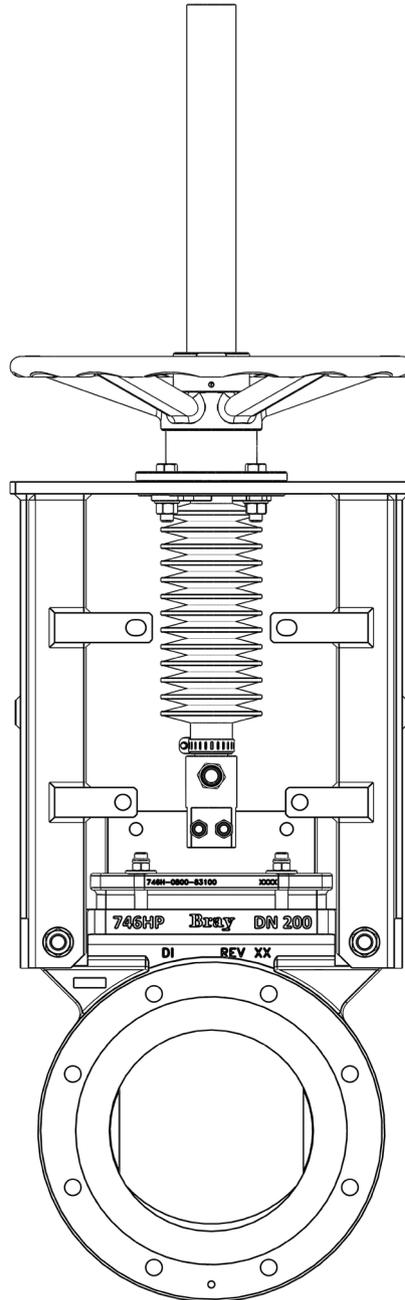


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**SERIES 746HP**

# **BIDIRECTIONAL POLYURETHANE LINED HIGH PERFORMANCE KNIFE GATE VALVES**

Installation, Operation, and Maintenance Manual



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**READ AND FOLLOW THESE INSTRUCTIONS CAREFULLY.  
SAVE THIS MANUAL FOR FUTURE USE.**

**0.0 DEFINITION OF TERMS**

All information within this manual is relevant to the safe operation and proper care of your Bray valve. Please understand the following examples of information used throughout this manual.

---

**0.0 IDENTIFIES CHAPTER HEADING**

**0.00** Identifies and explains sequential procedure to be performed.

**NOTE:** Provides important information related to a procedure.

**SAFETY STATEMENTS:** To prevent unwanted consequences. Standard symbols and classifications are:



**DANGER**

Indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.



**WARNING**

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



**CAUTION**

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.



**NOTICE**

Used without the safety alert symbol, indicates a potential situation which, if not avoided, may result in an undesirable result or state, including property damage.

