NIBCO INC.
WORLD HEADQUARTERS
1516 MIDDLEBURY ST.
ELKHART, IN 46516-4740
USA
PHONE: 574.295.3000
FAX: 574.295.3307
WEB: www.nibco.com

Review Date: 08/01/2020
Original Date: 08/01/2017

Installation and Maintenance Guidelines

for

NIBCO® Bronze Spring-Loaded Check Valves

3/8” to 2”

NIBCO® Performance Bronze® Lead-Free* Spring-Loaded Check Valves

1/2” to 2”

Figure Numbers

T-480, -Y
S-480, -Y
T-480-Y-LF*
S-480-Y-LF*

*Weighted average lead content ≤ 0.25%

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 all sizes of NIBCO bronze spring-loaded check valves, two-piece construction, as well as, Lead-Free* Performance Bronze® spring-loaded check valves in potable water applications.

1.2 GENERAL DATA

A. MANUFACTURER

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

B. FIGURE NUMBERS AND DESCRIPTIONS

Figure Number	Description (Spring-Loaded Check Valves)
T-480	Threaded end, two-piece construction, Buna-N disc (no SWP) Class 125, Y – PTFE disc LF – Lead-Free* Performance Bronze® (15 SWP)
T-480	Threaded end, two-piece construction, Buna-N disc (no SWP) Class 125, Y – PTFE disc LF – Lead-Free* Performance Bronze® (15 SWP)

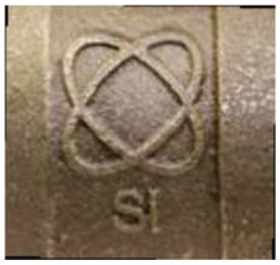
All threaded end preparations of valves meet American National Pipe Thread (N.P.T.) requirements as per ASME B1.20.1.
All solder end valves meet the requirements of ASME Standard B16.22.

C. IDENTIFICATION PLATES

Identification of the bronze swing check valves is made by checking for the name NIBCO cast onto the side of the valve body. The steam rating and CWP rating is a cross reference with the figure number listed above. These valves are directional. In order for them to function properly, they must be installed with the arrow pointing with the direction of flow. The arrow for direction of flow is cast onto the side of the body. In order to determine the type of seat that is used within the valve, it is necessary to look into its end and determine the seat type. The PTFE disc is always white in color and the Buna-N disc is black.

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

NIBCO® Lead-Free* HydraPure® valves can be identified by the double oval symbol and “Si” – indicative of silicon Performance Bronze® – cast in the body of the valve.



When more detailed information is required, the NIBCO *Lead-Free Valve* 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 *Chem-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 catalog. This information is taken from applicable ASME Standards.

NIBCO Lead-Free* Performance Bronze® maximum pressure-temperature recommendation is 100psi at 300°F and are suitable for low pressure (15psi) steam working pressure service.

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 ASME Standard.

Lead-Free* Performance Bronze® spring-loaded check valves conform to MSS SP-139, NSF/ANSI-61-8 Commercial Hot 180°F (includes Annex F and G), and NSF/ANSI-372. See NIBCO Technical Bulletin **NTB-1216** *Low Pressure/Low Temperature Valves Lead-Free* Standard Compliance – MSS SP-139 & 145* for further clarification of lead-free standards.

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 and/or MSS SP-139 Manufacturers Standardization Society requirements.

H. PRINCIPAL DIMENSIONS

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

1.3 DETAILED DESCRIPTION

The bronze check valves listed above and covered in these instructions are bronze valves made of UNS Alloy C84400 material for Class 125 valves.

The Lead-Free* Performance Bronze® swing check valves listed above and covered in these instructions are made from UNS Alloy C87850.

Check valves are used in systems which allow flow to move freely in the direction of the arrow cast onto the side of the valve body, however, should flow reversal occur, the disc in the valve will go to the closed position and not allow flow to reverse. The primary function of a check valve is to prevent backflow.

The disc is centered over the seat in the valve by means of center-guided, spring-loaded stem. Therefore, any movement of the disc will always center itself over the seat in the valve body. On NIBCO bronze check valves, no control of the disc can be affected from the exterior of the valve body. NIBCO does not offer custom spring options.

