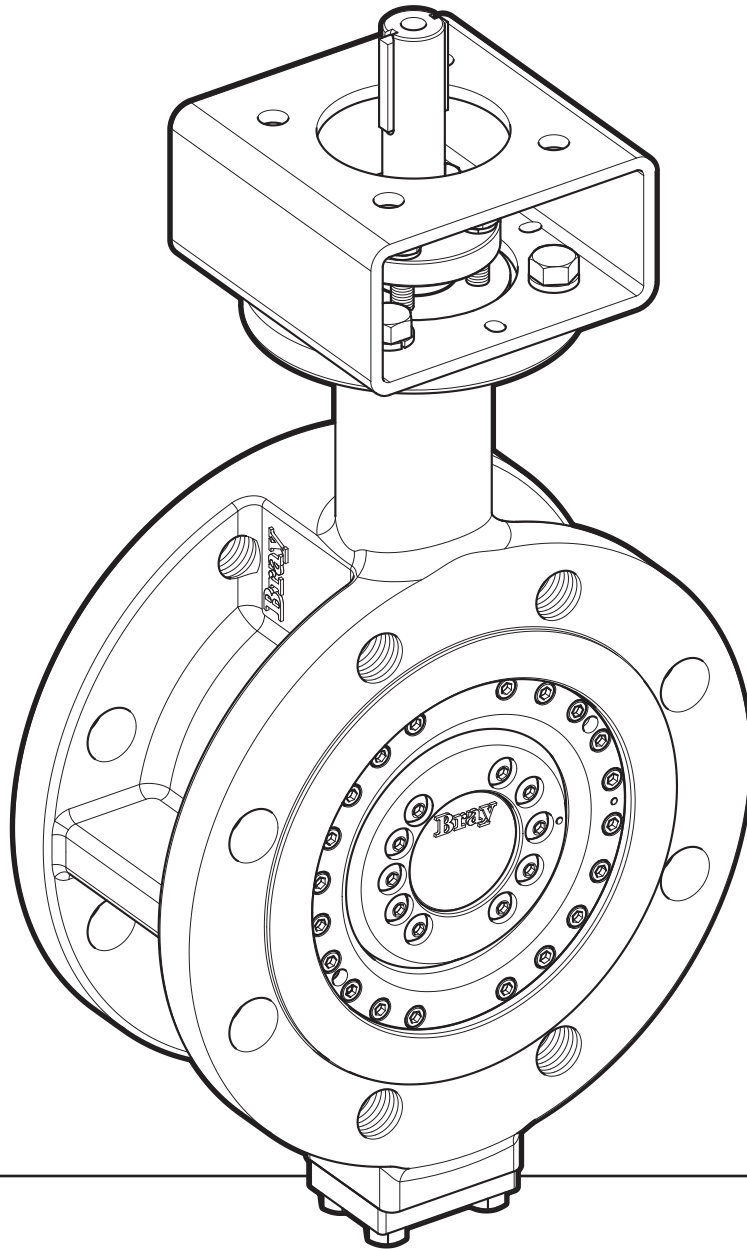

TRI LOK®-Cx

TRIPLE OFFSET BUTTERFLY VALVE

Installation, Operation, and Maintenance Manual



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THE HIGH PERFORMANCE COMPANY

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1.0 DEFINITION OF TERMS

- 1.1** 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.

X.X IDENTIFIES CHAPTER HEADING

- X.XX** Identifies and explains sequential procedure to be performed.

NOTE: Provides important information, useful tips, and recommendations related to a procedure.

SAFETY STATEMENTS

The terms DANGER, WARNING, CAUTION, and NOTICE are used in this document to prevent unwanted consequences. Standard symbols and classifications are:



DANGER

Indicates an immediate hazardous situation which, if not avoided, **will** result in death or serious injury and/or property damage.



WARNING

Indicates a potentially hazardous situation which, if not avoided, **could** result in death or serious injury and/or property damage.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, **may** result in minor or moderate injury and/or property damage.



NOTICE

Indicates and provides additional technical information which may not be obvious, even to qualified personnel. The term is not used for personal injury hazards or warnings, but can be used to indicate possible equipment or property damage.

- 1.2** Compliance with other notes — regarding transport, assembly, operation & maintenance, and about technical documentation (e.g., in the operating instructions, product documentation, or on the product itself) — is essential, to avoid faults which can directly or indirectly cause severe personal injury or property damage.

