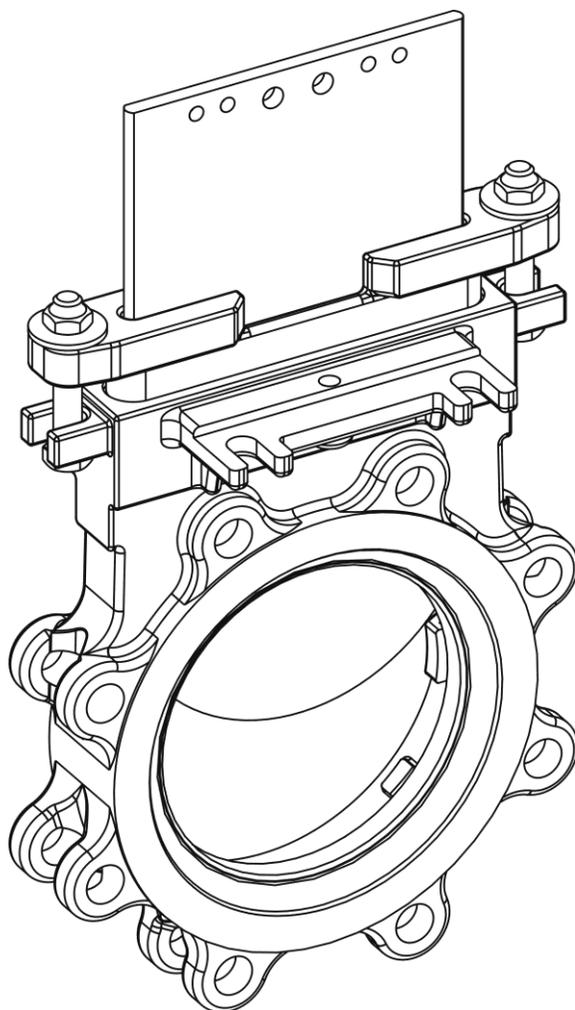


DeZURIK KGC-ES KNIFE GATE VALVES 2-24" (50-600mm)



Instruction **D10411**
January 2023

Instructions

These instructions are for use by personnel who are responsible for the installation, operation and maintenance of DeZURIK valves, actuators or accessories.

Safety Messages

All safety messages in the instructions are identified by a general warning sign and the signal word CAUTION, WARNING or DANGER. These messages indicate procedures to avoid injury or death.

Safety label(s) on the product indicate hazards that can cause injury or death. If a safety label becomes difficult to see or read, or if a label has been removed, please contact DeZURIK for replacement label(s).

⚠WARNING

Personnel involved in the installation or maintenance of valves should be constantly alert to potential emission of pipeline material and take appropriate safety precautions. Always wear suitable protection when dealing with hazardous pipeline materials. Handle valves which have been removed from service with suitable protection for any potential pipeline material in the valve.

Inspection

Your DeZURIK product has been packaged to provide protection during shipment; however, items can be damaged in transport. Carefully inspect the unit for damage upon arrival and file a claim with the carrier if damage is apparent.

Parts

Replaceable wear parts are listed on the assembly drawing. These parts can be stocked to minimize downtime. Order parts from your local DeZURIK sales representative or directly from DeZURIK. When ordering parts please provide the following information:

If the valve has a data plate: please include the 7-digit part number with either 4-digit revision number (example: 9999999R000) or 8-digit serial number (example: S1900001) whichever is applicable. The data plate will be attached to the valve assembly. Also, include the part name, the assembly drawing number, the balloon number and the quantity stated on the assembly drawing.

If there isn't any data plate visible on the valve: please include valve model number, part name, and item number from the assembly drawing. You may contact your local DeZURIK Representative to help you identify your valve.

DeZURIK Service

DeZURIK service personnel are available to maintain and repair all DeZURIK products. DeZURIK also offers customized training programs and consultation services. For more information, contact your local DeZURIK sales representative or visit our website at DeZURIK.com.

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Description

KGC knife gate valves have a stainless steel body and gate, and an all-metal or resilient-faced seat. The KGC knife gate valve is available in 2-48" (50-1200mm) sizes. This manual covers the 2-24" (50-600mm) sizes. A choice of several actuators and accessories is available.

