# Instruction & Operation Manual

## HSC Series Spring Check Valve


**Read and understand this manual prior to installing, operating or servicing this equipment**

DIXON

*The Right Connection®*

**This manual contains installation, operation, cleaning, repair instructions, model numbers and parts list for the Dixon® HSC Series Spring Check Valve.**

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# Safety Information

## Do's and Don'ts

- Do read and understand these instructions before installing or using the HSC Series spring check valve.
- Do use Dixon® spare parts when replacing components of the check valve.
- Do Not attempt to service the check valve while under pressure.
- Do Not place the check valve in an application where the service ratings are exceeded.
- Do Not attempt to modify the check valve assembly as it may compromise the integrity of the assembly and will void all warranties.

## Installation

- Do relieve product line pressure before attempting to install check valve.
- Do install line supports to prevent stress on fittings, valves and connections.
- Do Not install a damaged check valve assembly.
- Do Not install check valve between damaged clamp ferrules.

## Operation

- Do monitor the check valve assembly for any sign of leakage.
- Do check all clamp assemblies often to ensure that they have not loosened from vibration.
- Do Not attempt to loosen any clamp assemblies while the check valve is in operation.
- Do Not attempt to perform any type of service or adjustment to the check valve during operation.

## Maintenance

- Do drain piping completely before servicing.
- Do vent line to relieve any pressure.
- Do use caution and wear protective clothing if spring check valve has been used in applications using acids or other chemicals that may be harmful.

# Care of Stainless Steel

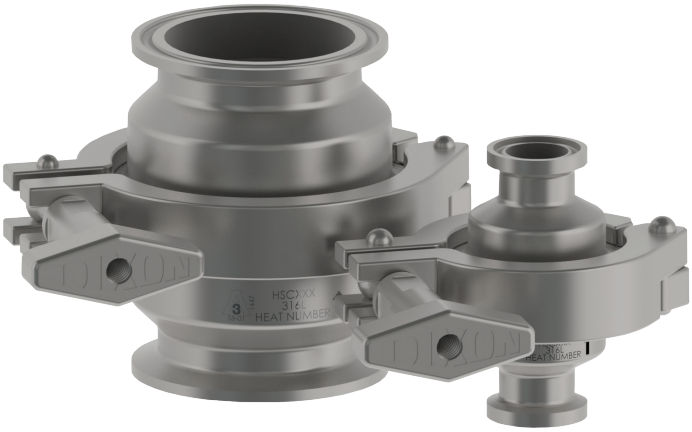
The stainless steel components in Dixon Sanitary equipment are machined, welded and assembled by skilled craftsmen using manufacturing methods that preserve the corrosion-resistant quality of the stainless steel.

Retention of corrosion-resistant qualities under processing conditions requires regular attention to the precautions listed below.

1. Regularly check all electrical devices connected to the equipment for stray currents caused by improper grounding, damaged insulation or other defects. Corrosion: Pitting often occurs when stray currents come in contact with moist stainless steel.


2. Never leave rubber mats, fittings, wrenches, etc. in contact with stainless steel. Corrosion: Pitting or galvanic action. Objects retard complete drying, preventing air from reforming the protective oxide film. Galvanic corrosion occurs when two dissimilar metals touch when wet.
3. Immediately rinse equipment after use with warm water until the rinse water is clear. Clean the equipment (manual or CIP) as soon as possible after rinsing. Corrosion: discoloration, deposits, pitting. Product deposits often cause pitting beneath the particles.
4. Use only recommended cleaning compounds. Purchase chemicals from reputable and responsible chemical manufacturers familiar with stainless steel processing equipment, they continuously check the effects of their products on stainless steel.
5. Use cleaning chemicals exactly as specified by the manufacturer. Do not use excessive concentrations, temperatures or exposure times. Corrosion: Pitting, discoloration, stress cracks. Permanent damage often occurs from excessive chemical concentrations, temperatures or exposure times.
6. For manual cleaning, use only soft non-metallic brushes, sponges or pads. Brush with the grain on polished surfaces, avoid scratching the surface. Corrosion: Pitting, scratches. Metal brushes or sponges will scratch the surface and promote corrosion over a period of time. Metal particles allowed to remain on a stainless steel surface will cause pitting.
7. Use chemical bactericides exactly as prescribed by the chemical manufacturer in concurrence with local health authority. Use the lowest permissible concentration, temperature and exposure time possible. Flush immediately after bacterial treatment. In no case should the solution be in contact with stainless steel more then 20 minutes. Corrosion: Protective film destroyed. Chlorine and other halogen bactericides can destroy the protective film. A few degrees increase in temperature greatly increases chemical activity and accelerates corrosion.
8. Regularly inspect the joints in pipelines. Be sure all connections are tight fitting without binding. Corrosion: Crevice corrosion. Small crevices caused by improperly seated gaskets will promote crevice corrosion. Stainless steel under stress will develop stress cracking especially in the presence of bactericides containing chlorine.
9. Regularly inspect equipment for surface corrosion (i.e. pitting deposits, stress cracks, etc.). If deposit or color corrosion is detected, remove it immediately using mild scouring powder and detergents. Rinse thoroughly and allow to air dry. Review production and cleaning procedures to determine the cause. Note: If corrosion is not removed, the protective film cannot be restored and corrosion will continue at an accelerated rate.

