

Technequip™

Knife Gate Valve

Wafer Style (TGW)

**INSTALLATION, OPERATION
and MAINTENANCE MANUAL**

FLSMIDTH
KREBS

October 2018

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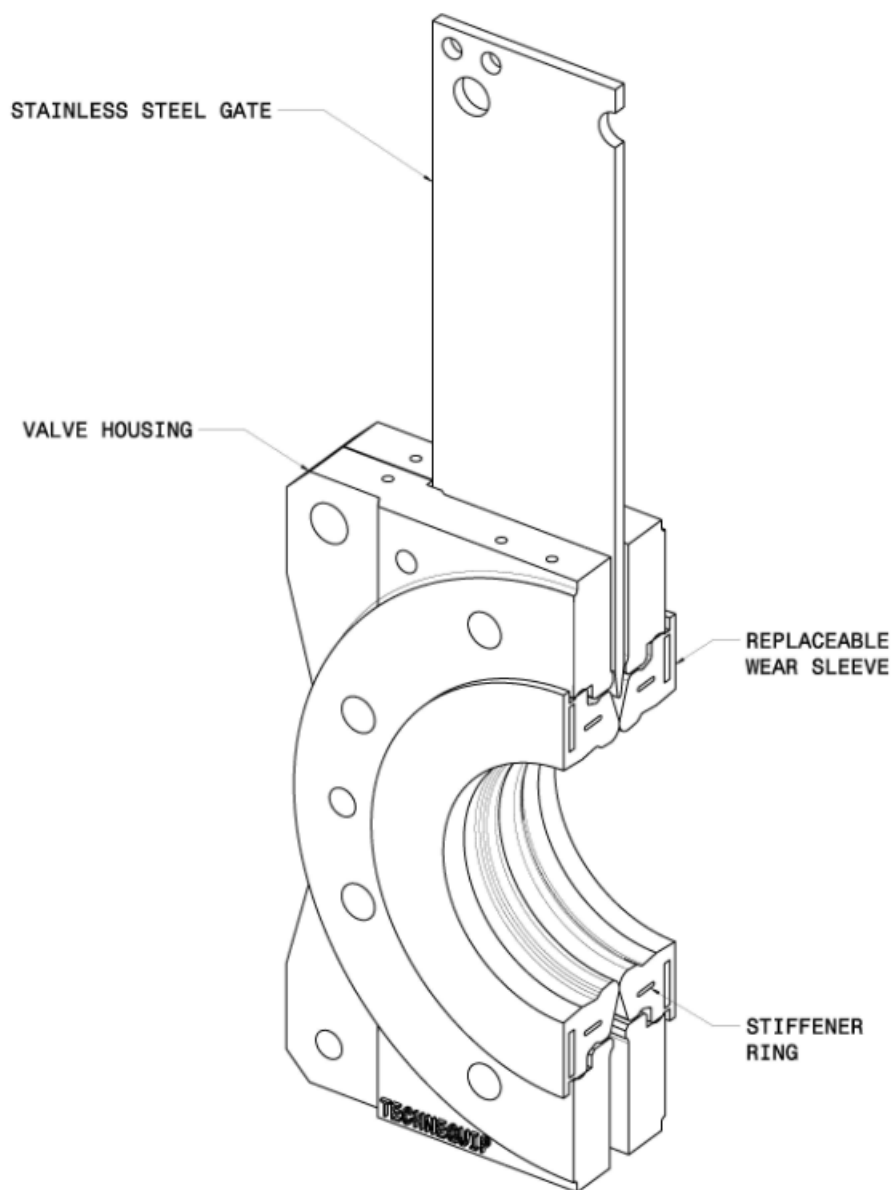
Options

- Standard 4-Way Solenoid Valves
- Standard LSC Reed Switches
- Standard Micro Switches
- Standard Leverless Proximity Switches
- Standard Inductive Proximity Switches

Contact Information

TECHNEQUIP™ KNIFE GATE VALVE GENERAL DESCRIPTION

The Technequip™ Knife Gate Valve is a true bi-directional packing-less slurry knife gate valve intended for on-off operation of pipe lines. When the valve is actuated, a stainless steel gate slides between two compressed replaceable wear sleeves. These sleeves, available in a number of elastomer types, were designed to seal and withstand the harsh abrasive duty primarily inherent in mining and milling facilities. The diagram below illustrates the integral components of this design.



TECHNEQUIP™ KNIFE GATE VALVE INSTALLATION – TGW SERIES

VALVE CONNECTION

The preferred pipe line companion flanges are flat face style to ensure full sleeve support. The following table outlines the standard flange connection and associated hardware details.

IMPERIAL Technequip™ Knife Gate Valves have housing connections with ANSI B16.5 Class 150 bolt drillings.
(all dimensions are in inches)

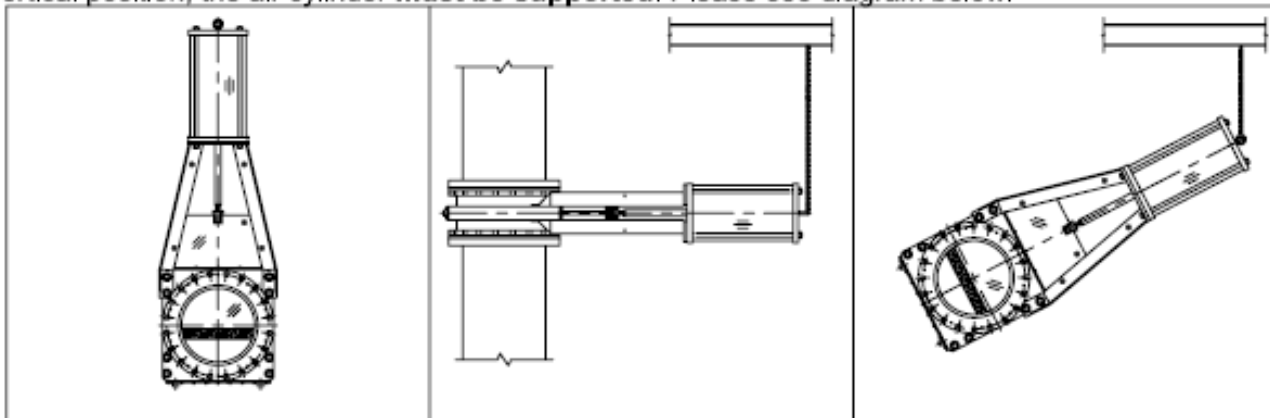
Valve Size	Bolt Circle Diameter	Bolt Diameter x Pitch	No. of Bolts/Studs per Valve	Housing Hole Depth	Recommended Tightening Torque Ft-lbs
2"	4 3/4	5/8-11 UNC	8	1/2"	40
3"	6	5/8-11 UNC	8	1/2"	40
4"	7 1/2	5/8-11 UNC	16	1/2"	40
6"	9 1/2	3/4-10 UNC	16	5/8"	70
8"	11 3/4	3/4-10 UNC	16	3/4"	70
10"	14 1/4	7/8-9 UNC	24	3/4"	110
12"	17	7/8-9 UNC	24	13/16"	110
14"	18 3/4	1-8 UNC	24	13/16"	170
16"	21 1/4	1-8 UNC	32	7/8"	170
18"	22 3/4	1 1/8-7 UNC	32	7/8"	240
20"	25	1 1/8-7 UNC	40	1"	240
24"	29 1/2	1 1/4-7 UNC	40	1"	240

METRIC Technequip™ Knife Gate Valves have housing connections with DIN PN10 and AS 2129 TABLE D OR E
(all dimensions are in mm)

Valve Size	Bolt Circle Diameter		Bolt Diameter x Pitch		No. of Bolts/Studs per Valve		Housing Hole Depth	Recommended Tightening Torque [N-m]
	* DIN PN10	AS2129 TABLE D/E	* DIN PN10	AS2129 TABLE D/E	* DIN PN10	AS2129 Table D/E		
50mm	125	114	M16x2.0	M16x2.0	8	8	13mm	50
75mm	160	145	M16x2.0	M16x2.0	16	8	13mm	50
100mm	180	178	M16x2.0	M16x2.0	16	8 / 16	13mm	50
150mm	240	235	M20x2.5	M16x2.0 / M20x2.5	16	16	16mm	95
200mm	295	292	M20x2.5	M16x2.0 / M20x2.5	16		19mm	95
250mm	350	356	M20x2.5	M20x2.5	24	16 / 24	19mm	155
300mm	400	406	M20x2.5	M20x2.5 / M24x3.0	24	24	21mm	155
350mm	460	470	M20x2.5	M24x3.0	32	24	21mm	230
400mm	515	521	M24x3.0	M24x3.0	32	24	22mm	230
450mm	565	584	M24x3.0	M24x3.0	40	24 / 32	22mm	325
500mm	620	641	M24x3.0	M24x3.0	40	32	25mm	325
600mm	725	756	M27x3.0	M27x3.0 / M30x3.5	40	32	25mm	325

VALVE ORIENTATION

When installing 10" and larger Air Cylinder Actuated Technequip™ Knife Gate Valves other than in a vertical position, the air cylinder **must be supported**. Please see diagram below.



TECHNEQUIP™ KNIFE GATE VALVE OPERATING SPECIFICATIONS – TGW SERIES

OPERATING WARNINGS

Ensure that the stainless steel gate is always **fully opened** or **fully closed**. **DO NOT** use the valve to “**throttle**” the flow, as premature wear of the gate and sleeves will result which can render the valve inoperable. It is normal during valve actuation for a small amount of slurry/liquid to be discharged. If slurry/liquid is harmful in any way or slurry containment is necessary please inquire about a splash guard option. If using the splash guard **do not** block both splashguards ports. For proper operation of valve please see table below to ensure your conditions are within the operating specifications.

IMPERIAL			AIR ACTUATED			HYDRAULIC ACTUATED			MANUALLY ACTUATED	
Valve Size	Maximum Valve Operating Pressure (psi)	Nominal Cylinder Stroke (inches)	Nominal Air Cylinder Bore (inches)	Air Min/Max Pressure (psi)	Continuous Cycling Free Air Consumption at 80psi (SCFM)	Nominal Hyd. Cylinder Bore (inches)	Hyd. Min /Max Pressure (psi)	Hyd. Cylinder Displacement (gal)	Hand wheel # of Rotations to Stroke Valve	Bevel Gear # of Rotations to Stroke Valve
2"	150	2.813	4.0	80/150	2.8	1.5	800/1200	0.023	7	---
3"	150	4	5.0	80/150	4.4	2.0	800/1200	0.052	10	---
4"	150	5.063	6.0	80/150	6.2	2.5	800/1200	0.107	13	61
6"	150	7.50	8.0	80/150	11.1	2.5	800/1200	0.158	19	90
8"	150	9.625	8.0	80/150	11.1	2.5	800/1200	0.204	24	116
10"	150	11.875	8.0	80/150	11.1	3.25	800/1200	0.426	30	143
12"	150	14.313	12.0	80/150	25.2	4.0	800/1200	0.774	---	171
14"	150	15.625	12.0	80/150	25.2	4.0	800/1200	0.849	---	188
16"	150	18	14.0	80/150	34.3	4.0	800/1200	0.980	---	288
18"	90	20.5	14.0	80/150	34.3	5.0	800/1200	1.741	---	328
20"	90	23	16.0	80/150	44.7	5.0	800/1200	1.954	---	368
24"	90	27.25	16.0	80/150	44.7	6.0	800/1200	3.333	---	436

METRIC			AIR ACTUATED			HYDRAULIC ACTUATED			MANUALLY ACTUATED	
Valve Size	Maximum Valve Operating Pressure (kPa)	Nominal Cylinder Stroke (mm)	Nominal Air Cylinder Bore (mm)	Air Min/Max Pressure (kPa)	Continuous Cycling Free Air Consumption at 550kPa (m ³ /hr)	Nominal Hyd. Cylinder Bore (mm)	Hyd. Min/Max Pressure (kPa)	Hyd. Cylinder Displacement (L)	Hand wheel # of Rotations to Stroke Valve	Bevel Gear # of Rotations to Stroke Valve
50mm	1034	78	100	550/1030	4.8	38	5520/8270	0.090	8	---
75mm	1034	99	127	550/1030	7.5	50	5520/8270	0.198	10	---
100mm	1034	129	150	550/1030	10.5	65	5520/8270	0.406	13	61
150mm	1034	191	200	550/1030	18.9	65	5520/8270	0.600	19	90
200mm	1034	244	200	550/1030	18.9	65	5520/8270	0.772	24	116
250mm	1034	302	200	550/1030	18.9	83	5520/8270	1.609	30	143
300mm	1034	362	300	550/1030	42.8	100	5520/8270	2.931	---	171
350mm	1034	397	300	550/1030	42.8	100	5520/8270	3.216	---	188
400mm	1034	457	350	550/1030	58.3	100	5520/8270	3.709	---	288
450mm	620	521	350	550/1030	58.3	127	5520/8270	6.59	---	328
500mm	620	584	400	550/1030	75.9	127	5520/8270	7.396	---	368
600mm	620	692	400	550/1030	75.9	150	5520/8270	12.615	---	436

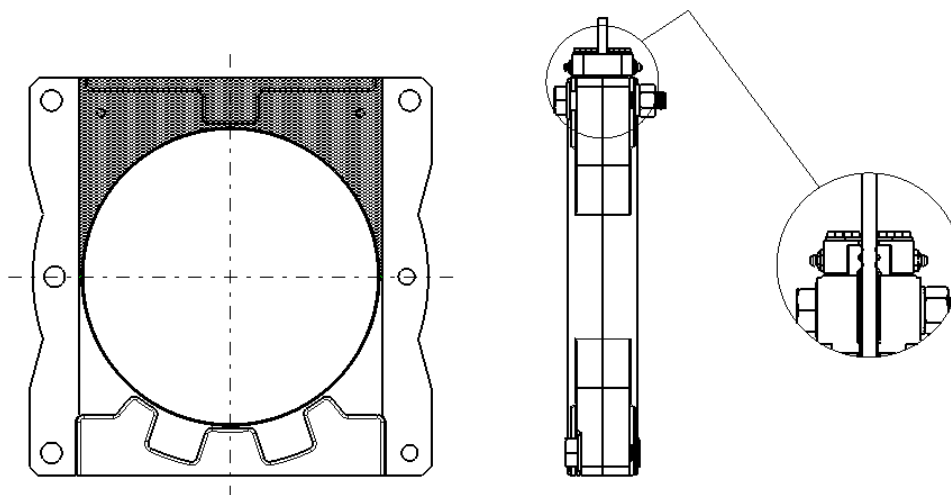
TECHNEQUIP™ KNIFE GATE VALVE MAINTENANCE & STORAGE – TGW SERIES

REQUIRED LUBRICATING PROCEDURE

The Technequip™ Knife Gate Valves requires regular lubrication using a silicone based lubricant (see below for acceptable lubricants). **DO NOT USE HYDROCARBON BASED LUBRICANTS** as they may damage the replaceable wear sleeves. Lubricate both sides of valve approximately every 50 cycles or after long periods of infrequent cycling. Lubrication fittings are located on the top of the valve housing (see schematic below). The table below outlines the approximate volume of lubricant needed per valve. Please note that all valves are lubricated when assembled and do not require initial lubrication.

