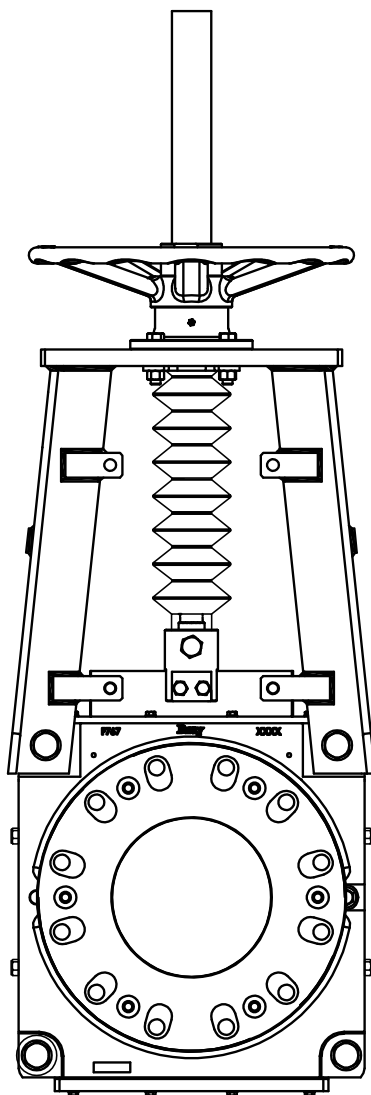

SERIES 767

BIDIRECTIONAL HIGH PRESSURE KNIFE GATE VALVES - BRAY SLURRYSHIELD®

Installation, Operation, and Maintenance Manual



Bray®

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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.



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, may 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



WARNING

Do not exceed the maximum pressure rating of the valve at any time during in operation.

1.1

Series 767 is a bidirectional high pressure slurry valve, designed for demanding high pressure slurry applications. Twin elastomer seats and push-through gate design facilitate self-cleaning and prevent media build up.

The cast WCB body is offered in a two-piece bolted wafer style. When fully open, the valve bore, offers no resistance to line media.

For all pressure and temperature capabilities of the valve, please refer to relevant Bray brochures.

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**

For a detailed list of product certifications please contact your local Bray representative.