Handling

The points below are for reference purposes only, use safe and proper lifting and support techniques.



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.

DO NOT lift valves with any adjoining pipe or other equipment attached. Lift with properly rated lifting equipment. Follow jurisdictional safety requirements.

Suggested lifting points are as shown below to lift valve assemblies that are in a horizontal orientation. Eye bolts in flange through holes can be used to lift the valve body or, for 2" through 12" valves, a sling can be strapped around the top of the valve body.

For valves with bevel gear actuators, a sling or chain can be wrapped around the bevel gear actuator body, between the mounting plate and the input shaft housing. This would be in conjunction with lifting from the valve body as well. See Figure 1.

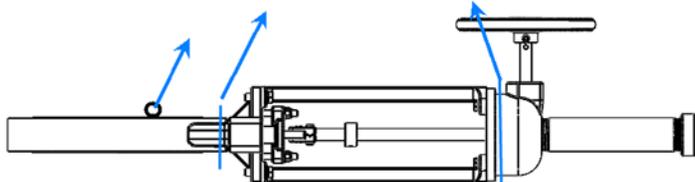


Figure 1— Knife Gate Valve with Bevel Gear Actuator, Horizontal Lifting

For valves with pneumatic cylinder actuators, a sling can be wrapped around the cylinder, near the cylinder head (piston rod end). This would be in conjunction with lifting from the valve body. Utilize caution to not bump, dent or damage the cylinder tube. DO NOT utilize the cylinder tie-rod ends to lift. See Figure 2.

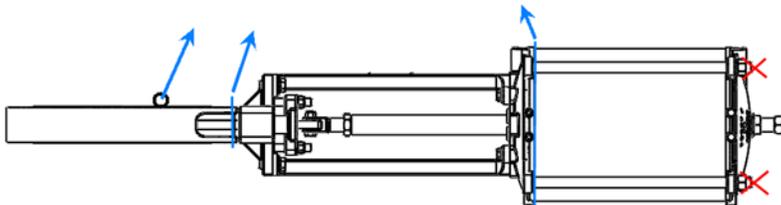


Figure 2, Knife Gate Valve with Pneumatic Cylinder Actuator, Horizontal Lifting

Handling *continued*

For valves with handwheel actuators, a sling or chain can be wrapped through the rim of the hand-wheel. For chainwheel actuators, a sling can be wrapped in the area between the yoke/legs and the chainwheel/guide assembly. This would be in conjunction with lifting from the valve body as well. See Figure 3.

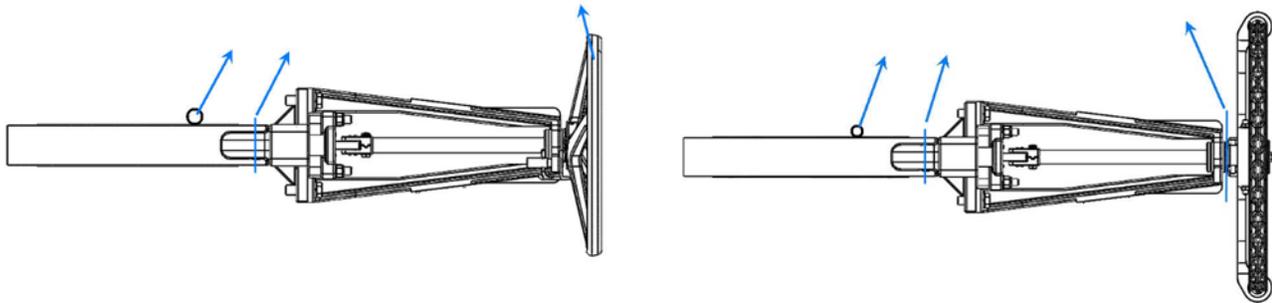


Figure 3, Knife Gate Valve with Handwheel or Chainwheel Actuator, Horizontal Lifting

Suggested lifting options are as shown below to lift valve assemblies that are in a vertical orientation. For valves with bevel gear actuators, wrap slings or chains around the top of each leg. Use caution not to put any side load on the bevel gear input shaft or on the valve's threaded stem. See Figure 4.

For valves with pneumatic cylinder actuators, wrap slings around the top of each leg. Use caution to not bump, dent or damage the cylinder tube and avoid any side load on the cylinder piston rod. DO NOT utilize the cylinder tie-rod ends to lift. See Figure 5.