2.0 INTRODUCTION



NOTICE

Failure to follow these procedures could affect product warranty.

Read and follow these instructions carefully and keep this manual in a safe place for future reference.

- 2.1** Information provided in this manual is for standard Tri Lok®-Cx configuration only. Specific instructions for non-standard materials of construction, temperature range, etc. should be referred to the factory.

Additional information on certification documentation is available on the Bray website or by contacting your local Bray Sales Representative.

- 2.2** This manual covers Tri Lok®-Cx valves in the following range:

Nominal Pressure	PN10, PN25, PN40
Sizes	DN80 to DN1200
Body Style	Lug, Double Flange

- 2.4** The Tri Lok®-Cx metal seated valve is fully rated to EN 12516, and complies with EN593.

- 2.5** Tri Lok®-Cx is torque-seated. Torque must be continually applied by an actuation device (valve operator) to the valve stem to ensure the valve seals against the line pressure.



WARNING

Do not remove or de-energize actuation devices while the valve is under line pressure.

- 2.6** The valve is inherently fire safe, and has been qualified to ISO 10497 and API 607 standards.

- 2.7** The preferred direction of flow is indicated by an arrow on the valve nameplate.

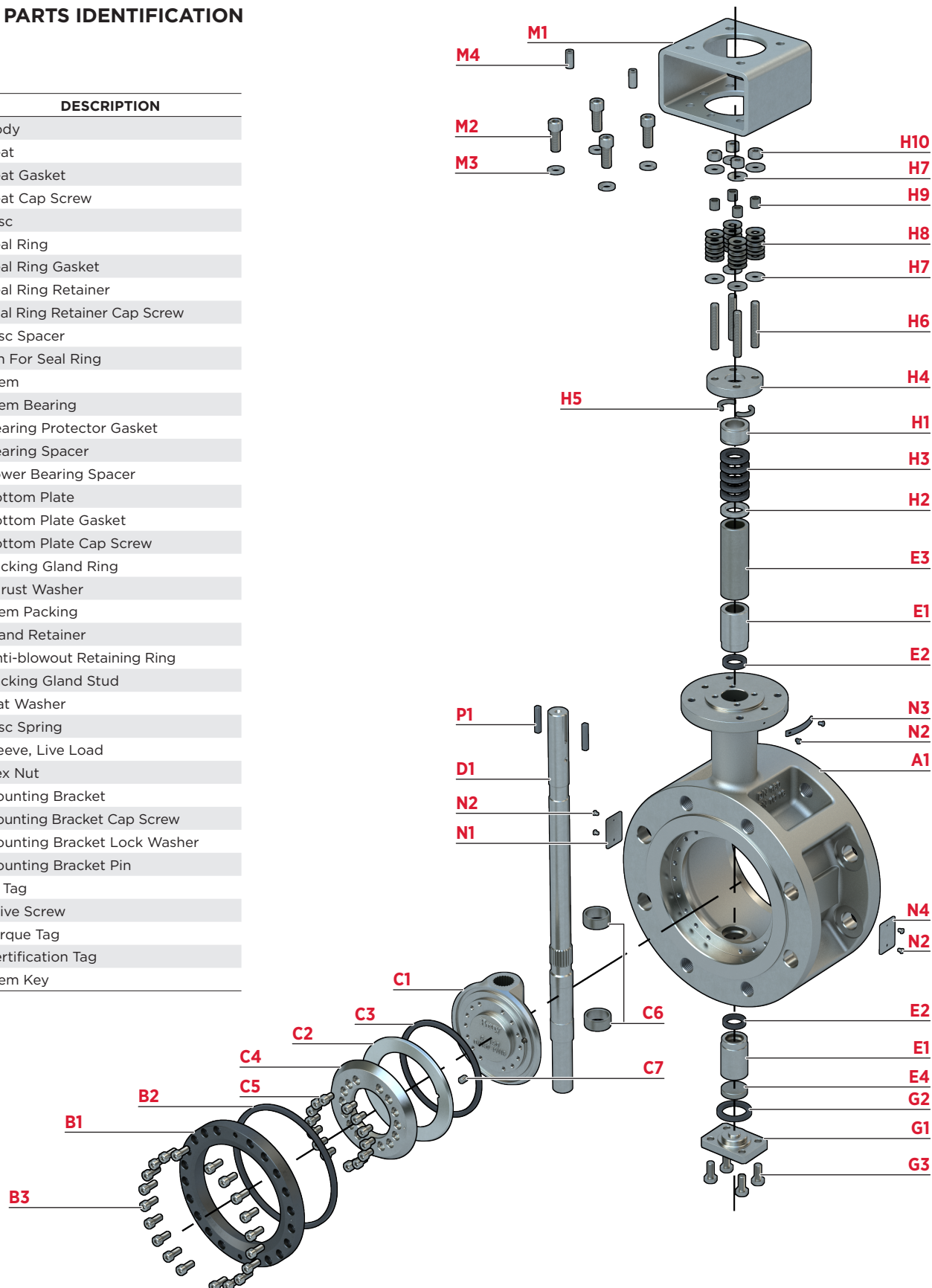
TRI LOK®-Cx TRIPLE OFFSET BUTTERFLY VALVE