RECOMMENDED LUBRICANT DOW#111

APPROVED ALTERNATIVES RHONE-POULENE RHODORSIL III, GENERAL ELECTRIC COMPOUND G661, DOW 4, DOW 44, MOLYTEC M813 (FOR APPLICATIONS WHEN TEMPERATURE IS FROM -50°C TO 200°C)



VOLUME OF LUBRICANT REQUIRED PER VALVE SIZE													
Valve Size in inches		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
Valve Size in mm		50	75	100	150	200	250	300	350	400	450	500	600
Lubricant Volume Per Valve Side	in ³	0.4	0.9	1.6	1.7	3.0	7.2	14.1	14.2	17.1	15.9	32.3	46.0
	cm ³	7	16	26	27	49	119	231	232	280	261	530	755

STORAGE

The Technequip™ Knife Gate Valves should always be stored with the gate in the open position. The valve must be stored away from direct sunlight, heat and any sources of ozone because these cause premature deterioration of all rubber valve components.

If below freezing conditions are involved, care should be taken when handling rubber components as they become brittle at very low temperatures.

TECHNEQUIP™ KNIFE GATE VALVE REPLACEMENT OF SLEEVES & WIPER – TGW SERIES

CAUTION! Use proper personal protective equipment. Isolate the piping. Plant tag out and other standard safety procedures must be followed.

Replacing the Wear Sleeves

Removal

1. IMPORTANT - Use valve actuator to bring the gate to the fully open position.
2. Remove valve from piping following proper lifting and support techniques.
3. With valve stabilized in the vertical position, remove sleeves from valve housing. (It may be necessary to use a screwdriver to pry the sleeves out.)
4. A quick inspection of the inside of housing bore should be done to look for excessive wear. If damage is visible the housing may need to be replaced.

Installation

5. Inspect the replacement sleeve for surface damage. The nose or sealing surface of the sleeves should be free of depression, slits or gouges.
6. Lightly grease the nose and outer diameter of both sleeves using the recommended lubricant.
7. Insert replacement sleeves into the valve housing.
8. The valve is now ready for installation. Keep the gate in the open position until installed.

Replacing the Wiper Blade

Removal

1. IMPORTANT - Use valve actuator to bring the gate to the fully open position.
2. Remove valve from piping following proper lifting and support techniques.
3. While supporting the valve, remove the bolts that attach the actuator to the frame.
4. Lift actuator and gate from the housing.
5. Remove all fasteners for removal of the wiper blade retainers.
6. Remove the wiper blade. It may be necessary to pry off the blade by sliding a flat screwdriver along the bottom edge.
7. Note that it is also possible to replace the wiper blade with the valve installed in the pipeline.

Installation

8. Inspect replacement wiper blade for any signs of damage. Fill inner grease cavity of blade wiper with recommended lubricant.
9. With flat surface of the blade on the bottom, lay wiper blade centered over the housing grease cavity.
10. Slide the wiper retainers in position from the sides of the blade and align holes with bolt holes on top of housing.
11. In preparation for reinsertion of the gate, loosely install all wiper retainer fasteners.
12. Inspect gate for damage that may cause premature wear on sleeves. If damaged it is recommended that it be replaced.
13. Lightly grease the beveled edge of gate.
14. Lower actuator and gate through wiper blade assembly and back into housing.
15. Bolt actuator to valve frame.
16. Tighten bolts on wiper blade retainers.
17. Inspect the sleeves and replace if necessary according to sleeve replacement above.
18. Fill grease cavity in valve housing through grease ports.
19. The valve is now ready for installation.
20. Keep the gate in the open position until installed.

TECHNEQUIP™ KNIFE GATE VALVE DISASSEMBLY INSTRUCTIONS – TGW SERIES

CAUTION! Use proper personal protective equipment. Isolate the piping. Plant tag out and other standard safety procedures must be followed.

Valve Disassembly

Actuator & Gate

1. IMPORTANT - Use valve actuator to bring the gate to the fully open position.
2. Remove valve from piping following proper lifting and support techniques.
3. Remove and inspect sleeves per IOM Instructions for replacing the wear sleeves.
4. Clean and inspect the inside bore of both valve housing cavities.
5. Remove bolts that are securing the frames to the actuator.
6. Lift the actuator and gate assembly off the frames and place on the ground.
7. Remove dust boot and replace if damaged.
8. Remove cotter pin from gate clevis pin.
9. Tap out gate clevis pin from the gate clevis and remove gate.
10. Inspect gate for straightness and/or damage and replace if necessary.
11. Inspect actuator for potential problems.
12. Inspect valve stem/piston rod for straightness.

Frames & Valve Housings

13. Actuator and Gate must be disassembled before proceeding.
14. Secure frames using overhead crane
15. Remove all bolts that are securing frame and valve housings.
16. Remove frames and examine for corrosion and other potential problems.
17. Remove wiper blade retainers and wiper blade per IOM instructions for replacing the wiper blade.
18. Remove remaining bolts securing the two valve housing halves.
19. Remove housing gaskets and discard.
20. Inspect housings and threaded holes for corrosion or damage.
21. Inspect all hardware for signs of corrosion and replace if necessary.

TECHNEQUIP™ KNIFE GATE VALVE ASSEMBLY INSTRUCTIONS – TGW SERIES

Valve Assembly

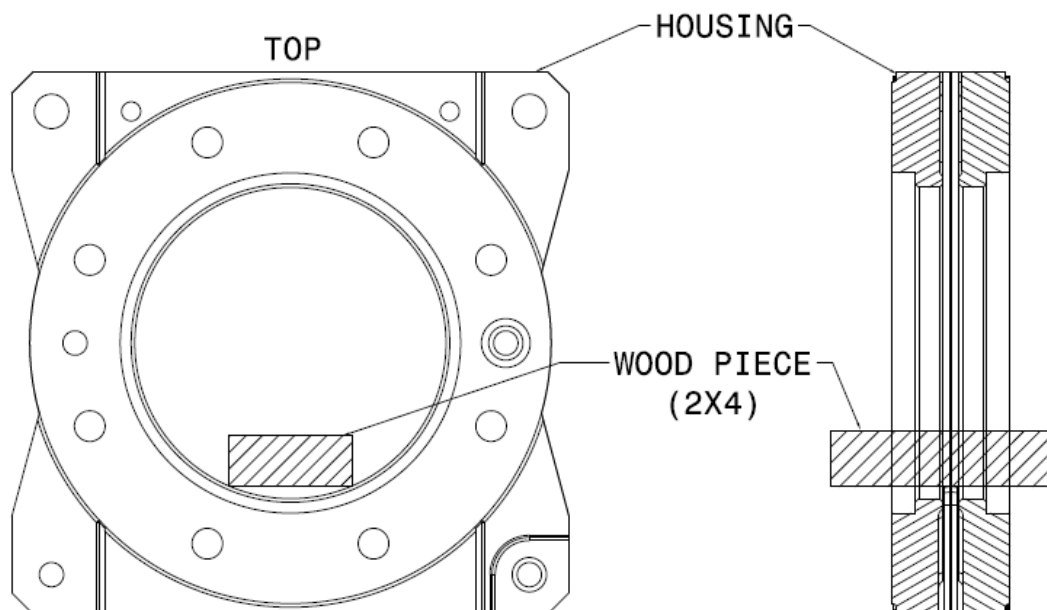
Valve Housings & Frames

1. Place valve housing half on flat work surface with interior facing up.
2. Clean both housings if necessary
3. Select one housing to install new housing gaskets.
4. Use spray adhesive to apply new housing gaskets ensuring that the straight edge of the gasket is aligned with the gate guide.
5. Adjust housings upright and place together aligning the square flange bolt holes.
6. Using the appropriate bolts and washers loosely secure the two valve housing halves together using only the bottom bolt holes. Do not put bolts through frame/valve housing holes.
7. Attach wiper blade assembly loosely.
8. Lift frames and align frame holes with upper valve housing holes and loosely secure frames to valve housings using appropriate bolts, washers and nuts.

Gate & Actuator

9. Place a piece of wood (preferably a 2" x 4") through the valve housing to prevent the gate from passing through the valve housing (*see Figure 1*).
10. Lift the gate and place the gate between the frames and wiper blade assembly and finally through the opening at the top of the valve housings until it rests on the piece of wood.
11. Remove the crane support from the gate if used.
12. For ease of actuator installation, ensure the bolts securing the frame and valve housings are loose. However, do not loosen the bolts on the bottom of the housing.
13. Attach the supplied gate clevis to the stem/rod of the actuator.
14. Attach the dust boot to the retainer plate and secure the assembly to the cylinder.
15. Extend piston rod and attach the opposite end to the piston rod directly above the gate clevis with the hose clamp.
16. Close piston rod in preparation of attaching the actuator to the frame.
17. Lift the actuator and place it on the frames aligning holes for attachment to the frames.
18. Slowly lower the piston rod to align the holes of the gate and gate clevis.
19. Once aligned, feed the gate clevis pin through the hole of the gate and gate clevis.
20. To secure this joint, feed the cotter pin through the small hole of the gate clevis pin.
21. Secure the actuator to the frames.
22. Tighten all bolts to secure the frames and valve housings.
23. Tighten the wiper blade assembly.

FIGURE 1: HOUSING



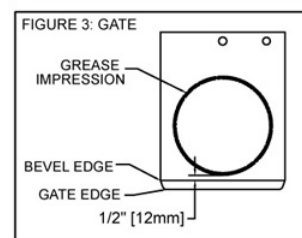
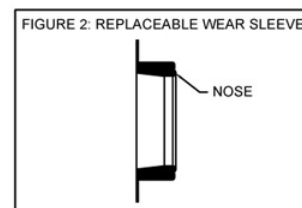
TECHNEQUIP™ KNIFE GATE VALVE ASSEMBLY INSTRUCTIONS – CONT'D

Lower Stroke Test

24. Remove the piece of wood placed in step 34.
25. Bring the gate down using the actuator to the fully closed position.
26. Lightly grease the nose of one of the replaceable wear sleeves (see Figure 2) with Dow Corning #111 Silicone.
27. With the gate in the closed position, place the replaceable wear sleeve into the valve housing until the nose touches the gate.
28. Remove the replaceable wear sleeve.
29. Look at the gate and check to see that the grease impression left by the replaceable wear sleeve is approximately between 1/4" [6mm] to 1/2" [12mm] above the bottom bevel edge of the gate. (see Figure 3)
30. If the impression is above the bevel edge between 1/4" [6mm] to 1/2" [12mm] you can proceed to the next step, if not, the stroke will need to be readjusted by rotating the gate clevis a couple turns.