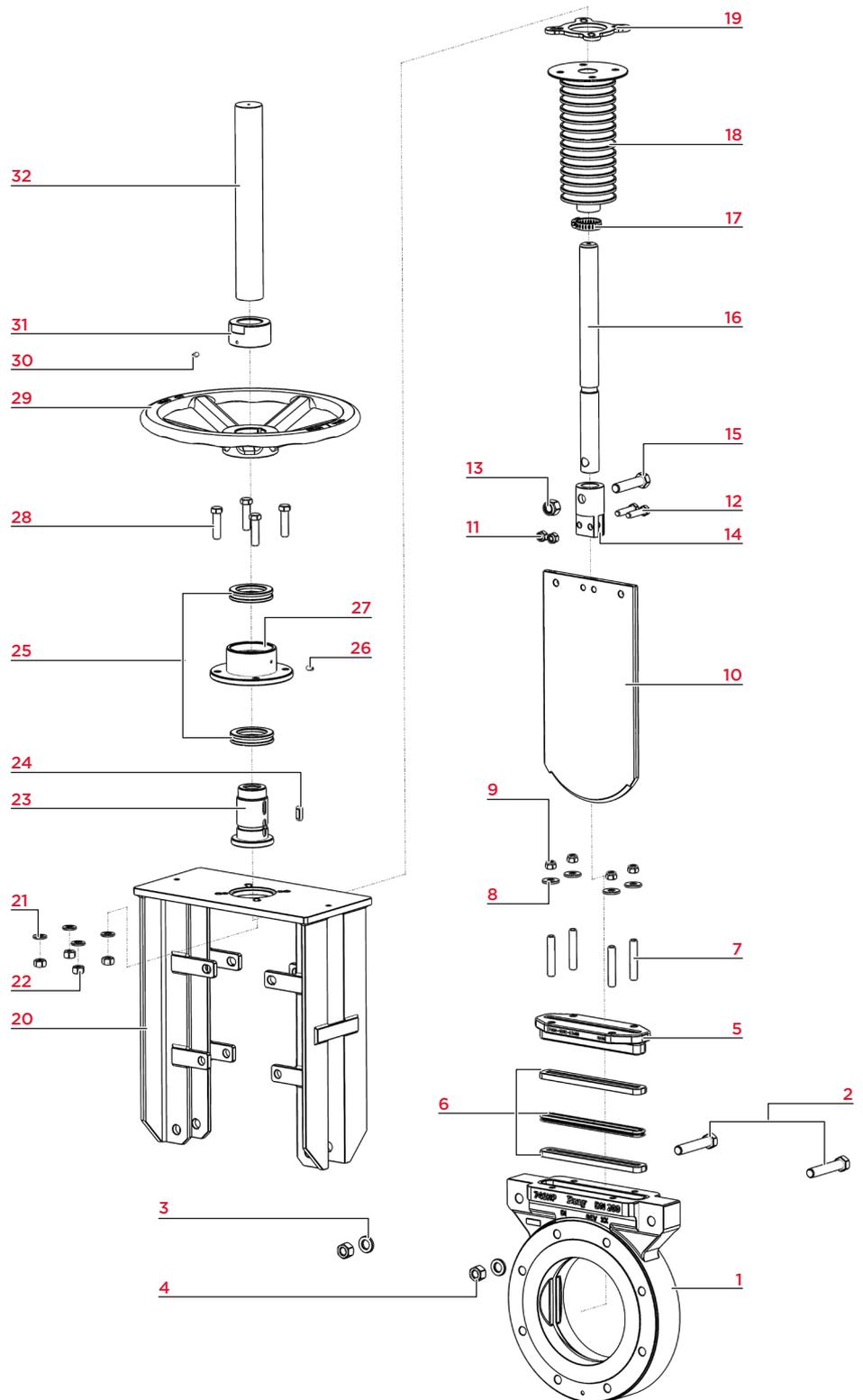
## 1.0 INTRODUCTION

- 1.1 The Bray knife gate Series 746HP's one-piece, cast body with molded-in lining offers rugged performance in applications ranging from general purpose to severe media handling.
- 1.2 Additional **product information** (such as application data, engineering specifications, actuator selection, etc.) is available from your local Bray distributor or sales representative, or online at **BRAY.COM**
- 1.3 For a detailed list of product certifications please contact your local Bray representative.

**2.0 PARTS IDENTIFICATION**

**Figure 1: Series 746HP Parts**

Item	Description
1	Body (Polyurethane Lined)
2	Tower Mounting Bolt
3	Tower Mounting Washer
4	Tower Mounting Nut
5	Gland
6	Gland Packing
7	Gland Mounting Stud
8	Gland Mounting Washer
9	Gland Mounting Nut
10	Gate
11	Clevis Gate Nut
12	Clevis Gate Bolt
13	Stem Clevis Nut
14	Clevis
15	Stem Clevis Bolt
16	Stem
17	Bellows Hose Clip
18	Bellows
19	Bellow Flange
20	Superstructure/Tower Assembly
21	Bellows Mounting Washer
22	Bellows Mounting Nut
23	Stem Nut
24	Key
25	Thrust Bearing
26	Grease Nipple
27	Handwheel Assembly Housing
28	Handwheel Assembly Housing Bolt
29	Handwheel
30	Grub Screws
31	Stem Lock Nut
32	Stem Guard



### 3.0 VALVE IDENTIFICATION

**3.1** All valves, actuators, or control products are provided with an identification tag that is unique to each device. The following table is a representation of information that may be included.

<b>Data</b>	<b>Label</b>	<b>Description</b>
Serial Number	SERIAL NUMBER	Unique serial number of valve.
Valve Size	SIZE	Valve size e.g. 6 in/150 mm.
Model	MODEL	Series number of the Valve
Flange Drill	FLG. DRILL	Flange Drill e.g. ASME B16.5 CL150.
Temperature Limits	MAX TEMP	Maximum temperature in °F/°C
Maximum Permissible Pressure	CWP	Maximum permissible pressure in psi/bar(g)
Body Material	BODY	Material grade of body e.g. CF8 (304) etc.
Gate Material	GATE	Material grade of gate e.g. 304 Stainless Steel.
Packing Material	PACKING	Material of packing e.g. PTFE w/EPDM Quad Seal.
Seat Material	SEAT	Material of seat e.g. Buna-N.

**4.0 HAZARD-FREE USE****NOTICE**

Failure to follow these procedures could affect product warranty.

- 4.1** This device left the factory in proper condition to be safely installed and operated in a hazard-free manner. The notes and warnings in this document must be observed by the user if this safe condition is to be maintained and hazard-free operation of the device assured.
- 4.2** Take all necessary precautions to prevent damage to the valve due to rough handling, impact, or improper storage. Do not use abrasive compounds to clean the valve, or scrape metal surfaces with any objects.
- 4.3** The control systems in which the valve is installed must have proper safeguards — to prevent injury to personnel, or damage to equipment — should failure of system components occur.
- 4.4** The upper limits of permitted pressure and temperature (depending on the housing and liner materials) must be observed. These limits are shown on the valve identification tag.
- 4.5** The valve must not be operated until the following documents have been observed:
- > Declaration on EU Directives
  - > IOM Manual (supplied with the product).

## 5.0 QUALIFIED PERSONNEL



### NOTICE

Failure to follow these procedures could affect product warranty.

**5.1** A **qualified person** (in terms of this document) is one who is familiar with the installation, commissioning, and operation of the device, and who has appropriate qualifications, such as:

- > Is trained in the operation and maintenance of electrical equipment and systems in accordance with established safety practices.
- > Is trained or authorized to energize, de-energize, ground, tag, and lock electrical circuits and equipment in accordance with established safety practices.
- > Is trained in the proper use and care of personal protective equipment (PPE) in accordance with established safety practices.
- > Is trained in the commissioning, operation, and maintenance of equipment in hazardous locations — in cases where the device is installed in a potentially explosive (hazardous) location.

## 6.0 HANDLING REQUIREMENTS

### 6.1 Packed Valves

Crates: Lifting and handling of the packed valves in crates will be carried out by a fork lift truck, by means of the appropriate fork hitches.

Cases: The lifting of packed valves in cases will be carried out in the lifting points and in the center of gravity position which has been marked. The transportation of all packed material must be carried out safely and following the local safety regulations.

### 6.2 Unpacked Valves

Lifting and handling of valves should be carried out by using appropriate means and observing the carrying limits. Handling must be carried out on pallets, protecting all machined surfaces to avoid any damage.

With large bore valves, rigging the load must be carried out by using the appropriate tools to prevent the valve from falling or moving during the lifting and handling.



#### **CAUTION**

For handling and/or lifting, the lifting equipment (fasteners, hooks, etc.) must be sized and selected while taking into account the product weight indicated in our packing list and/or delivery note. Lifting and handling must be performed only by qualified personnel.

Fasteners must be protected by plastic covers in sharp corner areas.