# Technical Data



## Sizes:

- ½" - 4"

## Materials:

- product contact parts: AISI 316L Stainless Steel
- product contact elastomers: FKM or EPDM
- non-product contact components: 304 Stainless Steel
- finish: 32 $R_a$ on all product contact surfaces, other finishes available

## Connections:

- Clamp (standard)
- other connections available

## Specifications:

| Model | Size | Pressure Rating | Cracking Pressure | Operating Temperature |
|---|---|---|---|---|
| **HSC*050** | ½" | **145 PSI** | **10.0 PSI** | **15°F - 200°F (-9°C - 93°C)** |
| **HSC*075** | ¾" | | **4.0 PSI** | |
| **HSC*100** | 1" | | **2.5 PSI** | |
| **HSC*150** | 1½" | | **1.0 PSI** | |
| **HSC*200** | 2" | | **1.5 PSI** | |
| **HSC*250** | 2½" | | **0.8 PSI** | |
| **HSC*300** | 3" | | **0.5 PSI** | |
| **HSC*400** | 4" | | **0.4 PSI** | |

*V=FKM or E=EPDM

### Repair Kits

½"-¾" Repair Kit Contains:
(1) body gasket
(1) plunger O-ring
(1) spider O-ring

1"-4" Repair Kit Contains:
(1) body gasket
(1) plunger O-ring

*V=FKM or E=EPDM

| Size | Part Number |
|---|---|
| ½" | **HSC-RK*050** |
| ¾" | **HSC-RK*075** |
| 1" | **HSC-RK*100** |
| 1½" | **HSC-RK*150** |
| 2" | **HSC-RK*200** |
| 2½" | **HSC-RK*250** |
| 3" | **HSC-RK*300** |
| 4" | **HSC-RK*400** |