Adjusting the Lower Stroke

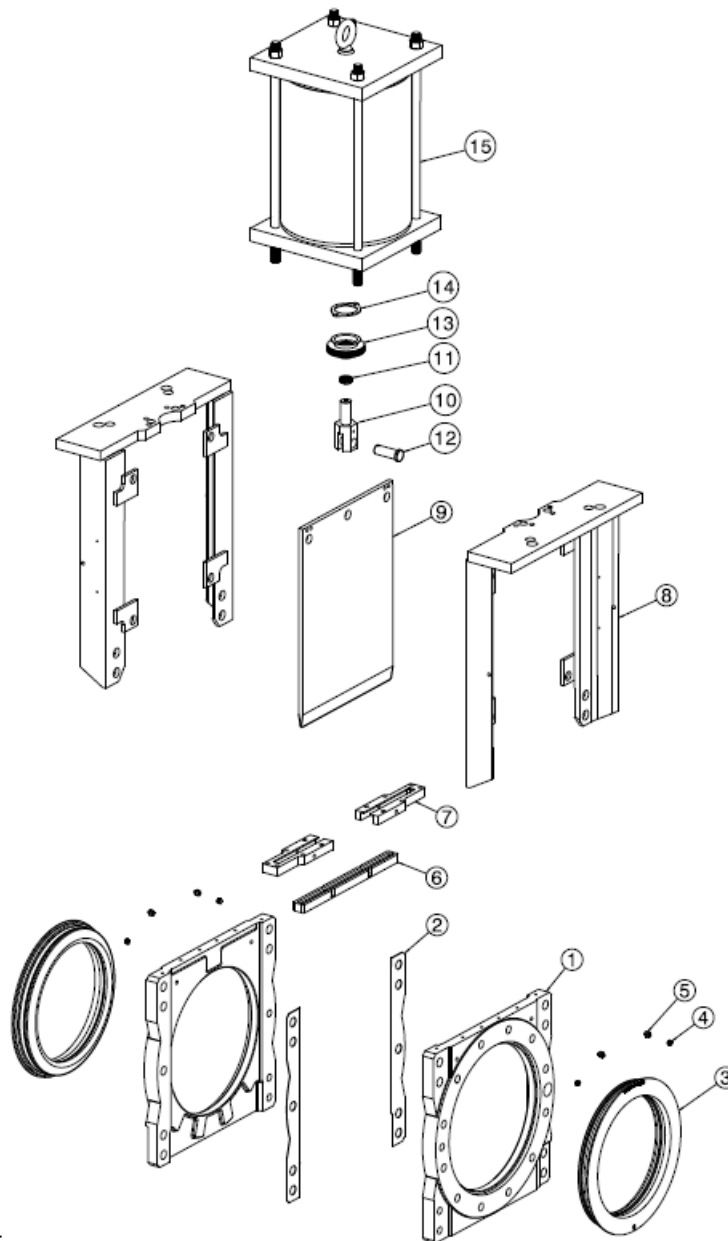
31. Note the distance needed to clear the bevel edge between 1/4" [6mm] to 1/2" [12mm].
32. Bring the gate up using the actuator.
33. Place the piece of wood back through the valve housing.
34. Bring the gate down using the actuator until the gate rests against the piece of wood.
35. Remove the cotter pin from the gate clevis pin.
36. Remove the gate clevis pin from the gate clevis and gate joint.
37. Bring the gate clevis/stem/rod to the up position using the actuator.
38. Adjust the stroke by turning the threaded gate clevis
39. Slowly bring the stem/rod of the actuator down towards the gate.
40. Align the holes of the gate and gate clevis.
41. Once aligned, feed the gate clevis pin through the holes of the gate and gate clevis.
42. To secure this joint, feed the cotter pin through the small hole of the gate clevis pin.
43. Bring the stem/rod and gate up using the actuator. Leave in this position.
44. Return to *step 24*.



Upper Stroke Test

45. Bring the gate to the open position using the actuator.
46. Check to be sure the frame gate maintenance hole is aligned with the hole in the gate.

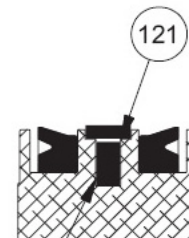
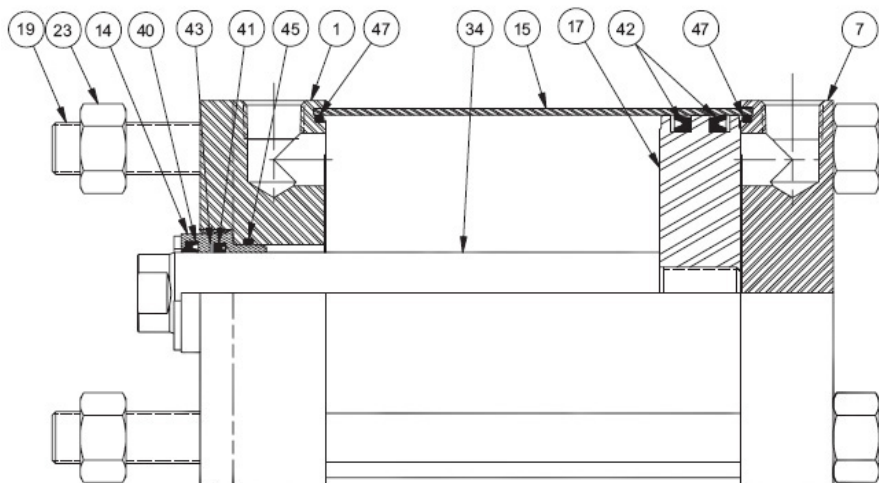
TECHNEQUIP™ KNIFE GATE VALVE AIR ACTUATED PARTS LIST – TGW SERIES



*Included in air cylinder kit

ITEM	QTY. REQ'D	DESCRIPTION	MATERIAL
1	2	VALVE HOUSING	DUCTILE IRON
2	2	VALVE HOUSING GASKET	VEGETABLE FIBER
3	4	REPLACEABLE WEAR SLEEVE	ELASTOMER / STEEL RING
4	VARIES	THREADED PLUG	STEEL
5	VARIES	THREADED GREASE FITTING	STEEL
6	1	WIPER BLADE	EPDM
7	2	WIPER RETAINER	STEEL
8	2	FRAME	STRUCTURAL STEEL
9	1	GATE	STAINLESS STEEL FLUOROCARBON COATED
*10	1	GATE CLEVIS	17-4PH STAINLESS STEEL
*11	1	HOSE CLAMP	STAINLESS STEEL
*12	1	GATE CLEVIS PIN	STEEL
*13	1	DUST BOOT	NYLON FABRIC
*14	1	DUST BOOT RETAINER PLATE	STEEL
*15	1	AIR CYLINDER	SEE AIR CYLINDER PARTS LIST

TECHNEQUIP™ KNIFE GATE VALVE AIR CYLINDER PARTS LIST – TGW SERIES



8
MAGNETIC PISTON

ITEM	QTY	DESCRIPTION	ITEM	QTY	DESCRIPTION
1	1	Head	34	1	Piston Rod
7	1	Cap	40	1	Rod (Wiper / Lipseal)
8	1	Magnet	41	1	Rod (Primary Lipseal)
14	1	Gland Assembly (contains items 40, 41 & 45)	42	2	Lipseal (Piston)
15	1	Cylinder Body	43	1	Backup Washer, Gland Lipseal
17	1	Piston	45	1	O-Ring (Gland to Head)
19	4	Tie Rod	47	2	O-Ring (Body Endseal)
23	8	Tie Rod Nut	121	1	Wearband



VALVE ACTUATED CYLINDER TIE ROD TORQUE		
VALVE SIZE	TIE ROD NUT TORQUE COMPOSITE TUBE	
	ft. lbs.	N-m
2" [50mm]	13	17
3" [75mm] & 4" [100mm]	30	41
6", 8" & 10" [150mm, 200mm & 250mm]	55	75
12" & 14" [300mm & 350mm]	78	106
16" & 18" [400mm & 450mm]	118	160
20" & 24" [500mm & 600mm]	250	339
26" [650mm]	350	475
30" [750mm] & 32" [800mm]	500	678

TECHNEQUIP™ KNIFE GATE VALVE AIR CYLINDER ASSEMBLY/DISASSEMBLY INSTRUCTIONS

REPLACING PISTON ROD SEALS AND BEARING (GLAND) ONLY

1. Remove the cylinder from the valve to which it is attached by following the equipment manufacturer's suggested procedure.
2. Inspect the piston rod to make sure it is free of burrs or other displaced metal which would prevent sliding the gland off the rod.
3. Using Gland Wrench (symbol 63) and Spanner Wrench (Symbol 63-A), unthread the gland from the cylinder head. See Figure 1.
4. The new gland assembly will come assembled, with an o-ring (Symbol 45). In most cases when replacing the gland only, the original o-ring in the cylinder head (Symbol 45) does not need to be replaced. See Figure 1.
5. Before installing the new gland inspect the surface of the piston rod for scratches, burrs, dents or other damage. A damaged piston will lead to premature rod seal failure.
6. Lubricate the ID of the rod gland assembly with a seal grease such as Lube-A-Cyl. Slide the gland assembly over the piston rod, and thread the gland into the cylinder head until it is seated against the shoulder in the cylinder head.
7. Using Gland Wrench (Symbol 63) and Spanner Wrench (Symbol 63-A) seat the gland firmly in place.

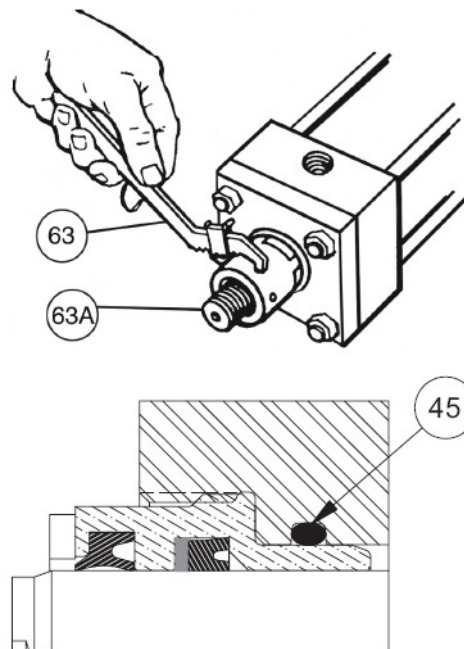


Figure 1

REPLACING PISTON and PISTON ROD SEALS

Note: If only replacing piston seals, skip step #3.

1. Remove the cylinder for the machine to which it is attached per the equipment manufacturer's procedure.
2. Inspect the piston rod to make sure it is free of burrs or other displaced metal which would prevent the gland from sliding off the rod.
Skip step 3 if only replacing the piston seal.
3. Using the Gland Wrench (Symbol 63) and the Spanner Wrench (Symbol 63-A), unthread the gland from the cylinder head.
4. If the cylinder has extended tie rods, record the length of these extensions.
5. Disassemble the cylinder on a bench by removing the flour tie rod nuts from the cap side of the cylinder.
6. Remove the cylinder head.

7. Remove the piston and rod assembly from the cylinder body.
8. Remove the cylinder body from the cap end of the cylinder.
9. Remove piston seals. (Symbol #42), cylinder body and seals (Symbol #47), and gland to head o-ring (Symbol#45).
10. Clean all parts thoroughly.
11. Inspect all parts, paying particular attention to the cylinder body, piston, piston rod, and piston rod for excessive wear or damage. Any component exhibiting signs of excessive wear or damage should be replaced immediately.

Note: All cylinders will have a wear band (Symbol#121) mounted on the piston. When replacing seals on these cylinders, DO NOT remove the Magnet (symbol#8) from the piston.

TECHNEQUIP™ KNIFE GATE VALVE AIR CYLINDER ASSEMBLY / DISASSEMBLY INSTRUCTIONS

RE-ASSEMBLY OF CYLINDER

Lubricate all seals, o-rings, with grease such as Lube-A-Cyl before assembly.

1. All parts should be clean and free of contamination.
2. Install body end seal o-rings (Symbol #47) into head and cap.
3. Install the gland to head o-ring (Symbol#45)
4. Lubricate the ID of the rod gland assembly with seal grease such as Lub-A-Cyl. Thread the gland into the cylinder head until it is seated against the shoulder in the cylinder head.
5. Lubricate the inside of the cylinder body.
6. Install one piston seal in the groove nearest to the rod end (the two lips of the Lipseal should face the rod end of the piston). All piston seals kits come with a wear band. If the piston had a wear band, lubricate and reinstall the wear band.
7. Lay the cylinder body on its side, and push the piston and rod assembly through the barrel just far enough to expose the piston groove for the second seal.
8. Place cap on bench and on top of a spacer block to allow the tie rods to go through the cap.
9. Place the piston rod assembly and cylinder body onto the cap of the cylinder. With a mallet, tap the top of the cylinder body (carefully) to seat the body into the cap.
10. Install the head onto the cylinder body. Use caution when passing the piston rod assembly through the head to avoid damage to the gland and gland seals. While performing this process, slip the tie rods through the cylinder cap.
11. With a mallet, seat the cylinder head on to the cylinder body.
12. Lay the cylinder assembly on its side. Be careful not to allow the cylinder assembly to come apart.
13. If the cylinder had extended tie rods, adjust the thread extension of each tie rod to the value recorded during disassembly.
14. If the cylinder has a front flange mount, thread each tie rod flush with the cylinder head, then back off 1/4 turn.
15. Apply a thread lubricant to the tie rods and the cap face where the tie rod nuts make contact and install the tie rod nuts hand tight.
16. For cylinders having a head mount, hold each tie rod vice grips so that the tie rod will not turn when torque is applied.
17. Determine the bore size and cylinder body of the cylinder being repaired. Then, determine the proper tie rod torque to be applied. Refer to the tables on the following page.
18. Torque each tie rod its proper value using a diagonal pattern (across corners). The torque applied should be stepped to achieve the final torque.
19. Using the Gland Wrench (Symbol 63) and the Spanner Wrench (Symbol 63-A), seat the gland firmly in place.

