

# INSTALLATION AND OPERATING INSTRUCTIONS



**WARNING!!! READ ALL OF THESE INSTRUCTIONS BEFORE PROCEEDING. ONLY EXPERIENCED PERSONNEL SHOULD BE ALLOWED TO INSTALL OR HANDLE THE ENCLOSED VALVE(S). ANY DAMAGE RESULTING FROM MISHANDLING OR IMPROPER INSTALLATION IS NOT COVERED BY THE MANUFACTURER'S WARRANTY. FOR WARRANTY DETAILS, REFER TO THE LATEST REVISION OF CHECK-ALL VALVE® MANUFACTURING COMPANY MANUFACTURER'S TERMS AND CONDITIONS (Form #160). SEE [www.checkall.com](http://www.checkall.com) OR REQUEST A COPY FROM THE FACTORY.**

The following instructions are meant as a guideline only. They do not cover every situation and rely on the common sense and expertise of the person installing the valve. In no way is Check-All® liable for any damage to the valve, the system, or for personal injury resulting from use of these guidelines.

## GENERAL INSTRUCTIONS

- **Inspection.** Prior to installation, inspect valves for any damage. Refer to Check-All Valve® Terms and Conditions Form #160 for warranty information.
- **Flow arrows.** Install each check valve in the line with the arrow pointing in the direction of the flow. To verify proper installation, make sure each valve opens in the direction of desired flow. Note: From the closed position the poppet moves away from the seat in the direction of flow.
- **Valve support.** Valves must be adequately supported with pipe hangers, etc. to prevent additional loading on the valve body.
- **Alignment & connection.** Refer to ASME B31 "Pressure Piping Code" and ASME PCC-1 "Guidelines for Pressure Boundary Bolted Flange Joint Assembly" for recommended guidelines on alignment, bolt torque, etc.
- **Safe connection.** Valves must be adequately connected (threaded, welded, etc.) to surrounding piping to prevent unsafe discharge during filling and/or operation.
- **Insert series valves.** Insert series valves may not be visible after installation. It is the end user's responsibility to verify that there is adequate identification of the presence of a check valve that is installed in the system and to take any necessary precautions to avoid injuries or spills when the line is disassembled for maintenance or other reasons. Please consult the factory or your local Check-All® representative for tagging options or further information.
- **Intended Use.** Valves compliant with the European Union Pressure Equipment Directive (2014/68/EU) that have been classified under Sound Engineering Practice may be limited in their use. They will be identified as such with either marking on the valve body or an additional tag. If such classification is marked on an additional tag it is the end-users responsibility to reattach such identification to the installed valve or surrounding piping.

## THREADED VALVES: (BU, BR), (CN, CR), (U3, UR), (U1, R1), AND (M1-M8)

Handle threads on these valves carefully to avoid damage. Use an anti-seize thread sealant to prevent galling. Note: Because Bushing Series (BU) valves open into downstream connections, ensure adequate clearance for the travel of the poppet.

## VALVES WITH TUBING CONNECTIONS: (TV), (TF), AND (M5-M8)

For a valve with flared fittings, slide the nut (not provided with the valve) onto the tubing and flare the tubing end. Tighten the nut onto the flared end of the valve. Note: Leakage can result if the flared surface is damaged. For a valve with compression fittings, first slide the nut on the tubing then the ferrule. Next, insert the tubing end into the valve fitting and tighten the nut. Note: The fittings are supplied as accessories only, and as such are not governed by the European Union Pressure Equipment Directive 2014/68/EU.

## FLANGED END VALVES: (HV)

Install each valve between ANSI class 150 raised face flanges with a gasket between each flanged joint and tighten the bolts per gasket manufacturer's torque recommendations.

## FLANGED END LINED VALVES: (HT)

Install each valve between ANSI Class 150 raised face flanges (no gaskets are necessary) and tighten the bolts only enough to ensure no leakage. Note: The valve liner may be damaged by over-tightening the bolts and/or by piping systems that add additional loads to the flanged joints.

## FLANGE, LINED PIPE, AND WAFER INSERT VALVES: (F1, F6, FP, FR), (LP), AND (WV)

Make sure the piping inside diameter is adequate because this type of valve extends into upstream and downstream piping. Additionally, make sure there are no obstructions that would disrupt fluid flow or interfere with poppet travel. Install each valve between ANSI raised face flanges with a gasket on each side of the valve (PTFE valves need no gaskets). Ensure that each valve is centered inside the bolt circle and tighten the bolts. Note: Plastic material valves can be damaged by over tightening the bolts and by piping systems that add additional loads to valve flanged joints. If a flag tag with a flow arrow is attached to the valve, the tag shall not be rotated or removed so that the flow arrow on the tag remains accurate.