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 bonnet-to-body joint is not meant to be a maintenance joint or otherwise disassembled in the field.

2.0 INSTALLATION

2.1 PRELIMINARY INFORMATION

The bronze check valves may be installed in both horizontal and vertical lines with upward flow or in an intermediate position. They will operate satisfactory in a declining plane no more than 15°. Under no circumstances should the valve be installed in a horizontal line with the bonnet facing in the vertical down position, this will not only trap fluids, but it will not allow the valve to function in the check position.

NIBCO recommends that check valves should not generally be used in close proximity to reciprocating pumps and compressors. The constantly fluctuating pressure curve passes pulsations to the moving parts of the valve and severely shortens the life of the valve due to wear and causes premature failure. Loose parts can also be passed down the line which would compound the problem. Screw type and centrifugal pumps and compressors that deliver a constant pressure curve do not have this problem. In some carefully designed systems check valve have been used successfully by incorporating surge tanks, hammer arrestors and other piping modifications with the valve placed downstream from the pump. The ultimate decision for fitness of use however lies in the hand of the end user and their piping designer.

NOTE: Check valves should never be installed immediately adjacent to a pump discharge or change in direction. Check Valves should be installed downstream from all sources of line turbulence, including fittings and valves, at a minimum of 5x the nominal pipe diameter (preferably 10x) with straight piping to provide laminar flow.

All NIBCO check 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 HANDLING AND INSTALLATION

Each valve should be handled very carefully and not dropped or exposed to 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 clean at all times 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 that the bronze material, therefore, the bronze will distort and cause valve malfunction or leakage at the joint.

On solder end valves it is necessary to take precautions to not overheat the valve. The major caution here is that excessive heat exposure can damage the seat, and that the proper amount of solder is used so that it does not flow into the valve, fouling the seat or damaging the disc, rendering it inoperable.

Attached to this manual, in the **Appendix**, are general instructions for soldering and threading installation of valves. For lead-free solderability information, see NIBCO Technical Bulletin **NTB-0910** *Lead-Free* Silicon Bronze Alloys Soldering & Brazing Recommendations*

WARNING: NIBCO 480 check valves cannot be brazed under any circumstances.

For more details on proper check valve selection and installation, see NIBCO Technical Bulletin **NTB-0703** *Design and Use of Check Valves*.

3.0 OPERATION

Check valves seal adequately when the back pressure is high, but some leakage is expected when the reverse pressure is relatively low. In testing procedures, a check valve is allowed to leak 4 times as much in the reverse flow (check) position as a metal- seated gate valve. In other words, the allowable leakage rate for gate valves is 10ml per nominal inch of diameter per hour; a check valve has an allowable leakage rate of 40ml per nominal inch of diameter per hour. This is in accordance with MSS Standard Practices for check valves.
(1 ML=.035 oz.).

The check valves described in this manual are not to be used as foot valves on a pump or pressure regulating devices. Their construction is not suited to these types of requirements.

For more details on check valves, see NIBCO Technical Bulletin **NTB-0596** *Check Valve Cracking Pressure.*

4.0 MAINTENANCE AND REPAIRS

NIBCO two-piece bronze check valves are not repairable and are considered disposable valves. There are no repair components available for these valves and should be replaced as needed.

5.0 Chemical Compatibility

Please consult the most current edition of the NIBCO Chem-Guide for recommendations regarding chemical compatibility of material exposure to specific media and media-treatment additives. The NIBCO Chem-Guide is a general guide on the topic of chemical compatibility and is by no means an exhaustive resource on the subject. Ultimately, proper material selection is the responsibility of the installer and/or end-user, taking into account all aspects of a system's design and intended use.

6.0 Galvanic Potential in Piping Systems

Galvanic corrosion or dissimilar metal corrosion is an electrochemical process that is created through the electrical interaction of two different metals under the influence of a conductive media (i.e.an electrolyte). An electrolytic cell, much like a battery, is generated by these dissimilar metals using water as the electrolyte. The electrical charge, developed within the electrolytic cell, drives a preferential attack on the more electrically active metal with the water acting as the recipient of the discarded metal ions. Such galvanic attack is often encountered in service where iron or steel components are installed, and later corrode, in a largely copper piping system. Please consult NIBCO Technical Bulletin **NTB-0714** *Dielectric Products Relative to Electrolysis and Galvanic Corrosion.*

For any technical enquiries please call NIBCO Technical Services.

