YARWAY

installation, operation and maintenance for gage valves
Models 4000T and 4000S

This manual has been prepared as an aid and guide for personnel involved in installation or maintenance. All instructions must be read and understood thoroughly before attempting any installation, operation or maintenance. Failure to follow any instructions could possibly result in a malfunction of the gage valves, with resulting leakage, property damage or physical injury to personnel.

CAUTION: Yarway Corporation does not have control over the manner in which its gage valve set is handled, installed, or used, and Yarway Corporation cannot and does not warrant or guarantee that a gage valve set is suitable or compatible with the user's specific application.

WARNING: Safety glasses should be worn when installing or operating a gage valve.

INTRODUCTION

Features and Specifications

Yarway gage valves are supplied in pairs, (upper and lower) and are designed to be used with liquid level gages to isolate the gages from the pressure vessel when it becomes necessary to drain and service the gages. These gages are equipped as a standard feature, with an outside screw and yoke and a ball check shut-off.

Other standard features are:

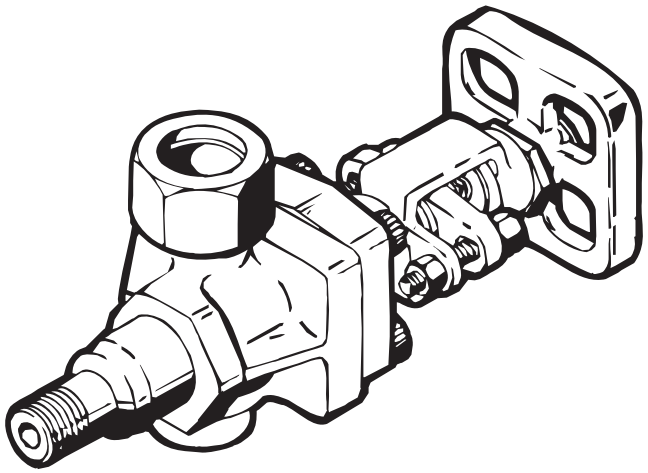
1. Offset Pattern
2. Solid Shank Vessel Connection
3. Threaded Renewable Seat.
4. Back Seating Stem

Design Ratings PSIG at Maximum and Minimum Operating Temperatures

To determine the maximum allowable working pressure for a specific temperature within the design limits, the user should refer to Yarway Corporation dimension sheets, or when provided, the specifically stated design limits on a Yarway Corporation product proposal or product nameplate data.

Application Data

The outside screw and yoke valve is designed for use where it is necessary to have external stem threads due to the pressure, temperature and corrosiveness of the contained fluid.



Model 4000T

For specific application data, the user should consult the Yarway Corporation product proposal for the specific model and size gage valve, or should request Yarway Corporation to supply the applicable technical data bulletin.

WARNING: Under no circumstances should this design rating or application data be exceeded. Exceeding design ratings or application data may cause property damage or physical injury to personnel.

INSPECTION AND PERFORMANCE

Receiving Inspection

Upon receipt of gage valve set, check all components carefully for damage incurred in shipping. If damage is evident or suspected, do not attempt installation. Notify carrier immediately and request damage inspection.

User's rating Inspection

The user should confirm:

1. That the gage valve set model number and pressure/temperature rating stamped on nameplate conforms to the description on the user's purchase order.

2. That the operating conditiions described in the purchase order agree with the actual operating conditions at the installation site.
3. That the actual operating conditions at the installation site are within the application data shown on the Yarway Corporation Technical Data Bulletin, product proposal referred to above or product nameplate data.
4. that the materials of construction of the gage valve set are compatible with both the contained fluid and the surrounding atmosphere in the specific application.

CAUTION: If the size, model, or performance data of the gage valve set as received does not conform with any of the criteria above, do not proceed with the installation. Contact Yarway Corporation for instructions.

INSTALLATION

Installation should only be undertaken by qualified experienced personnel who are familiar with this equipment and have read and understand all the instructions in this manual.

