

**Tri-Tech  
Medical Inc.**

*Manufacturer of  
Medical Gas Piping Equipment*

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***Installation & Operating & Maintenance Instructions  
For  
Tri-Tech Medical Zone Valve Boxes & Ball Valves***



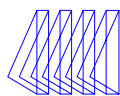
Ball Valve



Zone valve box with E Z  
Backfeed™ & E Z Find™



Zone Valve Box



## Introduction

Tri-Tech Medical ball valves and zone valve boxes are cleaned for use with oxygen. Each valve is tested for leakage in both the open and closed position. Each unit is designed and built in accordance with the National Fire Protection Association and Compressed Gas Association guidelines.

The installation and maintenance should be conducted in accordance with the following standards:  
NFPA 99C or CSA Z7396.1-06

### Warranty

All Tri-Tech Medical manifolds are warranted against defects in material and workmanship for the period of one year from date of purchase.

Ball valves must be inspected periodically for closure ability and leakage. A defective product should be repaired or replaced immediately. Parts that are broken, missing, worn, distorted or contaminated should be replaced immediately.

### Installation of Ball Valves

Ball valves must be installed in accordance with NFPA99 or CSAZ7396.1-06. Verify the valve is in the fully open position. An internal nitrogen purge must be used during the brazing operation. The purge gas should flow away from the valve body. Brazing alloys per appropriate standards must be used. Before brazing, wet rags must be wrapped around the tube extensions next to the valve flanges to prevent overheating and possible damage to the valve seals. Direct the flame away from the valve body. The valve body temperature must not exceed 300 degrees F to prevent damaging the Teflon seals. Do not braze the opposite side of the valve assembly until after the first side has cooled.

Note: the valve bolts may need to be re-tightened after brazing due to the effects of heating & cooling. Torque the the hex nuts in ¼ turn increments, using a cross pattern until the proper torque setting is reached per the chart below:

Valve Size	Torque (inch pounds)
½" to 1"	100
1 ¼" to 1 ½"	150
2"	270

The system must be tested (per appropriate standards) to ensure that no cross-connections have been made.

The system must be tested (per appropriate standards) for leaks.

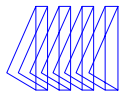
Gauges should not be installed until after the leak testing is completed. Excessive pressure will damage the gauges.

Note: Pressure in the system will increase or decrease with temperature rise or fall.

After the system passes the leak test, gauges may be installed. Pipe sealants used to install the gauges must comply with NFPA 99 or CSA Z7396.1-06. Use care to exclude pipe sealants from the valve cavity and from interior tube surfaces exposed to medical gas flow or vacuum service. Properly applied Teflon tape is an acceptable alternative to pipe sealants.

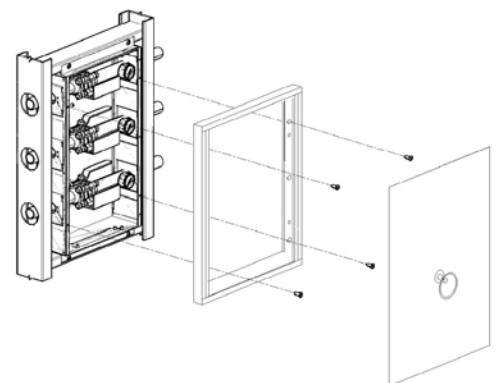
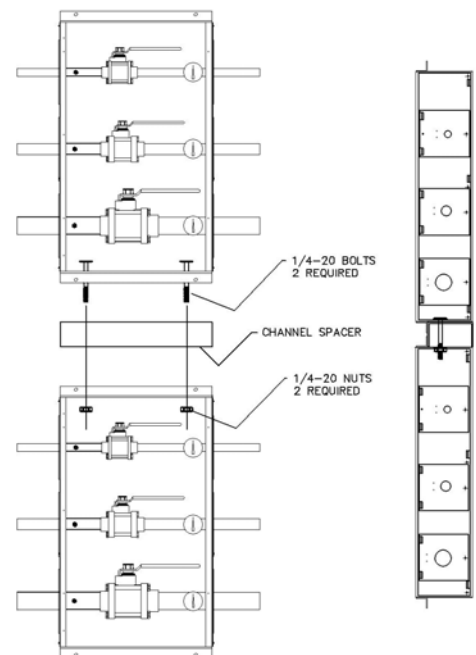
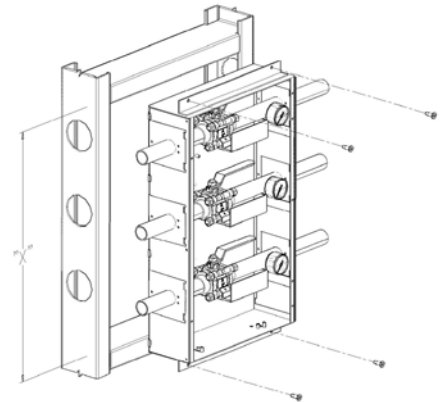
Check shutoff valve handle operation for proper clearance from any obstructions.

