



DEZURIK MASTERGEAR MANUAL ACTUATORS

Instruction D10326
August 2012

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

The Mastergear Manual Actuator is a quarter-turn gear actuator. The actuator is available in four sizes, with a choice of handwheel, chainwheel, or 2" (50 mm) square nut. Each actuator has adjustable open and closed position stops, and may be mounted on the valve in any of four mounting positions, depending upon valve type.

As an option, the handwheel actuator is available with a lockout device that allows the handwheel to be secured with a padlock.

Operation

Clockwise rotation of the handwheel, chainwheel, or 2" (50 mm) nut drives the actuator and valve clockwise towards the closed position of the valve, and counterclockwise rotation opens the valve. The approximate number of handwheel or chainwheel turns to drive the valve 90° are 8 turns on the MG-30 and MG-31, 12 turns on the MG-46, and 16 turns on the MG-64. With the optional lockout device, the handwheel may be locked with a padlock at any 1/8-turn increment.

Lubrication

The actuator is lubricated at the factory, and does not require further lubrication.

Adjustments

The open and closed position stops prevent the actuator from rotating beyond the open and closed positions of the valve. Each stop is adjustable. If the actuator is factory-mounted on the valve, the stops are preset, and do not require further adjustment.

If the actuator is not factory mounted on the valve, or if the actuator has been removed, the stops will require adjustment as described below. Refer to Figure 1 for component identification; also refer to the Valve Instructions for specific closed-position requirements for the valve.

To adjust the closed position stop:

1. Loosen the jam nut on the closed position stop screw, and back out the stop screw about two turns.
2. Turn the handwheel or chainwheel so that the valve is in the closed position.
3. Turn the closed position stop screw clockwise until resistance is felt from the stop screw contacting the gear inside of the actuator.
4. Hold the stop screw from turning, and tighten the jam nut to the torque in Table A.

To adjust the open position stop:

1. Loosen the jam nut on the open position stop screw, and back out the stop screw about two turns.
2. Turn the handwheel or chainwheel so that the valve is in the open position.
3. Turn the open position stop screw clockwise until resistance is felt from the stop screw contacting the gear inside of the actuator.
4. Hold the stop screw from turning, and tighten the jam nut to the torque in Table A.

Removing Actuator from Valve

Refer to Figure 1 for component identification.



WARNING!

Flow in the pipeline with the actuator removed can slam the valve closed causing personal injury and damaging the flow system. Shut down the flow in the pipeline before removing the actuator from the valve.

1. Close the valve.
2. Remove the four mounting screws (B6) and lockwashers (B7).
3. Remove the actuator from the valve.

Replacing Actuator on Valve

Refer to Figure 1 for component identification.

1. Place both the actuator and the valve in the closed position.
2. Some actuators include a splined drive bushing (B2) as indicated in Figure 1. If the actuator includes a bushing, but the bushing has come out of the actuator, note that one large tooth in the bushing is marked with an arrow. Place the bushing in the actuator so that the large tooth is engaged with the deep V-shaped groove in the actuator.
3. Select the desired actuator mounting position from the optional positions shown on the Installation Drawing. Place the gasket in position (see note below), engage the actuator with the valve shaft, and slide the actuator into position on the top of the valve.

Note: All chainwheel actuators include and use a 1/32" (0.8 mm) thick gasket (B28) between the actuator and the chainwheel support (B29). Handwheel actuators do not include a gasket. However, with high-temperature valves, a 1/16" (1.6 mm) thick insulating gasket (P5) is used on handwheel actuators, and is added under the chainwheel support on chainwheel actuators. The insulating gasket is used only when the gasket is included with the valve.

4. Mount the actuator and gasket (see note above) to the valve with the four mounting screws (B6) and lockwashers (B7). Tighten the screws as shown in Table A.
5. Adjust the open and closed position stops as shown in the Adjustments section.

