pipeline material and take appropriate safety precautions. Always wear suitable protection when dealing with hazardous pipeline materials.
3. Order parts from your local Pratt sales representative or directly from Pratt. When ordering parts, please include the serial number located on the valve tag.

NOTE: "WARNING" and "CAUTION" messages (flagged with an exclamation symbol) indicate procedures that must be followed exactly to avoid equipment damage, physical injury, or death.

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FUNCTIONAL DESCRIPTION

Rectangular butterfly valves are designed with both three and four sided disc seating surfaces. The discs rotate 1/4 turns to provide shutoff in reservoirs and conduits. Three sided seating valves will provide tight shutoff in an open conduit. Four sided seating valves will provide tight shutoff in closed conduits and reservoirs. The valves can be used to regulate flow rate by positioning the disc between 15 and 90 degrees open.

Manually operated butterfly valves are powered with gear actuators, which convert multiple handwheel, chainwheel or nut input turns into 1/4 turn valve operation. The travel of the valve disc is limited by physical stops in the actuator housing.

⚠ CAUTION: Forcing the handwheel, chainwheel or nut against the stops will not provide tighter shutoff of the valve and may damage the actuator. Only actuator adjustments will affect valve shutoff.

Motor operated butterfly valves are powered with gear actuators, which convert multiple motor input turns into 1/4 turn valve operation. The travel of the valve disc is limited by limit switches in the motor housing and physical stops in the actuator housing. Valve shutoff is affected by limit switch and physical stop settings.

⚠ CAUTION: Improperly set limit switches and/or physical stops may damage the motor and/or actuator.

Hydraulically operated butterfly valves are powered with a gear box and double acting cylinder. The linear stroke of the cylinder is converted to 1/4 turn operation by the gear box. Auxiliary controls are provided to direct hydraulic power to the cylinder and to control the operating speed of the cylinder.



INSTALLATION

Refer to the mechanical general arrangement drawings prepared for this specific valve during installation. The flow direction and actuator orientation are given on the drawing. The valve should be installed with the disc in the closed or near closed position to prevent damage to the disc edge. Insert the lifting sling through the opening of the valve to lift the frame.

⚠ CAUTION: DO NOT lift the valve assembly by slinging the actuator only.

The butterfly valve should be bolted to the wall frame with a 1/4" thick soft (40 - 50 durometer) rubber gasket. Studs or bolts can be used with bevel washers on the valve side of the connection. With the valve fully mounted, the position of the actuator should be verified. If the actuator position must be changed to accommodate field problems, the factory should be contacted to provide a procedure or assistance in its change.

⚠ WARNING: All persons who will install, operate or adjust this equipment must read the instructions and drawings carefully. Injury and property damage may occur from improper use. It is understood that this equipment will be installed by individuals with knowledge and skills in electrical equipment. The manufacturer cannot be responsible for the misuse of this information or equipment, nor can it assume any resultant liability.

START-UP

Manually Operated

Manually operated valves should be fully cycled from open to close and back to the closed position to verify operation. DO NOT force the valve in the closed position if tight shutoff is not achieved; make adjustments to the actuator per the maintenance instructions.

Motor Operated

Motor operated valves should be operated through three complete cycles to verify operation. The valve should then be closed and water pressure applied to one side of the valve. The seat bolts can be tightened to eliminate any leakage.

Cylinder Operated

Connect the specified hydraulic pressure to the cylinder and controls. All hydraulic supplies must be filtered to prevent contamination and clogging of the controls. The valve can be cycled open and closed by switching the cylinder control solenoid either electrically or manually.

OPERATION

Manual Actuator Function and Use

The manually operated rectangular butterfly valves are operated by rotating the handwheel, chainwheel, or nut. The actuator is equipped with gearing to convert the many turns into 1/4 turn operation. Inside actuator stops that limit the travel of the valve are pre-set at the factory. Prior to initial operation the valve should be fully cycled from close to open and back to closed position. DO NOT force the valve if tight shutoff is not achieved; make adjustments to the actuator per the maintenance instructions. Forcing the handwheel, chainwheel, or nut will not cause the valve to shut off any tighter and may cause damage to the gearing.