**WARNING: Miss-connection of the gases could lead to serious or fatal injury to patients. Following installation, valves must be tested for cross-connection (per appropriate standards) to ensure that the intended services are correctly connected to the appropriate service lines.**



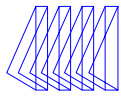
## Zone Valve Box Installation

1. Tri-Tech Medical zone valve boxes may be plumbed in either direction – with the patient (use) side on the left or the right. The dual gauge ports allow for installation of the gauge on either side of the valve. This saves the plumber time and money.
2. The rough-in (back box) is shipped with a cardboard dust cover installed. You will need to remove the dust cover to install the rough-in and perform the pressure test. The dust cover should be re-installed after the pressure test to protect the valves until the wall covering (drywall, paint etc.) is complete.
3. The center of the rough-in box should be 60" in height\* above the finished floor. Fasten the valve box to horizontal braces installed between the studs so that the front edge of the rough in box will be flush or slightly recessed with the finished wall covering.
4. Before brazing, remove the plastic tube caps from the valves. Ball valves must be installed in accordance with "Installation of Ball Valves" instructions on page 2.
5. The system must be tested (per appropriate standards) to ensure that no cross-connections have been made. The system must be tested (per appropriate standards) for leaks. Gauges should not be installed until after the leak testing is completed. Excessive pressure will damage the gauges. Note: Pressure in the system will increase or decrease with temperature rise or fall.
6. If more than 4 valves are required, multiple zone valve boxes may be installed using a ZV-801 zone valve box coupling kit as shown here.
7. After the system passes the leak test, gauges may be installed. Gauges must be installed on the downstream (patient) side of the valve. Pipe sealants used to install the gauges must comply with NFPA 99 or CSA Z7396.1-06. Use care to exclude pipe sealants from the valve cavity and from interior tube surfaces exposed to medical gas flow or vacuum service. Properly applied Teflon tape is an acceptable alternative to pipe sealants.
8. Mark the areas controlled by each valve on the labels provided on each valve.
9. After the wall covering is complete, the dust cover may be removed from the rough-in box and the window frame and window may be installed.



**WARNING: Mis-connection of the gases could lead to serious or fatal injury to patients. Following installation, valves must be tested for cross-connection (per appropriate standards) to ensure that the intended services are correctly connected to the appropriate service lines.**

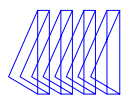
**WARNING: Make certain the labeling coincides with the gas service, and areas controlled by the valve and that it is easily read.**



## **Maintenance**

1. Ball valves should be operated periodically and tested for closure ability and leakage. If seals stick or leak, they should be replaced.
2. Clean the exterior of the valve boxes routinely with soap and water. Strong solvents will damage the lexan window and the silk screened printing on the window.
3. The ball valves have a removable swing out body design which allows for the changing of internal components. All valve bodies can be accessed by loosening all bolts and nuts and removing only one bolt, for valves sizes up to 2" and two bolts for 2 1/2" and 3" valves, at this point the body may be swung out for servicing.