## SANITARY INSERT VALVES: (CB, TC)

Verify that ferrules (CB and TC) are correct for each valve to be installed by comparing the fit between the two. If the fit is correct, center the valve in the ferrules and tighten the clamp. A valve can be damaged by misalignment, by over tightening, and by piping system loads that affect the joint that contains the valve.

## SANITARY CARTRIDGE VALVES: (3S) AND (SC)

The inside diameter of the sanitary tubing must be the size listed in the catalog description of the valve. Lubricate the body o-rings, push the valve into the piping, and then secure the clamp or nut. Note: A valve may leak if piping is misaligned. Also refer to "3S Disassembly for Cleaning Instructions" (Form #152) and "SC Installation Instructions" (Form #157). See [www.checkall.com](http://www.checkall.com) or request a copy from the factory.

## VACUUM INSERT VALVES: (VI)

Make sure the inside diameter of the vacuum flange is adequate because this type of valve extends upstream and downstream. Also refer to "VI installation instructions" (Form 170). See [www.checkall.com](http://www.checkall.com) or request a copy from the factory.

## UNION INSERT VALVES: (UV)

Note that the union the UV is installed into must have a 45° seat and the ID must be equal to the ID of schedule 40 pipe. Center each valve in the union so the angles match and tighten the union nut enough to seal. Attach the metal identification tag to the union according to its instruction sheet.

## STRAIGHT-SIDED INSERT VALVES: (SI)

This series is designed to fit in a designed cavity. Note: Forcing a valve into a cavity could cause the seat to deflect or warp and cause leakage.

## UNIVERSAL SOCKET WELD AND BUTT WELD VALVES: (US) AND (B4, B8)

These series' are designed to weld into a system. When welding, use standard welding procedures and safety precautions. A material data safety sheet for the body material will be provided upon request. **WARNING:** A valve can be damaged by excessive heat that may warp or melt the seat and cause it to leak. Use a heat sink or other means to prevent valve damage from occurring.

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## PLASTIC VALVE INSTALLATION

Torque values for plastic body valves are not specified due to the many variables involved with a bolted joint. Leak-tight joints require the flanges to be concentric, flange faces to be parallel, and rigid pipe support. Once confirmed the valve can be installed and the connection tightened only enough to create a seal. Misalignment, over-tightening, and piping system loads can result in leaks or damage to the check mechanism. Due to material relaxation the connection may need to be checked periodically and retightened, most notably after initial 24 hours.

## MAINTENANCE & INSPECTION:

- ◇ Corrosive media. For valves installed in corrosive media, Check-All® recommends establishing inspection schedules to ensure the continued safe use of the valve.
- ◇ Depressurization & draining. To avoid potential hazards due to discharge, depressurize and drain the surrounding system prior to removing the valve from the system.
- ◇ Surface temperature. To avoid personal injury, do not touch surface of valves if the media within is colder or hotter than room temperature. Allow the valve to return to room temperature prior to removing from the system.
- ◇ Valve inspection. For applications that necessitate periodic valve inspection, Check-All® can provide, upon request, the critical pressure boundary dimensions of valve bodies. Maintenance or other qualified personnel should also visually inspect the valves for signs of wear that could adversely affect valve performance.
- ◇ Cleaning. Care should be exercised when cleaning valves (with steam, chemicals, etc) to protect them against excessive pressure, temperature, and/or corrosion.
- ◇ Field repair. Check-All® does not recommend field repair for any valve, except the 3S series. If field repair is absolutely necessary contact the factory or the local representative for instructions. A defective valve may be returned to the factory and MUST be accompanied by a completed and signed Return Material Authorization.