# Installation

## Unpacking

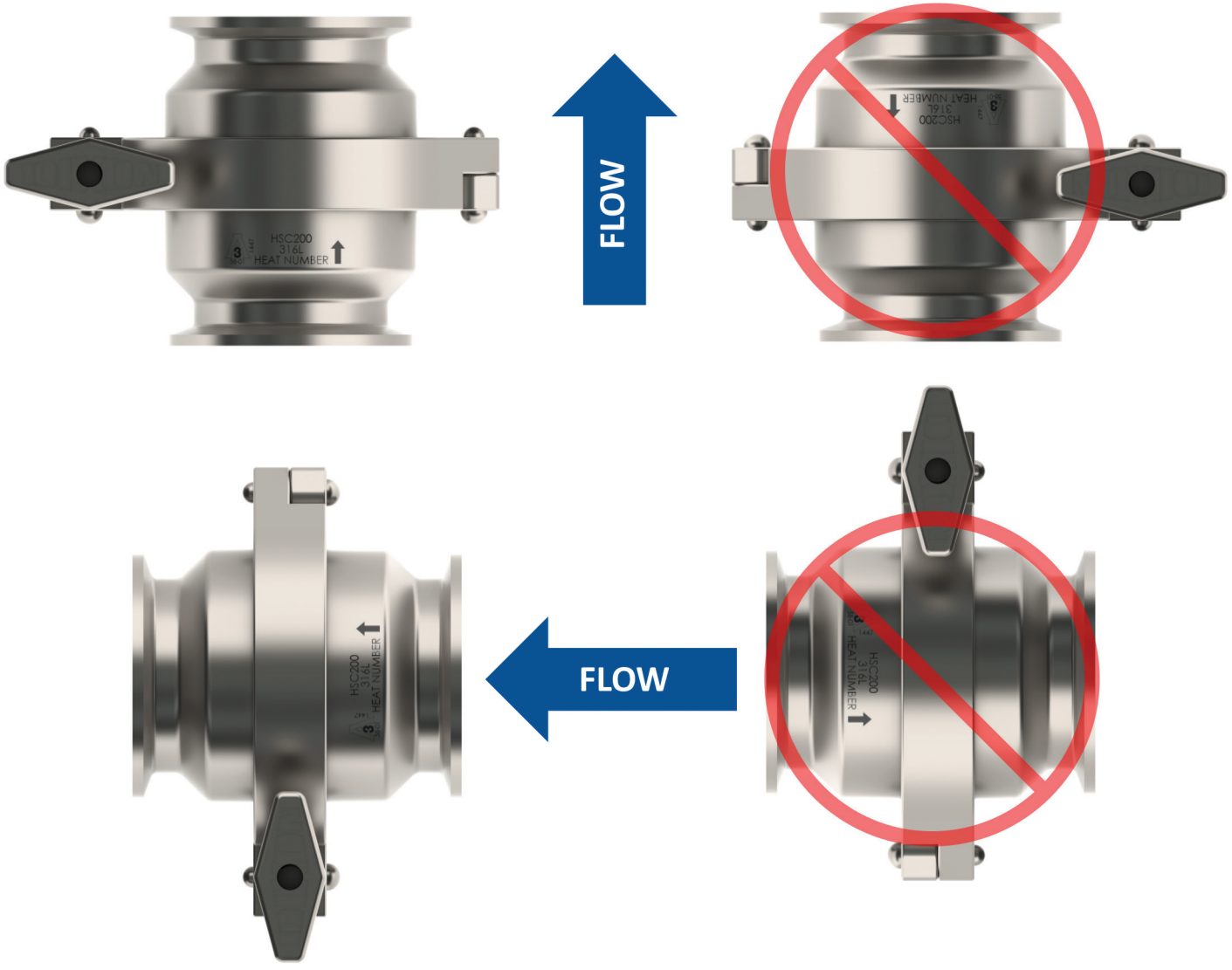
Carefully unpack all parts of the valve and inspect for damage that may have occurred during shipment. Report any damage to the carrier immediately.

The ports on the valve are protected with a plastic cover. If any covers are missing or damaged, inspect the ports on the valve thoroughly for any damage.

Cycle the Dixon® HSC Series spring check valve by reaching into the lower body, depressing and releasing the plunger twice. Ensure no binding or interference is taking place.

## Installation Orientation

The valve should be installed so that the fluid pressure is acting on the valve stem end. The following diagram should be followed when installing the valve. **DANGER:** Improper installation of the valve could lead to serious injury.



# Maintenance

To ensure that your Dixon® HSC Series spring check valve functions as designed, it is important to make sure that it is properly maintained. Only use genuine Dixon® replacement parts when replacing any components of the HSC Series spring check valve.

DO NOT attempt to modify the valve in any way. Doing so will void all warranties and could result in injury.

## Manual Cleaning

1. Refer to the disassembly section of the manual and follow instructions to remove all product contact components of the valve.
2. Inspect the product contact components of the valve for any signs of possible damage. Replace components as necessary.
3. Clean all surfaces of the product contact components by manually brushing in a bath of cleaning solution (acid detergents or simple alkaline soda type detergents).
4. After cleaning, rinse all components thoroughly with water.

   Note: Seat seal (2) must be replaced after removal.
5. Refer to the assembly section of the manual and follow instructions to properly reassemble the valve.

## Cleaning In Place

Note: Model sizes ½" and ¾" are not rated for CIP. Refer to Manual Cleaning of the Valve for those models.

1. Flush the valve with a suitable medium before regular operation.
2. Regularly flush the valve with a suitable medium to preserve seals and integrity of the check valve. Such as when there is a product changeover or downtime. These intervals shall be determined by the end user.
3. Only use cleaning agents which will not harm the seals and stainless steel.
4. The necessary cleaning times, temperatures and cleaning agents will depend on the degree of contamination and must be adapted accordingly.