**WARNING:** To protect the lives of patients, always notify the appropriate medical facility staff before shutting off the supply of medical gas or vacuum through a ball valve. Do not close ball valves except in cases of emergency. Authorized hospital should close ball valves in the event of fire, explosion or damage to the pipeline or equipment.

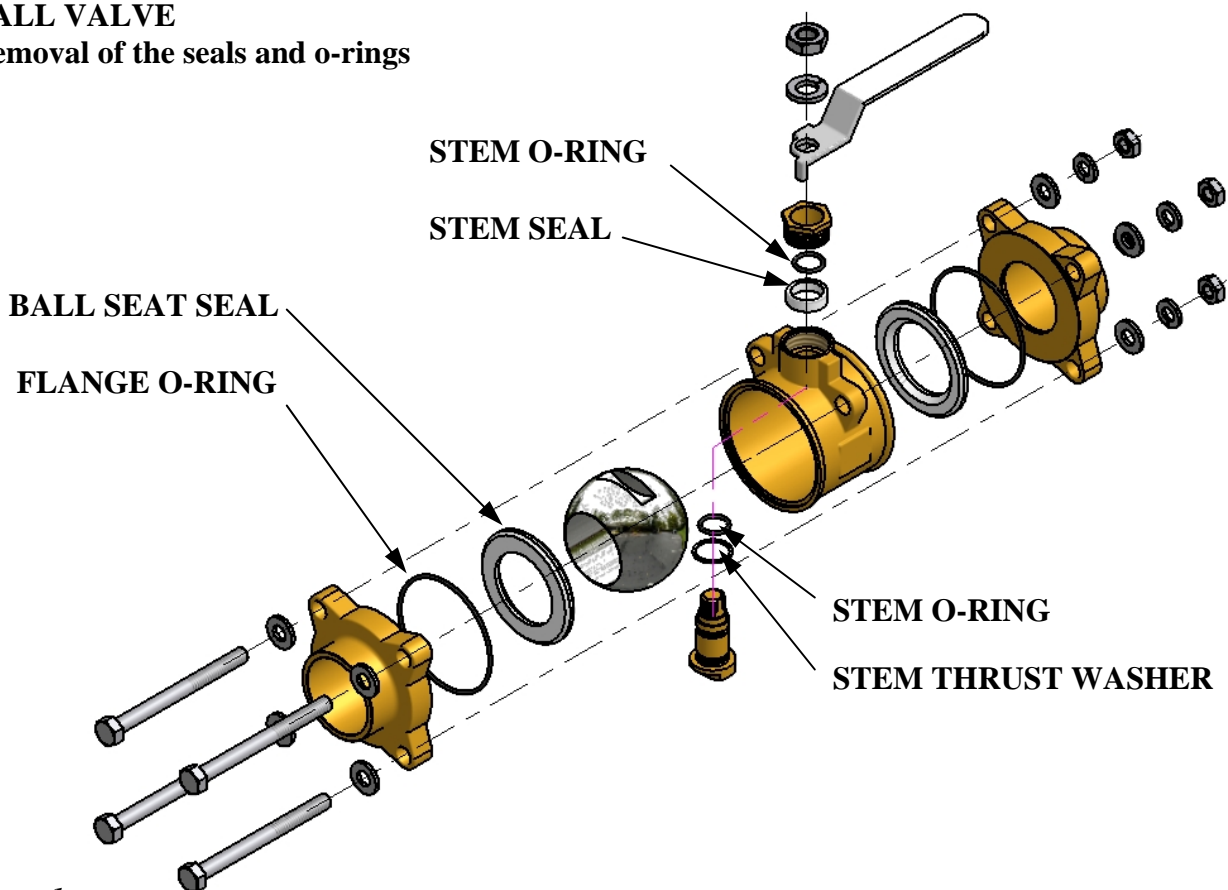


FOR TRI-TECH MODEL NUMBERS:

1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"
51-02	51-03	51-04	51-05	51-06	51-07	51-08	51-09
51-02LH	51-03LH	51-04LH	51-05LH	51-06LH	51-07LH	51-08LH	51-09LH

**BALL VALVE**

**Removal of the seals and o-rings**



*Figure 1*

Remove and discarded the warn-out seals and o-rings from Ball Valve.

