

# KALREZ™ Packing System for Fisher™ Sliding-Stem Valves

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## Introduction

### Scope of Manual

This instruction manual includes installation, maintenance, and parts information for KALREZ valve stem packing (KVSP) systems. These systems are available for Fisher sliding-stem valves with 9.5, 12.7, 19.1, 25.4, and 31.8 mm (3/8, 1/2, 3/4, 1, and 1-1/4 inch) diameter stems. The system can be used with many sliding-stem valves as shown in the Applications section of the Specifications. Refer to appropriate valve and actuator instruction manuals for necessary information relating to the disassembly and assembly of the valve and actuator.

Do not install, operate, or maintain KALREZ packing systems without being fully trained and qualified in valve, actuator, and accessory installation, operation, and maintenance. To avoid personal injury or property damage, it is important to carefully read, understand, and follow all the contents of this manual, including all safety cautions and warnings. If you have any questions about these instructions, contact your [Emerson sales office](#) or Local Business Partner before proceeding.

### Description

Emerson Automation Solutions offers KALREZ packing systems that you can easily install into your existing valves or that you can purchase with new valves. The KVSP 500 Series uses Vespel™ CR-6100 backup rings and KALREZ seal rings. The KVSP Fire-Safe Series uses Vespel CR-6100 backup rings, KALREZ seal rings, and a die-formed flexible graphite ring located on top of the KALREZ packing set.

These packing systems help seal your process to conserve valuable fluids, and help protect the environment against the emission of toxic or polluting liquids and gases. The external live-loading provides a constant load over the life of the packing material, which reduces your need for packing box adjustment and maintenance.

If the piping and valve are insulated, do not allow insulation to extend above the yoke boss surface, covering the KALREZ packing arrangement. Keep the KALREZ packing arrangement exposed to ambient air conditions.

Table 1. Specifications

<p><b>Applicable Valve Designs</b></p> <p>Fisher valves using CL125 through 600, ■ A, ■ easy-e™ valves (for example, EAT, EZ, ETR, EWD, etc.), ■ EH, ■ HP, ■ YD, and ■ YS<sup>(1)</sup></p> <p><b>Applications</b></p> <p>Valve Stem Diameters: ■ 9.5, ■ 12.7, ■ 19.1, ■ 25.4, and ■ 31.8 mm (3/8, 1/2, 3/4, 1, and 1-1/4 inches)</p>	<p><b>Pressures and Temperatures<sup>(2)</sup></b></p> <p>Maximum Application Temperature  <i>KVSP 500 Series: 260°C (500°F)</i>  <i>KVSP Fire-Safe Series: 260°C (500°F)</i>  Maximum Application Pressure  <i>For Environmental Service: 31 bar (450 psig)</i>  <i>For Non-Environmental Service: Pressure is limited to the maximum valve rating</i>  Also see bulletin 59.1:062, Packing Selection Guidelines for Sliding-Stem Valves</p>
<p>1. For availability of a KALREZ packing system with a specific valve, contact your <a href="#">Emerson sales office</a> or Local Business Partner.  2. The pressure/temperature limits in this manual, in the valve literature, and any applicable code or standard limitation, should not be exceeded.</p>	

## Installation and Maintenance

Use these instructions to install KALREZ packing in valves that have standard packing or when inspecting or replacing KALREZ packing.

### **⚠ WARNING**

**Avoid personal injury from sudden release of process pressure or uncontrolled movement of parts. Before performing any installation or maintenance operations:**

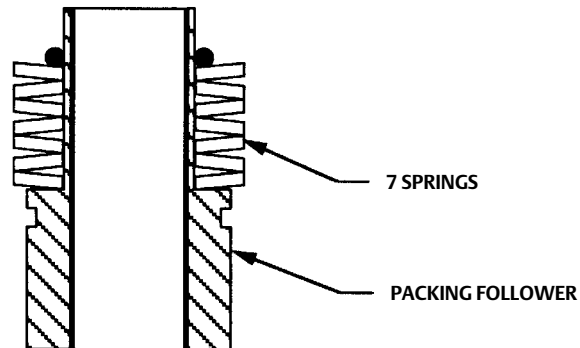
- Do not remove the actuator from the valve while the valve is still pressurized.
- Always wear protective gloves, clothing, and eyewear when performing any maintenance operations to avoid personal injury.
- Disconnect any operating lines providing air pressure, electric power, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.
- Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure from both sides of the valve. Drain the process media from both sides of the valve.
- Vent the power actuator loading pressure and relieve any actuator spring precompression.
- Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.
- The valve packing box may contain process fluids that are pressurized, *even when the valve has been removed from the pipeline*. Process fluids may spray out under pressure when removing the packing hardware or packing rings, or when loosening the packing box pipe plug.
- Check with your process or safety engineer for any other hazards that may be present from exposure to process media.