Cylinder Operator Function and Use

The cylinder operated rectangular butterfly valves are operated automatically by directing hydraulic pressure to either side of the power cylinder. Solenoid valves are used to direct the fluid to the cylinder ports based on electrical power signals. In cylinder actuators, the travel stops are in the cylinder so that full hydraulic pressure can be held on the cylinder at either end of travel. Prior to initial operation, connect the specified

hydraulic pressure to the cylinder and controls. All hydraulic supplies must be filtered to prevent contamination and clogging the controls. The valve can be cycled open and closed by switching the cylinder control solenoid either electrically or manually.

Motor Actuator Function and Use

The motor actuator is designed to open and close the valve through its one quarter turn of rotation. It contains gearing so that hundreds of turns of the motor or handwheel will slowly move the valve from open to close position in about 60 seconds or vice versa. Electrical controls are included in the motor actuator for local electrical control.

The output motion of the actuator is limited to about 100 degrees of output rotation by mechanical stops in the gearing. These are factory set and should not need adjustment. The actual positioning of the valve disc will be done by limit switches in the motor actuator. The switches are also set at the factory but adjustment is sometimes required if the motor unit is installed on a separate mounting base or floorstand. Detailed procedures are given in the motor manual if adjustment is needed for the mechanical stops or the limit

switches. The wiring and power requirements are given on wiring diagrams included in this instruction manual. The limit switches should be set so that the disc edge is centered over the rubber seat. DO NOT allow the motor actuator to torque the valve into the valve disc stops, or premature failure to the valve or motor may occur. Prior to initial operation, the valve should be operated through three complete cycles to verify operation. The valve should then be closed and flange bolts can be tightened to eliminate any leakage. Refer to the motor actuator instruction manual for start-up information.

⚠ WARNING: All persons who will install, operate or adjust this equipment must read the instructions and drawings carefully. Injury and property damage may occur from improper use. It is understood that this equipment will be installed by individuals with knowledge and skills in electrical equipment. The manufacturer cannot be responsible for the misuse of this information or equipment, nor can it assume any resultant liability.

MAINTENANCE

The following actions are recommended to be performed annually to ensure proper operation of your valve.

- 1.** Cycle valve to verify operation and no interference in line.
- 2.** Close valve and check for leakage. If leakage is found, check actuator stops to verify that the disc is fully closed. If leakage persists, inspect

seat. If damage is found, contact the Pratt Field Service Department immediately.

- 3.** Check flange connections for leakage. Tighten bolts accordingly.
- 4.** Check top trunnion area for shaft leakage. If leakage is detected, replace valve packing. Contact the Pratt Field Service Department for procedure to replace valve packing.