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3.0 PARTS IDENTIFICATION

ITEM	DESCRIPTION
A1	Body
B1	Seat
B2	Seat Gasket
B3	Seat Cap Screw
C1	Disc
C2	Seal Ring
C3	Seal Ring Gasket
C4	Seal Ring Retainer
C5	Seal Ring Retainer Cap Screw
C6	Disc Spacer
C7	Pin For Seal Ring
D1	Stem
E1	Stem Bearing
E2	Bearing Protector Gasket
E3	Bearing Spacer
E4	Lower Bearing Spacer
G1	Bottom Plate
G2	Bottom Plate Gasket
G3	Bottom Plate Cap Screw
H1	Packing Gland Ring
H2	Thrust Washer
H3	Stem Packing
H4	Gland Retainer
H5	Anti-blowout Retaining Ring
H6	Packing Gland Stud
H7	Flat Washer
H8	Disc Spring
H9	Sleeve, Live Load
H10	Hex Nut
M1	Mounting Bracket
M2	Mounting Bracket Cap Screw
M3	Mounting Bracket Lock Washer
M4	Mounting Bracket Pin
N1	ID Tag
N2	Drive Screw
N3	Torque Tag
N4	Certification Tag
P1	Stem Key



4.0 VALVE IDENTIFICATION



NOTICE

- > Ensure the box is not damaged externally.
- > Remove the valve from the packaging and check for any damage to the valve and its components during transit.
- > Report any damage or discrepancies immediately.
- > Every valve has an identification tag and must not be removed or covered, so that the installed valve remains identifiable.
- > Depending on the region, the valve identification tag may vary.

- 4.1** All valves, actuators, or control products are provided with an identification tag that is unique to each device.

All products for the Cx Line feature a digital valve identification tag. The electronic tagging system — **Bray DIGI-ID™** — ensures that each valve is uniquely and easily identifiable by simply scanning the QR Code on the product identification tag. This allows the operator to gain instant access to all relevant product information. This solution is in accordance with the DIN EN IEC 61406 (DIN Spec 91406) standard.



Scan code for a more information
about Bray DIGI-ID™.

5.0 SAFETY INFORMATION

5.1 ATEX Directive 2014/34/EU



WARNING

When using this product in hazardous environments, the national directives and laws which apply in your country for hazardous areas must be followed. The specifications of the examination certificate valid in country of operation must be also observed.

5.2 Special Conditions for Safe Use

The following factors must be carefully considered in order to ensure the valve is compatible with the atmosphere in which it is applied. The system designer and/or end user should formally address each item and carefully document the reasoning behind specific measures taken to ensure continued compliance throughout the life of the Tri Lok®-Cx valve.

5.3 Material Considerations

Titanium is not to be used in Group I mining applications and Group II Category 1 equipment, due to the potential of ignition from sparks caused by mechanical impacts. Please consult factory for details regarding material limitations.

5.4 Temperature Considerations

The surface temperature of the Tri Lok®-Cx valve is wholly dependent on the ambient temperature in combination with the temperature (T_s) of the process medium. The maximum surface temperature of the Tri Lok®-Cx valve may be calculated from the maximum ambient temperature (T_a) plus the maximum process medium temperature (T_p) as shown below:

Equation 1 — Surface Temperature Calculation

$$T_s(\text{max}) = T_a(\text{max}) + T_p(\text{max})$$

The system designer is responsible for ensuring the maximum temperature, either inside the valve body or on the external surface, will remain well below the ignition temperature of the atmosphere. Additional protective devices may be required to ensure a sufficient thermal safety margin, including but not limited to thermal shut-off devices and cooling devices.