Caution must be taken during handling to avoid this equipment passing over workers, or over any other place where a possible fall could cause injury or damage. In all cases, local safety regulations must be respected.

## 7.0 STORAGE



### NOTICE

The packaging is designed to protect the valve only during shipping. If you are not installing the valve immediately after delivery, then you must store it according to these requirements.

Failure to follow these procedures could affect product warranty.

- 7.1** **Short-term storage** is defined as storage of valves to allow for project construction and will be installed within a relatively short amount of time (typically one to three months). During short-term storage, the following is required:
- 7.2** The preferred storage location is a clean, dry, protected warehouse. Do not expose the valve to temperature extremes.
- 7.3** End protectors shall remain on the valve ends to prevent the entrance of dirt, debris, or insects/wildlife.
- 7.4** Remain in the original shipping container with the original packaging materials. This packaging method will not protect valves that will be stored outside, uncovered, and unprotected.
- 7.5** Storage of valves in an open, uncovered area is permissible, but requires provisions for inclement weather. The product must be elevated from the ground on a pallet, a shelf, or other suitable surface, and must be covered with a secure, waterproof tarp.
- 7.6** **Do not** stack the valves on top of each other.
- 7.7** Manually actuated valves may be stored in the vertical or horizontal position. For air or hydraulic actuated valves, the preferred orientation is with the valve and cylinder in the vertical position. Access ports should be secured to prevent unauthorized entry and prevent contamination.

(continued)

- 7.8** **Long-term storage** is defined as storage of valves longer than three months. During long-term storage, the following is required:
- 7.9** The storage location shall be a clean, dry, protected warehouse. Do not expose the valve to temperature extremes.
- 7.10** End protectors shall remain on the valve ends to prevent the entrance of dirt, debris, or insects/wildlife.
- 7.11** Product shall remain in the original shipping container with the original packaging materials.
- 7.12** **Do not** stack the valves on top of each other.
- 7.13** Manually actuated valves may be stored in the vertical or horizontal position. For air or hydraulic actuated valves, the preferred orientation is with the valve and cylinder in the vertical position. Access ports should be secured to prevent unauthorized entry and prevent contamination.
- Valves and equipment containing elastomers, including O-rings, must be stored in a climate-controlled warehouse according to SAE-ARP5316D requiring:
- > The ambient relative humidity to be less than 75%.
  - > No exposure from direct ultraviolet or sunlight.
  - > Protection from ozone generating equipment or combustible gases and vapors.
  - > Storage at temperatures below 100°F (38°C), away from direct sources of heat.
  - > No exposure to ionizing radiation.
- Storage inspection — visual inspection shall be performed on a semi-annual basis and results recorded. Inspection, as a minimum, shall include reviewing the following:
- > Packaging.
  - > Flange covers.
  - > Dryness.
  - > Cleanliness.
- 7.14** Actuators to be stored with all cable/pneumatic entries plugged to prevent entry of foreign material.
- 7.15** Leave protective caps and covers on the product.

**8.0 INSTALLATION AND COMMISSIONING**



**WARNING**

Verify line is depressurized before installing, removing, or repairing a valve or operator.

Do not pressurize the line without an operator on the valve.



**CAUTION**

Never try to assemble a valve with misaligned pipe flanges



**CAUTION**

Support should be used for valves installed in vertical pipeline. Failure to do so can result in improper valve operation and/or valve failure.

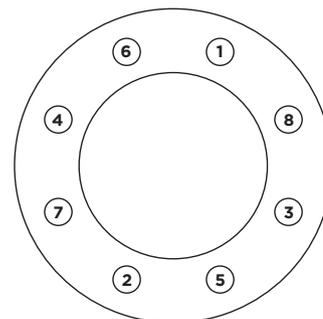
**8.1** Before installing the valve, check the valve body port for any foreign material that may have collected during shipping or storage.

- 8.1.1 These valves have a preferred flow direction. Refer to the identification mark on the valve.
- 8.1.2 This valve is designed with a built-in flange gasket function. Do not use additional flange gaskets.
- 8.1.3 Tighten bolts in a crisscross pattern for uniform tightness of flanges. See **Figure 2**.
- 8.1.4 Exceeding recommended torque values will reduce the overall valve performance and may permanently damage the seat or other parts. See **Table 1** for maximum flange bolt tightening torques for metallic and FRP flanges.
- 8.1.5 Gland packing is tightened to hold the specified pressure and tested for no leakage before shipping. However, this may require some adjustment at site due to loosening in transit, etc., if gland leak is observed, tighten the gland uniformly in a criss-cross pattern until the leakage stops.
- 8.1.6 Ensure the mating line flanges are properly aligned prior to valve installation.

**8.2 FLANGING DETAILS AND MOUNTING HARDWARE**

- 8.2.1 Series 746HP has a flanged style body and uses threaded bolts to mount between pipeline flanges.
- 8.2.2 The gate comes out through the chest when opening like all wafer knife gate and slurry valve designs, with tapped BLIND holes in the chest area.
- 8.2.3 The length of the bolt used with the chest holes must prevent bottoming while tightening. For the number of bolts necessary and bolt diameter, please refer to the applicable flange standard listed in **Table 2** and **Table 3** on the following page.