Appendix - General Installation Recommendations

SOLDERING

1. Cut tube end square. Ream, deburr, and check for dry fit. Do not use tubing that is out of round or fits so tightly into the solder cup that it must be forced or hammered into place.

2. Prior to preparing a solder cup on a valve:
- Open a ball valve fully, to avoid damaging the ball
- Close a gate or globe valve fully, to avoid getting sanding fines in the seat well or damaging the sealing surfaces
- Remove the hanger assembly on a swing check valve, especially on soft seal discs such as Buna-N or PTFE discs.

Use sand cloth or a steel wire brush to clean both ends to a bright metal finish. Steel wool is *not* recommended. Apply flux immediately upon cleaning surfaces of joints to be soldered. If fluxed parts are allowed to stand, the water in the flux will evaporate, and dried flux is liable to flake off, exposing metal surfaces to oxidation.

3. Apply flux to outside of tube and inside of solder cup. Surfaces to be joined must be completely covered. Use flux sparingly.

4. Assemble joint by inserting tube into socket hard against the stop. The assembly should be firmly supported so that it will remain in alignment during the soldering operation.

Prior to soldering:
- Close a ball valve to trap the seats against the surface of the ball.
- Open fully a gate or globe valve, to prevent soldering the closure member to the seats.
- Remove the hanger assembly on a swing check valve.
- Take care not to overheat a spring-loaded check valve.
    - On leaded-alloy bronze spring-check valves, wrap the body in a wet rag

NOTE: On one-inch and larger valves, it is difficult to bring the whole joint up to temperature at one time. It will frequently be found desirable to use a double-tip torch to maintain the proper temperature over the larger area. A mild pre-heating of the whole socket area is recommended.

Apply heat to tube first. Transfer as much heat as possible through tube into valve. Avoid prolonged heating of valve itself. Never direct the flame into the capillary gap between the tube and solder cup – always work the flame away from the gap. Evenly apply the flame across the joint, from base of the cup to a inch past the tubing, sweeping the entire circumference of the cup and tube in continuous motion and not dwelling on any one point.

When flux appears liquid and transparent, start sweeping flame back and forth along axis of joint to maintain heat on parts to be joined, especially toward base of valve socket, while feeding solder into the capillary gap.

5. Use just enough solder: with wire solder, use 3/4" for a 3/4" valve, etc. If too much solder is used, it may flow past tube stop and clog sealing area. When the joint is filled, a continuous run of solder alloy will be visible and drip from the bottom of the joint.

For vertical joints, any excess flux that runs down the tubing should be wiped clean, before applying solder, as this will prevent solder from “chasing” the flux and eliminate wasted runs of solder on the tubing.

6. Remove excess solder with small brush or rag while wet, leaving a fillet around end of valve as it cools.

7. Allow a solder joint to cool to room temperature – ***Never shock a solder joint cool with water***. This could damage the integrity of the filler material.

THREADING

Grit, dirt, or any foreign matter accumulated in the pipe can hinder efficient valve operation and seriously damage vital valve parts. Thoroughly clean pipe internally before assembly. When threading pipe, gauge pipe threads for size and length to avoid jamming pipe against seat and disc. Thoroughly clean threaded end to remove any harmful steel or iron deposits.

For a long-term integrity of a joint, use either PTFE tape or pipe compound. ***Never use both materials to assemble a threaded joint***.

If pipe compound is used, apply sparingly on pipe threads, ***never on valve threads***. Do not allow any pipe compound into valve body, in order to avoid damage to disc and seat, and otherwise foul the valve’s sealing performance.

Before installation, check the line of flow through valve, so that valve will function properly.

Apply an open-end or adjustable wrench on the hex of the valve adjacent to the pipe joint to be made. Never use a pipe wrench on the valve connection/hex end, as this can lead to possible distortion of the valve.

Never “wrench through” a valve; i.e., never drive a pipe nipple into one side of a valve in an attempt to tighten both pipe nipples/connections at one time. Always assemble each threaded joint by isolating the assembly to a single end of the valve.

After installation of valve, support line; a sagging pipe line can distort valve and cause failure.