Note: For operating temperatures above 200°C, Bray recommends thermal insulation of the valve body.

5.5 Static Electricity Considerations

Where the process medium is a liquid or semi-solid material with a surface resistance in excess of 1 G-ohms, special precautions should be taken to ensure the process does not generate electro-static discharge. This may be done through ensuring the flow rate of the process media remains below 1 m/s or providing sufficient discharge points along the process path to eliminate electrostatic build-up. Consultation to EN 50404 is recommended.

Note: Appropriate grounding may be necessary through the use of grounding straps or other means.

5.6 Stray Electric Current Considerations

When the Tri Lok®-Cx valve is used near sources of high current or magnetic radiation, a secure bonding to earth ground should be made so as to prevent ignition due to inductive currents or a rise in temperature due to these currents.

5.7 Filtration of Process Medium Considerations

Special consideration should be made regarding the filtration of the process medium if there is a potential for the process medium to contain solid particulates. The process medium is recommended to be filtered to allow particles no greater than 1 mm in diameter through the valve assembly where there is a high probability of solid particulates. Larger particulate sizes may be deemed appropriate based on the possibility of particulates within the process medium and the area classification. The decision regarding filtration levels and limits should be well-documented by the system designer and/or end user to ensure continued compliance through the life of the valve.

5.8 Labelling Information

The following information is printed on valves intended for ATEX applications:

Certificate Number:	CSANe 21ATEX6120X
ATEX Marking:	II 1G Ex h IIC Tx Ga (Non-Mining Applications)
	I M1 Ex h I Ma (Mining Applications)

Specific valve information is printed on the identification label. Manufacturer information is printed on both labels.

6.0 HAZARD-FREE USE

- 6.1** 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.
- 6.2** 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
- 6.3** 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.
- 6.4** The upper limits of permitted pressure and temperature (depending on the housing and liner materials) are shown on the valve tag and identified with PS and TS.
- 6.5** The valve must not be operated until the following documents have been observed:
- > Declaration on EU Directives
 - > IOM-Manual, which are supplied with the product.

7.0 QUALIFIED PERSONNEL

- 7.1** 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.
 - > In cases where the device is installed in a potentially explosive (hazardous) location — is trained in the commissioning, operation, and maintenance of equipment in hazardous locations.
- 7.2** Additional information about Tri Lok®-Cx valves — including application data, engineering specifications, and actuator selection — is available from your local Bray distributor or sales representative.

8.0 HANDLING REQUIREMENTS



WARNING

A potential hazard exists with handling valves. Failure to handle valves properly may cause a valve to shift, slip or fall causing serious injury or death and/or equipment damage.



CAUTION

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.

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.

In all cases, local safety regulations must be respected.

8.1 Packed Valves

The transportation of all packed material must be carried out safely and following the local safety regulations.

- > **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.

8.2 Unpacked Valves

Lifting and handling of valves should be carried out by using appropriate means and observing 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.

9.0 LONG TERM STORAGE

- 9.1** If valves are to be stored before installation, storage must be carried out in a controlled manner as follows:
- > Valves must be stored in a closed, clean and dry environment.
 - > Valve disc to be in closed position and the body end faces must be covered with appropriate flange protection. Flange protectors should only be removed at the time of installation.
 - > Valves should be stored indoors with a preferred temperature range from 4°C to 29°C.
 - > The valves should be checked to ensure the above conditions are maintained every three months.
 - > These are general guidelines for valve storage. Please consult the factory for information regarding specific requirements.

10.0 INSTALLATION

10.1 Tri Lok®-Cx is designed to be installed between DIN EN 1092-1 flanges. When the valve is open, a portion of the disc will protrude into the pipe. Adjacent piping must be large enough to allow the open disc to clear the pipe. **Table 1** shows the minimum allowable pipe ID.

10.2 The valve closes with clockwise rotation of the stem and opens with counterclockwise rotation.



CAUTION

Avoid uncontrolled rotation of the disc beyond fully-open position (counterclockwise) as this could damage the sealing surfaces.