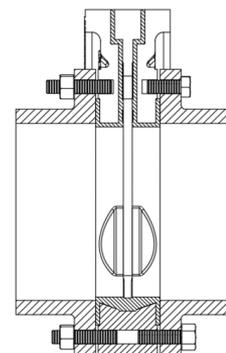
**Figure 2:** Bolt Tightening Sequence



**Table 1: Recommended Tightening Torque**

Valve Size		Tightening Torque for Standard Flange		Tightening Torque for FRP Flange	
NPS	DN	ft-lb	N-m	ft-lb	N-m
2	50	40	54	25	34
3	80	40	54	25	34
4	100	40	54	25	34
6	150	70	95	49	66
8	200	70	95	49	66
10	250	110	150	65	88
12	300	110	150	65	88
14	350	170	230	100	136
16	400	170	230	100	136
18	450	240	325	140	190
20	500	240	325	140	190
24	600	240	325	140	190
28	700	170	230	102	138
30	750	192	260	115	156
32	800	258	350	155	210
36	900	280	380	168	228

**Figure 3:** Flanged body installation options



# SERIES 746HP POLYURETHANE LINED HP KNIFE GATE VALVES

Installation, Operation, and Maintenance Manual

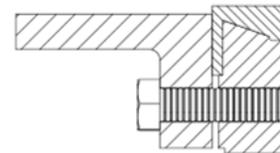


**Table 2: RECOMMENDED FASTENERS - ASME B16.5 Class 150 Flanges**

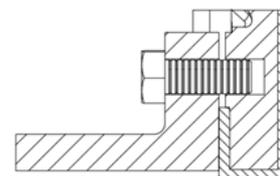
Valve Size		L5 (Figure 4)		L6 (Figure 5)			Washer* Quantity
NPS	DN	Bolt & Nut Size	Flange Bolt Length	Flange Bolt Qty	Chest Bolt Length	Chest Bolt Qty	
2	50	5/8-11	1.75	4	1.25	4	8
3	80	5/8-11	1.75	4	1.50	4	8
4	100	5/8-11	1.75	4	1.50	12	16
6	150	3/4-10	2.00	4	1.50	12	16
8	200	3/4-10	2.50	4	1.75	12	16
10	250	7/8-9	2.50	8	2.00	16	24
12	300	7/8-9	2.50	8	2.00	16	24
14	350	1-8	2.75	8	2.00	16	24
16	400	1-8	3.00	12	2.25	20	32
18	450	1 1/8-8	3.25	12	2.50	20	32
20	500	1 1/8-8	3.25	20	2.75	20	40
24	600	1 1/4-8	4.00	20	3.00	20	40
28	700	1 1/4-8	4.75	20	4.25	36	56
30	750	1 1/4-8	5.00	16	4.50	40	56
32	800	1 1/2-8	5.25	20	4.75	36	56
36	900	1 1/2-8	5.50	20	5.00	44	64

\* Washer Type B Wide

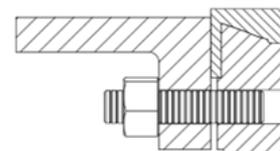
**Figure 4: L5 Flange Bolt**



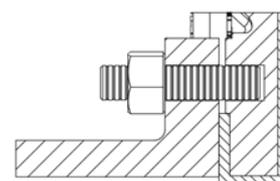
**Figure 5: L6 Chest Bolt**



**Figure 6: L7 Flange Stud**



**Figure 7: L8 Chest Stud**



**Table 3: RECOMMENDED FASTENERS - ASME B16.5 Class 150 Flanges**

Valve Size		L7 (Figure 6)		L8 (Figure 7)			Nut Qty	Washer* Qty
NPS	DN	Stud & Nut Size	Flange Stud Length	Flange Stud Qty	Chest Stud Length	Chest Stud Qty		
2	50	5/8-11	2.50	4	2.25	4	8	8
3	80	5/8-11	2.75	4	2.50	4	8	8
4	100	5/8-11	2.75	4	2.50	12	16	16
6	150	3/4-10	3.00	4	2.50	12	16	16
8	200	3/4-10	3.50	4	2.75	12	16	16
10	250	7/8-9	3.75	8	3.00	16	24	24
12	300	7/8-9	3.75	8	3.00	16	24	24
14	350	1-8	4.00	8	3.25	16	24	24
16	400	1-8	4.25	12	3.50	20	32	32
18	450	1 1/8-8	4.50	12	3.75	20	32	32
20	500	1 1/8-8	4.75	20	4.25	20	40	40
24	600	1 1/4-8	5.50	20	4.50	20	40	40
28	700	1 1/4-8	6.25	20	5.50	36	36	56
30	750	1 1/4-8	6.25	16	5.75	40	40	56
32	800	1 1/2-8	6.25	20	6.25	36	36	56
36	900	1 1/2-8	7.25	20	6.75	44	44	64

\* Washer Type B Wide

**8.3 COMMISSIONING**

- 8.3.1 Before the valve is put into regular use, stroke the valve to check for smooth operation.
- 8.3.2 For manually operated valves, closing and opening the valve once or twice is recommended.
- 8.3.3 For pneumatically operated valves with a double-acting cylinder, connect a closed airline to the upper actuator port and gradually increase the air supply pressure to the rated pressure on the nameplate to close the valve; repeat by connecting the airline to the other port to slowly stroke the valve back to open position. If movement with the rated air supply pressure is smooth, the valve is ready to be put into service. For valves with spring-return actuators, use the air port to stroke the valve in one direction and release air slowly to stroke by spring in the opposite direction.
- 8.3.4 Ensure that the valve is stroking fully between the **OPEN** and **CLOSED** indicators provided. Normal stroke lengths for the valves are listed below in **Table 4**.

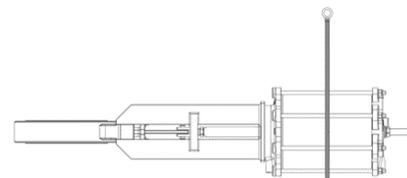
**Table 4:** STROKE LENGTH

<b>Size (NPS)</b>	2	3	4	6	8	10	12	14	16	18	20	24	28	30	32	36
<b>Stroke (in)</b>	2.0	3.1	4.0	6.0	8.0	10.0	12.0	13.2	15.3	17.2	19.3	23.2	27.3	29.1	30.7	33.5
<b>Size (DN)</b>	50	80	100	150	200	250	300	350	400	450	500	600	700	750	800	900
<b>Stroke (mm)</b>	50	80	102	152	203	254	305	335	388	438	490	590	690	740	780	850