Table A: Fastener Torque Requirements

Fastener	Actuator Size							
	MG-30		MG-31		MG-46		MG-64	
	Ft lbs	Nm	Ft lbs	Nm	Ft lbs	Nm	Ft lbs	Nm
Open and Closed Position Stop Nuts	9 ± 1	12 ± 1	47 ± 6	64 ± 8	83 ± 10	113 ± 14	215 ± 30	290 ± 40
Actuator Mounting Screw (B6) CS is Carbon Steel; SS is Stainless Steel	23 ± 3 CS 16 ± 2 SS	31 ± 4 CS 22 ± 3 SS	83 ± 10 CS 58 ± 8 SS	113 ± 14 CS 79 ± 11 SS	435 ± 60 foot lbs (590 ± 80 Nm) CS 300 ± 40 foot lbs (400 ± 50 Nm) SS			
Chainwheel Set Screw (B18)	7 ± 1 foot lbs (9 ± 1 Nm)							

Component Identification

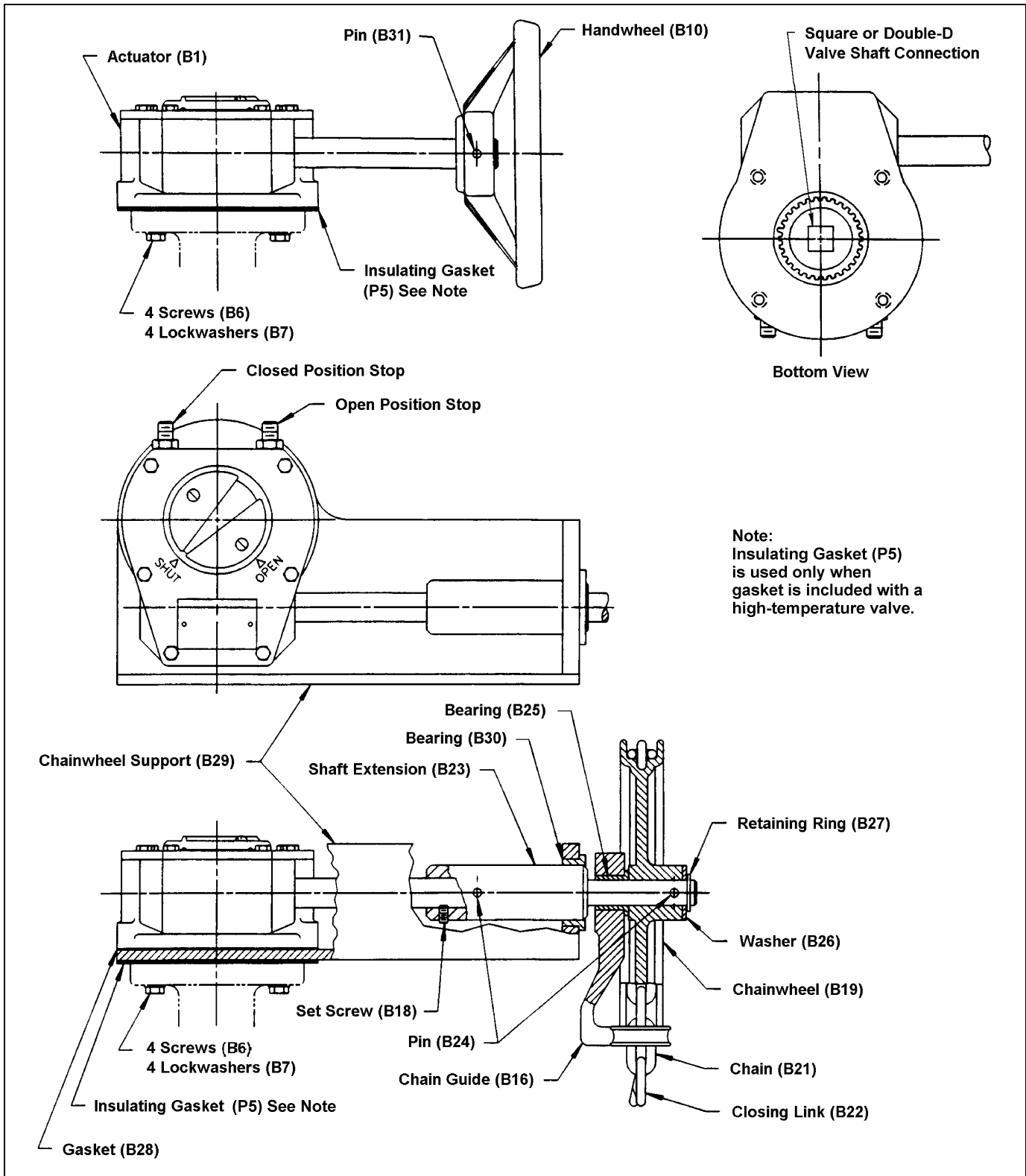


Figure 1—Component Identification

Replacing Handwheel with Chainwheel

The handwheel may be replaced with a chainwheel by following the steps below. Refer to Figure 1 for component identification.

