

INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS

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Installation and Maintenance Guidelines for NIBCO[®] Bronze Gate Valves 1/4" to 3" Class 125, 150, 200, 300 and 175 WWP

Figure Numbers

T-103-HC
T-104-O
T-111-113
S-111-113
T-134-136
S-134-136
T-131
T-133
T-135
T-154-A
T-174-A
T-176-A
T-174-SS
T-176-SS

CAUTION: Only qualified personnel should undertake the procedures outlined in this document. NIBCO INC., its agents, representatives, and employees assumes no liability for the use of these procedures. These procedures are offered as suggestions only.

1.0 GENERAL INFORMATION

1.1 SCOPE

These instructions are furnished for use in the installation, operation, and maintenance of NIBCO 1/4" to 3" Class 125, 150, 200, 300 and 175 WWP bronze gate valves, with screwed in or union bonnet, rising stem or non-rising stem, and having handwheel operation.

1.2 GENERAL DATA

A. MANUFACTURER

NIBCO INC.
1516 Middlebury Street
Elkhart, IN 46516
Phone: (574) 295-3000

B. FIGURE NUMBERS AND DESCRIPTIONS

<u>Figure Number</u>	<u>Description (Gate Valves)</u>
T-111	Class 125 threaded end, rising stem valve, screw in bonnet
S-111	Class 125 solder end, rising stem, screw in bonnet
T-113	Class 125 threaded end, non-rising stem, screw in bonnet
S-113	Class 125 solder end, non-rising stem, screw in bonnet
T-131	Class 150 threaded end, rising stem, screw in bonnet
T-134	Class 150 threaded end, rising stem, union bonnet
S-134	Class 150 solder end, rising stem, union bonnet
T-135	Class 150 threaded end, rising stem, union bonnet, split wedge
T-136	Class 150 threaded end, non-rising stem, union bonnet
S-136	Class 150 solder end, non-rising stem, union bonnet
T-174-A	Class 300 threaded end, rising stem, union bonnet, Ni-Alloy wedge
T-176-A	Class 300 threaded end, non-rising stem, union bonnet, Ni-Alloy wedge
T-174-SS	Class 300 threaded end, rising stem, stainless steel seat rings, union bonnet
T-176-SS	Class 300 threaded end, non-rising stem, stainless steel seat rings, union bonnet
T-103-HC	175 WWP threaded end, non-rising stem, hose cap and chain
T-104-O	175 WWP threaded end, OS&Y solid wedge

All threaded end preparations of valves meet American National Pipe Thread (N.P.T.) requirements.

All solder end valves meet the requirements of ASME Standard B16.22.

C. IDENTIFICATION PLATES

An aluminum identification plate is attached beneath the handwheel nut. This identification plate gives the figure number of the valve, some general information about the trim and location of NIBCO's corporate offices.

When more detailed information is required, the NIBCO Bronze & Iron or Fire Protection catalog should be referred to using the valve figure number as the guide.

D. SERVICE

When installing valves for service in corrosive media, the NIBCO Chemical Resistance Guide may be consulted for specific data or contact can be made with NIBCO Technical Services. It is, however, the obligation of the user to make the ultimate decision of fitness for use.

E. PRESSURE TEMPERATURE RATINGS

Pressure and temperature ratings may be found in the Engineering section of the latest printing of NIBCO Bronze & Iron or Fire Protection Catalogs. This information is taken from applicable ANSI, ASME, or UL/FMRC Standards.

F. CODES & REGULATIONS

A valve used under the jurisdiction of the ASME boiler and pressure vessel code, the ANSI code for pressure piping, government, or other regulations, is subject to any limitation of that code or regulation and to the applicable ANSI Standard.

G. PRODUCTION TEST PROCEDURES

Valves are pneumatically shell tested, and seat tested at a pressure of 80 psi in accordance with Federal Specifications and MSS SP-80 Manufacturers Standardization Society Requirements.

Fire Protection valves are tested in accordance with the appropriate Underwriters Laboratories (UL) and Factory Mutual Research Corp. (FMRC) specifications.

H. PRINCIPAL DIMENSIONS

Principal dimensions of the valve are specified in the appropriate catalog.