For valves with handwheel or chainwheel actuators, wrap slings or chains around the top of the each leg or yoke side. Use caution to not put any side load on the valve's threaded stem. See Figure 6.

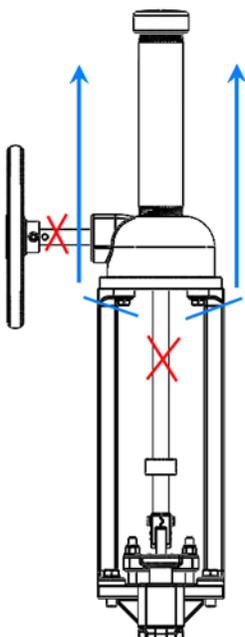


Figure 4- Knife Gate Valve with Bevel Gear Actuator, Vertical Lifting

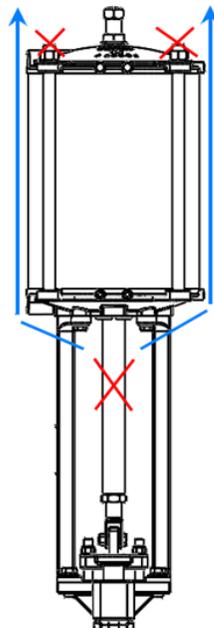


Figure 5- Knife Gate Valve with Pneumatic Cylinder Actuator, Vertical Lifting

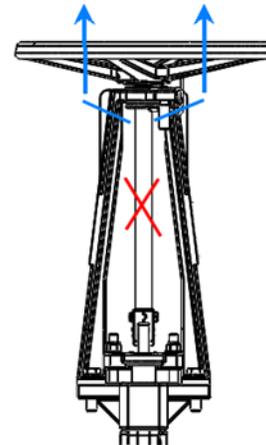


Figure 6- Knife Gate Valve with Handwheel or Chainwheel Actuator, Vertical Lifting

Installation

Install the valve between ASME Class 125 or Class 150 pipeline flanges, or other flanges that match valve end connection. Flange gaskets are required. Before installation, remove foreign material such as weld spatter, oil, grease, and dirt from the valve and pipeline.

Normal Installations

Install the valve so that the side marked "SEAT" is on the lower pressure side of the valve when the valve is closed; the pipeline pressure will then help seal the valve in the closed position.

Gravity (Dry) Service Installations

When installing the valve in a vertical pipeline (such as a hopper bottom, gravity flow, or other dry service application), install the SEAT side of the valve facing upstream as shown in Figure 1. Installing the valves with the seat side upstream prevents process media buildup in the seat and chest area of the valve. This orientation also allows the seat to act as an integral deflection cone, protecting the seat from wear.

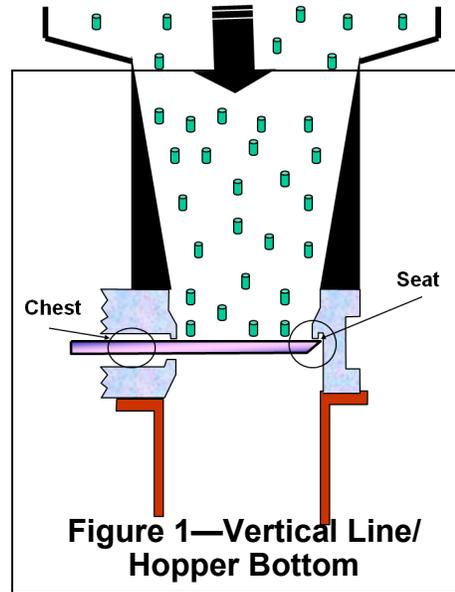
General Guidelines

Observe the following points to prevent distortion of the valve body and gate when the flange bolts are tightened:

- Align the mating pipeline flanges.
- Select the length of the flange bolts so that the bolts used in the blind holes near the chest area of the valve do not bottom out when tightened. We recommend using studs with nuts in the blind holes.
- Tighten the flange bolts evenly, in a crisscross pattern. Refer to Table A for recommended flange bolt/stud torques.

Note: Torque ranges are based on ASME Pressure Vessel Code Calculations and lab test data. These torques are only for the listed gasket types. For other gasket types listed in ASME, consult DeZURIK.