If you are installing the packing system in a valve that is still connected to an actuator, remove the actuator from the valve to provide sufficient space to install the packing assembly. If a spring-return actuator is used, it is possible that disconnecting the stem connector will allow the spring to force the actuator to the end of its travel. Be sure the actuator spring is resting on its travel stop. Refer to the appropriate valve and actuator instruction manuals to remove the actuator.

Carefully remove the old packing parts from the packing box by using the valve instruction manual procedures. Both the valve stem surface condition and the packing bore are critical in obtaining a good seal. If the valve stem surface is

scratched, nicked, or worn, replace the valve stem before installing the KALREZ Packing System. Check the condition of the packing bore and clean or hone it out, as necessary. Refer to the appropriate valve instruction manual to replace the valve stem.

Figure 1. Belleville Spring Stacking Order



For key number locations refer to figure 3. Then proceed as follows:

1. The original packing flange studs used for standard packing arrangements should be long enough to accommodate the KALREZ packing parts. If you determine that the existing studs and nuts should be replaced however, due to their condition, replace them with new studs and nuts (keys 200 and 212).
2. Complete all valve maintenance before installing the KALREZ packing system into the bonnet.
3. Be careful NOT to position the KVSP packing system adjacent to any lubrication holes in the bonnet which could compromise its sealing performance.

#### Note

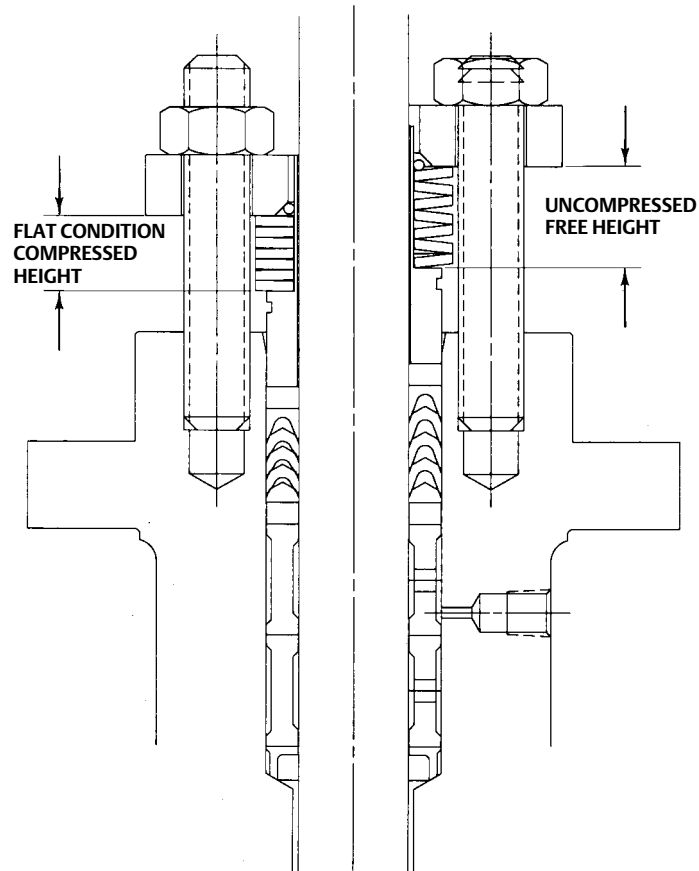
Ensure that the Belleville springs are stacked properly (see figure 1) and packing box parts are assembled in the correct order (see figure 3). Packing parts cannot function properly if the Belleville springs or other packing parts are not stacked correctly.