**Seal Kit Part Number**

51-0002S  
51-0003S  
51-0004S  
51-0005S  
51-0006S  
51-0007S  
51-0008S  
51-0009S

**Valve Size**

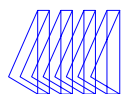
1/2"  
3/4"  
1"  
1 1/4"  
1 1/2"  
2"  
2 1/2"  
3"

**Seal Kits Includes the Following**

2 Ball Seat Seals  
2 Flange O-Rings  
2 Stem O-Ring  
1 Stem Seal  
1 Stem Thrust Washer

**Tools Needed**

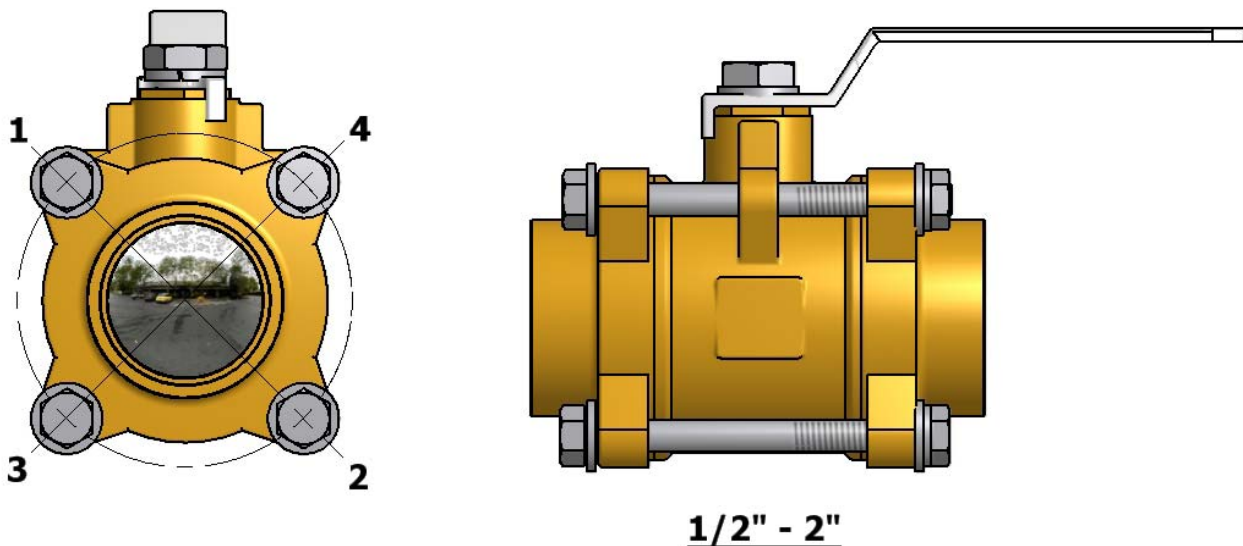
1- Adjustable Wrench      3/16", 5/16", 3/8" and 1/2" Hex Wrench



FOR TRI-TECH MODEL NUMBERS:

1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"
51-02	51-03	51-04	51-05	51-06	51-07	51-08	51-09
51-02LH	51-03LH	51-04LH	51-05LH	51-06LH	51-07LH	51-08LH	51-09LH

**1 1/2" BALL VALVE SHOWN**



*Figure 1*

*Note: Tighten Bolts in the Numbered Sequence shown above.*

Configuration for 2 1/2" and 3" Ball Valve not shown.

Part No.	Valve Size	Bolt Size	kgf-cm	in-lbs
51-02	1/2"	1/4-20	70	61
51-03	3/4"	5/16-18	120	104
51-04	1"	5/16-18	120	104
51-05	1 1/4"	3/8-16	250	217
51-06	1 1/2"	3/8-16	300	260
51-07	2"	1/2-13	450	390
51-08	2 1/2"	1/2-13	450	390
51-09	3"	1/2-13	450	390