After installing the valve, pressurize pipeline and ensure the packing is not leaking. If the packing leaks, adjust the packing as described on the next page.



**Figure 1—Vertical Line/
Hopper Bottom**

Table A: Recommended Flange Bolt/Stud Torque Range in ft-lbs (non-lubricated)

Valve Size	ASME Gasket Types	
	Rubber with Soft Fabric Filler, & 1/8" Thick Hard	Soft Elastomer Gasket Shore Durometer < 75A
2" (50mm)	26 - 29	8 - 9
3" (80mm)	37 - 41	14 - 16
4" (100mm)	26 - 29	11 - 12
6" (150mm)	41 - 45	22 - 24
8" (200mm)	55 - 61	35 - 39
10" (250mm)	56 - 62	40 - 44
12" (300mm)	80 - 88	59 - 65
14" (350mm)	107 - 118	81 - 89
16" (400mm)	103 - 114	79 - 87
18" (450mm)	128 - 141	102 - 112
20" (500mm)	123 - 136	99 - 109
24" (600mm)	188 - 207	155 - 171

Operation

The gate in the valve is positioned by the valve actuator. The actuator moves the gate over the valve port in the closed position, and withdraws the gate from the seat in the open position. Refer to the Actuator Instructions for adjustment and maintenance requirements for the actuator.

Lubrication

The valve does not require lubrication. If applicable, ensure that valve threaded stems are maintained with proper lubrication. Refer to the Actuator Instructions for lubrication requirements for the actuator.

Packing

The gate packing is contained and compressed by the packing gland. See Figure 2 for component identification.

Note: The packing gland is slightly loosened prior to shipping. This is done to increase the life of the packing during extended storage.

Adjustment

If packing leaks, tighten the adjustment nuts on top of the packing gland. Tighten the nuts evenly and gently just enough to stop the leak. Over tightening will cause excessive operating forces, and will decrease the life of the packing.