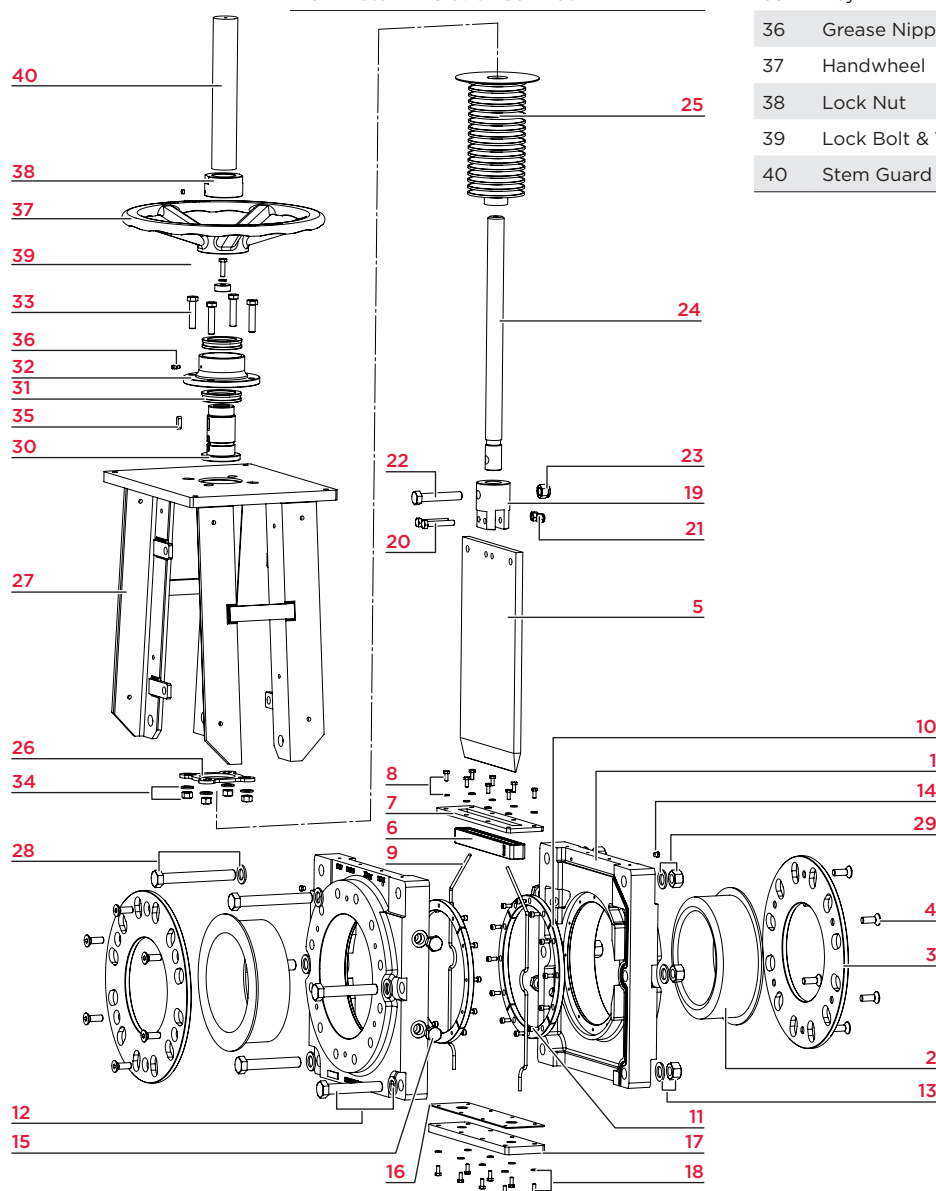
2.0 PARTS IDENTIFICATION

Figure 1: Series 767 Exploded View

Item	Description
1	Body
2	Seat
3	Seat Retainer
4	Seat Retainer Screws
5	Gate
6	Secondary Seal
7	Gland Plate
8	Gland Plate Fasteners & Washers
9	Body O-Ring
10	Gate Support
11	Gate Support Mounting Screws

Item	Description
12	Body Mounting Bolt & Washer
13	Body Mounting Nut & Washer
14	Plug - Grease Injection Port
15	Plug- Flushing Port
16	Drain Plate Gasket (optional)
17	Drain Plate (optional)
18	Drain Plate Fasteners & Washers (opt.)
19	Clevis
20	Gate - Clevis Bolt
21	Gate - Clevis Lock Nut
22	Stem - Clevis Bolt
23	Stem - Clevis Lock Nut

Item	Description
24	Stem
25	Bellows
26	Bellows Flange
27	Superstructure/Tower Assembly
28	Tower Mounting Bolts
29	Tower Mounting Nuts & Washers
30	Stem Nut
31	Thrust Bearings
32	Handwheel Assembly Housing
33	Housing Mounting Bolts & Washers
34	Housing Mounting Nuts & Washers
35	Key
36	Grease Nipple
37	Handwheel
38	Lock Nut
39	Lock Bolt & Washer
40	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.

Data	Label	Description
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 SAFETY INFORMATION

NOTICE

Failure to follow these procedures could affect product warranty.



WARNING

- > The valve must only be installed, commissioned, operated, and repaired by qualified personnel.
- > The device generates a large mechanical force during normal operation.
- > All installation, commissioning, operation, and maintenance must be performed under strict observation of all applicable codes, standards, and safety regulations.
- > Observe all applicable safety regulations for valves installed in potentially explosive (hazardous) locations.



WARNING

This valve will discharge media during cycling. This is normal operation and required to maintain a fully functioning valve. Do not install this valve over walkways, roadways, electrical or other equipment without the use of a discharge containment system.

5.0 HAZARD-FREE USE

NOTICE

Failure to follow these procedures could affect product warranty.

- 5.1** 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.
- 5.2** 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.
- 5.3** 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.
- 5.4** 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.
- 5.5** The valve must not be operated until the following documents have been observed:
 - > Declaration on EU Directives
 - > IOM Manual (supplied with the product).

6.0 QUALIFIED PERSONNEL

NOTICE

Failure to follow these procedures could affect product warranty.

6.1 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:

- 6.1.1 > Is trained in the operation and maintenance of electrical equipment and systems in accordance with established safety practices.
- 6.1.2 > Is trained or authorized to energize, de-energize, ground, tag, and lock electrical circuits and equipment in accordance with established safety practices.
- 6.1.3 > Is trained in the proper use and care of personal protective equipment (PPE) in accordance with established safety practices.
- 6.1.4 > 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.