1. Remove the actuator from the valve as described in the Removing Actuator from Valve section.
2. Support the actuator shaft on a solid surface, drive out the handwheel pin (B31), and remove the handwheel (B10).
3. Place the shaft extension (B23) on the actuator shaft, and align the pin holes. Support the shaft extension on a solid surface, and drive the pin (B24) into position.
4. Turn the set screw (B18) into the threaded hole in the shaft extension, and tighten the set screw to 7 ± 1 foot pounds (9 ± 1 Nm).
5. Some actuators include a splined drive bushing (B2) as indicated in Figure 1. If the actuator includes a bushing, but the bushing has come out of the actuator, note that one large tooth in the bushing is marked with an arrow. Place the bushing in the actuator so that the large tooth is engaged with the deep V-shaped groove in the actuator.
6. With the gasket (B28) in position as shown, place the shaft extension (B23) through the bearing (B30) in the support (B29). Assemble the chain guide (B16) and the chainwheel (B19) onto the shaft extension, and align the pin holes in the shaft extension and the chainwheel. Place the hub of the chainwheel on a solid surface, and drive the pin (B24) into position. Place the washer (B26) on the end of the shaft extension, and then place the retaining clip (B27) in the groove on the end of the shaft extension.
7. Select the desired actuator mounting position. The actuator may be mounted in any one of four positions as indicated on the installation drawing for the valve. With the actuator and the valve in the closed position, engage the actuator with the valve shaft and slide the actuator (B1), gasket (B28), and support (B29) into position on the top of the valve. Fasten the four mounting screws (B6) and lockwashers (B7). Tighten the screws as shown in Table A.

Note: All chainwheel actuators include and use a 1/32" (0.8 mm) thick gasket (B28) between the actuator and the chainwheel support (B29). Handwheel actuators do not include a gasket. However, with high-temperature valves, a 1/16" (1.6 mm) thick insulating gasket (P5) is used on handwheel actuators, and is added under the chainwheel support on chainwheel actuators. The insulating gasket is used only when the gasket is included with the valve.

8. Adjust the open and closed position stops as shown in the Adjustments section.

Replacing Chainwheel with Handwheel

The chainwheel may be replaced with a handwheel by following the steps below. Refer to Figure 1 for component identification.

1. Remove the actuator from the valve as described in the Removing Actuator from Valve section.
2. Loosen the set screw (B18), and drive out the pin (B24). Remove the support (B29) and the shaft extension (B23)—including the chain guide (B16) and the chainwheel (B19)—from the actuator.
3. Place the handwheel (B10) on the actuator shaft. Align the pin holes, support the actuator shaft on a solid surface, and drive the pin (B31) into position.
4. Replace the actuator on the valve as described in the Replacing Actuator on Valve section.

Changing Actuator Mounting Position On Valve

Before changing the actuator mounting position, check to assure that dimensional clearance is available for the proposed actuator location. The actuator may be mounted in any one of four positions as indicated on the Installation Drawing for the valve. To change the position, follow the steps in the Removing Actuator from Valve section and in the Replacing Actuator on Valve section.

Lockout Device

The handwheel actuator is available with an optional lockout accessory that allows the handwheel to be locked with a padlock at any 1/8-turn increment. The actuator may be ordered with the lockout included, or the lockout may be ordered separately as a kit and added as described below. A padlock is not included with the lockout accessory.

Adding Lockout to MG-30 Actuator

Refer to Figure 2 and follow the steps below to assemble a lockout kit to an MG-30 Handwheel Actuator.

1. Remove the handwheel pin (B31), and remove the handwheel (B10) from the handwheel shaft.
2. Note the drilled hole in the side of the actuator next to the shaft. Drive the pin (X3) into the hole so that the pin is bottomed out in the hole.
3. With the hub side of the housing flange (X1) facing the actuator, slide the flange onto the shaft so that the hole in the flange is aligned with the pin (X3) in the actuator. Carefully drive the flange onto the pin until the flange hub is against the side of the actuator.
4. With the flat side of the shaft flange (X2) facing the actuator, slide the flange onto the shaft so that there is about 1/16" (1.6 mm) clearance between the flat sides of the two flanges. Hold the shaft flange in that position, and drill a 3/16" (4.76 mm) diameter hole through the boss in the flange hub and through the actuator shaft. Do not drill through the other side of the flange hub. Drive the shaft pin (X5) through the hole in the flange hub and into the hole in the shaft so that the pin is approximately flush with the flange hub.
5. Place the handwheel (B10) in the original position on the handwheel shaft, and secure the handwheel with the pin (B31).