10.3 To benefit from the most favorable low operating torque and best sealing conditions, install the valve with the stem on the upstream (pressure side) of the installation. The valve tag is marked with an arrow indicating the preferred direction of flow.

10.4 Whenever possible, install with the stem horizontal. If this installation is not possible, orient the stem at an inclined angle above the horizontal centerline.

10.5 Flange gaskets should conform to the requirements of DIN EN 1092-1 flanges. Spiral wound gaskets conforming to EN1514-2 are recommended.

10.6 When bolting the valve into the line, use standard bolting torque as recommended by applicable flange gasket manufacturers or piping standards. The valve's ability to seal is independent from the flange bolting. Additional force from the flange bolts is not required.

Table 1: Minimum Allowable Pipe ID for Tri Lok®-Cx Installation

Valve/Pipe Size	Minimum Pipe ID	
	PN10	PN25 PN40
DN	mm	mm
80	61	64
100	84	91
150	135	137
200	180	185
250	228	244
300	278	297
350	310	315
400	359	371
450	403	417
500	454	467
600	554	528
700	616	613
750	686	729
800	747	737
900	846	889
1000	834	925
1050	992	Consult Factory
1200	1140	

Notes:

- 1 Minimum allowable ID of pipe with recommended clearances (per API 609).
- 2 This table assumes that the valve is centered in the pipe flanges.
- 3 A minimum of 1.6 mm thick gasket is used between the pipe flange and the face of the valve body.

11.0 OPERATOR AND TRAVEL STOP SETTING INSTRUCTIONS

- 11.1** Tri Lok®-Cx is a quarter turn, metal-seated triple offset valve. There is no mechanical stop in the valve at the “closed” position.
- 11.2** When installing ANY type of operator on a Tri Lok®-Cx valve, the following general instructions should be followed closely. These general instructions include all operator types: manual gear, pneumatic, hydraulic, and electric actuators.
- > Select a desired orientation for the operator mounting relative to the valve. The disc should be oriented with the disc indicator marked on the stem.
 - > Rotate BOTH valve and operator to either the full “open” or full “closed” position to establish a common reference point.
 - > Mount operator to the valve and secure.



NOTICE

With valve/operator in the closed position, it may be necessary to loosen the “closed” mechanical stop to allow the mounting holes to align properly.

Special applications may require more specific instructions. Please consult the Bray factory or operator manual for further instruction.



CAUTION

Valves can be damaged if proper care is not exercised during the setting of open and /or closed stops.

11.3 Operator Stop Settings

The Tri Lok®-Cx valve is a torque seated valve. During normal operation, only the open mechanical stop on the operator should function. Set the opening stroke stop to stop the disc rotation in the fully open (90°) position.

For safety reasons, the closed mechanical stop shall be set as follows:

- > Unscrew the closing stroke mechanical stop.
- > Close the valve applying the correct end-to-close torque required for the particular service. Check that the mechanical stop is free.
- > Adjust mechanical stop until engagement.
- > Loosen the mechanical stop 1 to 1½ turns to ensure there is enough travel for the valve to receive the required torque and to protect the valve from excessive torque.
- > Tighten the stop lock nut with the torque specified in the operator manual.
- > Mark the closing stop set position.

12.0 STANDARD MAINTENANCE



WARNING

Precautions should be taken before beginning any work on the valve assembly.

Protective clothing, as required by appropriate safety codes, should be worn.

Relieve line pressure and close valve before:

- > Removing any actuation.
- > Loosening any packing gland nuts.

Do not pressurize the line without an actuation device properly installed and working on the valve.

Use only Bray parts for maintenance and repairs.



CAUTION

The Tri Lok®-Cx valve must be in the closed position to be removed from the line to prevent damaging the disc seal ring.

Note: When handling the valve, care should be taken not to scratch the seal ring, seat and gasket faces on both sides of the valve. Replacement seat, disc seal ring, and other parts are available from authorized Tri Lok®-Cx sales and service locations.

12.1 Recommended Lubricants

- > Molykote® Plus CU-7439 (grease) or equivalent for fasteners.
- > Molykote® Spray 321 R (dry lubricant) or equivalent for disc seal ring.
- > Light mineral oil for packing and gasket interface areas (disc seal ring and gasket grooves).