7.0 HANDLING REQUIREMENTS

7.1 Packed Valves

- 7.1.1 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.
- 7.1.2 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.

7.2 Unpacked Valves

- 7.2.1 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.
- 7.2.2 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.

8.0 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.

8.1 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:

- 8.1.1 The preferred storage location is a clean, dry, protected warehouse. Do not expose the valve to temperature extremes.
- 8.1.2 End protectors shall remain on the valve ends to prevent the entrance of dirt, debris, or insects/wildlife.
- 8.1.3 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.
- 8.1.4 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.
- 8.1.5 **Do not** stack the valves on top of each other.
- 8.1.6 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)

8.2 Long-term storage is defined as storage of valves longer than three months. During long-term storage, the following is required:

- 8.2.1 The storage location shall be a clean, dry, protected warehouse. Do not expose the valve to temperature extremes.
- 8.2.2 End protectors shall remain on the valve ends to prevent the entrance of dirt, debris, or insects/wildlife.
- 8.2.3 Product shall remain in the original shipping container with the original packaging materials.
- 8.2.4 **Do not** stack the valves on top of each other.
- 8.2.5 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.
- 8.2.6 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.
- 8.2.7 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.

8.3 Actuators to be stored with all cable/pneumatic entries plugged to prevent entry of foreign material.

8.4 **Do not** stack the valves on top of each other.

8.5 Leave protective caps and covers on the product.

9.0 INSTALLATION AND COMMISSIONING



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

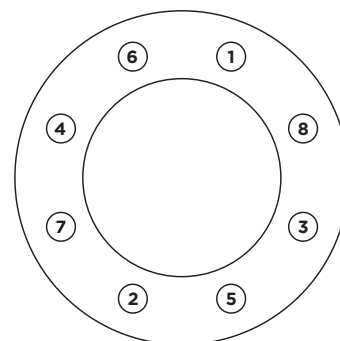
Do not pressurize the line without an operator on the valve.



CAUTION

When used with other than flat faced flanges or when the pipe protrudes past the flange face, appropriate Seat retainer ring must be used. Failure to use seat retainer ring may result in premature failure of the valve sleeves due to excessive compression of elastomer sleeves.

Figure 2: Bolt Tightening Sequence



- 9.1** Before installing the valve, check the valve body port for any foreign material that may have collected during shipping or storage.
- 9.1.1 Seats require lubrication before installation; please refer to section “Lubrication” (page 20).
- 9.1.2 These valves can be mounted with flow in either direction.
- 9.1.3 The retainers of the valve are elastomer coated which functions as the gasket for installation into the pipeline.
- 9.1.4 Tighten bolts in a crisscross pattern for uniform tightness of flanges. See **Figure 2** for alternating sequence.
- 9.1.5 Exceeding recommended torque values will reduce the overall valve performance and may permanently damage the seat or other parts. See **Table 1** on the following page for maximum flange bolt tightening torques for metallic and FRP flanges.
- 9.1.6 Series 767 is designed for installation in conventional bolted flange connections. The pipeline companion flanges should be raised or flat type to ensure full sleeve support and a continuous unvarying ID., if slip-on flanges are used, the pipe should be cut square & welded in position with the pipe end to match evenly with the flange face.
- 9.1.7 Ensure the mating line flanges are properly aligned prior to installation.

(continued)

9.2 FLANGING DETAILS AND MOUNTING HARDWARE

- 9.2.1 Series 767 is a flanged valve & uses threaded bolts to mount between pipeline flanges.
- 9.2.2 Please refer to the tag plate the pipeline flange the valve is designed to mate with and select mounting hardware accordingly.
- 9.2.3 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 1** below.