I. EQUIVALENT PIPE LENGTH PRESSURE DROP VALUES OF HOSE VALVES

T-103-HC 2½" Size – Feet of schedule 40 pipe = 1.1 Feet

1.3 DETAILED DESCRIPTION

The gate valves listed above and covered in these instructions are bronze valves made of ASTM B62 material for Class 125, 150, and 175 WWP valves and from ASTM B61 material for Class 200 and 300 valves.

The valves are operated with the handwheel and are used to start or stop the flow of fluids in piping systems. Clockwise rotation of the handwheel closes the valve.

The body and bonnet are held together by threads of the male and female type; male threads being on the bonnet section and female threads being within the body. There are no gaskets between the body and bonnet to affect seals. This is strictly a metal-to-metal seal as required by standards. This general arrangement is used on the Class 125 and is also used on the Class 150 gate valves.

For the union bonnet arrangement, the body has male threads, the bonnet has no threads at all, however, a threaded union nut is placed over the bonnet to fasten it to the body. The seal between the body and bonnet is also metal-to-metal without a gasket.

Flow through the valve is stopped by forcing the wedge down between the seats of the body. The wedge is a solid type and is guided through its entire travel by guides in the body.

The head of the stem on the rising stem version fits into a T-slot in the top of the wedge to allow sufficient wedge movement for effective seating with the seats of the body. On the non-rising stem version, the wedge has internal female threads, and the stem has male threads which are left-handed to cause the wedge to close when the handwheel is turned in a clockwise direction and the wedge to rise when it is turned in a counterclockwise direction.

All valves have back seats between the shoulder of the stem and the valve bonnet. This is a requirement of standards so that the valve may be repacked while the valve is under full pressure. **CAUTION: This is dangerous and could result in serious injury. It is not recommended by NIBCO.** In addition, standards, organizations, and governing societies today do not encourage valves to be repacked while the valve is transmitting a fluid at full pressure and/or temperature.

The stuffing box is formed by the annular space between the stem and the bonnet and is filled with non-asbestos packing. The packing is compressed in the stuffing box by a gland bushing and the packing nut drawn down against the packing by turning the nut clockwise.

2.0 INSTALLATION

2.1 PRELIMINARY INFORMATION

The gate valves should preferably be installed with the stem pointed vertically upward. However, it is normally acceptable to have the valve stem pointed in a horizontal position either in vertical or horizontal piping.

Although a gate valve will function satisfactorily in an inverted position it is not generally recommended because it allows fluids to become trapped in the bonnet cavity resulting in contamination and inability to fully drain the system. This is critical in water lines exposed to freezing temperatures.

Valves are shipped in the closed position to prevent damage to the seating surfaces. There is not internal blocking used for shipment. All NIBCO valves are shipped in cardboard boxes for protection against exterior damage and accumulation of dust or dirt on the delicate seating surfaces. The boxes are not waterproof and, therefore, require that they be protected from the weather.

2.2 VALVES FOR FIRE PROTECTION SERVICE

Valves used in fire protection systems shall be installed and used in accordance with NFPA 13, NFPA 13R, NFPA 14, or NFPA 20. Valves shall be inspected, tested, and maintained in accordance with NFPA 25.

2.3 HANDLING AND INSTALLATION

Each valve should be handled very carefully and not dropped or placed into a dirty environment before it is assembled into the system. Under no circumstances should the valve be installed into the line by wrenching through the valve body, this means that when a valve is being threaded onto a pipe, the wrench should be on the end where the joint is being made.

It is very important to make certain that the threads of the pipe are always clean and machined properly. When improperly tapered pipe is screwed into the female valve threads the pipe can be screwed so deep that it can ruin the seats of the valve. Care should also be used to assure that the valve is not over tightened because the steel pipe

is much stronger than the bronze material, therefore, the bronze will distort and cause valve malfunction or leakage at the joint. When screwing the valve onto the pipe, the wedge should remain in the closed position.

On solder end type valves, it is necessary to make sure that the valve wedge is in the open position while it is being heated for soldering into the line. The major caution here is that the valve not be overheated and that the proper amount of solder is used so that it does not flow into the valve rendering it inoperable.