Drawings

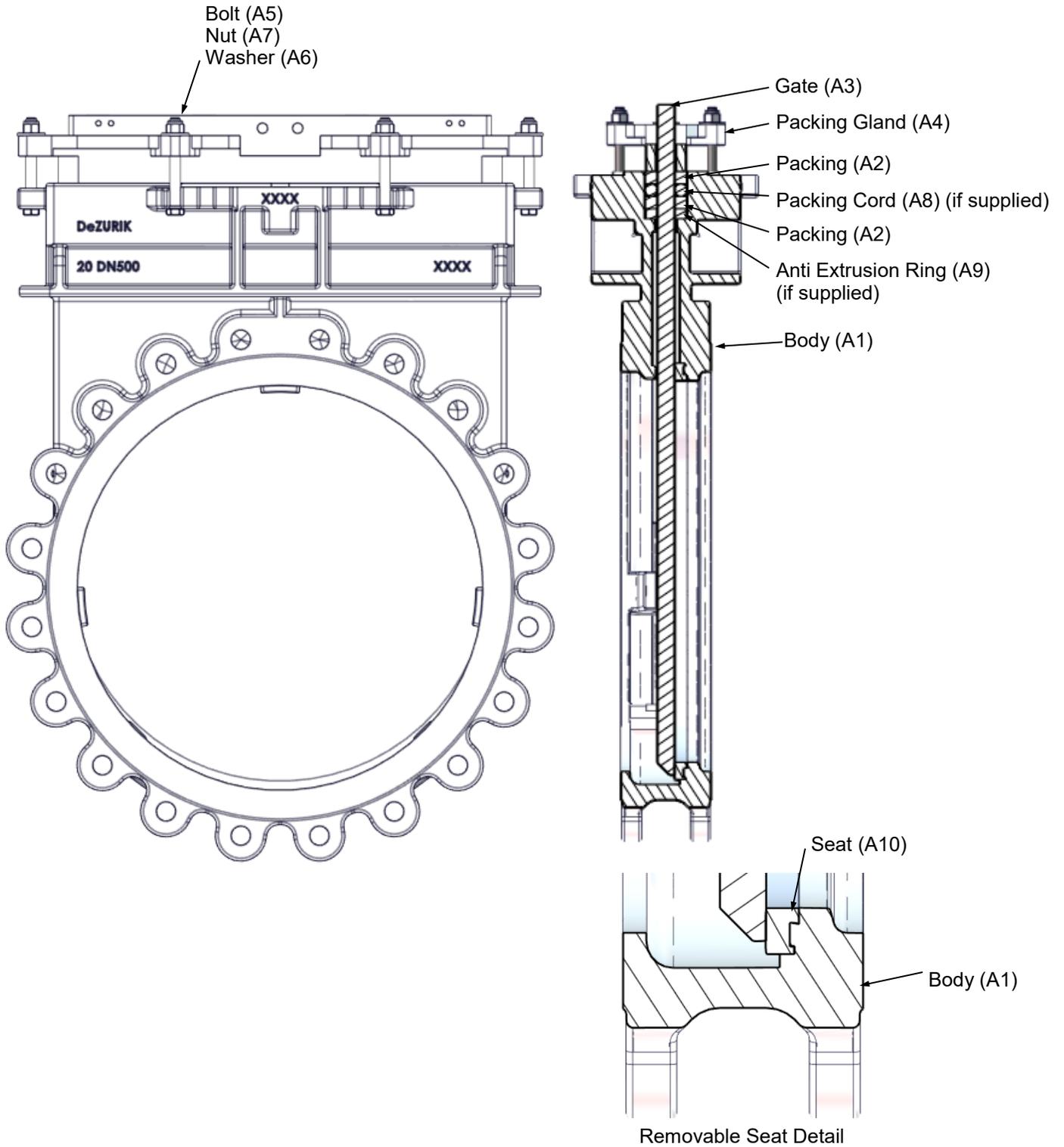


Figure 2—Component Identification

Packing Replacement

Removing the Old Packing

1. Relieve the pressure in the pipeline and close the valve.



WARNING!

Pipeline pressure can cause personal injury or equipment damage. Relieve pipeline pressure before removing gate stem and packing gland nuts.



WARNING!

Accidental operation of power actuator can cause personal injury or equipment damage. Disconnect and lock out power to actuator before servicing.

2. If the actuator is powered, disconnect and lock out power to prevent accidental operation of the actuator.
3. Remove the two screws and nuts near the top of the gate and disengage the stem from the gate by stroking the actuator (not the valve) to the open position.
4. Remove the gland nuts (A7), bolts (A5) and packing gland (A4).
5. Remove the used packing (A2), anti-extrusion ring (A9) if supplied and packing cord (A8) if supplied, from the packing chamber.

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2-24" KGC ES KNIFE GATE VALVES

Installing the New Packing

Packing (A2) strip length and quantity are shown in Table B. Ensure the inside and outside edges of each ring are packed against the gate and packing chamber, so that each strip is compressed flat and evenly. DeZURIK provides extra packing in their packing kits, but do not try to put more packing into a layer than shown in Table B. If packing is for low pressure applications (40psi [2.7 bar]) contact DeZURIK.

Do not compress the packing any more than needed to stop leaks.

1. Ensure the gate (A3) is fully closed and centered in the body before packing.
2. If used, place the anti-extrusion ring (A9) or scraper ring in the bottom of the packing chamber.

Note: Ensure that the anti-extrusion ring fits tightly around the gate and that there is approximately 1/32-1/16" clearance around the packing chamber.

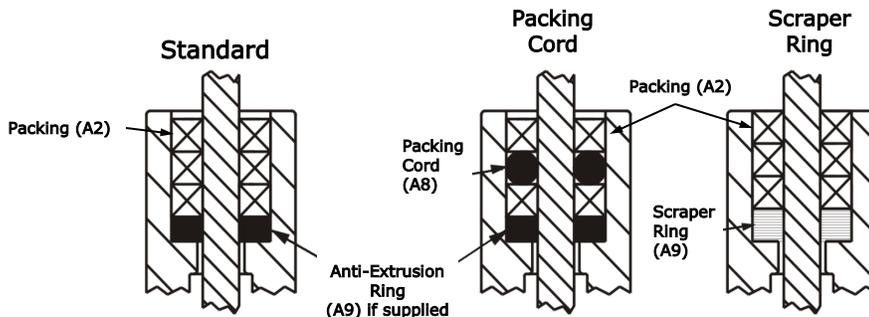
3. Assemble and pack the rings one at a time, with the ends together, but not overlapped

Note: Stagger the joints, on the long side of the packing chamber. For packing rings, we recommend using a square-ended wood or plastic tool, driven by a hammer or mallet. Do not use a sharp tool to pack the rings.