The user should refer to Yarway Corporation dimension sheets or Yarway Corporation product proposal to obtain dimensional data for the specific model gage valve set.

Yarway recommendations on gage valve installation are necessarily related to the installation of liquid level gages. The number of different types of gage and valve installations is too great to adequately explain in an installation manual. It is, therefore, the user's responsibility to assure that knowledgeable installation personnel plan and carry out the installation in a safe manner. The following procedures are some of the installation guides that should be employed.

Mounting

1. Prior to actual installation, turn handwheel of each valve clockwise until stem closes against seat.
2. Mount upper and lower valves to vessel using a good grade of high temperature pipe sealant on all male tapered pipe thread connections.
3. Follow all installation instructions for the specific liquid level gage as there are many points to consider on gage installations, among them, piping strain, dofferential thermal expansion, weight, and bolt torque.

WARNING: Failure to follow any of the liquid level gage installation instructions could result in a malfunction of failure of the gage with resulting sudden release of pressure, leakage of contained fluid, property damage or physical injury to personnel.

Installation with Stuffing Box Connection.

1. Install tubular packing nut, tubular packing gland, and tubular packing to each end of gage connection.
2. Turn upper valve counterclockwise (approx. $^1/_8$ turn).
3. Insert end connection of gage into upper valve stuffing box connection as far as it will go.
4. Tighten upper valve to original position while holding gage in position with upward force to insure its clearing of lower stuffing box location. Check vertical alignment of valves.
5. Slide gage assembly down into lower gage stuffing box connection to a positive stop.
6. Tighten upper and lower tubular packing nuts.

OPERATION

Pre-Operational Check

1. Assure that all installation procedures have been completed.
2. Check to determine that all connections are pressure tight.

Hydrostatic Test

1. Take all precautions necessary to handle the possibility of leakage during test.
2. Hydrostatic pressure test all installations to 100 psig (7 bar), and correct any leakage before proceeding.

Operating

Gage valve assemblies should be brought into service slowly. The glass used in Yarway Corporation gages is tempered and can stand minimal thermal shock and mechanical stress.

To avoid excessive thermal shock or mechanical stress on the glass, the connecting valves should be opened slightly, and the gage temperature and pressure allowed to slowly equalize with the vessel. The valves must be opened all the way after the pressure and temperature have equalized to permit operation of the automatic ball check in the event of gage failure.

Maintenance should only be undertaken by qualified experienced personnel who are familiar with this equipment and have read and understand the instructions in this manual.

During system shut down, the gage valves should be left open to permit the gage to lose pressure and cool with the rest of the system.

Failure to leave the valves open during system shut down will trap high pressure fluid in the gage.

CAUTION: Do not proceed with maintenance of a gage valve unless the gage valve has been relieved of all pressure or vacuum, has been allowed to reach ambient temperature, and has been drained or purged of all fluids.

Preventative Maintenance

The user must create maintenance schedules, safety manuals and inspection details for each specific installation of a gage valve set.

On all installations, the following items should be regularly evaluated by the user for purposes of maintenance.

1. Valves, for signs of leakage between body and yoke.
2. Valves, for signs of leakage around stem packing.

3. Valves, for signs of internal stem leak.
4. Valves, for signs of leakage around stuffing box connection if applicable.
5. Valves, for signs of internal or external corrosion.

The user must determine upon evaluation of his or her own operating experience an appropriate maintenance schedule necessary for his or her specific application. Realistic maintenance schedules can only be determined with full knowledge of the services and application situation involved.