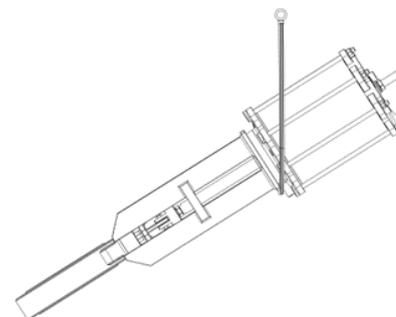
**8.4 MOUNTING ORIENTATION AND SUPPORTS**

- 8.4.1 Series 746HP valve may be mounted in piping in any orientation; however, where possible, a vertical mounting on horizontally laid out piping is preferable and recommended.
- 8.4.2 The valve superstructure is designed to provide rigid mounting and generally no additional supports are required for valves mounted in vertical orientation. Additional supports may be necessary where specifically recommended by Bray for valves with exceptionally tall actuator assemblies, etc.
- 8.4.3 Where valves are mounted in **orientations where the valve shaft is not vertical (horizontal, slanted)** additional supports are recommended for all valve sizes with pneumatic or other powered actuators.
- 8.4.4 Typical recommended supports are shown in **Figures 8 & 9**; for any assistance on other types of mounting requirements, please contact Bray.

**Figure 8:** Installation support for a Valve installed in Horizontal orientation



**Figure 9:** Installation support for a Valve installed in Horizontal orientation



## 9.0 OPERATION

- 9.0.1 Series 746HP is suitable for on-off service and not recommended for throttling application.
- 9.0.2 The valve closes by moving the gate which slides between the polyurethane liner, providing a bubble tight shutoff.
- 9.0.3 The valve is designed not to discharge process media to the environment.  
The bottom of the seat is flush eliminating trapped debris and slurry, allowing for leak-free closure.
- 9.0.4 The Polyurethane liner is chemically bonded to the valve body.
- 9.0.5 Gate is easily replaceable, and are available in a different material.

**10.0 ACTUATION AND TRAVEL STOPS**



**WARNING**

Verify line is depressurized before installing, removing, or repairing a valve or operator.

Do not pressurize the line without an operator on the valve.

**10.1** Series 746HP valves may be supplied with a variety of actuation options.

**10.2 MANUAL** - Direct or bevel gear with hand wheel / chain wheel

10.2.1 These actuators are designed to operate without any routine maintenance. In case the operation is found to require excessive rim pull than normal (about 30 kgf), standard lubricant grease can be injected using a hand-held grease gun at the nipples provided; typical location of the grease nipple is shown in the exploded view (24).

**10.3 PNEUMATIC** - Double-acting or spring return cylinder

10.3.1 Bray pneumatic actuators use the following port connections, unless specially ordered otherwise. Connections are listed below in **Table 5**.

**Table 5:** PORT CONNECTIONS

C80-C100	C150-C200	C250-C600	C800
1/4" NPT	1/2" NPT	3/4" NPT	1-1/2" NPT

10.3.2 Please use air supply as indicated in the tag plate/order documentation, using suitably sized air filter regulator; other relevant details of the actuators are given in **Table 6** below.

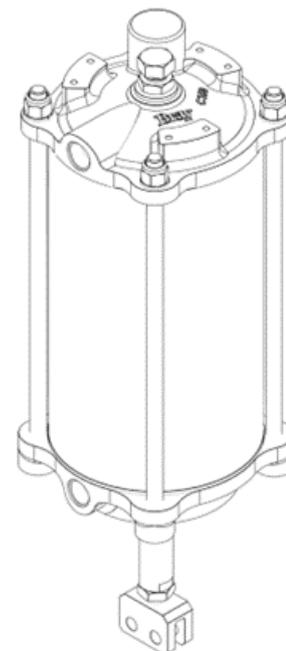
**Table 6:** AIR SUPPLY & TEMPERATURE

	Recommended	Typical Selection	Maximum Permissible
<b>Air Supply Pressure</b>	44 to 100 psi (3 to 7 bar)	73 psi (5 bar)	100psi (7bar)
<b>Maximum Ambient Temperature</b>	392°F (200°C) - Metal Cylinder w/Viton Seal 194°F (90°C) - Metal Cylinder w/Nitrile Seal 270°F (132°C) - FRP Cylinder w/Viton Seal 194°F (90°C) - FRP Cylinder w/Nitrile Seal		
<b>Minimum Ambient Temperature</b>	-4°F (-20°C)		

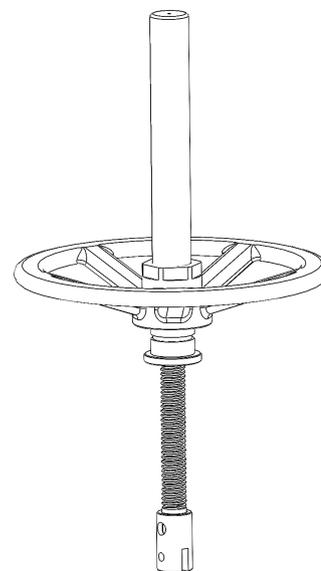
10.3.3 Bray actuators are also designed to provide long duration trouble-free service without any routine maintenance or lubrication. They are suitable for use with a lubricated or non-lubricated air supply. For constructional details and replacement of worn out parts, please refer to the “Bray Pneumatic Actuator Installation & Operation Manual.”

10.3.4 For actuators supplied by other vendors, please refer to the manufacturer manuals provided by Bray with the supply or the manufacturer’s website. Please contact Bray for any assistance required.