If it is necessary to remove the bonnet before the valve is put into a line either for brazing, soldering, or threading, it is always essential that the bonnet be removed with great care. It is necessary that a chain wrench rather than a pipe wrench be used to loosen the bonnet union nut. If possible, it is more desirable to use a socket wrench to remove the nut. The union nut, body and bonnet should all be marked so they can be returned to the same position as originally assembled. After the nut has been carefully removed or in the case of a screw in bonnet, the bonnet has been broken loose, (which may require slight impact), it is then necessary to open the wedge approximately to its halfway position before removing the bonnet assembly from the valve body. After doing this, it is important that a mark be put on the wedge and the body so that it is put back in the same orientation in the valve body, as it was taken out.

It is vital that no nicks or scars be put on the body or bonnet sealing areas, as this will create a leak path. It is extremely important to make sure that the wedge does not fall and hit any hard surface as it is being removed from the valve. Any mark or dent may cause leakage on the delicate seating surfaces after the valve is reassembled.

The valve body should then be installed into the pipe system using the appropriate procedures as outlined in valve installation for soldered, brazed, or threaded ends. When reassembling the valve, the wedge should be again positioned at the approximate halfway open position. Care should also be exercised so the wedge guides are properly engaged in the body guides.

A slight amount of lubricant equivalent to about 10 weight oil should be put on the bonnet joint sealing surface of the body and the bonnet and on the top side of the bonnet when union nut joints are used. This gives lubrication to the joint so good tightening pressures can be applied. The chain wrench or socket wrench should be used to tighten the bonnet. Stop the union nut approximately at the same place where it was when the valve was disassembled or possibly slightly past that mark. Remember any nick on the surfaces on the bonnet sealing area assures leakage.

After the valve has been installed, the valve should be tested to make sure that it opens and closes easily and that the bonnet joints or pipe joints are not leaking.

3.0 OPERATION

Gate valves should never be used for throttling purposes. They should be fully opened or fully closed. If the valves were only slightly opened, wire drawing and erosion of the wedge and seats would result. It is not recommended valves be tightly back-seated as line contamination over a long period of time may lock up the valve causing problems when the valve has to be closed.

4.0 TROUBLESHOOTING

4.1 LEAKAGE THROUGH THE STUFFING BOX

Leakage through the stuffing box packing may be stopped by tightening the packing nut. Do not over tighten as excessive tightening may cause difficult operation of the valve and could cause damage to the stem or packing nut.

If the gland has run out of travel, isolate, and depressurize the valve for repacking or the addition of more packing. Repacking of valves under pressure is not a recommended practice. This is dangerous and could result in serious injury even if the valve appears to be back-seated.

Foreign matter may have accumulated on the back seat, or by accident the stem could be knocked off the back seat position thereby allowing dangerous fluids to injure maintenance personnel.

Remove the handwheel, packing nut, and gland to remove the old packing. If the packing is removed, discard and do not try to put it back once it has been removed. Clean the stem and examine it for damage. On very small valves the packing is sometimes rope and is sometimes spiral wound around the stem and pushed into the stuffing box. Install the new packing which may be one piece or split rings purchased from NIBCO. If it is split ring rope packing install one ring at a time with the diagonal cut in each ring being staggered 90° away from the cut in the ring below. Each ring should be firmly compressed in the stuffing box after it is placed in position before the next ring is added.

Install the gland bushing and packing nut and tighten down. The packing nut should be tightened only enough to prevent leakage. Pressurize the valve and check the packing for leakage. Tighten as required.

5.0 MAINTENANCE

5.1 TOOLS AND EQUIPMENT

Standard wrenches and tools are suitable for servicing valves as follows:

- A. For removing bonnet of the union type – a chain wrench is normally used or the appropriate socket that will fit the bonnet union nut. For screw in type bonnets – generally a socket wrench or open-end wrench may be used if extreme caution is used. Pipe wrenches on union nuts or screw in bonnets have a definite crushing action which will deform the component and are not recommended.

A Standard packing tool can be used and/or a blunt hook is generally used to remove packing rings. A screwdriver can be used to raise the packing gland (if it is in the fully down position) and generally open-end wrenches are used to tighten the packing nut.

DOES NOT APPLY TO FIRE PROTECTION VALVES.

For any technical enquiries please call NIBCO Technical Services.