Maintenance Procedures

1. Leakage between body and yoke can often be stopped by tightening the yoke screws. If leak persists, the yoke gasket should be replaced by following steps a and b of Disassembly and d and e of Reassembly instructions.
2. Stem packing leakage can often be stopped by tightening the stem packing nut. If leak persists, the stem packing should be replaced by following steps a through e of Disassembly and a through f of Reassembly.
3. Signs of an internal stem leak is an indication of a worn or damages stem or seat.
   a. To replace stem, follow Disassembly steps a through e and Reassembly steps a through f.
   b. To renew seat surface, follow Disassembly steps a and b. Renew seat by using a fine lapping compound and a mandral the same size, shape, and seat angle as the stem. Flush valve body clean and reassemble by following steps d and e of Reassembly.
   c. Remove seat by turning counterclockwise with 1/4" square drive. Replace new seat by turning clockwise with 1/4" square drive, making sure that the ball check is replaced in the body. Tighten seat in place. Follow Reassembly steps d and e.
4. Signs of leakage around stuffing box connection indicates worn out tubular packing or improper compression of packing. To replace packing, follow Disassembly steps f.1 through f.5 and Reassembly steps g1. through g.5. In the event of improper compression, leakage can be stopped by tightening the tubular packing nut.
5. Signs of internal or external corrosion could be an indication of a misapplication. An investigation should immediately be carried out as to the cause of the problem. It is the user's responsibility to choose a material of construction compatible with both the contained fluid and the surrounding atmosphere in the specific application.

REMOVAL-DISASSEMBLY-REASSEMBLY

CAUTION: Do not proceed with removal of gage valve until it has been relieved of all pressure or vacuum, has been allowed to reach ambient temperature, and has been drained or purged of all fluids.

Disassembly

a. Loosen and remove yoke screws and slide yoke assembly from body.
b. Remove yoke gasket.
c. Remove handwheel nut and handwheel.
d. Remove stem from yoke by turning it through the yoke.
e. Remove stem packing retainer, stem packing and stem packing gland from stem.
f. For valves equipped with stuffing box connection:
   1. Loosen tubular packing nuts on both upper and lower valves.
   2. Slide gage assembly into upper valve as far as it will go.
   3. While holding gage in this upward position, rotate the upper valve counterclockwise (approx. 1/8 turn) to allow clearance to remove gage from upper valve.
   4. Remove gage from upper valve.
   5. Remove tubular packing nuts, tubular packing glands and tubular packing from both upper and lower valves.