**Figure 10:** Cylinder Actuator



**Figure 11:** Manual Valve Stem



## 11.0 LOCKOUT

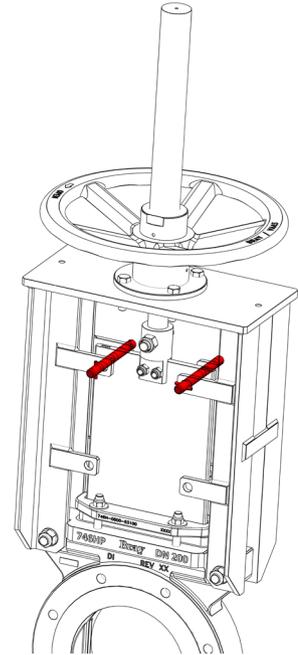
- 11.1 Lockouts are optional in Series 746HP valves.
- 11.2 If provided, the open-closed lockout brackets are designed to resist the normal valve operating thrust.
- 11.3 To assure complete lockout compliance, any actuated valve (Pneumatic or Hydraulic or Electric) must be placed in a “Zero energy state” by isolating all potential energy sources including electricity, operator supply air or hydraulic fluids.



### CAUTION

Valves supplied with spring to close or open have cylinders containing a mechanical spring which is compressed. In this case, the mechanical energy of the compressed spring cannot be placed in a ZERO ENERGY STATE. Take extreme care when inserting and removing the lockout pin. If the valve is actuated or the opposing pneumatic force is removed during the insertion process, the cylinder rod, gate and accompanying hardware will move and injury could occur.

**Figure 12:** Lockout pin through yoke and gate.



## 12.0 STANDARD MAINTENANCE



### **WARNING**

Verify line is depressurized before installing, removing, or repairing a valve or operator.

Do not pressurize the line without an operator on the valve.



### **WARNING**

After completing any alterations or maintenance procedures, the product must be tested to confirm performance requirements.



### **NOTICE**

Any modification or use of unauthorized parts voids all warranty considerations.



### **NOTICE**

Note assembly positions before removal.

- 12.0.1 Inspect the valve body and gate at a regular interval. Check for any signs of corrosion, components wear and/or damage caused by process media
- 12.0.2 Look for corrosion, galling or lack of lubrication in the valve stem, stem nut or extension stems. If the valve stem requires lubrication, utilize the grease fitting provided and pump standard bearing grease through the HW housing to lubricate the stem and stem nut assembly. Additional lubrication may be applied directly to stem or stem threads.

## 13.0 FIELD ADJUSTMENTS



### WARNING

Verify line is depressurized before installing, removing, or repairing a valve or operator.

Do not pressurize the line without an operator on the valve.

## 13.1 REPLACEMENT OF PARTS AND MODIFICATIONS

- 13.1.1 Parts listed in **Table 7** may wear out and require replacement during the normal life of the valve; they may be replaced on-site by the user with spare parts supplied by Bray.

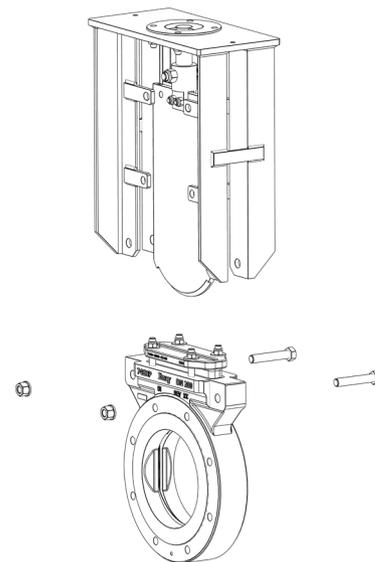
## 13.2 GATE REPLACEMENT

- 13.2.1
1. Relieve the line pressure and open the valve. Flush the line if necessary.
  2. Remove the cylinder port tubing and vent the air inside the cylinder if the valve with Pneumatic operated.
  3. Lock the gate in opened position using a suitable locking pin in the holes provided.
  4. If the valves are supplied with bellows, ensure stem is not rotated, as rotation will damage the bellows.
  5. Disassemble the super structure by removing the fasteners with body.
  6. Lift the damaged/old gate & superstructure from the body assembly using suitable sling strapped below the base plate of superstructure. An overhead hoist may be required for larger size valves.
  7. Lay the superstructure & old gate assembly in horizontal position & disconnect the stem/Piston rod from the gate by removing the clevis bolts & nuts.
  8. Remove the gland and packing and inspect the packing for suitability to reuse.
  9. Lubricate the new gate and install it in body carefully.
  10. Assemble the packing back into the packing chamber.
  11. Re-attach the gland onto the valve body.
  12. Tighten the gland fasteners.
  13. Mount the actuator and super structure on the valve.
  14. Hand tighten the body bolting to the superstructure.
  15. Tighten the actuator bolting.
  16. Connect the gate and stem by clevis bolts and nuts.
  17. Lower the stem by rotating the hand wheel clockwise (or by applying air gradually for cylinder operated valves) while holding the stem and fasten the stem to the gate with bolts and nuts.
  18. Operate the valve for a few cycles and then tighten the body to superstructure bolting as per the recommended torque.
  19. Adjust and ensure the gate positions from the of the body according to **Table 8**.
- 13.2.2 Changing or repair of valve parts other than Gate and packing by users is not recommended; please contact Bray for any further advice and assistance.