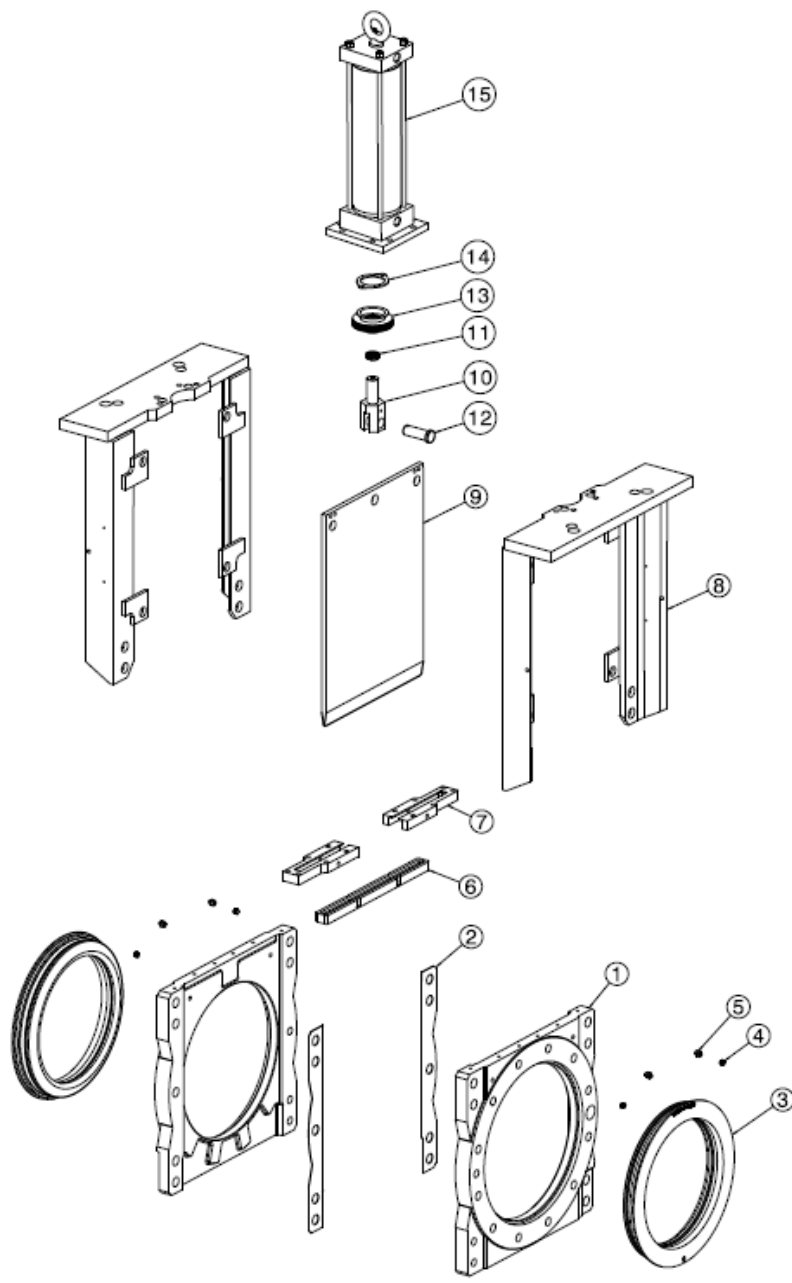
Service Kits of expendable parts for fluid power cylinders are stocked in principal industrial locations across the USA and other countries. For prompt delivery and complete information, contact your nearest Cylinder Division distributor office.

Standard Seals: Class 1 Service Kits are standard and contain Buna N seals for standard fluid service. These seals are suitable for use in air service with a recommended operating temperature range of -10°F (-23°C) to +165°F (+74°C).

HI Temperature Seals: Class 5 service kits are available, and contain Fluorocarbon seals for standard fluid service. These seals are suitable for use in air service. The recommended operating temperature range for Class 5 Seals is -10°F (-23°C) to +250°F (+121°C).

Low Temperature Seals: Class 4 Service kits are available, and contain Nitrile Seals for standard fluid service. These seals are suitable for use in air service. The recommended operating temperature range for Class 4 Seals is: -50°F (-46°C) to +150°F (+66°C).

TECHNEQUIP™ KNIFE GATE VALVE HYDRAULIC ACTUATED PARTS LIST – TGW SERIES



*Included in hydraulic cylinder kit

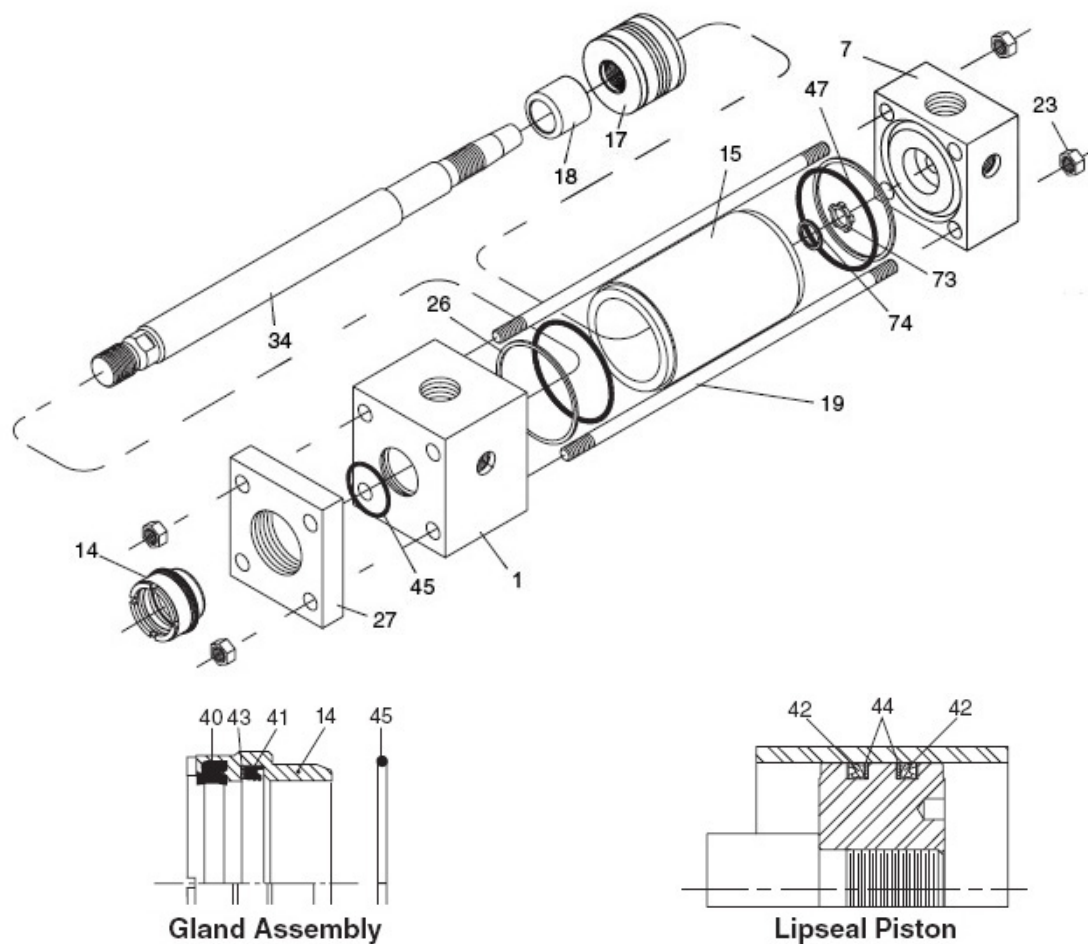
ITEM	QTY. REQ'D	DESCRIPTION	MATERIAL
1	2	VALVE HOUSING	DUCTILE IRON
2	2	VALVE HOUSING GASKET	VEGETABLE FIBER
3	4	REPLACEABLE WEAR SLEEVE	ELASTOMER / STEEL RING
4	VARIABLES	THREADED PLUG	STEEL
5	VARIABLES	THREADED GREASE FITTING	STEEL
6	1	WIPER BLADE	EPDM
7	2	WIPER RETAINER	STEEL
8	2	FRAME	STRUCTURAL STEEL
9	1	GATE	STAINLESS STEEL FLUOROCARBON COATED
*10	1	GATE CLEVIS	17-4PH STAINLESS STEEL
*11	1	HOSE CLAMP	STAINLESS STEEL
*12	1	GATE CLEVIS PIN	STEEL
*13	1	DUST BOOT	NYLON FABRIC
*14	1	DUST BOOT RETAINER PLATE	STEEL
*15	1	HYDRAULIC CYLINDER	SEE HYDRAULIC CYLINDER PARTS LIST

TECHNEQUIP™ KNIFE GATE VALVE HYDRAULIC CYLINDER PARTS LIST – TGW SERIES

Service Assemblies and Seal Kits

Service Assemblies and Seal Kits for Parker hydraulic and pneumatic cylinders simplify the ordering processes. They contain sub-assemblies which are ready for installation, and are supplied with full instructions. When ordering Service Assemblies and Seal Kits, please refer to the identification plate on the cylinder body, and supply the following information.

Serial Number – Bore – Stroke – Model Number - Fluid Type



ITEM NO.	DESCRIPTION
1	Head
7	Cap
14	Gland
15	Cylinder Body
17	Piston
18	Cushion Sleeve
19	Tie Rod
23	Tie Rod nut
27	Retainer

ITEM NO.	DESCRIPTION
34	Piston Rod
40	Wiperseal – for 14
41	Lipseal – for 14
42	Lipseal, Piston
43	Back-up washer, gland Lipseal 41 (not hydraulic Class 1 seals)
44	Back-up washer, Lipseal
45	O-ring – gland / head
47	O-ring – cylinder body

TECHNEQUIP™ KNIFE GATE VALVE HYDRAULIC CYLINDER ASSEMBLY / DISASSEMBLY INSTRUCTIONS

Operating Fluids and Temperature Ranges

The table shows the main types of fluid used with hydraulic cylinders. If the operating conditions of the particular application cannot be met by the seal classes described, please consult the factory and supply complete application details.

Class No.	Typical Fluids	Temperature Range
1. Nitrile & Polyurethane	Air, Nitrogen Hydraulic oil, Mil-H-5606 Oil	-10°F (-23°C) to +165°F to (+74°C)
2. Nitrile, Nitroxile and Fluorocarbon	Water. Water Glycol, H. W. C. F. – Water-in-Oil Emulsion – Houghto-Safe 271, 620, 5040 Mobil Pyrogard D, Shell Iruis 905 Ucon Hydrolube J-4	-10°F (-23°C) to +165°F to (+74°C)
3. Fluorocarbon	High Temperature Houghto-Safe 1010,10551 1120 Fryquel 150, 220, 300, 550 Mobil Pyrogard 42. 43, 53, 55 Note: Fluorocarbon seals are not suitable for use with Skydrol fluid, but can be used with hydraulic oil if desired.	-10°F (-23°C) to +250°F to (+121°C)
4. Nitroxile, Fluorocarbon and Nitrile	H.W.C.F. – Houghton Hydrolubric 120B Sonsol Lubrizol, for other H.W.C.F. consult factory	+40°F (+4°C) to +120°F to (+49°C)

Cylinder Modifications or Repairs

Cylinders as shipped from the factory are not to be disassembled and or modified. If cylinders require modifications, these modifications must be done at company locations or by The Company's certified facilities. The Cylinder Division Engineering Department must be notified in the event of a mechanical fracture or permanent deformation of any cylinder component (excluding seals). This includes a broken piston rod, tie rod, mounting accessory or any other cylinder component. The notification should include all operation and application details. This information will be used to provide an engineered repair that will prevent recurrence of the failure.

It is allowed to disassemble cylinders for the purpose of replacing seals or seal assemblies. However, this work must be done by strictly following all the instructions provided in this bulletin.

Although Parker Hydraulic Cylinders are designed to make on-site maintenance or repairs as easy as possible, some operations can only be carried out in our factory. It is standard policy to fit a cylinder returned to the factory for repair with those replacement parts, which are necessary to return it to 'as good as new' condition. Should the condition of the returned cylinder be such that repair would be uneconomical, you will be notified.

The piston is sealed and securely locked to the piston rod with anaerobic adhesive. This threaded connection is ONLY to be disassembled or reassembled by factory trained personnel.

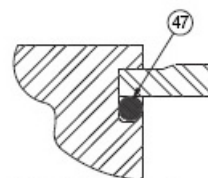
WARNING: Some cylinders contain heavily loaded springs. Improper disassembly of these cylinders can cause severe bodily injury or death. Always disassemble a cylinder containing a spring by following the instructions in Bulletin 0805-G-TSD-1.

After the cylinder has been disassembled, carefully remove the seals that will be replaced to avoid damaging groove surfaces. Carefully clean all parts. Seals will be easier to install if they are lubricated. Always lubricate seals and other components of a hydraulic cylinder with the operating fluid. Pneumatically operated cylinders should be lubricated with Lub-A-Cyl. Neither hydraulic nor pneumatic cylinders fitted with Class 3 seals (EPR) can be lubricated or operated with petroleum based products.

Servicing Piston Seals

The cylinder bore and piston must be closely examined for signs of scoring. If either the cylinder body or piston is damaged they must be replaced. When a cylinder is overhauled, a new set of piston seals is required. It is also recommended that the cylinder be reassembled with new cylinder body O-rings. All piston seal kits contain piston seals as well as two cylinder body O-rings (47).

Body O-Rings

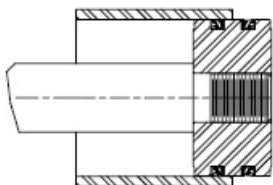


All Other Series
& Bore Sizes

TECHNEQUIP™ KNIFE GATE VALVE HYDRAULIC CYLINDER ASSEMBLY / DISASSEMBLY INSTRUCTIONS

Lipseal Piston

PK kits for Lipseal pistons contain two lipseals (42) and two back-up washers (44). Apply lubricant to the piston OD and all grooves. Install one piston seal in the groove nearest the rod. The two 'lips' of this Lipseal should face toward the rod end of the piston. Install the back-up washer in the same groove opposite the 'lips' of the seal. Lubricate the cylinder body ID and insert the piston – cap end first – into the cylinder body as shown. Next, turn the cylinder body on its side and push the piston through the tube just far enough to expose the groove for the second seal. Now, install the second Lipseal and backup washer in the exposed groove with the two 'lips' facing away from the rod. If the piston has a groove for a wear ring, install the wear ring in the groove and lubricate the wear ring OD. Then pull the piston into the cylinder body.



Cast Iron Piston Rings

Kits for cast iron piston rings contain four rings (48). Most 3L Series cylinders use only three rings and in some larger sizes, only two. All other series cylinders use four rings.