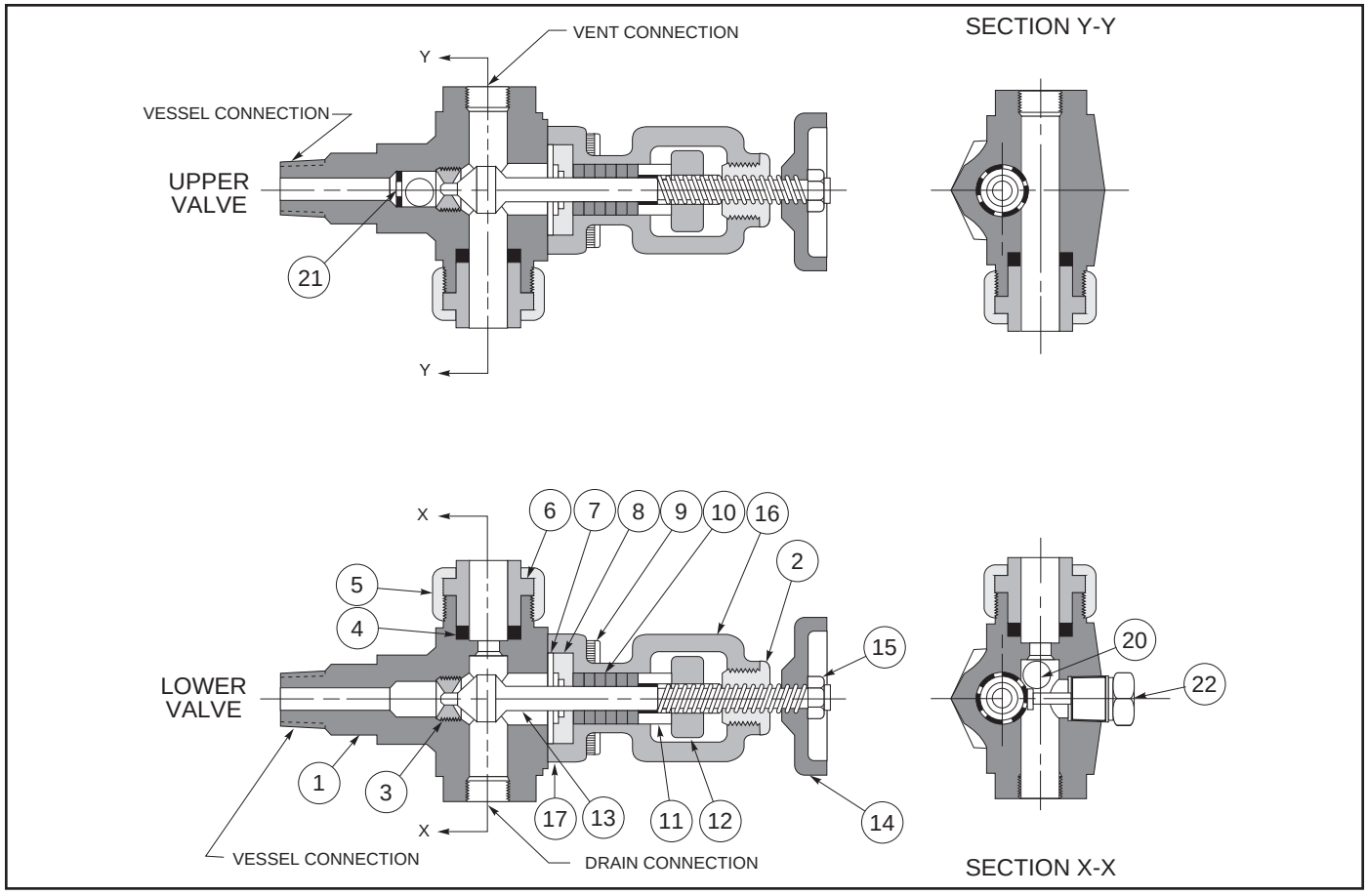
Reassembly

a. Insure that the stem packing gland screws are loose enough to allow room for new stem packing.
b. Install stem packing retainer, new stem packing and stem packing gland onto stem and thread assembly into yoke by turning counterclockwise. Thread stem into yoke until it seats and back off one turn.
c. Attach handwheel, handwheel nut and tighten in place.
d. Install new yoke gasket in yoke.
e. Mount yoke assembly to body and secure yoke screws.
f. Tighten stem packing gland nuts.

NOTE: Yoke screws and stem packing nuts should be tightened evenly to compress yoke gasket and stem packing evenly.

g. For valves equipped with stuffing box connection:
   1. Replace tubular packing nut, tubular packing gland and tubular packing on each end of gage connection.
   2. With upper valve turned 1/8 turn counterclockwise from vertical, insert one end of the gage into the stuffing box connection of the upper valve to sufficient depth to insure clearance of the lower valve stuffing box connection.
   3. Tighten upper valve to original position while holding gage with upward force to insure clearance of lower valve stuffing box connection. Check vertical alignment of valves.
   4. Slide gage assembly down into lower stuffing box connection to a positive stop.
   5. Tighten tubular packing nuts.

Refer to Operation Section when returning gage valve to service.



Models 4000T and 4000S Parts List

Part No.	Item	Min. Qty. Spare Parts
1	Body	—
2	Yoke Bushing	—
◥ 3	Seat	1
◥ 4	Tubular Packing	2
5	Tubular Packing Nut	—
6	Tubular Packing Gland	—
◥ 7	Gasket	2
◥ 8	Packing Retainer	1
9	Cap Screw	—
◥ 10	Packing Set	2
◥ 11	Packing Gland	1

Part No.	Item	Min. Qty. Spare Parts
12	Gland Follower	—
◥ 13	Stem Assembly	1
14	Handwheel	—
15	Handwheel Nut	—
16	Yoke	—
17	Nameplate	—
18	Packing Gland Screw (not shown)	—
◥ 19	Packing Gland Nut (not shown)	2
20	Ball	—
21	Ball Retainer (Upper)	—
22	Ball Retainer (Lower)	—

◥ Recommended spare parts

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