12.2 Packing Replacement

(Refer to Parts Identification 3.0 and Tables 15.0)

- 12.2.1 If the valve is installed, relieve line pressure. Remove actuator from the valve. Remove the keys (P1). Remove socket head cap screws (M2) and lock washers (M3). Remove mounting bracket (M1) and pins (M4). Mark assembly positions of the actuator and the mounting hardware for reinstallation.
- 12.2.2 Remove hex nuts (H10), flat washers (H7), disc springs (H8), live load sleeves (H9), and the additional flat washers (H7) located under disc springs. Remove gland retainer (H4), anti-blowout retaining ring/split ring (H5) and gland ring (H1). Remove all stem packing (H3), taking care not to scratch the stem (D1) or the bore of the valve body. Do not remove the thrust washer (H2) unless further valve disassembly is required.
- 12.2.3 Examine the valve body packing bore and the stem surface. Clean as necessary to remove any corrosion, foreign matter and minor surface imperfections.
- 12.2.4 Apply a small amount of grease to the stem end. Lubricate each packing ring (H3) and install them into the valve body packing bore one at a time.
- 12.2.5 Reinstall gland ring (H1), anti-blowout retaining ring (H5) and gland retainer (H4). Reinstall flat washers (H7), live load sleeves (H9), disc springs (H8), flat washers (H7), and hex nuts (H10). Tighten hex nuts (H10) utilizing a cross bolting technique to the proper torque value given in **Table 2**. Reinstall mounting bracket (M1) and pins (M4) with cap screws (M2) and lock washers (M3). Tighten according to the torque specified in **Table 4**. Install the key (P1) and remount actuation device on top of the valve, ensuring the actuator is properly oriented.
- 12.2.6 Operate the valve open and closed several times to set the stem packing rings. Loosen hex nuts (H10) and retighten, utilizing a cross bolting technique, to torque value given in **Table 2**.

12.3 Replace Bottom Plate Gasket

(Refer to Parts Identification 3.0 and Tables 15.0)

- 12.3.1 Hex nuts (H10) should be in tightened condition while replacing the bottom plate gaskets during inline maintenance.
- 12.3.2 If the valve is installed, remove line pressure.
- 12.3.3 Completely remove the bottom plate cap screws (G3). Remove the bottom plate (G1) and the bottom plate gasket (G2). Clean the bottom plate and body gasket area of residual graphite or foreign materials.
- 12.3.4 Grease the body/bottom plate gasket groove area. Place the new gasket (G2) on the bottom plate (G1) and install it onto the body.
- 12.3.5 Reinstall the bottom plate cap screws (G3) and using a cross bolting technique, tighten them according to the torque specified in **Table 3**.

13.0 SEAT & SEAL RING REPLACEMENT

(Refer to Parts Identification 3.0 and Tables 15.0)

Note: It is highly recommended that both the seat (B1) and seal ring (C2) be replaced at the same time. However, individual components are not matched in pairs and may be replaced separately if desired.



CAUTION

Exercise extra care when handling the seat and seal ring to avoid damage to the sealing surfaces.

13.1 Replace Seat & Seal Ring (Both at Same Time)

- 13.1.1 Remove the valve with the disc in the closed position from line. Place the valve on a flat stable surface with the body seat (B1) facing up.

Note: If valve is actuated with fail close or fail open pneumatic/hydraulic actuator (without manual override), remove it from the valve. A suitable gearbox must be installed to perform maintenance on the valve.
- 13.1.2 Carefully clean the surface of the seat and remove all foreign matter from the hex sockets of seat cap screws (B3). Use compressed air to blow out the gap between the seat OD and the wall of the retaining cavity in valve body (A1). Apply a suitable lubricant into the gap between the seat outside diameter (B1) and the body (A1) to help in extracting the seat (B1) from the body cavity.
- 13.1.3 Open the valve until the seal ring is disengaged from the seat using a wrench, remove all seat cap screws (B3).
- 13.1.4 Using a hardwood or aluminum drift and a light hammer, tap the top of the seat (B1) lightly all around to loosen the seat in the retaining cavity. Using full-threaded bolts or suitable threaded rod matched to the threads in all tapped jacking holes, begin jacking the seat (B1) evenly out from the retaining cavity. Tap the seat lightly with the drift as necessary to keep it in alignment with the walls of the retaining cavity in the body (A1). Remove the seat (B1) from the body (A1).
- 13.1.5 Close the valve. Remove the seal ring retainer screws (C5) from seal ring retainer (C4). Remove disc seal ring retainer (C4). Remove the seal ring (C2) and seal ring gasket (C3) from the disc groove.
- 13.1.6 Using soft tools and a suitable wire brush, carefully clean any remnants of removed gasket and foreign matter within the retaining cavity of the body (A1) and face of the disc (C1). Blow out all threaded holes and the gasket groove with compressed air.