Iron piston rings seldom need replacement. If the rings show no signs of damage or abnormal wear, they may be reused. To install piston rings, collapse the rings one at a time while inserting the piston into the cylinder body, using a light oil to aid this process.

Cylinder Assembly

The cylinder should be re-assembled as follows:

1. The back-up washers, where fitted, and then the body O-rings should be lightly lubricated and pressed into the grooves in the head and cap, without twisting. The cylinder body, with the piston and rod already fitted, can then be assembled to the cap by 'rocking' it down over the O-ring until the cylinder body is in contact with the cap. The head is then fitted over the piston rod and assembled to the cylinder body. Rock gently until the body and head are in metal-to-metal contact.
2. Lightly lubricate the gland seals.

3. Screw the gland into the retainer about one thread short of the retainer face that contacts the cylinder head. Slide the gland/retainer assembly over the piston rod end, taking care not to damage the seal lips. Orient holes in full square retainers over the tie rod holes in the head or line up holes in smaller retainers with threaded mounting holes. Assemble bolts that secure bolt-on retainers finger tight.
4. Ensuring that the head and cap are kept in alignment, refit the cylinder tie rods.

Note: Some cylinder configurations have tie rods threaded into a component other than tie rod nuts (e.g. head, cap, flange plate, etc). Before torquing the tie rods, use paint on the tie rods as an indicator that adequate thread engagement is achieved. Ensure that no unpainted thread is exposed at the connection to the mating component.

For both style retainers, torque tie rod nuts to values listed in Table 1 – Tie Rod Torque. **Torque tie rods gradually starting at one corner and work in a diagonal pattern to ensure evenness of tightening. DO NOT TORQUE ONE TIE ROD COMPLETELY AND THEN THE OTHERS.** Then, on cylinders with bolt-on retainers, torque bolts to the values listed in Table 1 – Tie Rod Torque.

Servicing Cylinder Gland Seals

Fluid leakage from the piston rod at the gland normally indicates worn gland seals. The cylinder should, if possible, be removed for overhaul, or the piston rod disconnected.

Removal

1. Inspect the piston rod to make sure it is free from burrs or damage which would prevent the gland sliding off the rod.

The Parker gland is a cartridge design consisting of a bronze gland (14), primary rod seal (41), back-up washer (43) for all hydraulic cylinder seal classes, and a double lip wiperseal (40). The gland is threaded into a gland retainer plate. These glands are usually removable without disturbing the tie rod torque. In some cases, where a large diameter rod gland is threaded into a large square retainer, it may be necessary to loosen the tie rods to remove the gland.

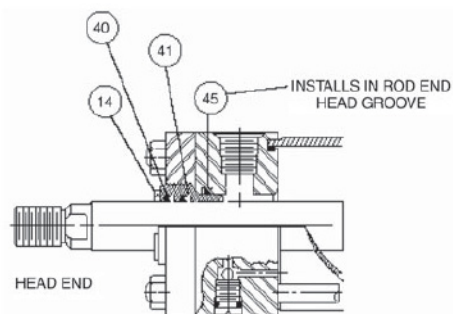
2. Where the gland is screwed into a square retainer, unscrew the gland using a Gland Wrench and Spanner, and slide the gland off the piston rod.

TECHNEQUIP™ KNIFE GATE VALVE HYDRAULIC CYLINDER ASSEMBLY / DISASSEMBLY INSTRUCTIONS

Continued - Removal

Where the gland is screwed into a circular retainer, undo the socket head cap screws and slide the gland/retainer assembly off the piston rod. Unscrew and withdraw the gland from the inner face of the retainer.

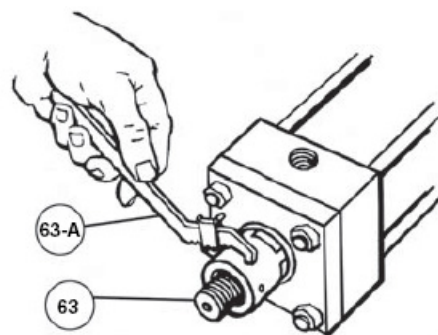
- Remove the seals using a sharp pointed instrument, taking care not to damage the gland. Clean and inspect the gland bore and seal grooves. If any wear is present replace with a Gland Cartridge Kit containing seals of the correct type for the conditions.



Installation

Inspect the surface of the piston rod for damage which could cause early seal failure. When fitting the gland over the rod thread, a slight rotary motion will help prevent damage to the seals. In addition, shim stock or other thin, tough material can be wrapped around the threads to protect the seal lips.

- Ensure that the kit contains seals of the correct type. Lubricate the gland and seals, and fit the wiper (40) into the groove closest to the outside face of the gland.
- If a Class 1 material rod seal, for a hydraulic cylinder, is being fitted to a standard gland, no back-up washer is necessary. A back-up washer (43) is included in seal kits for all other service classes. Install this in the rod seal groove, against the wall closest to the wiper. Install the lipseal (41) in the groove, with the lips facing the pressure (cylinder) side of the gland. See illustrations on top right of this page.
- Each kit with a threaded type gland contains an O-ring (45) which seals the gland to the cylinder head. This O-ring is a static seal, and the original must be left in place unless it is faulty.



Note: Some seal kits contain more than one O-ring. In this case, fit the one which is identical in size and thickness to the existing O-ring. Any extra O-rings should be discarded.

- Slide the gland cartridge over the piston rod and thread it into the retainer. Tighten the gland firmly against the cylinder head using a Gland Wrench and Spanner. In some cases (especially large piston rod diameters) it may be necessary to loosen the tie rod nuts or retainer bolts, and remove the retainer, in order to thread the gland back into place.
- In those cases, thread the gland into the retainer about one thread short of the retainer face that contacts the cylinder head. Slide the gland assembly over the piston rod and orient holes in large retainers with tie rod holes and holes in bolt-on retainers with threaded mounting holes. Seat the retainer against the cylinder head. Assemble bolts that secure bolt-on retainers finger tight. For both style retainers, torque tie rod nuts to values listed in Table 1 - Tie Rod Torque.

TECHNEQUIP™ KNIFE GATE VALVE HYDRAULIC CYLINDER OPERATING INSTRUCTIONS

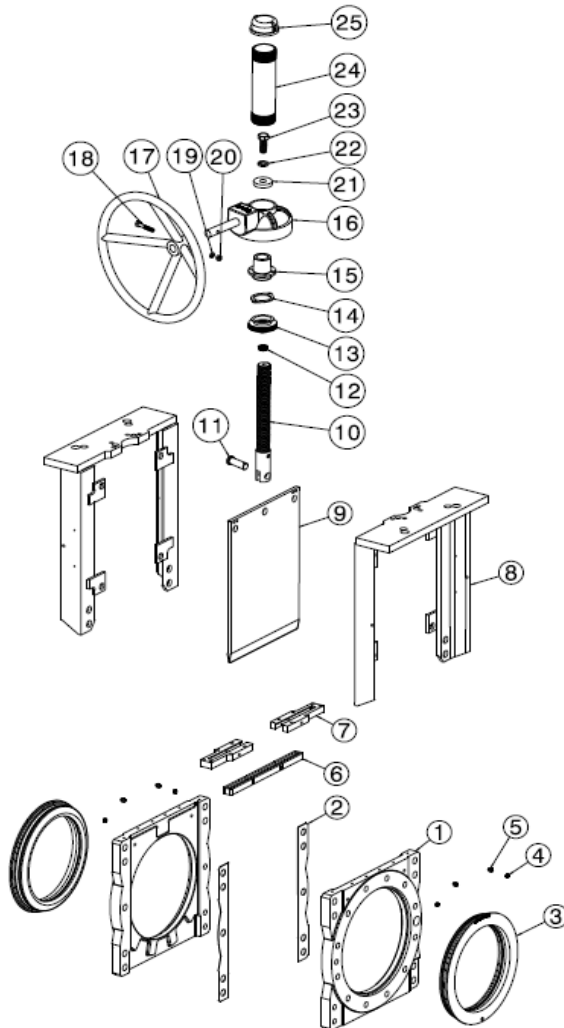
Torque ties rods gradually starting at one corner and work in a diagonal pattern to ensure evenness of tightening. **DO NOT TORQUE ONE TIE ROD COMPLETELY AND THE OTHERS.** Then, on cylinders with bolt-on retainers, torque bolts to the values listed in Table 1 – Tie Rod Torque (below). To complete the assembly, in all cases, tighten the gland cartridge firmly against the cylinder head using a Gland Wrench and Spanner.

Gland seals are pressure activated and do not need adjustment.

Table 1 – Tie Rod Torque

Valve Size	Tie Rod Torque	
2" [50mm]	60 - 70 in lbs.	69 – 81 cm-kg
3" [75mm] to 8" [200mm]	11 - 12 - ft lbs.	15 - 16 N-m
10" [250mm] to 16" [400mm]	25 - 26 ft-lbs.	34 - 35 N-m
18" [450mm] & 24" [600mm]	60 - 64 ft-lbs.	81 - 87 N-m

TECHNEQUIP™ KNIFE GATE VALVE BEVEL GEAR ACTUATED PARTS LIST – TGW SERIES

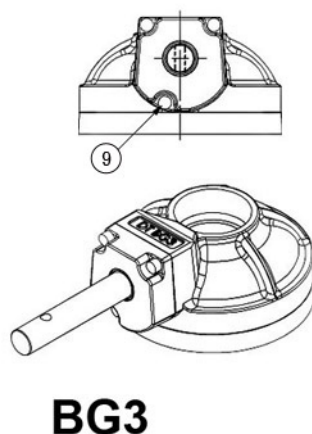
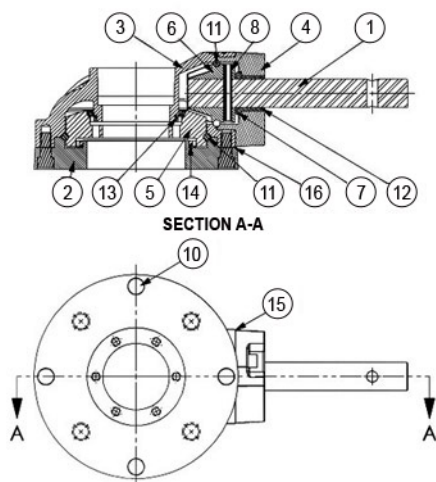


*Included in bevel gear kit

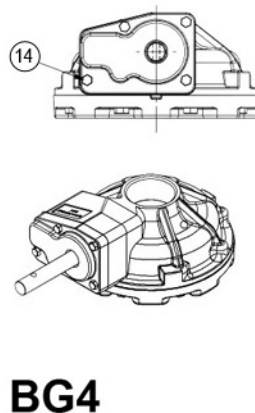
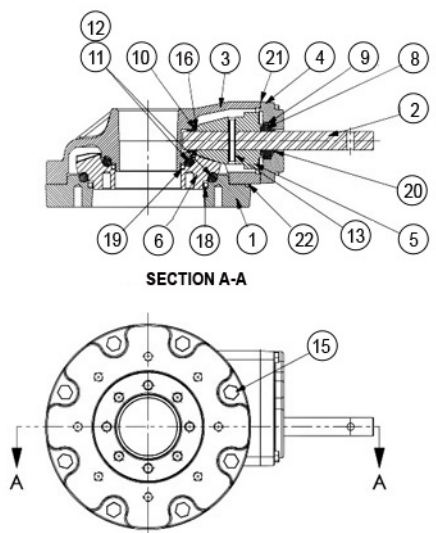
ITEM	QTY. REQ'D	DESCRIPTION	MATERIAL
1	2	VALVE HOUSING	DUCTILE IRON
2	2	VALVE HOUSING GASKET	VEGETABLE FIBER
3	4	REPLACEABLE WEAR SLEEVE	ELASTOMER / STEEL RING
4	VARIABLES	THREADED PLUG	STEEL
5	VARIABLES	THREADED GREASE FITTING	STEEL
6	1	WIPER BLADE	EPDM
7	2	WIPER RETAINER	STEEL
8	2	FRAME	STRUCTURAL STEEL
9	1	GATE	STAINLESS STEEL FLUOROCARBON COATED
*10	1	STEM ASSEMBLY	304 STAINLESS STEEL
*11	1	GATE CLEVIS PIN	STEEL
*12	1	HOSE CLAMP	STAINLESS STEEL
*13	1	DUST BOOT	NYLON FABRIC
*14	1	DUST BOOT RETAINER PLATE	STEEL
*15	1	YOKE SLEEVE	660 BRONZE
*16	1	BEVEL GEAR	SEE BEVEL GEAR ACTUATOR PARTS LIST
*17	1	HANDWHEEL	MILD STEEL
*18	1	HEX BOLT	GRADE 5 OR CLASS 8.8
*19	1	LOCK WASHER	GRADE 5 OR CLASS 8.8
*20	1	HEX NUT	GRADE 5 OR CLASS 8.8
*21	1	TRAVEL STOP	316 STAINLESS STEEL
*22	1	LOCK WASHER	GRADE 5 OR CLASS 8.8
*23	1	HEX BOLT	GRADE 5 OR CLASS 8.8
*24	1	STEM COVER	ASTM A53 STEEL
*25	1	STEM COVER CAP	BLACK MALLEABLE IRON 150lb

TECHNEQUIP™ KNIFE GATE VALVE BEVEL GEAR PARTS LIST – TGW SERIES

SPECIFICATION	DYNATORQUE BG3 6"-16" [150mm-400mm] VALVES	DYNATORQUE BG4 18"-24" [450mm-600mm] VALVES
Ratio	3:1	4:1
Thrust	22,000 lbs [90kN]	30,000 lbs [133kN]
Torque	625 ft-lb [848 N-m]	1600 ft-lb [848 N-m]
Temperature	-20 to 150°F [-29 to 66°C]	-20 to 150°F [-29 to 66°C]
Weight	38 lbs [17kg]	60 lbs [27kg]