Figure 3: Flanged Style Body

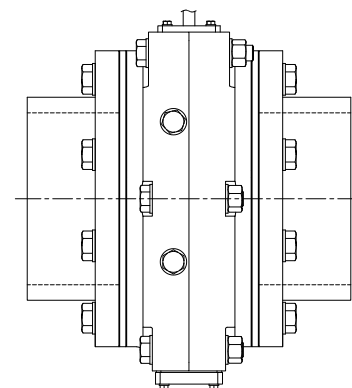


Table 1: RECOMMENDED TIGHTENING TORQUE

Valve Size		Total Number of holes	Bolt/Stud size (S)	Flange thickness (F) mm	Raised face height (R) mm	Flange hole depth including Retainer flange thickness (B)		Tightening Torque for Standard flange		Tightening Torque for FRP flange	
NPS	DN					in	mm	ft-lb	N-m	ft-lb	N-m
3	80	Refer to the Flange Standard				1.38	35	70	95	44	60
4	100					1.38	35	70	95	44	60
6	150					1.57	40	70	95	44	60
8	200					1.57	40	115	155	72	98
10	250					1.57	40	170	230	102	138
12	300					1.77	45	240	325	144	195
14	350					1.77	45	240	325	144	195
16	400					1.77	45	350	470	210	282
18	450					2.17	55	350	470	210	282
20	500					2.36	60	350	470	210	282
24	600					2.36	60	620	880	372	528

With F= Flange thickness, R=Raised face height and B=Blind hole depth. Bolt/stud lengths: Blind hole tapped bolt length = F+R+B

9.3 COMMISSIONING

- 9.3.1 Before the valve is put into regular use, stroke the valve to check for smooth operation.
- 9.3.2 For manually operated valves, closing and opening the valve once or twice is recommended

(continued)

- 9.3.3 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.
- 9.3.4 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.
- 9.3.5 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 2**.

Table 2: STROKE LENGTH

Size (DN)	80	100	150	200	250	300	350	400	450	500	600
Stroke (mm)	137	157	224	278	330	390	450	495	540	600	725
Size (NPS)	3	4	6	8	10	12	14	16	18	20	24
Stroke (in)	5.39	6.18	8.82	10.94	12.99	15.35	17.72	19.49	21.26	23.62	28.54

(continued)

9.4 MOUNTING ORIENTATION AND SUPPORTS

- 9.4.1 Series 767 valve may be mounted in piping in any orientation; however, where possible, a vertical mounting on horizontally laid out piping is preferable and recommended.
- 9.4.2 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.
- 9.4.3 Where valves are mounted in **orientations where the valve shaft is not vertical (horizontal, slanted)** additional supports are recommended with pneumatic (or other powered actuators).
- 9.4.4 Typical recommended supports are shown in **Figures 4 & 5**; for any assistance on other types of mounting requirements, please contact Bray.

Figure 4: Valve with Actuator

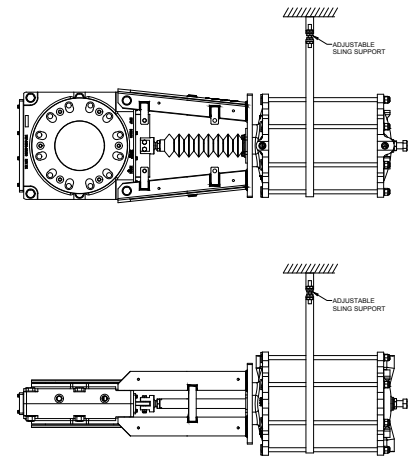
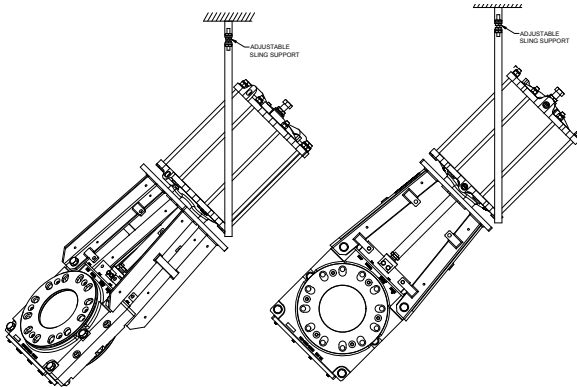


Figure 5: Valve with Actuator at 45°



10.0 OPERATION

NOTICE

Do not plug or restrict the ports of the drain plate, as this will prevent smooth operation.

- 10.0.1 Series 767 is suitable for on-off service and **not recommended** for throttling application.
- 10.0.2 The valve closes by moving the gate between the elastomer seats, providing a bubble tight shutoff.
- 10.0.3 When the valve is in full open condition, the elastomer seats butt against each other under a high compression load and form a leak free seal.
- 10.0.4 When the valve is closed, the seats seal against the gate face, isolating the two sides of the valve and connected pipelines.
- 10.0.5 When the gate moves, a gap is created between the faces of the seats that may allow media to flow, potentially clogging or jamming the body cavity of the valve.