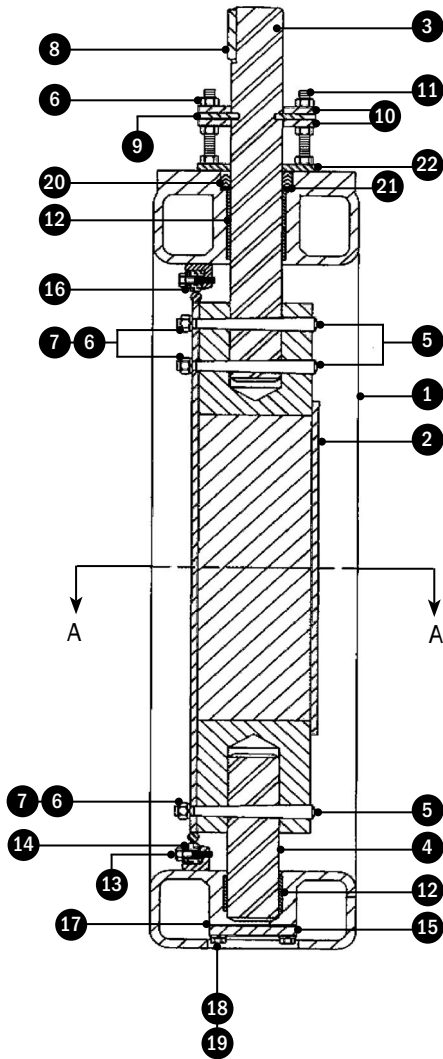
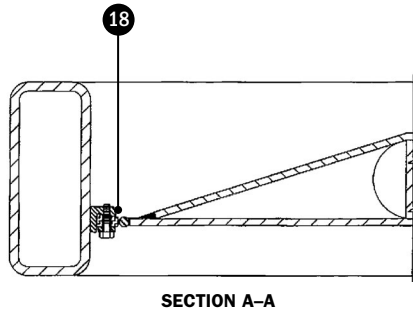
- 5.** If access to line is possible, then removal of scale that may interfere with the disc travel is suggested.
- 6.** Should be inspected for wear and taper pin nuts should be tight.
- 7.** Lubrication of the valve is not required.
- 8.** Stocking of spare parts not recommended.

TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Leakage between valve and actuator	<ul style="list-style-type: none"> • Packing leak 	<ul style="list-style-type: none"> • Clean packing bore and replace packing
Bottom trunnion leaks	<ul style="list-style-type: none"> • Packing or gasket 	<ul style="list-style-type: none"> • Replace bottom shaft packing, O-ring or gasket
Valve leaks when closed	<ul style="list-style-type: none"> • Disc not fully closed or past fully closed • Disc edge wear or damage • Rubber seat wear or damage • Loose debris in valve 	<ul style="list-style-type: none"> • Adjust actuator closed stop position • Clean and/or repair disc edge • Adjust or replace valve seat • Cycle valve five times to flush out debris
Valve hard to operate	<ul style="list-style-type: none"> • Foreign material in valve • Corroded operator parts • Loose actuator 	<ul style="list-style-type: none"> • Remove obstructions • Clean and grease actuator • Tighten actuator and mounting

RECTANGULAR BUTTERFLY VALVE

Parts Information



PARTS LIST

ID	DESCRIPTION	MATERIAL
1	Body Assembly	Carbon Steel A-500 GR B
2	Disc Assembly	Carbon Steel ASTM A-36*
3	Top Stub Shaft	304 Stainless Steel ASTM A-276
4	Bottom Stub Shaft	304 Stainless Steel ASTM A-276
5	Taper Pin	304 Stainless Steel ASTM A-276
6	Hex Nut	304 Stainless Steel
7	Lockwasher	304 Stainless Steel
8	Key	Cold Drawn Steel AISI C-1045
9	Thrust Bearing Plate	Bronze SAE 660
10	Thrust Bearing Collar	Carbon Steel ASTM A-36
11	Stud	Carbon Steel GR 2
12	Bearing	Teflon Lined, Fiberglass Backed
13	Hex Head Cap Screw	304 Stainless Steel
14	Segment Retainer	304 Stainless Steel ASTM A-276
15	Bottom Cover	Carbon Steel ASTM A-36
16	Seat	Hycar 50-DURO
17	Gasket	Granite
18	Sealant	RTV
19	Hex Head Cap Screw	Carbon Steel GR 8
20	V-Type Packing	Fabric Reinforced Neoprene or BUNA-N
21	Packing Retainer Ring	Nylon 101
22	Packing Retainer Plate	#10 Gauge Sheet Steel (C-1018)

*With Stainless Steel ASTM A-276 Type 304 Edge

TO ORDER: Contact our Parts Department.
 Pratt
 401 South Highland Avenue
 Aurora, IL 60506-5563
 Attn: Parts Manager
 630.844.4000

When ordering parts, please include the serial number located on the valve tag and description of part requested.

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