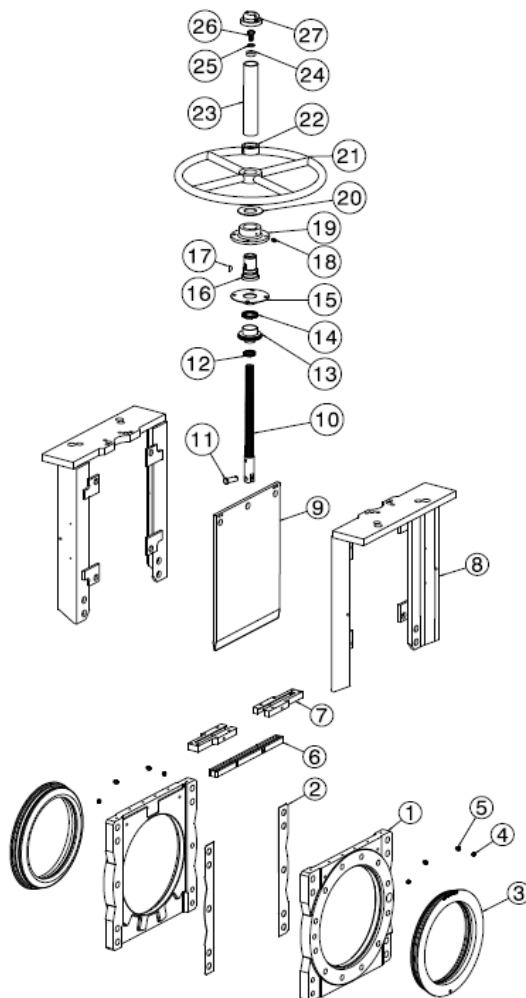


ITEM	QTY	DESCRIPTION	MATERIAL
1	1	Shaft	Stress proof Steel
2	1	Retainer	Ductile Iron
3	1	Housing	Ductile Iron
4	1	Bearing Housing	Ductile Iron
5	1	Bevel Gear	Ductile Iron
6	1	Bevel Pinion	Ductile Iron
7	1	Flange Bearing	Powdered Metal
8	1	Coil Pin	Heat Treated Steel
9	3	SHCS, 5/16"-18 x 7/8"	Grade 8
10	4	SHCS, 3/8"-16 x 7/8"	Grade 8
11	89	Ball Bearing	Chrome
12	1	Lip Seal	BUNA-N
13	1	Lip Seal	BUNA-N
14	1	Lip Seal	BUNA-N
15	1	Gasket, BRG HSG	Vellutherm 650 Paper
16	1	Gasket, BRG RET	Vellutherm 650 Paper
17	1	Paint (Not Shown)	Black Oxide
18	1	Grease (Not Shown)	Commercial Grade



ITEM	QTY	DESCRIPTION	MATERIAL
1	1	Bearing retainer	Cast Iron
2	1	Shaft	Hardened Steel
3	1	Housing	Cast Iron
4	1	Bearing Housing	Cast Iron
5	1	Bevel Pinion	Ductile Iron
6	1	Bevel Gear	Ductile Iron
7	1	Paint (not shown)	Black Oxide
8	1	Roller Bearing, Cone	Hardened Steel
9	1	Roller Bearing, Cup	Hardened Steel
10	1	Flanged Retainer	Cast Iron
11	36	Ball Bearing 0.5 Dia.	Chrome
12	36	Ball Bearing 1.469 Dia.	Chrome
13	1	Coil Pin	Heat Treated Steel
14	4	HHCS, 3/8" x 1 1/4"	Grade 5
15	8	HHCS, 1/2"-13 x 1 1/4"	Grade 5
16	1	Wave Washer	Standard
17	1	Grease (not shown)	Commercial
18	1	Lip Seal 6.0	BUNA-N
19	1	Lip Seal 3.5	BUNA-N
20	1	Lip Seal 1.0	BUNA-N
21	1	Gasket, Housing	Vellutherm 650 Paper
22	1	Gasket, retainer	Vellutherm 650 Paper

TECHNEQUIP™ KNIFE GATE VALVE HANDWHEEL ACTUATED PARTS LIST – TGW SERIES



*Included in hand wheel kit

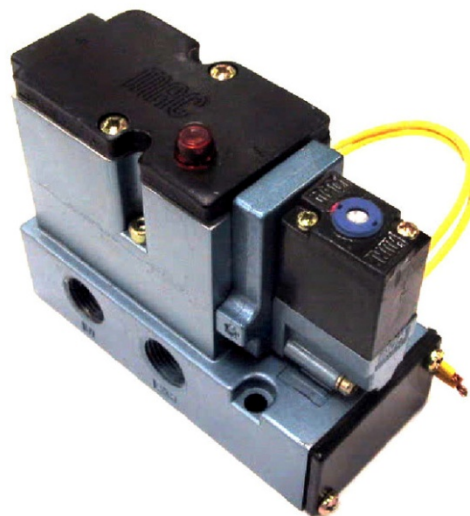
ITEM	QTY. REQ'D	DESCRIPTION	MATERIAL
1	2	VALVE HOUSING	DUCTILE IRON
2	2	VALVE HOUSING GASKET	VEGETABLE FIBER
3	4	REPLACEABLE WEAR SLEEVE	ELASTOMER / STEEL RING
4	VARIES	THREADED PLUG	STEEL
5	VARIES	THREADED GREASE FITTING	STEEL
6	1	WIPER BLADE	EPDM
7	2	WIPER RETAINER	STEEL
8	2	FRAME	STRUCTURAL STEEL
9	1	GATE	STAINLESS STEEL FLUOROCARBON COATED
*10	1	STEM ASSEMBLY	304 STAINLESS STEEL
*11	1	GATE CLEVIS PIN	STEEL
*12	1	HOSE CLAMP	STAINLESS STEEL
*13	1	DUST BOOT	NYLON FABRIC
*14	1	HOSE CLAMP	STAINLESS STEEL
*15	1	DUST BOOT PLATE	MILD STEEL
*16	1	YOKE SLEEVE	660 BRONZE
*17	1	WOODRUFF KEY	AISI 1045 MILD STEEL
*18	1	GREASE FITTING	STEEL
*19	1	HAND WHEEL BASE	AISI 1045 MILD STEEL
*20	1	THRUST WASHER	304 STAINLESS STEEL
*21	1	HAND WHEEL	ASTM A563. AISI 1045 MILD STEEL
*22	1	YOKE COLLAR	660 BRONZE
*23	1	STEM COVER	ASTM A53 STEEL
*24	1	TRAVEL STOP	316 STAINLESS STEEL
*25	1	LOCK WASHER	GRADE 5 OR CLASS 8.8
*26	1	HEX BOLT	GRADE 5 OR CLASS 8.8
*27	1	STEM COVER CAP	BLACK MALLEABLE IRON 150lb

TECHNEQUIP™ KNIFE GATE VALVE

OPTIONS: MAC 82 SERIES 4-WAY SOLENOID

2" [50mm] TO 18" [450mm] VALVES

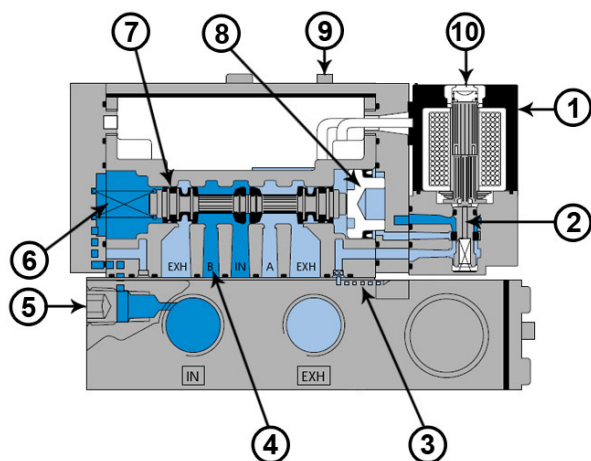
SPECIFICATION DESCRIPTION	SPECIFICATION		
Spool Type	Single (Coil) Operator – Single Pressure Spring Return or Dual Coil Operator		
Port Size	3/8" NPTF or 3/8" BSPP		
Flow: Cv	1.35		
Pilot Style	Universal Pilot, Pilot Exhaust Out Main Exhaust		
Voltage	24VDC	120V/60Hz 110V/50Hz	240V/60Hz 220V/50Hz
Power Rating	5.4W	5.4W	5.9W
Lead Wire Length	36" [900mm]		
Manual Operator	Non-Locking Operator		
Operating Temperature Range	-18°C to 50°C 0°F to 120°F		
Operating Pressure Range	20-150 psi 138kPa to 1035 kPa		



SINGLE COIL SHOWN

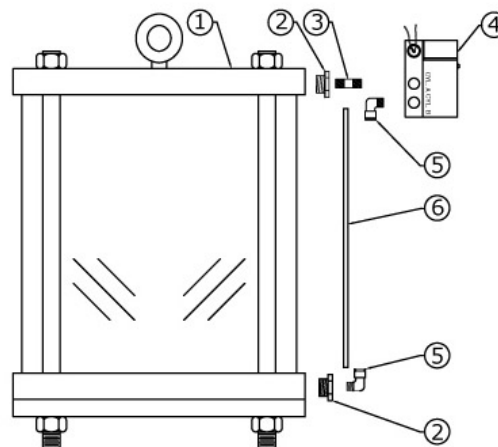
SOLENOID VALVE CROSS-SECTION

SINGLE COIL SHOWN

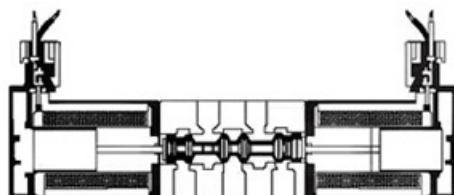


ITEM	ITEM DESCRIPTION
1	MACSOLENOID®
2	Poppet Pilot Valve
3	Plug In Design
4	High Flow Ports
5	Optional Common External Pilot
6	Spring Return
7	Mac Spool & Bore
8	Piston
9	Power Indicator Light
10	Non-Locking Manual Operator

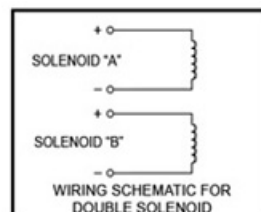
SOLENOID VALVE MOUNTING ASSEMBLY



ITEM	ITEM DESCRIPTION
1	Air Cylinder Actuator
2	1/2" X 3/8" Threaded Bushing (12" [300mm] & 14" [350mm] Valves) 3/4" X 3/8" Threaded Bushing (16" [400mm] and 18" [450mm] Valves)
3	3/8" X 2 1/2" [65mm] Threaded Nipple
4	4-Way Solenoid Valve
5	3/8" CAMOZZI Swivel Joint Push Fit Below
6	3/8" or 10mm Polyurethane Tube



CONVENTIONAL DOUBLE SOLENOID

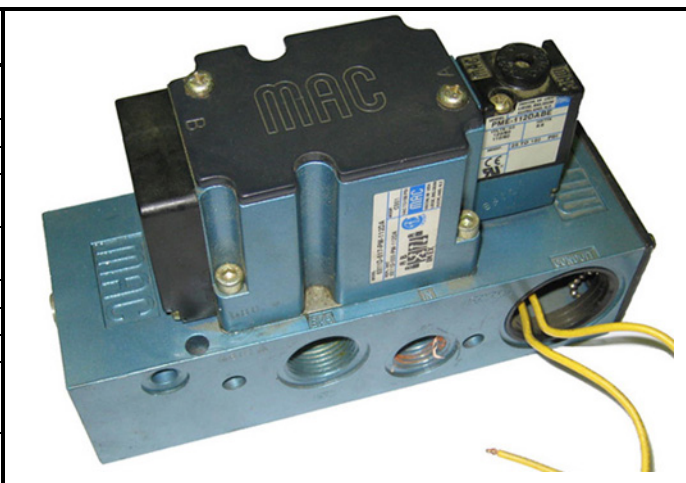


TECHNEQUIP™ KNIFE GATE VALVE

OPTIONS: MAC 6300 SERIES 4-WAY SOLENOID

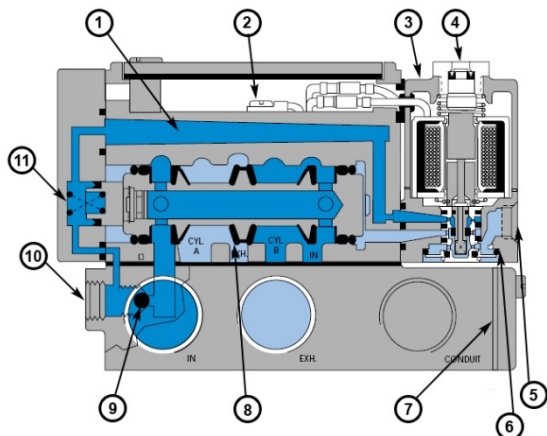
20" [500mm] TO 26" [650mm] VALVES

SPECIFICATION DESCRIPTION	SPECIFICATION		
Spool Type	Single (Coil) Operator – Single Pressure Spring Return or Dual Coil Operator		
Port Size	1/2" NPTF or 1/2" BSPP		
Flow: Cv	3.0		
Pilot Style	Universal Pilot, Pilot Exhaust Out Main Exhaust		
Voltage	24VDC	120V/60Hz 110V/50Hz	240V/60Hz 220V/50Hz
Power Rating	8.5W	6.8W	6.5W
Lead Wire Length	36" [900mm]		
Manual Operator	Non-Locking Operator		
Operating Temperature Range	-18°C to 50°C 0°F to 120°F		
Operating Pressure Range	20-150 psi 138kPa to 1035 kPa		