NOTE: This needs to be purged and cleared out from the valve housing to have a smooth operation.
- 10.0.6 Series 767 valves have a drainage area in the bottom of the valve.
- 10.0.7 This drain may be closed with an optional removable drain plate. The ports provided in this plate allow drainage of any accumulated line medium that may prevent full gate closure.
- 10.0.8 Flush with water from one of the ports to improve the draining action. With the drain plate in place, any solids, slurry, or flush water ejected from the valve can be handled in a controlled manner.

11.0 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.

11.1 Series 767 valves may be supplied with a variety of actuation options.

11.2 MANUAL - Direct or bevel gear with hand wheel / chain wheel

11.2.1 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 (9).

11.3 PNEUMATIC - Double-acting or spring return cylinder

11.3.1 Bray pneumatic actuators use the following port connections, unless specially ordered otherwise. Connections are listed below in **Table 3**.

Table 3: PORT CONNECTIONS

C80-C100	C150-C200	C250-C500
1/4"NPT	1/2" NPT	3/4" NPT

11.3.2 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 4** below.

Table 4: AIR SUPPLY & TEMPERATURE

	Recommended	Typical Selection	Maximum Permissible
Air Supply Pressure	44 to 102 psi (3 to 7 bar)	73 psi (5 bar)	102psi (7bar)
Maximum Ambient Temperature	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		
Minimum Ambient Temperature	-4°F (-20°C)		

11.3.3 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."

11.3.4 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.

12.0 LOCKOUT

- 12.1** Series 767 valves are equipped with lockout tabs, lockout pins are optional.
- 12.2** If provided, the open-closed lockout brackets are designed to resist the normal valve operating thrust.
- 12.3** In order 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.

13.0 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 any and all warranty considerations.

NOTICE

Note assembly positions before removal.

- 13.0.1 Inspect the valve body assembly and gate at a regular interval. Check for any signs of corrosion, components wear and/or damage caused by process media.
- 13.0.2 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 collar/yoke hub to lubricate the stem and stem nut assembly. Additional lubrication may be applied directly to stem or stem threads.

13.1 LUBRICATION

WARNING

Hydrocarbon based greases cannot be used to lubricate these valves as the elastomer seats will swell and disintegrate.

- 13.1.1 Series 767 valves are lubricated when assembled – therefore lubrication before first usage is not required if the valves are not stored for an extended period.
- 13.1.2 Lubricate both sides of the valve with **silicon-based lubricant**, every 100 strokes for NPS 3 - 10 (DN 80 - 250) sizes and every 50 strokes for NPS 12 (DN 300) and greater sizes, after long periods of being left open or closed, or after infrequent cycling.

(continued)

- 13.1.3 **Required silicon-based lubricant:** MOLYKOTE 111 or Bray approved equivalent.

Recommended application:

1. Using a hand grease gun with 6mm nozzle size or with suitable automatic lubricators (Perma Flex 125 or similar)
2. Lubricate the gate surface on both sides at full open position.

13.2 BODY FLUSHING AND DISCHARGE

NOTICE

Any additional piping system must not be capped or otherwise prevented from flowing freely as this may cause clogging of the valve.

- 13.2.1 Media discharge during operation is normal for the series 767 valve. This helps to prevent any solids from building up between the seats that would prevent a tight seal when the valve in the fully open or closed position.
- 13.2.2 Discharge can be managed with the use of a drain plate with drain holes (optional) or with a drain pan (optional). The drain plate holes should be connected to a customer-supplied drain piping or left to drain or drain plates should be removed for satisfactory operation of the valve.
- 13.2.3 A drain pan is recommended if the application involves high concentration slurries with possible higher deposits and can be used to flush the body cavity.

13.3 RECOMMENDATIONS FOR DISCHARGE CONTROL

- > ALWAYS take care to avoid personnel coming into contact with discharge.
- > Wear appropriate personal protective equipment as required.
- > When operating a manual valve, be aware of and stay away from discharge.
- > Do not install valves over walkways, electrical or other critical equipment without the use of a drain pan/drain plate or similar device.
- > Do not cap or close off both ends of the drain pan. This can result valve failure.
- > One end of the drain pan can be used as flush inlet.
- > Additional drain piping may be attached to the drain pan to direct discharge to a collection or drainage point. Use of non-collapsible, rigid pipe is recommended. Using hose or other collapsible types of pipe extension is not recommended.
- > Keep pipe extensions clear of build-up by flushing or cleaning regularly.