- 13.1.7 Place a new seal ring gasket (C3) into the groove on the disc face (C1). The mating side of the seal ring gasket may be lightly greased to improve retention in the groove. Apply a suitable lubricant to the sealing surfaces of the seal ring (C2). Place the new seal ring (C2) onto the disc such that the notch is aligned. Place the seal retainer (C4) over the seal ring. Apply anti-seize compound to the seal ring retainer cap screws (C5). Replace the screws if required. The seal retaining flange cap screws (C5) should be fully threaded into the disc (C1), but remain only finger-tight at this time. Open the valve to approximately 20°.
- 13.1.8 Place the seat gasket (B2) into the groove of the seat (B1). It is highly recommended to apply grease to the mating side of the seat gasket to secure its position in the groove. Apply a suitable lubricant to the sealing surfaces of the seat (B1). Insert the seat (B1) into the body (A1) making sure the alignment dimples in the seat (B1) and the retaining cavity in the body (A1) match. Apply anti-seize compound to seat retaining cap screws (B3) and install the screws (B3) finger tight. Replace the screws if required. Using a cross bolting technique, to 50% of the torque specified in **Table 3**. Once all screws are tightened, proceed to fully tighten them to 100% of the listed torque value.
- 13.1.9 Using a suitable actuation device, close and open the valve 2 to 3 times, only closing the valve to the point where the seal ring engages with the seat. Check each time that the disc seal ring makes full contact without torqueing into the seat. Attention should be paid in the closing stroke that the seat does not scratch the seal ring. This will allow the seal ring and seat to be properly aligned.
- 13.1.10 Close the valve. Tighten at least four screws in the seal ring retainer to prevent the seal ring from further movement. Open the valve sufficient enough to tighten the seal ring retainer screws. Tighten all seal ring retainer screws (C5) using a cross bolting technique, to 50% of the torque specified in **Table 3**. Once all screws are tightened, proceed to fully tighten them to 100% of the listed torque value.
- 13.1.11 Re-apply lubricant to the sealing surfaces of the valve. Reinstall actuation device (wherever applicable) and test the valve.

13.2 Replace Seat Only

To replace the seat and to reuse the existing seal ring, refer to **Section 13.1 Replace Seat & Seal Ring (Both at Same Time)** where the existing seal ring removed from the valve can be cleaned and reused. However, the existing seal ring gasket (C3) has to be replaced while using the existing seal ring. Exercise extra care when handling the seal ring to prevent it from any damage.

**NOTICE**

The seal ring may be replaced in two ways; without the seat removal or with the seat removal.

13.3 Replace Seal Ring (Without Seat Removal from the Valve)

Note: This procedure is not suitable if the seal ring (C2) is to be replaced while the valve is installed in the pipeline. In addition, this procedure is not recommended for large valves where manipulating the valve may be more difficult than removing the seat (B1) and installing the seal ring (C2) solely from the seat side of the body.

- 13.3.1 To remove the seal ring (C2) without removing the seat (B1), the actuation device must be removed and the valve oriented in a manner that allows access to both sides.
- 13.3.2 Remove the valve with the disc in the closed position from line. Clean the surface of the valve with compressed air, blow out all debris around the seal ring retainer (C4) and clean out the hex sockets of the seal ring retainer cap screws (C5).
- 13.3.3 Open the valve a few degrees until the seal is disengaged from the seat.
- 13.3.4 Loosen all seal ring retainer cap screws (C5), but leave them in the valve with the seal ring retainer (C4) attached to the disc (C1).
- 13.3.5 Using a wrench, rotate the valve stem (D1) counterclockwise past the fully open position far enough so the disc's position is able to allow seal ring retainer and seal ring removal (C2). Be careful not to over-rotate the stem (D1) to the point where the seal ring (C2) or disc edge (C1) contact the body (A1). Make sure the packing gland retainer nuts (H10) are tight enough to prevent the valve stem (D1) from rotating on its own under the eccentric weight of the disc (C1).
- 13.3.6 Remove the seal ring retaining cap screws (C5), disc seal ring retainer (C4), seal ring (C2) and the seal ring gasket (C3).
- 13.3.7 Rotate the disc (C1) as necessary to access the seal face on the disc (C1). Using soft tools and suitable wire brush, carefully clean any remnants of removed gasket and foreign matter from the face of the disc (C1). Blow out all threaded holes and the gasket groove with compressed air.