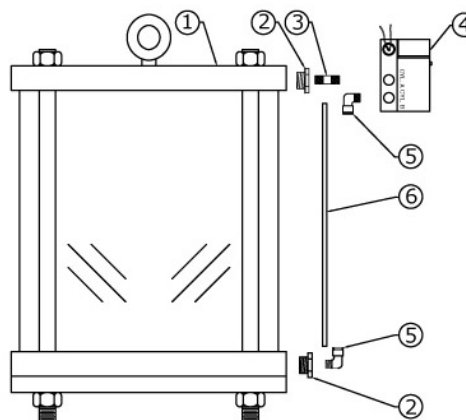


4 WAY SOLENOID VALVE CROSS-SECTION (SERIES 6300)

SINGLE COIL SHOWN

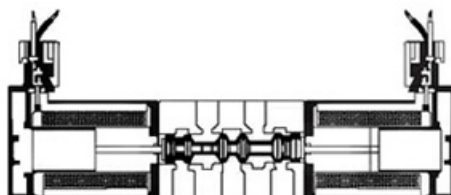


SOLENOID VALVE MOUNTING ASSEMBLY

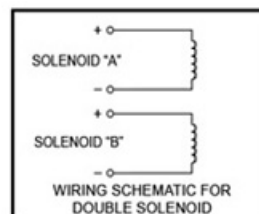


ITEM	ITEM DESCRIPTION
1	Pilot Air Accumulator
2	Integral Ground Wire
3	Sealed Solenoid Enclosure
4	Manual Operator
5	Optional Pilot Exhaust Tapped Port
6	Integral Muffler
7	Sealed Wiring Tuck Space
8	Bonded Flow Seal Spool
9	Internal Pilot Supply Ball Check
10	External Pilot Supply Port
11	Air / Spring Return

ITEM	ITEM DESCRIPTION
1	Air Cylinder Actuator
2	3/4" X 1/2" Threaded Bushing
3	1/2" X 2 1/2" [65mm] Threaded Nipple
4	4-Way Solenoid Valve
5	1/2" CAMOZZI Swivel Joint Push Fit Below
6	1/2" or 12mm Polyurethane Tube



CONVENTIONAL DOUBLE SOLENOID



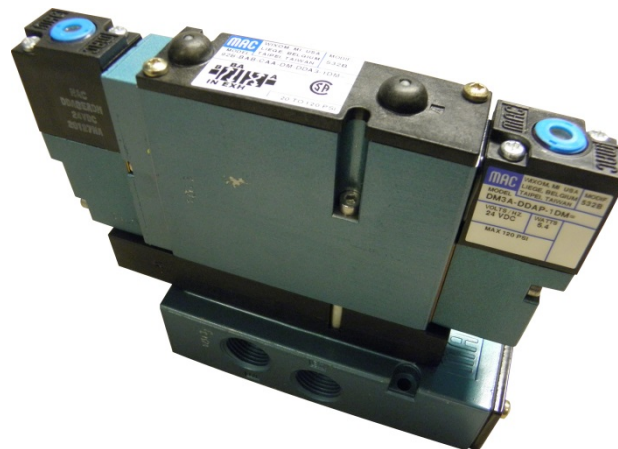
TECHNEQUIP™ KNIFE GATE VALVE

OPTIONS: MAC 92 SERIES 4-WAY SOLENOID

2" [50mm] TO 18" [450mm] VALVES

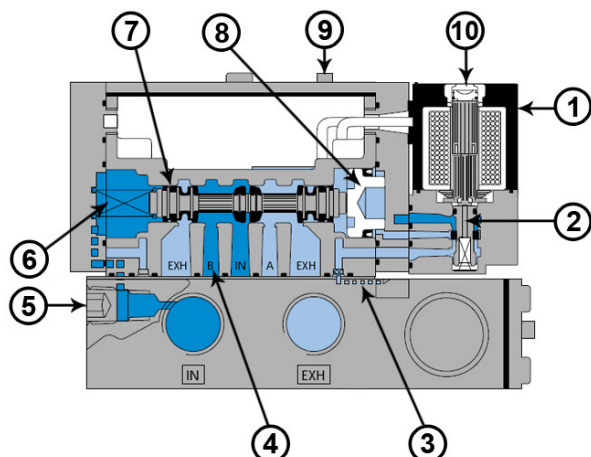
SPECIFICATION DESCRIPTION	SPECIFICATION		
Approvals	CSA, CE(110, 220 VAC ONLY)		
Spool Type	Single (Coil) Operator – Single Pressure Spring Return or Dual Coil Operator		
Port Size	3/8" NPTF or 3/8" BSPP		
Flow: Cv	1.2		
Pilot Style	Universal Pilot, Pilot Exhaust Out Main Body		
Voltage	24VDC	120V/60Hz 110V/50Hz	240V/60Hz 220V/50Hz
Power Rating	5.4W	2.9W	2.9W
Model No.	92B-ACB-CAA-DU-DDA3-1DM=0532B	92B-ACB-CAA-DU-DJA3-1DM=0532B	92B-ACB-CAA-DU-DJB3-1DM=0532B
Lead Wire Length	36" [900mm]		
Manual Operator	Non-Locking Operator		
Operating Temperature Range	-18°C to 50°C 0°F to 120°F		
Operating Pressure Range	20-120 psi 138kPa to 827 kPa		

DUAL COIL SHOWN



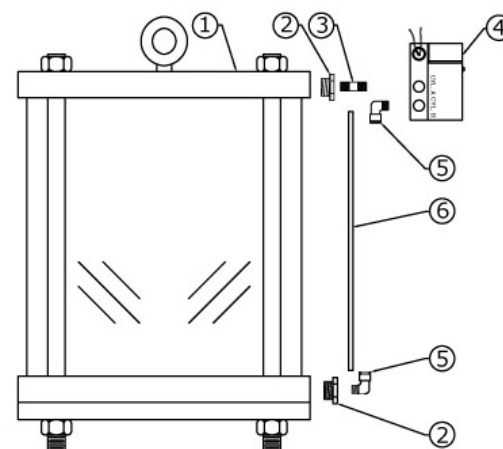
SOLENOID VALVE CROSS-SECTION

SINGLE COIL SHOWN

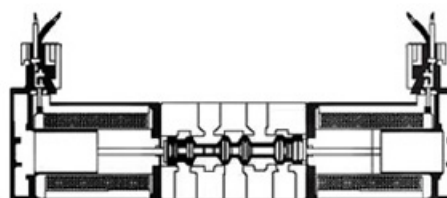


ITEM	ITEM DESCRIPTION
1	MACSOLENOID®
2	Poppet Pilot Valve
3	Plug In Design
4	High Flow Ports
5	Optional Common External Pilot
6	Spring Return
7	Mac Spool & Bore
8	Piston
9	Power Indicator Light
10	Non-Locking Manual Operator

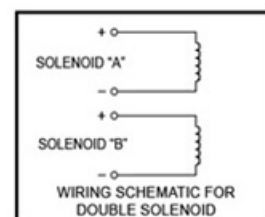
SOLENOID VALVE MOUNTING ASSEMBLY



ITEM	ITEM DESCRIPTION
1	Air Cylinder Actuator
2	1/2" X 3/8" Threaded Bushing (12" [300mm] & 14" [350mm] Valves)
2	3/4" X 3/8" Threaded Bushing (16" [400mm] and 18" [450mm] Valves)
3	3/8" X 2 1/2" [65mm] Threaded Nipple
4	4-Way Solenoid Valve
5	3/8" CAMOZZI Swivel Joint Push Fit Below
6	3/8" or 10mm Polyurethane Tube



CONVENTIONAL DOUBLE SOLENOID

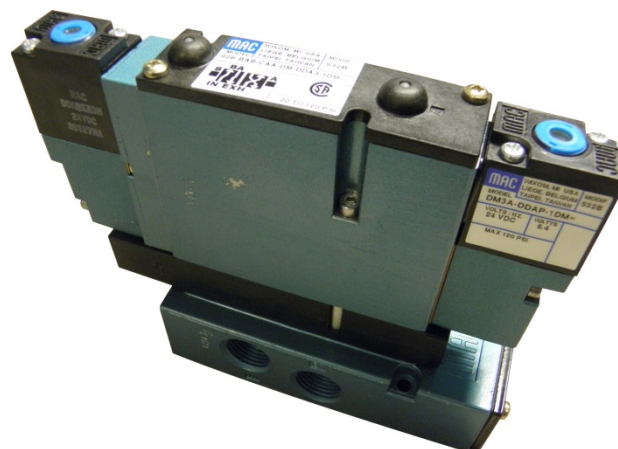


TECHNEQUIP™ KNIFE GATE VALVE

OPTIONS: MAC 93 SERIES 4-WAY SOLENOID

20" [500mm] TO 26" [650mm] VALVES

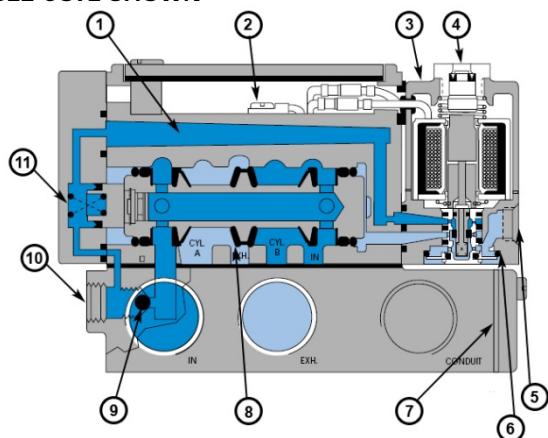
SPECIFICATION DESCRIPTION	SPECIFICATION		
Approvals	CSA, CE(110, 220 VAC ONLY)		
Spool Type	Single (Coil) Operator – Single Pressure Spring Return or Dual Coil Operator		
Port Size	1/2" NPTF or 1/2" BSPP		
Flow: Cv	3.4		
Pilot Style	Universal Pilot, Pilot Exhaust Out Main Exhaust		
Voltage	24VDC	120V/60Hz 110V/50Hz	240V/60Hz 220V/50Hz
Power Rating	5.4W	2.9W	2.9W
Model #	93A-ACB-CAA-DU-DDA3-1DM=0532B	93A-ACB-CAA-DU-DJA3-1DM=0532B	93A-ACB-CAA-DU-DJB3-1DM=0532B
Lead Wire Length	36" [900mm]		
Manual Operator	Non-Locking Operator		
Operating Temperature Range	-18°C to 50°C 0°F to 120°F		
Operating Pressure Range	20-120 psi 138kPa to 827 kPa		



MAC 92 SERIES SHOWN

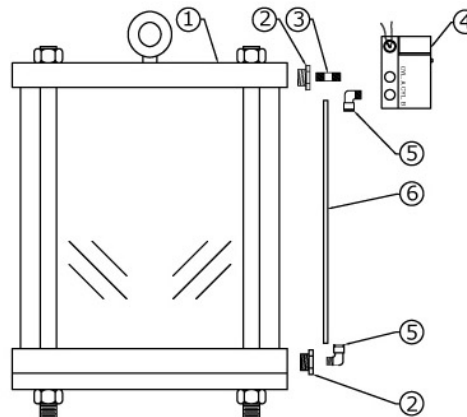
4 WAY SOLENOID VALVE CROSS-SECTION

SINGLE COIL SHOWN

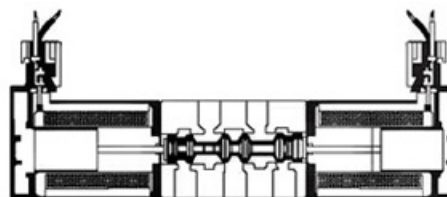


ITEM	ITEM DESCRIPTION
1	Pilot Air Accumulator
2	Integral Ground Wire
3	Sealed Solenoid Enclosure
4	Manual Operator
5	Optional Pilot Exhaust Tapped Port
6	Integral Muffler
7	Sealed Wiring Tuck Space
8	Bonded Flow Seal Spool
9	Internal Pilot Supply Ball Check
10	External Pilot Supply Port
11	Air / Spring Return

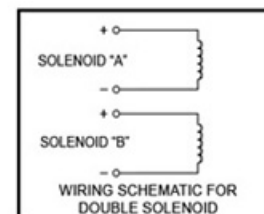
SOLENOID VALVE MOUNTING ASSEMBLY



ITEM	ITEM DESCRIPTION
1	Air Cylinder Actuator
2	3/4" X 1/2" Threaded Bushing
3	1/2" X 2 1/2" [65mm] Threaded Nipple
4	4-Way Solenoid Valve
5	1/2" CAMOZZI Swivel Joint Push Fit Below
6	1/2" or 12mm Polyurethane Tube



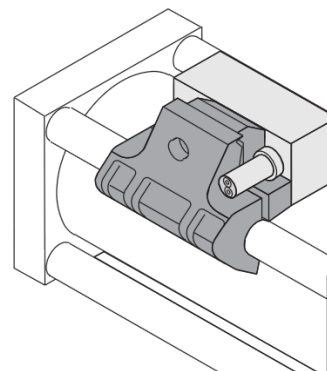
CONVENTIONAL DOUBLE SOLENOID



TECHNEQUIP™ KNIFE GATE VALVE OPTIONS: LSC REED SWITCH

Switch Specifications

Manufacturer: Part #	Canfield: 710-000-004
Type	2-Wire Reed
Output Function	Normally Open
Operating Voltage	5-240V AC/DC, 50/60 Hz
Switching Power	30 Watts max.
Continuous Current	1 Amp max., .005 Amps min.
Response Sensitivity	85 Gauss min.
Max. Operating Frequency	500 Hz
Voltage Drop	3 V
Hysteresis	6 AT min., 10 AT max.
Enclosure Rating	Nema 6, IP67
Shock and Vibration Stress	30g, 11ms, 20g, (10 - 55 Hz)
Operating Temperature Range	-20°C to 80°C (-4°F to 176°F)
Housing Material	Ultem and Nylon
Supplied Lead Length	2.7m (9ft.)
Approvals	CSA, CE
Indicator Lamp	LED w/ closed contact



