

## INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS

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### Installation and Maintenance Guidelines for NIBCO<sup>®</sup> Bronze, Globe and Angle Valves 1/4" to 3" Class 125, 150, 300, and 175 WWP

#### Figure Numbers

##### GLOBE

KT-211-W-UL  
T-211-B, Y  
S-211-B, Y  
S-235-B, Y  
T-235-B, Y  
T-256-AP  
T-275-B, Y  
T-276-A  
T-276-AP

##### ANGLE

T-301-W  
T-311-Y  
S-311-Y, -W  
T-331-HC  
T-335-Y  
T-375-B  
T-376-A, -AP  
KT-65-UL  
KT-67-UL

**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, 300, and 175 WWP bronze, globe, and angle valves, with screwed in or union bonnet, 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

<b>Figure Number</b>	<b>Description (Globe Valves)</b>
T-211-B, Y	Class 125 threaded end, rising stem, screw in bonnet, B – bronze disc or Y – PTFE disc.
S-211-B, Y	Class 125 solder end, rising stem, screw in solder end bonnet, B – bronze disc or Y – PTFE disc.
T-235-B, Y	Class 150 threaded end, rising stem, union bonnet, B – bronze disc or Y – PTFE disc.
S-235-B, Y	Class 150 solder end, rising stem, union bonnet, B – bronze disc or Y – PTFE disc.
T-256-AP	Class 200 threaded end, rising stem, union bonnet, 420 stainless steel plug and seat
T-275-B, Y	Class 300 threaded end, rising stem, union bonnet, B – bronze plug or Y – PTFE disc.
T-276-(A/AP)	Class 300 threaded end, rising stem, union bonnet, A – nickel alloy disc & seat or AP –420 stainless steel plug & seat.
KT-65-UL	175 WWP, threaded end, rising stem, union bonnet, Buna-N disc, UL approved to Subject 258
KT-211-W-UL	175 WWP, threaded end, rising stem, union bonnet, Buna-N disc, UL approved to Subject 258

<b>Figure Number</b>	<b>Description (Angle Valves)</b>
T-301-W	175 WWP threaded end, rising stem, screw in bonnet
T-311-Y	Class 125 threaded end, rising stem, screw in bonnet, Y – PTFE disc.
S-311-Y, W	Class 125 solder end, rising stem, screw in bonnet, Y – PTFE disc or W – Buna-N disc.
T-331-HC	300 WWP threaded x National Fire Hose Thread with Cap & Chain, rising stem, screw in bonnet, Buna-N disc.
T-335-Y	Class 150 threaded end, rising stem, union bonnet, Y – PTFE disc.
T-375-B	Class 300 threaded end, rising stem, union bonnet, B – bronze plug.
T-376-(A/AP)	Class 300 threaded end, rising stem, union bonnet, A – nickel alloy disc & seat or AP –420 stainless steel plug & seat.

KT-67-UL 175 WWP, threaded end, rising stem, union bonnet, Buna-N disc, UL approved to Subject 258.

Threaded end preparations of valves meet ASME B1.20.1 (NPT) requirements or in the case of fire protection hose threads, Standard for Hose Valves UL 668. 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 Catalog 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 Catalog or Fire Protection Catalog. 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 Approvals (FM) 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**

<b>T-331-HC</b>	2½" Size - Feet of schedule 40 pipe = 21.9 Feet
<b>T-301-W</b>	1¼" Size - Feet of schedule 40 pipe = 23.3 Feet
<b>T-301-W</b>	1½" Size - Feet of schedule 40 pipe = 31.9 Feet
<b>T-301-W</b>	2" Size - Feet of schedule 40 pipe = 23.7 Feet

## 1.3 DETAILED DESCRIPTION

The globe and angle valves listed above and covered in these instructions are bronze valves made of ASTM B62 material for Class 125, 150, 175, and 300 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, stop, or throttle the flow of fluids in piping systems. Globe and angle valves are rising stem type only. Non-rising stem globe valves are not available. The disc is closed through a clockwise turning direction of the handwheel.

The screwed bonnet type body and bonnet are held together by threads of the male and female type. 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 globe and angle valves only.

The union bonnet arrangement on 150 and 300 class has male threads on the body. The bonnet has no threads at all; however, a union nut is placed over the bonnet to fasten it to the body. Here the seal between the body and bonnet is also metal-to-metal without a gasket.

Flow through globe or angle valves is stopped by forcing the disc down onto the valve body seat. Throttling is accomplished by carefully turning the handwheel to some position between full open and full closed. The disc is either of bronze construction directly connected to the stem or in some cases where a soft seat is desired, the disc is made of PTFE or Nitrile. On bronze globe valves the disc is held in place on the stem by retainer bushings or in the special non-return models (N.R.) the disc is so arranged that it travels up and down within the valve body using guides on the disc itself and it is not attached to the stem. This valve is a directional valve operated by gravity to prevent backflow. It may also be used as a globe or angle valve; however, the non-return feature will only operate in the direction of the flow arrow on the side of the valve body.

All valves have back seats between the shoulder of the stem and the valve body. This was a requirement of standards so that the valve may be repacked while it 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/or the packing nut draws down against the packing by turning the packing nut clockwise.