## HAZARDS & DAMAGE DUE TO MISUSE:

- Installation next to an "ell". Do not install the valve next to the discharge of an elbow "ell" or directly after any component that could alter or disrupt the flow pattern. Check-All® valves are best suited for use with fully developed flow. Although there are many factors affecting the achievement of fully developed flow (such as media, pipe roughness, and velocity), usually (10) pipe diameters of straight pipe immediately upstream of the valve is sufficient. This is particularly important after flow skewing devices such as elbows, tees, centrifugal pumps, etc.
- Shock-load applications. Do not install the valve on the discharge of a reciprocating compressor or any other element that will cause a physical and/or thermal shock-load.
- Pressure limit. Maximum allowed room temperature pressure rating is shown on the pertinent catalog pages. In the case of valves ordered with CE marks or registered in Canada (CRN), the room temperature pressure rating is marked on the valve or flag tag supplied. Over-pressurization (due to fluid heating, chemical reaction, explosion, external fire, etc) can cause failure of the valve body and/or the valve internals; therefore, other means must be taken in the surrounding system to prevent this.
- Additional loads & considerations. Pressure ratings are based on internal pressure only. Additional loadings (environmental, head pressure, line-loads, etc) on valves must be accounted for by the end-user. Valve weights are listed in the Check-All® catalog or at [www.checkall.com](http://www.checkall.com).
- Temperature limits. Allowable operating temperature limits are shown in the catalog. In the case of valves ordered with CE marks, the limitations are marked on the valve body or accompanying flag tag. Temperatures higher or lower (due to the media, chemical reactions, environmental, conduction, convection, etc) than those allowed can cause failure of the valve body and/or internals. Contact Check-All® for temperature range information and reduced pressure ratings at elevated temperatures.
- Corrosive applications. Corrosion allowances are available upon request for all valves. It is the end-users responsibility to determine the suitability of the valve material for the internal and external environment in which it is used, as well as to establish inspection schedules. Refer to the latest revision of Form #180 "Body Material Definition for Check-All® Valve Products" to determine from what material valve bodies are made. Where the possibility of condensation of gaseous fluids exists, external means in the surrounding system may need to be provided for drainage and removal of deposits from low areas to avoid damage from corrosion. Carbon steel valves are supplied with an oil coating but are not plated.
- Media debris, leakage, & erosion. Check-All® valves are best suited for clean, particle-free liquids or gases. Debris such as sand or fibers can prevent the valve from sealing properly, erode the body and/or internal components, or otherwise adversely affect valve travel. These particles should be filtered out prior to entering the valves.
- Valve sizing. Proper operation requires correct valve sizing. If valves are oversized for the operating conditions, trim can chatter and cause excessive wear to the entire valve. Sizing accuracy requires the valve be fully open which occurs when the pressure drop across the valve reaches or exceeds approximately three times the spring cracking pressure (five times for 3S series). If valves are undersized, pressure drop may be excessive and cause the o-ring to come out of the groove. Valves can be sized using the equations or flow charts located in the Check-All® catalog or the Flow Data section of the Check-All® website [www.checkall.com](http://www.checkall.com). Contact the factory, [sales@checkall.com](mailto:sales@checkall.com), or your local Check-All® representative for further information or assistance.
- Seat leakage. PTFE o-rings, plastic-to-plastic seats, and metal-to-metal seats are not necessarily "bubble tight". Allowable leakage rates are listed in the Check-All® catalog or at [www.checkall.com](http://www.checkall.com) in the Application Guidelines section.
- Decomposition of unstable media. Check-All® valves are not designed to withstand excessive temperature and/or pressure beyond their marked limits due to the decomposition of unstable media.
- Fatigue life. CE marked valve bodies have been evaluated using the ASME Boiler and Pressure Vessel Code latest revision or material manufacturer literature.
- Safety accessory. Valves are not to be used as safety accessories as defined in the Pressure Equipment Directive (PED) 2014/68/EU.
- External fire. Any risk arising from external fire must be accounted for in the surrounding system.
- Galvanic reactions. Suitability of the valve body material when connected with the surrounding piping material is the sole responsibility of the end-user. Galvanic reactions can lead to material loss that can lead to failure of the pressure boundary. Refer to Form #180 "Body Material Definition for Check-All Valve® Products" to determine from what material valve bodies are made.

Check-All Valve® Mfg. Co. seeks for the highest level of quality and performance in its products. If you have comments regarding its products, the instructions, require documents referred herein, or need further assistance, please contact your local representative or:

**Check-All Valve Mfg. Co.**  
1800 Fuller Road  
West Des Moines, IA 50265 U.S.A.  
Phone: 515-224-2301 – Fax: 515-224-2326  
Website: [www.checkall.com](http://www.checkall.com) – Email: [sales@checkall.com](mailto:sales@checkall.com)