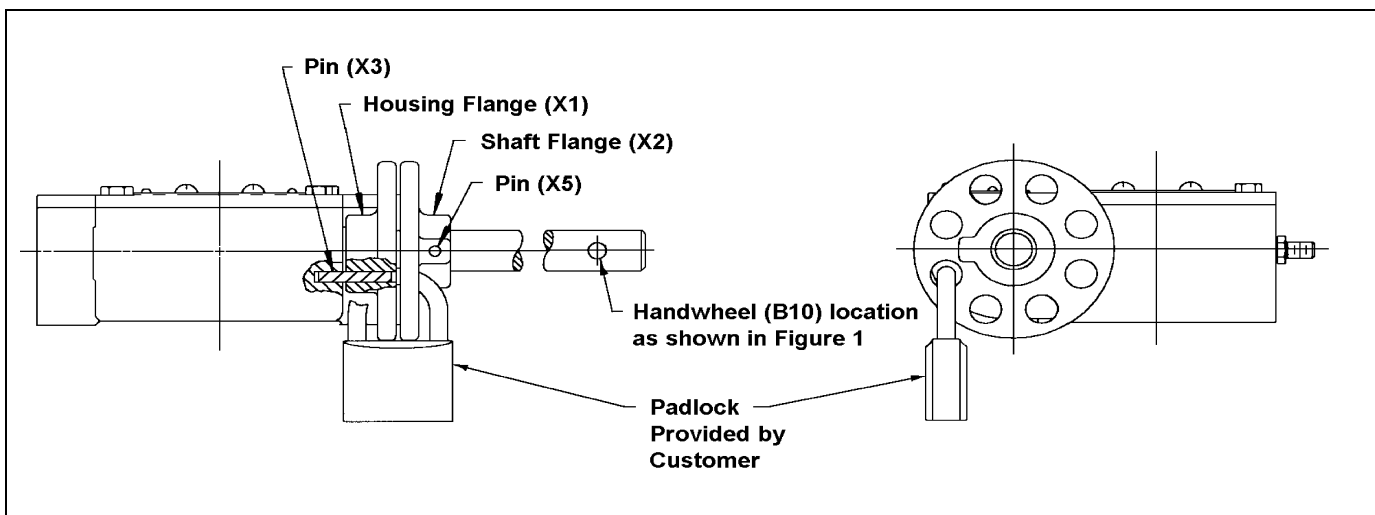


Figure 2—Lockout on MG-30 Handwheel Actuator

Lockout Device *(continued)*

Adding Lockout to Other Actuators

Refer to Figure 3 and follow the steps below to assemble a lockout kit to an MG-31, MG-46, or MG-64 Handwheel Actuator.

1. Remove the handwheel pin (B31), and remove the handwheel (B10) from the handwheel shaft.
2. Note the two drilled holes in the side of the actuator next to the shaft. Use the holes to mount the bracket (X3) with two self-tapping screws.
3. Drill a 1/4" (6.35 mm) diameter hole in one side of the hub of the shaft flange (X2). With the hub side of the shaft flange facing the actuator, slide the flange onto the shaft so that there is about 1/16" (1.5 mm) clearance between the flange and the bracket. Hold the shaft flange in that position; use the 1/4" (6.35 mm) hole in the hub as a template, and drill a 7/32" (5.56 mm) diameter hole through the actuator shaft. Do not drill through the other side of the flange hub. Mount the flange to the shaft with the self-tapping screw (X6).
4. Place the handwheel (B10) in the original position on the handwheel shaft, and secure the handwheel with the pin (B31).