# Valve Disassembly & Assembly

## Disassembly

**WARNING:** Relieve fluid pressure in the line before disassembling the valve.

1. Loosen the wing nut and remove the body clamp (6) from the center of the valve.
2. Carefully separate the body halves.
3. Lift off the upper body (7). For ½" and ¾" sizes, remove spider (8) and spider O-ring (9).
4. Remove the spring (4) and the plunger (3).
5. If necessary, remove the plunger O-ring (2) using a small screwdriver. Be careful as to not damage the plunger or O-ring.

## Assembly

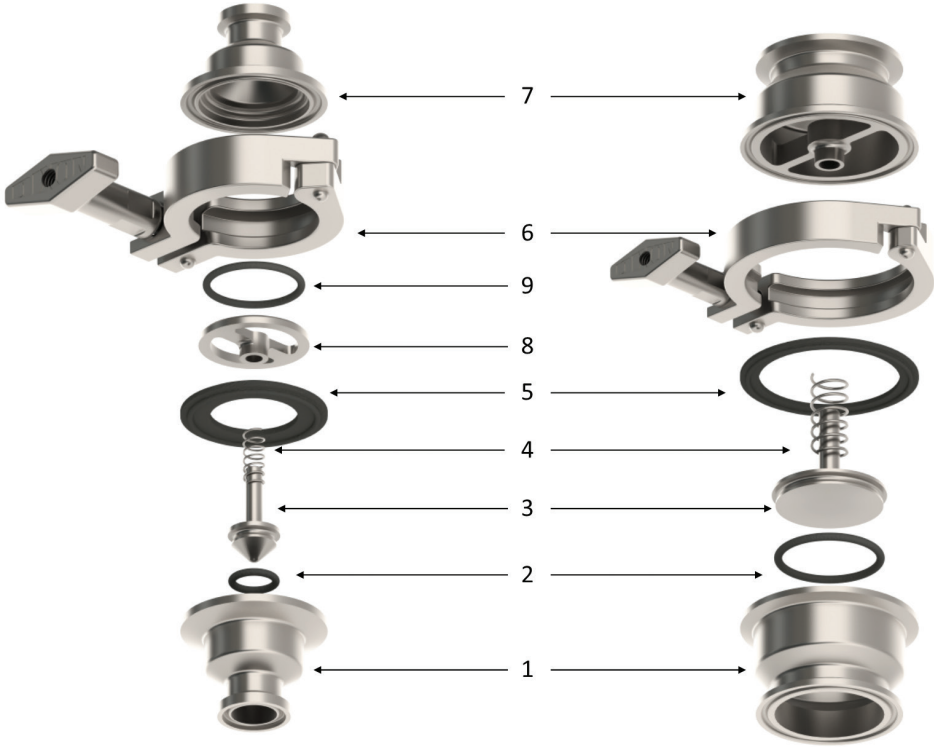
1. Place the body halves on a flat surface with clamp ends down.
2. Carefully slide plunger O-ring (2) into the plunger O-ring groove.
3. Set the plunger (3) down onto the sealing surface of the lower body.
4. Slide the spring (4) down onto the plunger stem.
5. Place body gasket (5) on lower body (1).
    a. For ½" and ¾" sizes:
        i. Install spider O-ring (9) in upper body (7).
        ii. Install spider (8), with plunger bushing facing up, in upper body (7).
        iii. Set body gasket (5) on upper body (7).
6. Slide upper body spider bushing over plunger stem and compress the spring until body halves and gasket meet.
    a. For ½" and ¾" sizes:
        i. Grab upper body, spider O-ring, spider, and body gasket and slide spider onto plunger compressing the spring until body halves and gasket meet.
7. While holding the body halves together, put body clamp around the center of the valve body and tighten wing nut.