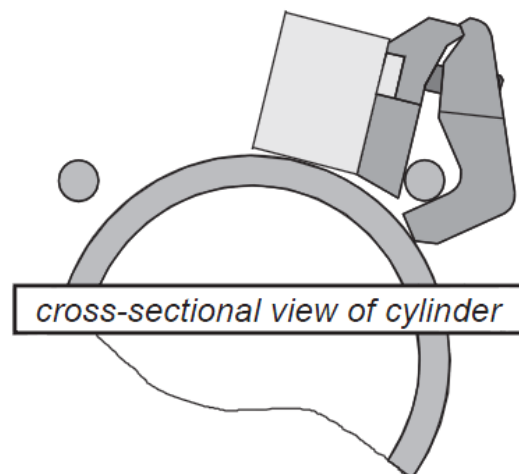
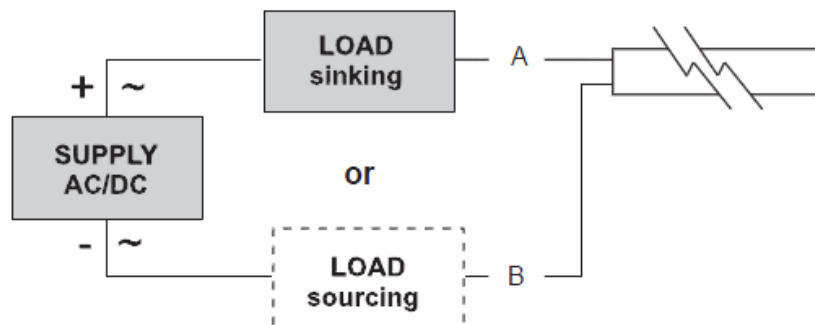
Wiring Diagram:

Installation Instructions

1. Connect Reed Switch to the cylinder as shown below, according to proper clamp style.
Hand tighten clamp only, allowing adjustment of sensor position on cylinder.
2. Connect wiring as per enclosed diagram.
3. While operating cylinder, adjust sensor to desired position. Firmly secure clamp assembly, once desired results are achieved.

Installation Tips

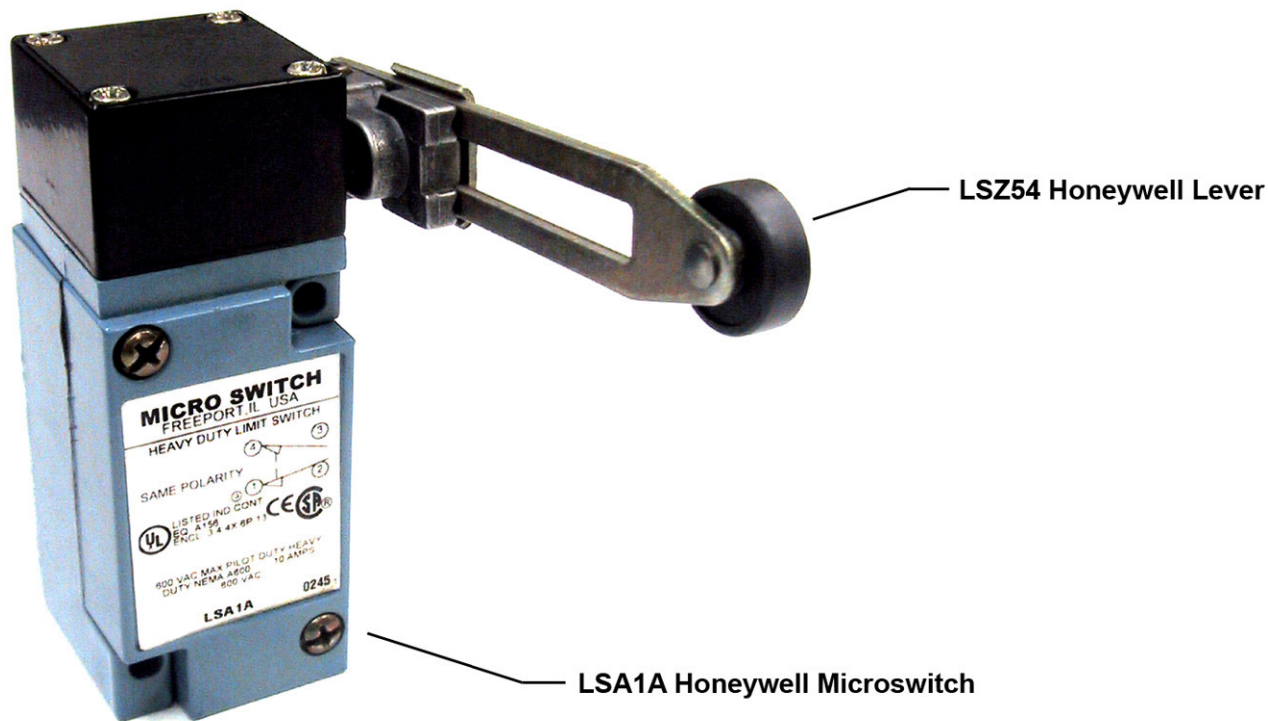
1. Current & voltage demands of the load must NOT exceed the current & voltage ratings of the selected switch (shown on the enclosed wiring diagram). Failure to use proper load will ruin the switch. For DC voltages, always observe polarity.
2. Two wire versions can NOT be connected directly across the power supply without a series load. Failure to use a series load will damage the switch and possibly the power supply.
3. Never test switch with a filament light bulb as a load. Severe inrush currents will impair the switch or cause premature failure.
4. There are three types of loads: Resistive (PC or PLC), Capacitive (long wire runs), Inductive (solenoids)
5. The shorter the wire runs, the lower the capacitive load and the longer the switch life.
6. Always keep the area around the switch clean and free from potentially magnetic field-carrying debris. The switches actuate on magnetic fields produced from the cylinder position. Stray magnetism can give unwanted switch actuation or change the switch point.
7. When using the switch to actuate a solenoid, always use a surge suppression version and/or Canfield MPC solenoid valve surge suppression connector. Without surge suppression, large inductive spikes can severely limit switch life expectancy.
8. Use the switch to indicate end of physical stroke. Do not rely on switch alone to stop cylinder travel.
9. Be sure the sensing area of the switch is installed completely against the cylinder wall.
10. Some Reed and Electronic switches are equipped with indicator lights. Their light always depicts the on state of the switch. On these versions, the two wire hook-up necessitates a minimum load current rating which must be enough to light the LED (@ 0.005 Amps). Three wire versions take no minimum load current rating to light the LED.



Switching Mounting

The one-piece switch bracket mounts directly on the cylinders' tie rods. Start with the limit switches at bottom and top of tie rod. Move switches towards center of cylinder until switch is activated and desired output is achieved.

TECHNEQUIP™ KNIFE GATE VALVE OPTIONS: LSB MICRO SWITCHES



SPECIFICATIONS	
Operating Force	0.45 Nm [4in.lb] max.
Pre-travel (P.T.)	15° max.
Over-travel (O.T.)	60° min.
Differential Travel (D.T.)	5° max.
Actuator	Side Rotary
Circuitry	1NC 1NO Single-Pole Double-Throw, Snap-Action, Double Break
Ampere Rating	10 A (Thermal)
Supply Voltage	600 VAC and 250 VDC max.
Housing Material	Zinc Die-Cast
Terminal Type	1/2"-14 NPT conduit
Housing Type	HDLS Plug-in
Sealing	NEMA 3, 4, 4X, 6P, 13
Operating Temperature Range	-12°C to 121°C [10°F to 250°F]
Approvals	UL Listed, CSA certified, CE certified

TECHNEQUIP™ KNIFE GATE VALVE

OPTIONS: GO LEVERLESS PROXIMITY SWITCHES



TOPWORX MODEL #:73-13528-A2

SPECIFICATIONS	
Thread Size	5/8" - 18 UNF
Approvals	UL General Purpose (standard) CSA (must be specified at time of order)
Enclosure Rating	Nema 4, 4X, 6, 6P, 7 & 9 IP65, 67 & 68
Repeatability	0.002" [0.05mm]
Response Time	8 milliseconds
Differential	Approx. 0.02" [0.51mm]
Operating Temperature	-40°F to 221°F [-40°C to 105°C]
Contact Material	Palladium silver w/ saw tooth surface
Contact Form	Single Pole Double Throw (Form C)
Ratings	4A @ 120 VAC 2A @ 240 VAC 3A @ 24 VDC
Target Material	Ferrous Steel
Sensing Range	0.100" [3mm] 0.20" [5mm] w/AMP3 magnet
Conduit Outlet	1/2" NPT
Enclosure Material	303 Stainless Steel
Lead Connection	Black – Common Blue – Normally Open Red – Normally Closed
Lead Dimensions	Insulated 18 gauge 36" [914mm] length

TECHNEQUIP™ KNIFE GATE VALVE

OPTIONS: GO1 LEVERLESS PROXIMITY SWITCHES

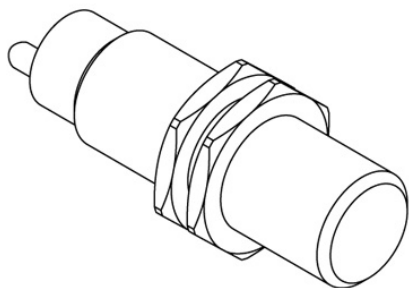


TOPWORX MODEL #: 81-20528-A3

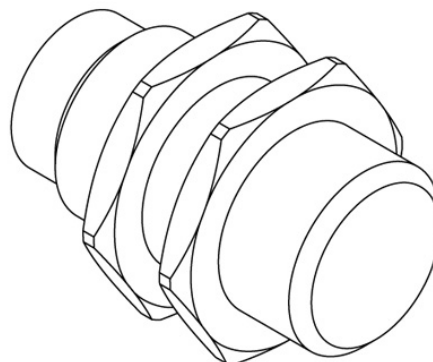
SPECIFICATIONS	
Mounting Hole Size	(2) 0.21" [5.2mm]
Dimensions	1-1/2" [38mm] Square x 4-9/16
Approvals	UL General Purpose (standard) CSA (must be specified at time of order)
Enclosure Rating	Nema 4, 4X, 6, 6P, 7 & 9 IP65, 67 & 68
Repeatability	0.002" [0.05mm]
Response Time	8 milliseconds
Differential	Approx. 0.25" [6mm]
Operating Temperature	-58°F to 221°F [-50°C to 105°C]
Contact Material	Silver Cadmium Oxide, Gold Flashed
Contact Form	Double Pole Double Throw (DPDT)
Ratings	5A @ 240VAC 10A @ 120 VAC 3A @ 24 VDC
Target Material	Ferrous Steel
Sensing Range	0.25" [6mm]
Conduit Outlet	1/2" NPT
Enclosure Material	Stainless Steel
Lead Connection	Black & Orange – Common 1 & 2 Blue & Black/White– Normally Open 1 & 2 Red & White – Normally Closed 1 & 2 Green - GND
Lead Dimensions	Insulated 18 gauge 72" [1829mm] length

TECHNEQUIP™ KNIFE GATE VALVE

OPTIONS: LST INDUCTIVE PROXIMITY SWITCHES



2" to 16" [50mm to 400mm]



18" to 36" [450mm to 900mm]

Valve Size	2" to 16" [50mm to 400mm]	18" to 36" [450mm to 900mm]
Manufacturer	Telemecanique	Telemecanique
Model Number	XS618B1MAL2	XS630B1MAL2
Switch Type	Inductive	Inductive
Thread Type	M18 x 1	M30 x 1.5
Repeatability	0.008 [0.20mm]	0.014" [0.36mm]
Response Time	0.5 milliseconds	0.5 milliseconds
Differential	0.04" [1mm]	0.07" [1.78mm]
Operating Temperature	-13°F to 158°F [-25°C to 70°C]	-13°F to 158°F [-25°C to 70°C]
Contact Material	Silicon	Silicon
Contact Form	Single Pole Single Throw (SPST), Normally Open	Single Pole Single Throw (SPST), Normally Open
Voltage Range	24-240 VAC 24-210 VDC	24-240 VAC 24-210 VDC
Current Limit	AC: 5 to 300mA DC: 5 to 200mA	AC: 5 to 300mA DC: 5 to 200mA
Voltage Drop	5.5 V	5.5 V
Leakage Current	0.8mA	0.8mA
Maximum Operating Frequency	AC: 25 Hz DC: 1000 Hz	AC: 25 Hz DC: 500 Hz
Target Material	Ferrous	Ferrous
Sensing Range	0.25" [6.4mm]	0.47" [12mm]
Conduit Outlet	None	None
Enclosure Material	Nickel Plate Brass	Nickel Plate Brass
Lead Connection	Blue – NO Brown - Common	Blue – NO Brown - Common
Lead Dimensions	79" [2000mm]	79" [2000mm]
Enclosure Rating	Nema 3, 4X, 6P, 12, 13 IP68	Nema 3, 4X, 6P, 12, 13 IP68
Agency Certification	UL, CSA, CE	UL, CSA, CE

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