WARNING

Valves are provided with elastomer seats and other parts. Do not exceed the maximum temperature/pressure indicated in the nameplate even for short duration.

(continued)



Do not operate the valves with the drain plate drain holes plugged; drain holes should be connected suitably to flushing lines and flushed periodically using suitable flushing media to avoid any material buildup in the bottom valve body. **Operating the valves with material buildup in the body bottom part will seriously affect functioning and/or may damage the valve parts.**



WARNING

We recommend use of only oil-free lubricants.

Do not use oil/hydrocarbon-based lubricants in valves supplied with EPDM seats.

14.0 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.

14.1 REPLACEMENT OF PARTS AND MODIFICATIONS

14.1.1 Parts listed in **Table 5** below 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.

TABLE 5: REPLACEMENT PARTS

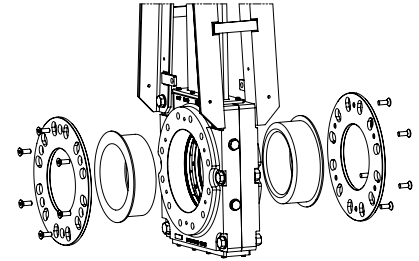
PART #	DESCRIPTION	MATERIAL	QTY PER VALVE	RECOMMENDED REPLACEMENT QTY
2	Seat	See name plate	2	One or both as required based on inspection
3	Gate	See name plate	1	One
4	Secondary Seal	EPDM	1	Complete set
17	Seat Retainer	See name plate	2	One or both as required based on inspection

(continued)

14.2 SEAT REPLACEMENT

- 14.2.1 1. Relieve the line pressure and close the valve. Flush the line if necessary.
2. Retract the gate to full open condition.
3. Remove the valve from the line.
4. Clamp the valve in the vertical position (up to 12"/300mm) and in the horizontal position (for the sizes above 12"/300mm) to a fixture. Do not block the valve port when clamping the valve. An overhead hoist may be needed for larger size valves.
5. Verify that the valve bore is clear of all debris, scale, and elastomer residue.
6. Remove the retainer flange bolts taking caution to prevent retainer flanges from falling free. Remove the retainer flanges from the valve.
7. Remove the seats from the valve by gently pulling them out.
8. Lay the valve down in a horizontal position on a flat surface.
9. Check the bore diameter for unusual or excessive wear. If found, valve housing may require replacement.
10. Lubricate the O.D. and sealing lip of the first seat. Use recommended lubricant.
11. Install the seat, being careful to center the flange end in the bore of the housing.
12. Place a retainer flange on the top of the seat. Align the retainer flange bolt holes with the matching holes in the round flange. Align the I.D. of the seat and retainer flange.
13. Install the retainer bolts. Only tighten sufficiently to allow installation of the next bolt. Continue this until all bolts are installed.
14. Once all bolts are in place, tighten the retainer flange bolts using a cross pattern until there is a 0" - 1/8" (0 - 3 mm) gap between the retainer flange and the housing. Do not cycle valve with only one seat in place.
15. Turn the valve over so the installed seat is on the flat surface.
16. Lubricate the O.D. and sealing lip of the second seat. Use recommended lubricant.
17. Install the second seat and retainer flange in a similar way.
18. The valve is now ready for installation. The gate must remain in the open position until the valve is installed and ready for operation.

Figure 6: Seat replacement assembly



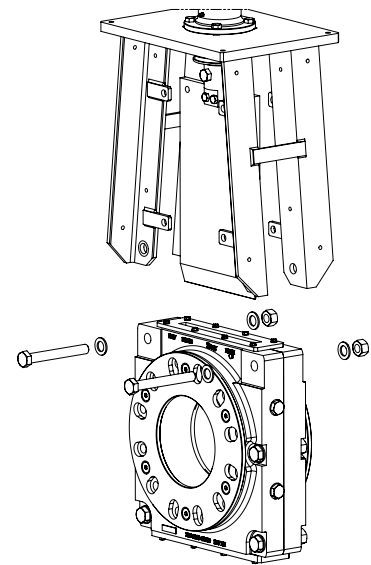
(continued)