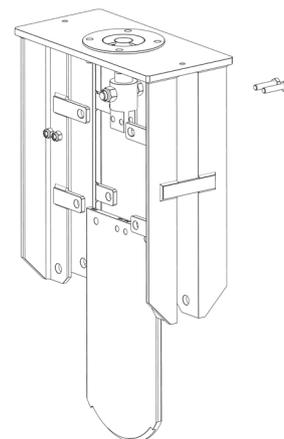
**Table 7: Replacement Parts**

Part #	Description	Qty
10	Gate	1
6	Gland Packing	1

**Figure 13: Gate Disassembly**



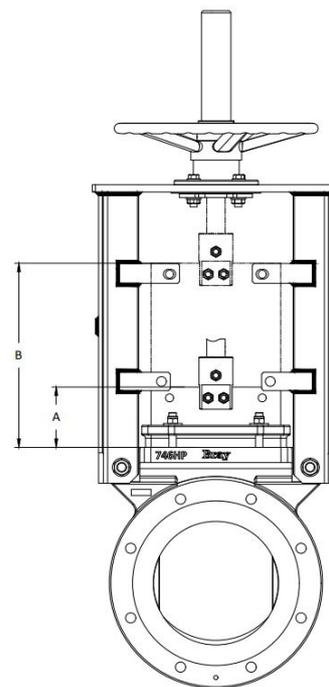
**Figure 14: Gate Removal**



**13.3 PACKING REPLACEMENT**

- 13.3.1
  1. Relieve the line pressure and close the valve. Flush the line if necessary.
  2. Remove the cylinder port tubing and vent the air inside the cylinder if the valve is Pneumatically operated.
  3. Ensure the valve is fully closed.
  4. If the valves are supplied with bellows, ensure stem is not rotated, as rotation will damage the bellows.
  5. Loosen the bolts on tower and remove from valve body.
  6. Remove the gland fasteners and gland.
  7. Remove the old packing (6) from the packing chamber one layer at a time, using a long thin tool to pry it out.
  8. Install the new packing one at a time firmly and evenly into the chamber before installing next layer; the end each layer should meet but not overlap.
  9. Install the gland and its fasteners. Ensure the gap between the gland and gate is uniform all around.
  10. Tighten the gland nuts finger tight plus one-half turn.
  11. Mount the actuator and super structure along with the valve.
  12. Lower the stem by rotating the hand wheel clockwise or apply air slightly for cylinder operated valves.
  13. Ensure the gate positions from top of the body according to **Table 8** as appropriate.

**Figure 15:** Stroke Length A & B



**Table 8:** STROKE LENGTH

VALVE SIZE		A (in)	B(in)	A(mm)	B(mm)
NPS	DN				
2	50	2.40	4.37	61	111
3	80	2.64	5.79	67	147
4	100	2.80	6.81	71	173
6	150	3.31	9.29	84	236
8	200	3.90	11.89	99	302
10	250	3.86	13.86	98	352
12	300	4.17	16.18	106	411
14	350	4.37	17.56	111	446
16	400	5.35	20.63	136	524
18	450	5.94	23.19	151	589
20	500	5.59	24.88	142	632
24	600	6.30	29.53	160	750
28	700	8.46	35.63	215	905
30	750	8.46	37.59	215	955
32	800	9.44	40.15	240	1020
36	900	9.44	42.91	240	1090

**14.0 ACTUATOR CONVERSION**

14.1 Most Bray valve models can be changed from manual actuation to pneumatic actuation with Bray Pneumatic actuators in the field without additional parts

14.2 To convert a manually operated valve to pneumatic, please follow steps below:

**REMOVE THE HANDWHEEL ACTUATOR ASSEMBLY**

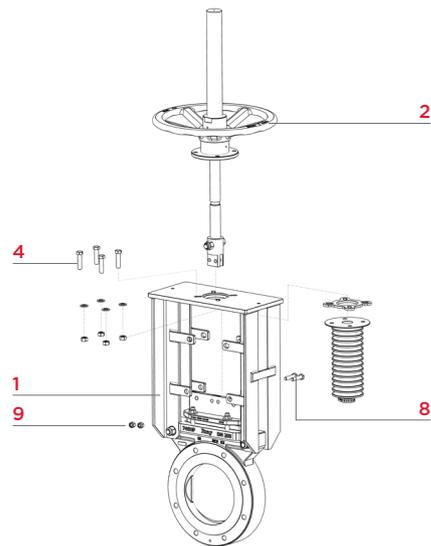
- 14.2.1 Relieve the line pressure and close the valve. Flush the line if necessary.
- 14.2.2 Disconnect the stem from the gate by removing the clevis bolt and nut. **(Figure 16: Items 8 & 9)**
- 14.2.3 Loosen the bellows hose clip.
- 14.2.4 Remove the hand wheel assembly fasteners in the super structure. **(Figure 16: Item 4)**
- 14.2.5 Remove the hand wheel assembly, the stem, and the bellows, hose clip and bellows flange.

Finally, remove the clevis from the gate.

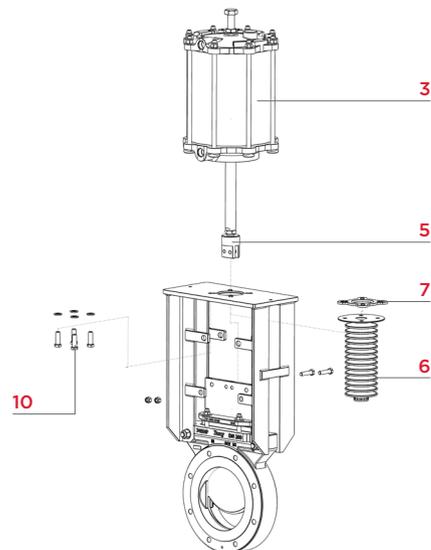
**14.2.6 INSTALL THE PNEUMATIC ACTUATOR ASSEMBLY**

- 14.2.7 Remove the clevis from the piston rod in the actuator assembly **(Figure 17: Item 5)**
- 14.2.8 Place the actuator on the super structure and fasten loosely using the bellows flange. **(Figure 17: Item 3)**
- 14.2.9 Give air supply to actuator and extend the piston rod towards closing position.
- 14.2.10 Insert the bellows and bellow flange in the piston rod. Remove the bolts used for actuator mounting with the super structure
- 14.2.11 Insert the actuator mounting bolts through the bellow flange and hand tighten. Keep the assembly loose and floating.
- 14.2.12 Attach the clevis with actuator piston rod, mark the clevis position and adjust accordingly. **(Table 10)**
- 14.2.13 Afterwards adjust the Clevis by half rotation (180 deg) counter clockwise to provide additional thrust or load on the PU seating surface.
- 14.2.14 Apply the air slightly to the actuator to lower the piston rod and fasten the gate.
- 14.2.15 Fasten the clevis bolts and nuts and tighten the lock nut.