4. For packing systems with the packing cord (A8), assemble and pack one row of packing (A2) and then insert the packing cord (A8). Assemble and pack the last row of packing. See detail below:

Table B: Packing Ring and Packing Cord Length & Quantity

Valve Size	Square Size	Length, inches	Quantity	Qty Cord
2" (50mm)	3/8"	7.50	4 w/o anti-ext ring or cord	1
3" (80mm)		9.50		
4" (100mm)		11.50		
5" (125mm)		13.50		
6" (150mm)		15.50		
8" (200mm)		20.00		
10" (250mm)	1/2"	25.00	3 w/o cord	
12" (300mm)		29.00		
14" (350mm)		32.00		
16" (400mm)		36.75		
18" (450mm)	5/8"	41.25	2 with cord	
20" (500mm)		45.25		
24" (600mm)		53.50		



Detail

**Figure 3—
Packing Ring**

Reassembling Valve

1. Replace the packing gland (A4), bolts (A5), washer (A6) and nuts (A7). Tighten the nuts evenly and finger tight, plus 1/2 turn.
2. Reconnect the stem to the gate with the two screws and nuts.
3. If the actuator is a powered actuator, reconnect power to the actuator.
4. Pressurize the pipeline and inspect packing for leakage.
5. If packing leaks, tighten the adjustment nuts on top of the packing gland. Tighten the nuts evenly and gently - just enough to stop the leak. Over tightening will cause excessive operating forces, and will decrease the life of the packing.

Replacing the Seat

See Figure 2 for component identification.

1. Relieve the pressure in the pipeline and close the valve.



WARNING!

Pipeline pressure can cause personal injury or equipment damage. Relieve pipeline pressure before removing gate stem and packing gland nuts.

-
2. If the actuator is powered, disconnect and lock out power to prevent accidental operation of the



WARNING!

Accidental operation of power actuator can cause personal injury or equipment damage. Disconnect and lock out power to actuator before servicing.

actuator.

3. Remove the two screws and nuts near the top of the gate and disengage the stem from the gate.
4. Remove the pipeline flange bolts and flange from the side of the valve body opposite the word "SEAT". As an alternative, remove both flanges, and remove the valve from the pipeline.
5. Remove the actuator yoke and actuator from the valve.
6. Remove the gland nuts (A7), washers (A6), and packing gland (A4).
7. Remove the gate (A3) from the body.
8. Remove the packing (A2) from the packing chamber.
9. Remove the seat. Push the top of the removable seat (A10) toward the center of the valve, and remove the seat through the packing chamber.
10. Install the new replaceable seat:
 - a. Note the gate side and body side of the seat as shown in Figure 4.
 - b. Insert the new seat (A10) through the packing chamber.
 - c. Place the seat behind the lug at the 5 and 7 o'clock positions in the body. Then push the top of the seat into position.

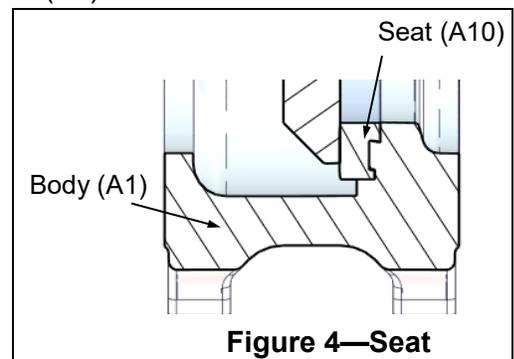


Figure 4—Seat

Seat Replacement *Continued*

Reassembling the Valve

1. Reassemble the gate (A3) in the body, with the beveled edge facing away from the resilient seat. See Figure 4.
2. Place the gate in the fully closed position.
3. Reassemble the packing, as described in "Installing New Packing".
4. Reassemble the packing gland (A4), washers (A6), nuts (A7) and bolts (A5). Tighten the nuts evenly to finger tight, plus 1/2 turn.
5. Reassemble the yoke and actuator on the valve.
6. Reconnect the stem to the gate with the two screws and locknuts.
7. Reassemble the pipeline flange and flange bolts, or reassemble the valve in the pipeline if the valve was removed. Refer to the requirements in the "Installation" section.
8. If the actuator is a powered actuator, reconnect power to the actuator.
9. Pressurize the pipeline and inspect the valve for leaks.
10. If the packing leaks, tighten the adjustment nuts (A7) on top of the packing gland. Tighten the nuts evenly and slowly, just enough to stop the leakage. Over tightening will cause excessive operating forces, and will decrease the life of the packing.