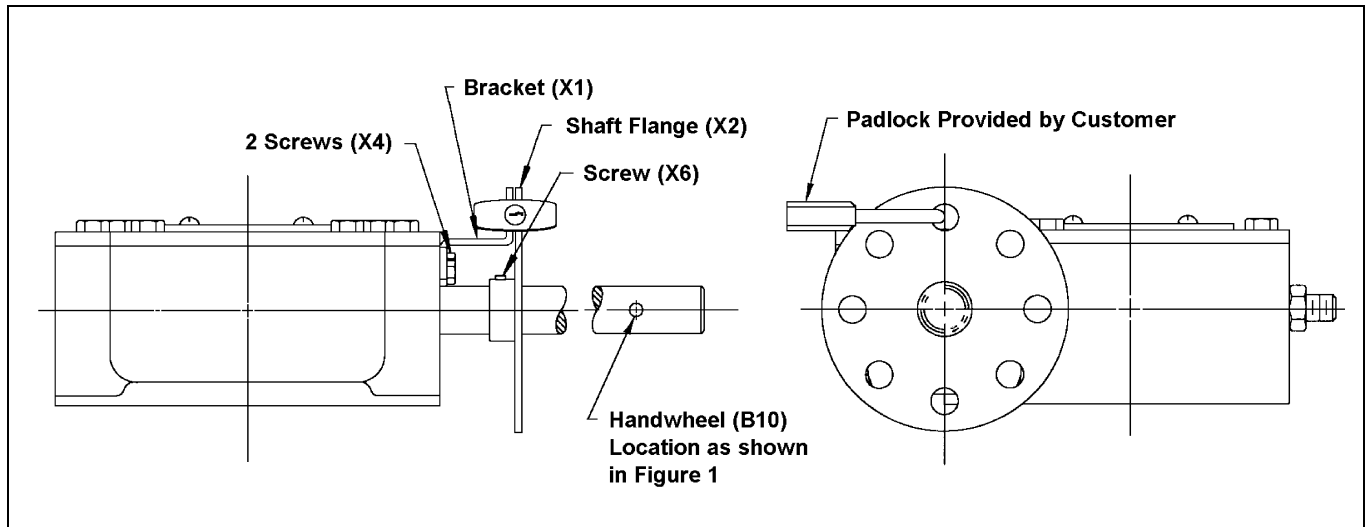


Figure 3—Lockout on MG-31, MG-46, or MG-64 Handwheel Actuator

Troubleshooting

Condition	Possible Cause	Corrective Action
Actuator closes to wrong position.	Closed position stops set incorrectly.	Adjust closed position stop. See <i>Adjustments</i> section.
Actuator opens to wrong position.	Open position stops set incorrectly.	Adjust open position stop. See <i>Adjustments</i> section.
Actuator will not fully operate valve.	Pipeline obstruction in valve is preventing closure.	Remove obstruction.

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.

THE FOREGOING REPAIR AND REPLACEMENT LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, OBLIGATIONS AND LIABILITIES, INCLUDING, BUT NOT LIMITED TO, ALL WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR OF MERCHANTABILITY OR OTHERWISE, EXPRESSED OR IMPLIED IN FACT OR BY LAW, AND STATE SELLER'S ENTIRE AND EXCLUSIVE LIABILITY AND YOUR EXCLUSIVE REMEDY FOR ANY CLAIM IN CONNECTION WITH THE SALE AND FURNISHING OF SERVICES, GOODS OR PARTS, THEIR DESIGN, SUITABILITY FOR USE, INSTALLATION OR OPERATIONS. NEITHER ANY PERFORMANCE OR OTHER CONDUCT, NOR ANY ORAL OR WRITTEN INFORMATION, STATEMENT, OR ADVICE PREPARED BY SELLER OR ANY OF OUR EMPLOYEES OR AGENTS WILL CREATE A WARRANTY, OR IN ANY WAY INCREASE THE SCOPE OR DURATION OF THE LIMITED WARRANTY.

Disclaimer

Metric fasteners should not be used with ASME Class 150/300 bolt holes and flange bolt patterns. If you use metric fasteners with ASME Class 150/300 bolt holes and flange bolt patterns, it may lead to product failure, injury, and loss of life. DeZURIK Inc. disclaims all liability associated with the use of metric fasteners with ASME Class 150/300 bolt holes and flange patterns, including but not limited to personal injury, loss of life, loss of product, production time, equipment, property damage, lost profits, consequential damages of any kind and environment damage and/or cleanup. Use of metric fasteners with ASME Class 150/300 bolt holes and flange bolt patterns is a misuse that voids all warranties and contractual assurances. If you use metric fasteners with ASME Class 150/300 bolt holes and flange bolt patterns, you do so at your sole risk and any liability associated with such use shall not be the responsibility of DeZURIK, Inc. In addition to the foregoing, DeZURIK's Manufacturer's Conditions apply.

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Sales and Service

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

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DeZURIK, Inc. reserves the right to incorporate our latest design and material changes without notice or obligation.

Design features, materials of construction and dimensional data, as described in this manual, are provided for your information only and should not be relied upon unless confirmed in writing by DeZURIK, Inc. Certified drawings are available upon request.