14.3 GATE REPLACEMENT

Figure 7: Gate Disassembly

- 14.3.1 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. Remove the seat as per seat replacement procedure.
4. Lock the gate in opened position using a suitable locking pin in the holes provided.
5. If the valves are supplied with bellows, ensure stem is not rotated, as rotation will damage the bellows.
6. Disassemble the super structure by removing the fasteners with body.
7. 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.
8. Lay the superstructure & old gate assembly in horizontal position & disconnect the stem/Piston rod from the gate by removing the clevis bolts & nuts.
9. Remove the secondary seal, wiper and retainer and inspect the seal for suitability to reuse.
10. Lubricate the new gate and install it in body carefully.
11. Insert the secondary seal back into the packing chamber.
12. Re-attach the wiper and secondary seal retainer onto the valve body.
13. Tighten the secondary seal retainer bolts.
14. Inject the recommended lubricant at the grease nipple.
15. Mount the actuator and super structure on the valve.
16. Hand tighten the body bolting to the superstructure.
17. Tighten the actuator bolting.
18. Connect the gate and stem by clevis bolts and nuts.
19. 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.
20. Operate the valve for a few cycles and then tighten the body to superstructure bolting as per the recommended torque as per Table Install the seat as per above procedure.
21. Adjust and ensure the gate positions from top of the body according to **Table 2** on page 15.

- 14.3.2 Changing or repair of other valve parts by users is not recommended; please contact Bray for any further advice and assistance.



(continued)

14.4 SECONDARY SEAL REPLACEMENT (CHEST SEAL)

14.4.1 DISASSEMBLY

1. Relieve the line pressure and close the valve. Flush the line if necessary.
2. Retract the gate to full open condition.
3. Remove the valve from the line.
4. Secure the valve in the vertical position (up to 12"/300mm) and in the horizontal position (for the sizes above 12"/300mm) to a fixture. An overhead hoist may be needed for larger size valves.
5. Remove the clevis bolts from the clevis.
6. Remove the frame to housing bolts. Lift the frame and actuator assembly off the housing to allow the secondary seal and gate removal.
7. Loosen the secondary seal retainer plate bolts.
8. Remove the gate. While the gate is available, inspect it for sharp edges or other damage. Replace it as needed.
9. Remove all fasteners and washers that hold the secondary seal plate in place.
10. Remove the secondary seal retainer plate.
11. Remove the secondary seal.

14.4.2 REASSEMBLY

1. Using an approved lubricant, completely fill all internal cavities of the new secondary seal.
2. Insert the new lubricated secondary seal into the valve housing.
3. Place the secondary seal retainer plate into position.
4. Replace and hand tighten all the retainer plate fasteners and washers.
5. Apply approved lubricant to the tapered faces of the gate for ease of re-installation.
6. Press the gate through the secondary seal into the valve housing until the gate reaches Dimension A, **Table 6, Figure 9**.
7. Fully tighten all the retainer plate fasteners.
8. Reinstall the actuator/frame assembly with fasteners loosely tightened.
9. Reconnect the gate to the actuator.
10. Cycle the valve to full open position and check the gate position (dimension B, **Table 6**). Adjust as required.
11. Cycle the gate full closed and full open to ensure a smooth and proper operation.
12. The valve is now ready for installation. The gate must remain in the open position until the valve is installed and ready for operation.

Figure 8: Secondary Seal Replacement

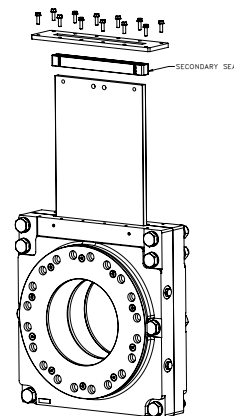


Figure 9: Setting the Stroke

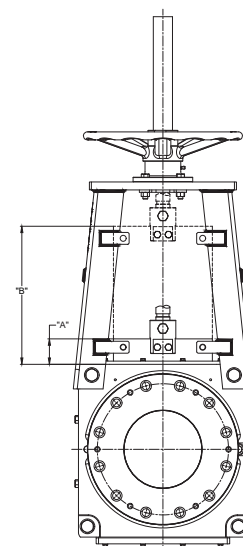


Table 6: STROKE LENGTH

VALVE SIZE		A (in)	B (in)	A (mm)	B (mm)
NPS	DN				
3	80	1.89	7.28	48	185
4	100	2.00	8.19	51	208
6	150	2.13	10.94	54	278
8	200	2.52	13.46	64	342
10	250	2.99	15.98	76	406
12	300	3.03	18.39	77	467
14	350	3.43	21.14	87	537
16	400	3.62	23.11	92	587
18	450	3.66	24.92	93	633
20	500	4.06	27.68	103	703
24	600	3.94	32.48	100	825