4. KVSP packing systems should be installed as a complete set, NOT AS INDIVIDUAL PIECES OR COMPONENTS.
5. All kits include a single use packet of KRYTOX™ GPL 206 high performance fluorinated grease to maximize service life and ease of assembly. KRYTOX lubricants are chemically inert to the chemicals regulated under the U.S. Clean Air Act, non-reactive to gaseous and liquid oxygen and chlorine services, with chemical compatibility consistent with KALREZ and the KVSP Systems.
6. Apply the KRYTOX lubricant **liberally** to both the I.D. and O.D. surfaces of each packing set component (key 215) before installing. All exposed surfaces of the packing assembly should be fully covered.
7. Carefully slide the packing down the stem while being careful not to force the packing and damage it on the stem threads. Use figure 3 to ensure that the packing parts and spring pack are assembled in the correct order.

## Tightening Procedures

A modified tightening procedure is recommended for live-loading the KVSP System to ensure the correct loading force is used during the life of the packing and to avoid any overcompression of the packing. This procedure also creates open space within the spring set that allows dynamic movement of the packing system to compensate for any volumetric changes that occur during thermal cycling.

Figure 2. KVSP System Tightening Procedure



90AY012600A  
B2459

The following tightening procedure will change the final loading force to about 1/2 of a fully compressed disk spring.

1. Hand tighten the gland nuts on the Belleville disk springs and measure the uncompressed or free height as shown in figure 2.
2. Fully compress the Belleville disk springs alternately and evenly to the flat condition. The flat condition will be evident by a sharp increase in the applied nut torque. Note that there may appear to be space left between the springs; this is due to friction between the springs. Measure the compressed height. See figure 2.
3. Back off the disk spring load by 1/3 or 33% of the difference between (1) the free spring height and (2) the fully compressed spring height.

## Other Considerations

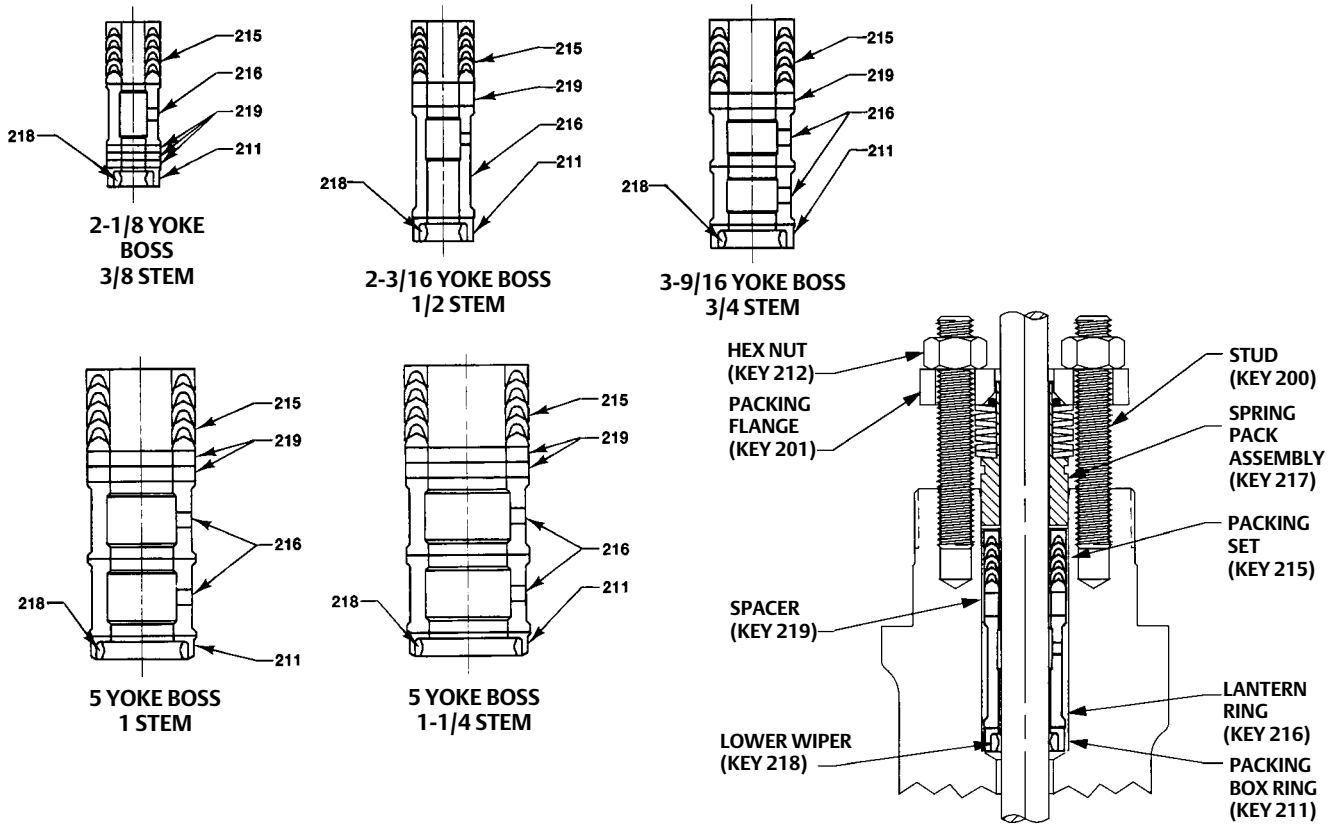
When retrofitting an existing packing system or repacking a valve with KALREZ packing that has been in service, check the condition of the packing bore after you have removed the packing. An easy method for cleaning debris and minor imperfections from the bore is to use a brake cylinder hone attached to an electric drill. This method will do a good job of cleaning the packing bore without changing the dimension of the bore.