# Dimensions


| Size | A (in) |
|---|---|
| ½" | 2.7 |
| ¾" | 2.7 |
| 1" | 3.3 |
| 1½" | 3.4 |
| 2" | 3.4 |
| 2½" | 3.4 |
| 3" | 3.4 |
| 4" | 4.1 |

# Bill of Materials

| Item | Description | Material | | | Quantity | |
|---|---|---|---|---|---|---|
| | | ½" & ¾" | 1" - 2" | 2½" - 4" | ½" & ¾" | 1" - 4" |
| 1 | lower body | 316L SS | 316L SS | 316L SS | 1 | 1 |
| 2 | plunger O-ring | FKM or EPDM | FKM or EPDM | FKM or EPDM | 1 | 1 |
| 3 | plunger | 316L SS | 316L SS | CF8M | 1 | 1 |
| 4 | spring | 316L SS | 316L SS | 316L SS | 1 | 1 |
| 5 | body gasket | FKM or EPDM | FKM or EPDM | FKM or EPDM | 1 | 1 |
| 6 | clamp | CF8M | CF8M | CF8M | 1 | 1 |
| 7 | upper body | 316L SS | 316L SS | 316L SS | 1 | 1 |
| 8 | spider | 316L SS | --- | --- | 1 | --- |
| 9 | spider O-ring | FKM or EPDM | --- | --- | 1 | --- |




½" & ¾" 1" - 4"

# Troubleshooting

Dixon Sanitary HSC Series spring check valves are manufactured and inspected to meet sanitary standards. Occasional problems may arise. The following guide will help determine the possible cause and offer suggestions on corrections to maximize the performance of your spring check valve. If you have any questions or concerns in regards to your product, we encourage you to contact Dixon Sanitary 800.789.1718.

| PROBLEM | POSSIBLE CAUSE | SUGGESTED ACTION |
|---|---|---|
| Fluid is leaking past plunger seal | Damage to plunger O-ring | Inspect and replace plunger O-ring |
| | Damage to spring | Inspect and replace spring |
| | Obstruction between plunger and body or in the spring | Inspect for obstructions and replace components if necessary |
| Valve is leaking between upper body and lower body | Damage to body gasket | Inspect and replace body gasket |
| Valve is not stroking properly | Obstruction between plunger and body or in the spring | Inspect for obstructions and replace components if necessary |
| Fluid not flowing through valve | Valve is installed improperly | Check installation section to make sure fluid is flowing correctly |
| Any other Issue | - | Contact Dixon Sanitary 800.789.1718 |

# Limited Warranty

Dixon Sanitary (herein called "Dixon") warrants the products described herein, and manufactured by Dixon to be free from defects in material and workmanship for a period of one (1) year from date of shipment by Dixon under normal use and service. It's sole obligation under this warranty being limited to repairing or replacing, as hereinafter provided, at its option any product found to Dixon's satisfaction to be defective upon examination by it, provided that such product shall be returned for inspection to Dixon's factory within three (3) months after discovery of the defect. The repair or replacement of defective products will be made without charge for parts or labor. This warranty shall not apply to: (a) parts or products not manufactured by Dixon, the warranty of such items being limited to the actual warranty extended to Dixon by its supplier; (b) any product that has been subject to abuse, negligence, accident, or misapplication; (c) any product altered or repaired by others than Dixon; and (d) to normal maintenance services and the replacement of service items (such as washers, gaskets and lubricants) made in connection with such services. To the extent permitted by law, this limited warranty shall extend only to the buyer and any other person reasonably expected to use or consume the goods who is injured in person by any breach of the warranty. No action may be brought against Dixon for an alleged breach of warranty unless such action is instituted within one (1) year from the date the cause of action accrues. This limited warranty shall be construed and enforced to the fullest extent allowable by applicable law.

Other than the obligation of Dixon set forth herein, Dixon disclaims all warranties, express or implied, including but not limited to any implied warranties of merchantability or fitness for a particular purpose, and any other obligation or liability. The foregoing constitutes Dixon's sole obligation with respect to damages, whether direct, incidental or consequential, resulting from the use or performance of the product.

Some products and sizes may be discontinued when stock is depleted, or may require a minimum quantity for ordering.

NOTE: Reasonable care has been taken in preparing this manual. Dixon Sanitary, a division of Dixon Valve & Coupling Company, reserves the right to make corrections and any dimensional changes.

Dixon, founded in 1916, is a premier manufacturer and supplier of hose couplings, valves, dry-disconnects, swivels, and other fluid transfer and control products. The company's global reach includes a wide range of products for numerous industries including petroleum exploration, refining, transportation, chemical processing, food & beverage, steel, fire protection, construction, mining and manufacturing. Dixon's strategic objective is to create solutions that make products safer, leak-free, longer lasting, and always available.

*The Right Connection®*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