



Installation, Maintenance, and Inspection of Short Stem Cryogenic Shut off Valves T9450 Series & T9460 and Similar Series

In its continuing quest for safety and quality performance, RegO® publishes a series of bulletins explaining the proper installation, inspection, and maintenance of various products. This document is not intended to conflict with federal, state, or local ordinances or regulations; these regulations should be observed at all times.

Objective:

The purpose of this bulletin is to offer guidance for the installation, maintenance, and inspection of RegO cryogenic short stem shut off valves.

Installation:

The installation process of the shut off valve depends on the specific application (i.e., Cryogenic Liquid or vapor phase).

Cryogenic Liquid Installation:

RegO recommends that the valves in liquid cryogenic service are mounted in a horizontal pipeline with the stem positioned vertically. Installing in this position will limit the exposure of the stem packing to the cryogenic liquid. If cryogenic liquid is allowed to contact the stem packing seal for prolonged periods of time, then the sealing elements can shrink beyond design limits and may result in a packing leak. An adequate packing seal can be optimized if the stem is within 45° of the vertical position.



Figure 1: Liquid Cryogenic Cylinder Short Stem Shutoff Valve Installation Example



For liquid cryogenic installation, it is recommended to use either brazed or back braze threaded end connections to avoid potential leakage through the threads that can occur during thermal cycling. RegO offers a diverse range of different end connections to help fit your specific installation needs.

Cryogenic Liquid Installation Steps:

1. Disassemble the valve, fully removing the upper assembly, prior to applying any high temperature heat processes to avoid damage to the soft materials, such as gaskets and seals.
2. Ensure that connections are clean and free of any debris.
3. Clean the nipple and valve threads and apply flux.
4. Position the valve such that the flow arrow is in the proper direction for the intended application.
5. The brazing process must be completed according to applicable codes and standards. Proper welding and brazing technique are imperative to ensure the structural integrity of the joint and the components.

WARNING: USE TORCH PROPERLY; FAILURE TO DO SO MAY RESULT IN LEAKS. A common mistake during the silver brazing process is the improper use of a torch. One common example is when the torch is oversized and produces overheating of the valve body. If the overheating condition is combined with a fast-cooling process, then it can create porosity in the brass body material, which can result in body leaks.

6. Purge and clean the body and pipeline to avoid debris or pollution that could affect the sealing of the valve.
7. After the purging of the valve body and pipeline is complete, it is very important to use a new copper gasket in the valve body. As seen in Figure 3, RegO includes an extra copper gasket attached to the topworks for this purpose. Place the topworks onto the body. Verify that the valve is in the fully open position and thread the topworks finger tight into the body. With a suitable torque wrench and crowfoot wrench apply 900 to 1100 in-lbs (75 to 92 ft-lbs) for the final adjustment.



Figure 2: Final adjustment with torque wrench.

WARNING: DO NOT REUSE GASKETS. If an old gasket is reused, then the probability of leakage is high as the gasket has already been previously deformed and is unable to properly fill the void space in the new position.

WARNING: DO NOT EXCEED THE TORQUE INDICATED; EXCESS TORQUE MAY DAMAGE GASKET AND RESULT IN LEAKAGE AT THIS JOINT. Some leak channels can appear over time, as a result of thermal cycles coupled with improper torque of the topworks. Do not exceed the torque indicated. Excess torque can cause damage to the gasket and cause premature leaking at this joint.



Figure 3: T9450 Series Topworks with Extra Copper Gasket Attached

8. Follow all local codes or national codes and standards for pressure testing and leak checking the installation before start up of the system.

Vapor phase Installation:

1. Ensure that connections are clean and free of any debris.
2. Clean the nipple and valve threads and apply sealant that is appropriate for the intended service to male thread of the connection.
3. Position the valve such that the flow arrow is in the proper direction for the intended application.
4. Restrain the valve with a vise or suitable wrench, and using an appropriate wrench for the connection, apply the proper torque to the connection according to applicable codes and standards.
5. Follow all local codes or national codes and standards for pressure testing and leak checking the installation before startup of the system.

Inspection:

The inspection period and process of the valves depends on the application, service conditions, environment, and regulatory requirements. Many visual inspections can be accomplished without disassembling the valve. The primary inspection points are:

- Packing system
- Bonnet gasket
- Body and bonnet

During this inspection, verify that the valves do not have the below conditions:

1. Any signs of corrosion due to water, salt, industrial pollutants, chemicals, and roadway contaminants.
2. Any physical damage that would prevent proper sealing or that may cause product failure under pressure.
3. Leaks in the valve bonnet area or between the body and end connections of the valve.

**Maintenance:**

The maintenance period and process of the valves depend on the application, service conditions, environment, and regulatory requirements. It is recommended that genuine RegO parts are used. The repair kit part number that applies for the T9450 Series & T9460 and similar Series is T9564-80, depending on the handwheel color the part number is indicated below.

Repair Kit	Handwheel Color
T9464-80	Silver
T9464-80B	Blue
T9464-80G	Green
T9464-80R	Red

NOTE: Always replace the gasket whenever the bonnet is removed.