Replacing the Gate

See Figure 2 for component identification.

1. Relieve the pressure in the pipeline and close the valve.
2. If the actuator is powered, disconnect and lock out power to prevent accidental operation of the



WARNING!

Pipeline pressure can cause personal injury or equipment damage. Relieve pipeline pressure before removing gate stem and packing gland nuts.

actuator.



WARNING!

Accidental operation of power actuator can cause personal injury or equipment damage. Disconnect and lock out power to actuator before servicing.

3. Remove the pipeline flange bolts, and remove the valve from the pipeline.
4. Remove the actuator, actuator yoke, packing gland (A4), and packing (A2) from the valve.
5. Remove and inspect the gate (A3). If the gate appears to be scratched or galled due to too-long flange bolts in the chest area of the body, check for body damage in the tapped flange holes and within the chest cavity. Carefully check the seat for damage. Repair or replace the body, as appropriate.

Gate Replacement Continued

6. Remove and inspect the seat components.
7. Replace or reinstall the seat components as described in step 10 in the “Seat Replacement “ section.
8. Place the new gate (A3) in the body, in the fully closed position.
9. Replace or reinstall the packing (A2) as described in “Installing New Packing”.
10. Replace the yoke and actuator on the valve.
11. Adjust the actuator, yoke, and packing gland so that the valve actuates smoothly full stroke in both directions, and so that there is no evidence of binding or scratching on the gate when the gate is visible in the fully open position.
12. Reinstall the valve in the pipe line —see “Installation” section.
13. If the actuator is a powered actuator, reconnect power to the actuator.
14. Pressurize the pipeline and inspect the valve for leaks.
15. If the packing leaks, tighten the adjustment nuts (A7) on top of the packing gland.

Note: Tighten the nuts evenly and slowly, just enough to stop the leakage. Over tightening will cause excessive operating forces, and will decrease the life of the packing.

Purge Port Option

When purge port options are ordered as illustrated, the intent is that the installer will connect purge lines.

Installation:



WARNING!

If pipeline is under pressure with purge port plugs in place, release line pressure before removing plugs. Serious or fatal injury may occur if not complied with.

1. Remove all purge plugs after valve has been installed in line and before line is pressurized.
2. Connect proper purge line to the ports.
3. Pressurize purge lines and check for leaks.
4. Pressurize pipe line.

See Figure 5 for Purge Port sizes and locations.

Purge Port Options

VALVE SIZE		
INCH	MM	A
2	50	1/4 "
3	80	
4	100	
5	125	
6	150	3/8 "
8	200	
10	250	
12	300	1/2 "
14	350	
16	400	3/4 "
18	450	
20	500	
24	600	

NOTE:

1. VALVE TO HAVE PURGE CONNECTIONS IN THIS AREA WHEN ORDERED BY CATALOG CHARACTERISTIC PCA OR PSC
2. VALVE TO HAVE PURGE CONNECTIONS IN THIS AREA WHEN ORDERED BY CATALOG CHARACTERISTIC PSA OR PSC