- 13.3.8 Rotate the disc (C1) to its previous position to facilitate installation of the seal ring (C2). Place a new seal ring gasket (C3) into the groove on the disc face (C1). The mating side of the seal ring gasket can be lightly greased to improve retention in the groove. Lubricate the sealing surfaces of the seal ring (C2) and place the seal ring (C2) onto the disc (C1) making sure the alignment line on the disc seal ring matches the locating dimple on the disc face. Place the seal ring retainer (C4) over the seal ring. Apply anti-seize compound to the seal ring retainer cap screws (C5). Replace the screws if required. The cap screws (C5) should be fully threaded into the disc (C1), but remain only finger-tight at this time.
- 13.3.9 Lubricate the sealing surfaces of the seat (B1). Using a suitable actuator, close and open the valve 2 to 3 times, only closing the valve to the point where the seal ring engages the seat. Check each time that the seal ring makes full contact without torquing into the seat. Attention should be paid in the closing stroke that the seat does not scratch the seal ring. This will allow the seal ring and seat to be properly aligned.
- 13.3.10 Close the valve. Orient the valve with the seat side facing up.
- 13.3.11 Tighten at least four screws in the seal ring retainer to prevent the seal ring from further movement. Open the valve sufficient enough to tighten the seal ring retainer screws. Tighten all seal ring retainer screws (C5) using a cross bolting technique, to 50% of the torque specified in **Table 3**. Once all screws are tightened proceed to fully tighten them to 100% of the listed torque value. Re-apply lubricant to the sealing surfaces of the valve.

13.4 Replace Seal Ring (With Seat Removal from the Valve)

To replace the seal ring by removing the seat from the valve, refer to **Section 13.1 Replace Seat & Seal Ring (Both at Same Time)** where the existing seat removed from the valve can be cleaned and reused. However, the existing seat gasket (B2) has to be replaced. Exercise extra care when extracting the seat (B1) from the retaining cavity in the valve body (A1). When using jacking bolts to extract the seat, avoid forcing the jack screws unevenly which could result in permanent deformation of the seat (B1). Ensure that the seat (B1) slides out of the retaining cavity easily in a balanced and level manner.

14.0 RETURN MERCHANDISE AUTHORIZATION

14.1 All products that are returned require a Return Merchandise Authorization (RMA). Contact a Bray representative for instructions and RMA forms to be completed prior to return of any product.

14.2 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.

15.0 TABLES

Table 2: Torque Values for Packing Gland Hex Nuts

Valve Size	PN10	PN25 PN40
DN	N m	N m
80	6	6
100	8	8
150	8	14
200	9	17
250	14	17
300	17	23
350	23	35
400	23	74
500	35	88
600	74	88

Table 3: Torque Values for Cap Screws — Seat Retainer, Seal Retainer, and Bottom Plate

Valve Size	PN10			PN25 PN40		
	Seat	Seal Ring Retainer	Bottom Plate Cap Screw	Seat	Seal Ring Retainer	Bottom Plate Cap Screw
DN	N m	N m	N m	N m	N m	N m
80	3	3	13	3	3	13
100	5	5	13	5	5	13
150	5	5	13	5	13	25
200	5	5	13	14	13	25
250	14	13	25	14	25	44
300	14	25	25	14	25	44
350	14	25	44	14	44	44
400	14	25	44	14	44	109
500	26	44	44	46	44	109
600	26	44	109	46	109	212

Table 4: Torque Values for Bracket Fasteners

Valve Size	PN10	PN25 PN40
DN	N m	N m
80	13	13
100	25	25
150	25	44
200	25	212
250	44	212
300	212	212
350	212	109
400	212	109
500	212	212
600	109	212

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