15.0 ACTUATOR CONVERSION

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

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

- 15.2.1 Relieve the line pressure and close the valve. Flush the line if necessary.
- 15.2.2 Disconnect the stem from the gate by removing the clevis bolt and nut. (**Figure 10:** Items 8 & 9)
- 15.2.3 Remove the hand wheel assembly fasteners in super structure. (**Figure 10:** Item 4)
- 15.2.4 Remove the hand wheel assembly along with stem and clevis.
- 15.2.5 Remove the clevis from the piston rod in the actuator assembly (**Figure 10:** Item 5)
- 15.2.6 Remove the bellows and bellows flange from the piston rod of the actuator assembly (**Figure 10:** Item 6 & 7)
- 15.2.7 Place the actuator on the super structure and fasten loosely. (**Figure 11:** Item 3)
- 15.2.8 Give air supply to actuator and extend the piston rod towards closing position.
- 15.2.9 Insert the bellows and bellow flange in the piston rod. Remove the bolts used for actuator mounting with the super structure
- 15.2.10 Insert the actuator mounting bolts through the bellow flange and hand tighten. Keep the assembly loose and floating. (**Figure 11:** Item 7 & 10).
- 15.2.11 Attach the clevis with actuator piston rod.
- 15.2.12 Apply the air slightly to the actuator to lower the piston rod and fasten the gate.
- 15.2.13 Adjust and ensure the gate positions from top of the body.
- 15.2.14 Ensure the whole assembly is aligned correctly.
- 15.2.15 Give air supply to actuator assembly and ensure smooth operation of the valve.
- 15.2.16 Tighten hose clip to keep the bellows fastened with piston rod.
- 15.2.17 Fully tighten the actuator mounting bolts. (**Figure 11:** Item 10)

Figure 10: Handwheel Actuator Conversion

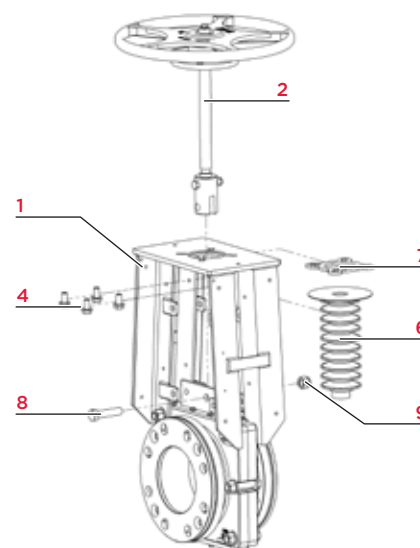


Figure 11: Pneumatic Actuator Conversion

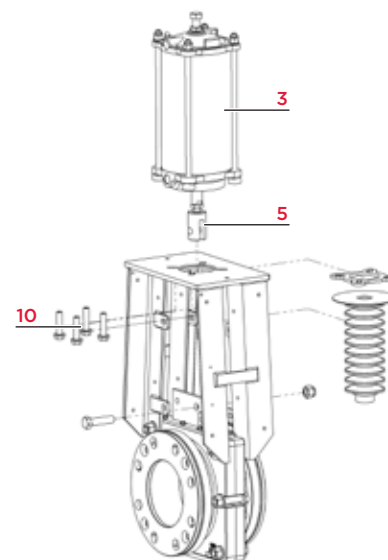


Table 7: PARTS

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

16.0 TROUBLESHOOTING

TROUBLE	POSSIBLE CAUSE	SOLUTION
In fully closed position, valve leaks	Seat is worn out or torn	Replace seat
	Seat is worn out or torn	Replace gate
In fully open position, valve leaks	Seat is worn out	Replace seat
	Improper stroke	Check and adjust stroke per IOM
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.

17.0 RETURN MERCHANDISE AUTHORIZATION

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

17.2 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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