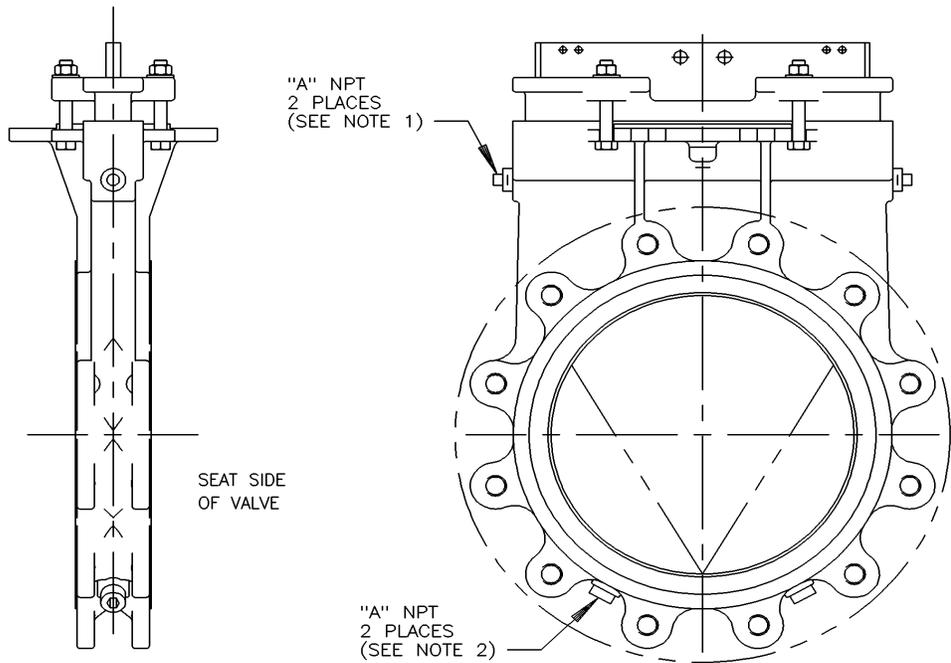


Figure 5—Purge Port Sizes and Locations

Troubleshooting

Condition	Possible Causes	Corrective Action
Packing leaks, with no evidence of galling on gate	Packing is loose	Adjust packing gland
	Packing is worn or torn	Replace packing
Packing leaks and gate is galled	Packing is worn or torn	Replace packing and gate, check seat for damage
Valve leaks when fully closed, with no evidence of galling on gate	Seat is worn or torn	Replace seat
Valve leaks when fully closed and gate is galled	Seat is worn or torn	Replace gate and seat

Limited Warranty

DeZURIK, Inc. ("Seller") manufactured products, auxiliaries and parts thereof that we manufacture for a period of twenty-four (24) months from date of shipment from Seller's factory, are warranted to the original purchaser only against defective workmanship and material, but only if properly stored, installed, operated, and serviced in accordance with Seller's recommendations and instructions.

For items proven to be defective within the warranty period, your exclusive remedy under this limited warranty is repair or replacement of the defective item, at Seller's option, FCA Incoterms 2020 Seller's facility with removal, transportation, and installation at your cost.

Products or parts manufactured by others but furnished by Seller are not covered by this limited warranty. Seller may provide repair or replacement for other's products or parts only to the extent provided in and honored by the original manufacturer's warranty to Seller, in each case subject to the limitations contained in the original manufacturer's warranty.

No claim for transportation, labor, or special or consequential damages or any other loss, cost or damage is being provided in this limited warranty. You shall be solely responsible for determining suitability for use and in no event shall Seller be liable in this respect.

This limited warranty does not warrant that any Seller product or part is resistant to corrosion, erosion, abrasion or other sources of failure, nor does Seller warrant a minimum length of service.

Your failure to give written notice to us of any alleged defect under this warranty within twenty (20) days of its discovery, or attempts by someone other than Seller or its authorized representatives to remedy the alleged defects therein, or failure to return product or parts for repair or replacement as herein provided, or failure to store, install, or operate said products and parts according to the recommendations and instructions furnished by Seller shall be a waiver by you of all rights under this limited warranty.

This limited warranty is voided by any misuse, modification, abuse or alteration of Seller's product or part, accident, fire, flood or other Act of God, or your failure to pay entire contract price when due.

The foregoing limited warranty shall be null and void if, after shipment from our factory, the item is modified in any way or a component of another manufacturer, such as but not limited to; an actuator is attached to the item by anyone other than a Seller factory authorized service personnel.

All orders accepted shall be deemed accepted subject to this limited warranty, which shall be exclusive of any other or previous warranty, and this shall be the only effective guarantee or warranty binding on Seller, despite anything to the contrary contained in the purchase order or represented by any agent or employee of Seller in writing or otherwise, notwithstanding, including but not limited to implied warranties.

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Sales and Service

For information about our worldwide locations, approvals, certifications and local representative:

Web site: www.dezurik.com E-Mail: info@dezurik.com



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