## 2.0 INSTALLATION

### 2.1 PRELIMINARY INFORMATION

The globe and angle 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 globe and angle valve will function satisfactorily in an inverted position it is not generally recommended because it allows fluids to become trapped in the bonnet cavity which results in contamination and the inability to fully drain the system.

To operate satisfactorily, the special model non-return (N.R.) can only be installed in the vertical position because gravity allows the disc to fall when the flow reverses. This feature also makes this valve directional and must be installed with fluid flow in the same direction as the flow arrow on the side of the valve.

Valves are shipped in the closed position to prevent damage to the seating surfaces. There is no 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.

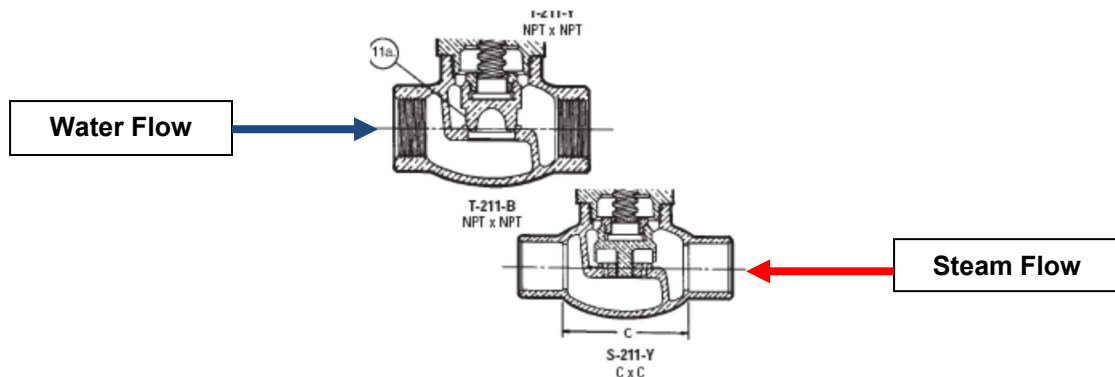
## 2.3 HANDLING AND INSTALLATION

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 threads the pipe can be driven too deeply and 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 disc should remain in the closed position.

On solder end type valves, it is necessary to make sure that the valve disc 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.

NIBCO globe valves should be installed with flow direction for optimal performance based on the general service application, water, or steam.



**For water service applications:** The flow should enter the valve so that it pushes up from underneath the seat disc. In other words, water flow should arrive from under the seat disc and flow smoothly out of the valve over the seat.

**For steam service applications:** The flow should enter the valve so that it can assist in sealing the disc against the seat. In other words, steam flow should arrive on top of the disc so that it pushes the disc down into the seat, to help seal the valve in the closed position.

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**

Globe valves are generally installed to be used for throttling purposes. They normally have high flow restriction and are not recommended where small pressure drops are mandatory.

A globe or angle pattern valve must be sized for the specific application, this is very important. When sizing a globe valve for throttling in either the straight or angle pattern it is important to avoid tight throttling. A valve sized too large that is tightly throttled can increase the velocity of the fluid to the point that it can cut (wire draw) through the seat and/or disc. When the valve is then shut off, it may leak.

### **4.0 TROUBLESHOOTING**

#### **4.1 LEAKAGE THROUGH THE BONNET JOINT**

If the bonnet joint leaks, the valve should be isolated and depressurized. The bonnet should be removed according to instructions in Section 5. The seating surfaces of the bonnet and body should be closely inspected. If there are any scratches or nicks on these surfaces, then it is necessary that a flat surface sanding plate with 400 grit be used on the body to remove all the scratches. After the scratches are removed, bluing should be applied to a flat plate and put onto the bonnet surface. If there are no high spots on the bonnet surface, then it is prepared for reassembly. If there are scratches or nicks that are evident on the bonnet surface, it is necessary that it be indicated in a lathe and a very slight cut taken off the bonnet sealing surface at an angle of approximately 2½ degrees tapered outward with a very fine 32 RMS finish. The two surfaces then can be reassembled using procedures in Section 2.

#### **4.2 LEAKAGE THROUGH THE STUFFING BOX**

Leakage through the stuffing box packing may be stopped by slight tightening the packing nut. 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 backseated. 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.

## **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.
- B. A standard packing tool can be used and/or a blunt hook is generally used to remove packing rings. A screwdriver 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.

## **6.0 SPARE PARTS**

Normal spare parts to be maintained on hand are listed on the NIBCO spare parts list.

If the bonnet or body is damaged, it is normally less expensive to remove the entire valve from the line and install a new one.

When placing an order for spare parts, it is necessary to give the size, the valve figure number found on the aluminum identification plate and the serial letter which is cast into the valve body on its side. This will be an alphabetical letter, A, B, C, D, etc. It is vital to give the serial letter because over a period the valve designs may have had modifications which could render the parts useless if they are of a different letter series.

## **7.0 MAJOR REPAIRS**

For other repairs or replacements not covered in the above description, contact the Technical Services Department of NIBCO INC. for special instructions. Always give the figure number and size shown on the identification plate affixed to the valve along with the general serial letter.

**FIRE PROTECTION VALVES ARE NOT RECOMMENDED FOR ANY MAJOR REPAIRS DUE TO STRICT TESTING REQUIREMENTS OF UL AND FM.**

*For any technical enquiries please call NIBCO Technical Services: 1-888-446-4226*