**Figure 16:** Handwheel Actuator Conversion



**Figure 17:** Pneumatic Actuator Conversion



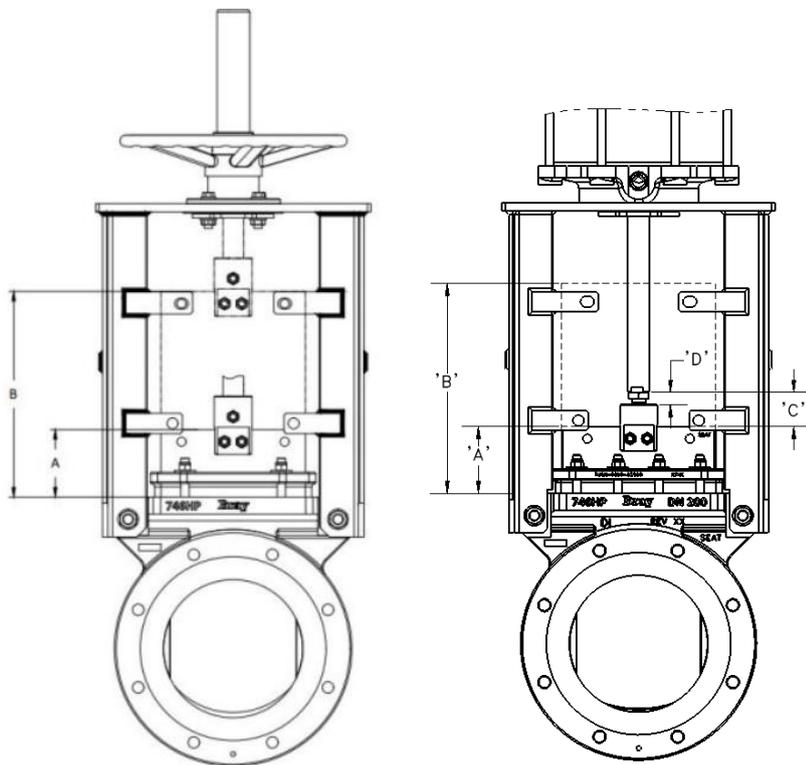
**Table 9:** PARTS

Item No.	Part Name
1	Superstructure Assembly
2	Handwheel Assembly
3	Pneumatic Operator
4	Handwheel Assembly Fasteners
5	Screwed Clevis
6	Bellows
7	Bellows Flange
8	Clevis Bolt
9	Clevis Nut
10	Actuator Mounting Bolts

**OPEN / CLOSE STROKE ADJUSTMENT**

- 14.2.16 In the closed position, adjust and ensure the gate positions from the top of the body. (**Table 10**)
- 14.2.17 In the open position the adjusting set screw (or stroke bolt) in the cylinder acts as the cylinder stroke adjustment. Adjust this adjusting screw (or stroke bolt) to set the gate open position. (**Table 10**)
- 14.2.18 Ensure the whole assembly is aligned correctly.
- 14.2.19 Give air supply to actuator assembly and ensure smooth operation of the valve.
- 14.2.20 Verify the seating of the gate using a 0.002” or 0.05mm feeler gauge at the bottom; the feeler gauge shall not enter at any point.
- 14.2.21 Secure the bellows to the stem using the hose clip.
- 14.2.22 Tighten hose clip to keep the bellows fastened with piston rod.
- 14.2.23 Fully tighten the actuator mounting bolts. (**Figure 17: Item 10**)

**Figure 18:** Dimensions of gate open - close positions



**Table 10:** Dimensions of gate open - close positions in **Figure 18**

Size		A	B	C	D
in	mm				
2	50	61	111	29	12
3	80	67	147	29	14
4	100	71	173	43	19
6	150	84	236	47	20
8	200	99	302	50	18
10	250	98	352	51	20
12	300	106	411	42	20
14	350	111	446	50	28
16	400	136	524	52	27
18	450	151	589	65	25
20	500	142	632	76	31
24	600	160	750	68	31
				(for C24)	(for C24)

**15.0 TROUBLESHOOTING**

<b>TROUBLE</b>	<b>POSSIBLE CAUSE</b>	<b>SOLUTION</b>
Media oozing out of gland packing	Packing deteriorated	Replace Packing
High torque during valve seating and unseating	Misalignment between gate and stem	a) Remove the clevis fasteners b) Loosen the superstructure fasteners c) Adjust the alignment of the stem and gate d) Connect the clevis fasteners e) Retighten superstructure fasten
	Packing is not tightened properly	Adjust gland nuts
Valve jerks during open and close	Superstructure fasteners loosen	Tighten the super structure fasteners
	Insufficient air supply	Pneumatic operated valves: Increase supply pressure
	Solenoid valve dust accumulation	Remove and clean solenoid valve
	Piston rod seal damaged	Replace seal

**NOTES:**

- > Bray does not accept any responsibility for the product if wear parts not tested and approved by Bray are used.
- > Bray does not accept any responsibility for the product if maintenance instructions are not followed during maintenance.

## **16.0 RETURN MERCHANDISE AUTHORIZATION**

**16.1** All products that are returned require a Return Merchandise Authorization (RMA). Contact a Bray representative to obtain authorization and shipping instructions.

**16.2** The following information must be provided when submitting RMA.

- > Serial number
- > Part number
- > Month and year of manufacture
- > Actuator specifics
- > Application
- > Media
- > Operating temperature
- > Operating pressure
- > Total estimated cycles (since last installation or repair)

**NOTE:** Product information is provided on identification tag attached to device.

### **NOTICE**

Materials must be cleaned and sanitized prior to return. MSDS sheets and Declaration of Decontamination are required.

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**BRAY INTERNATIONAL, INC.**

13333 Westland East Blvd.

Houston, Texas 77041

Tel: +1.281.894.5454

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