If any visible pits or defects remain in the packing bore, the bonnet should be replaced.

easy-e Packing (see figure 3)

KEY NUMBER	DESCRIPTION	STEM SIZE, mm (INCHES)									
		9.5 (3/8)		12.7 (1/2)		19.1 (3/4)		25.4 (1)		31.8 (1-1/4)	
		PN	Qty	PN	Qty	PN	Qty	PN	Qty	PN	Qty
200	Stud, SA-193-CL 2 (B8M), Strain Hardened	1E944135222	2	1E944435222	2	1E944935222	2	0V002535222	2	0W086935222	2
201	Packing Flange, S31600 (316 SST)	12B6923X012	1	12B6924X012	1	12B6925X012	1	12B6654X012	1	12B6680X012	1
211*	Packing Box Ring, S31600	1J873135072	1	1J873235072	1	1J873335072	1	1J873435072	1	1J873535072	1
212	Packing Nut SA-194-8M Strain Hardened S31600	1E944035252	2	1E944535252	2	1E944635252	2	1A343335252	2	1A368135252	2
213	Anti-Seize Lubricant	Not furnished with packing. Use anti-seize lubricant purchased from any supplier.									
215*	Packing Set, KALREZ/VespeI CR-6100	24B7042X012	1	24B7042X022	1	24B7042X032	1	24B7042X042	1	24B7042X052	1
215*	Packing Set, Fire-Safe	24B7043X012	1	24B7043X022	1	24B7043X032	1	24B7043X042	1	24B7043X052	1
216	Lantern Ring, S31600	22B6943X012	1	22B6944X012	1	0N028435072	2	0U099735072	2	0W087135072	2
217	Spring Pack Assembly S31600/N07718	12B6921X062	1	12B6921X072	1	12B6921X082	1	12B6921X092	1	12B6921X102	1
218*	Lower Wiper, PTFE	1J872106992	1	1J872206992	1	1J872306992	1	1J872406992	1	1J872506992	1
219	Spacer, S31600	14B7044X012	3 <sup>(1)</sup>	14B7045X012	1 <sup>(2)</sup>	14B7046X012	1 <sup>(2)</sup>	14B7047X012	2 <sup>(1)</sup>	14B7056X012	2 <sup>(1)</sup>
* Recommended spare part. 1. Quantity equals 1 for Fire-Safe. 2. Not used with Fire-Safe.											

Figure 3. KALREZ Packing Assembly for easy-e Valves



3487261-A  
 A6297/G1  
 B2460

## Parts Ordering

Each valve assembly is assigned a serial number that can be found on the valve body. Refer to this serial number when contacting your [Emerson sales office](#) or Local Business Partner for technical assistance. When ordering replacement parts, refer to this serial number and to the part description and part number from the following parts list. When ordering replacement parts, refer to the serial number and to the 11-character part number for each part required from the following parts list.

### **WARNING**

**Use only genuine Fisher replacement parts. Components that are not supplied by Emerson Automation Solutions should not, under any circumstances, be used in any Fisher valve, because they may void your warranty, might adversely affect the performance of the valve, and could cause personal injury and property damage.**

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Emerson Automation Solutions  
Marshalltown, Iowa 50158 USA  
Sorocaba, 18087 Brazil  
Cernay 68700 France  
Dubai, United Arab Emirates  
Singapore 128461 Singapore

[www.Fisher.com](http://www.Fisher.com)

