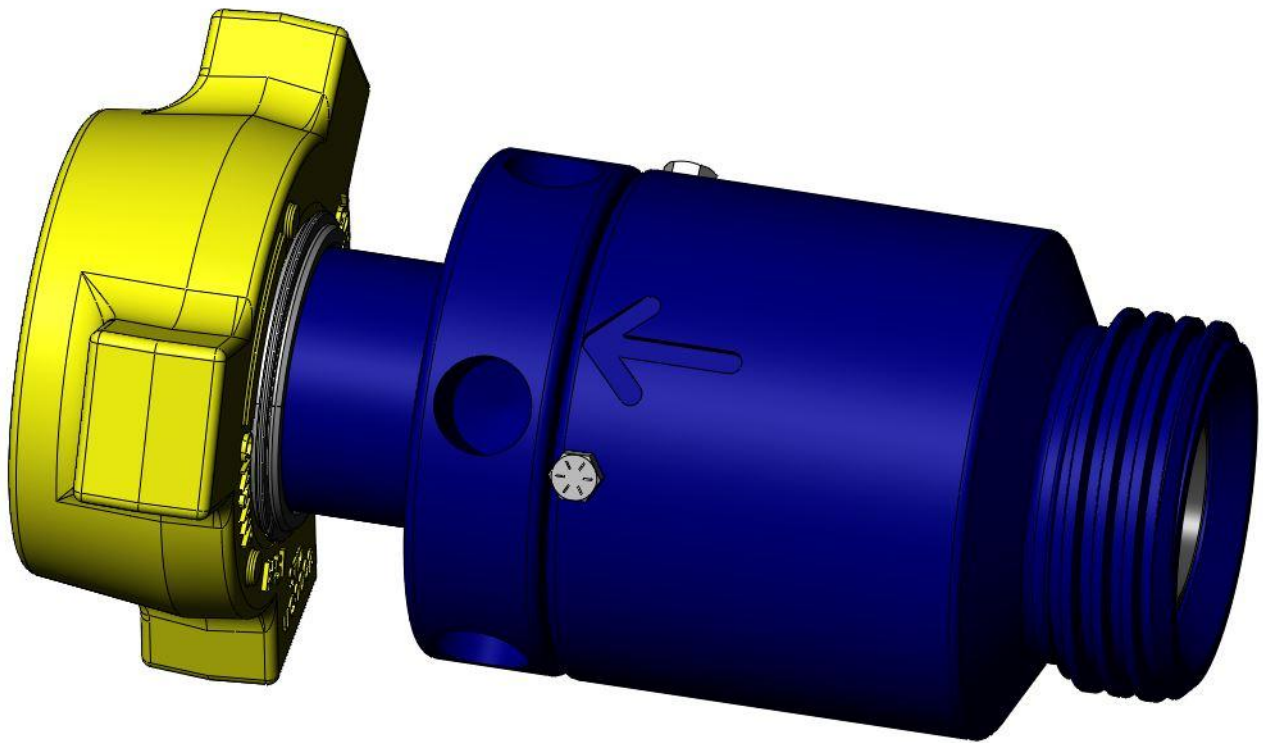




# Technical Manual

## MSI Dart Check Valve



**MSI – A Division of Dixie Iron Works, Ltd.**  
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## SECTION 1      WARNINGS

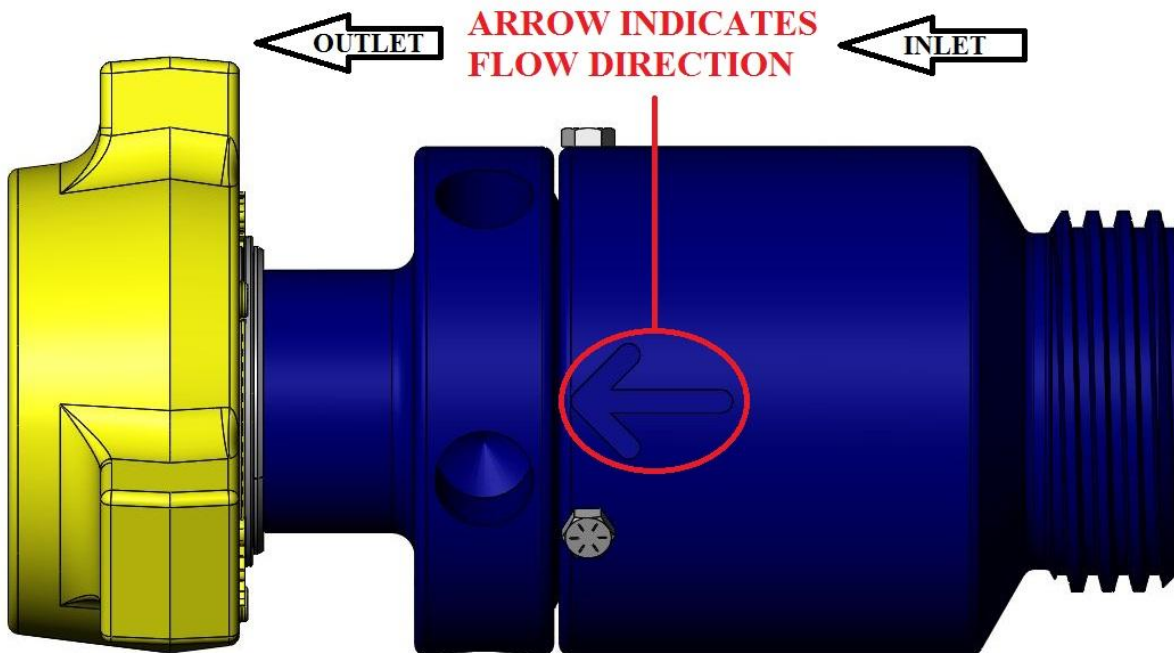
The MSI Dart Check Valve is used in high-pressure and high flow well service applications. High pressure equipment, if not used and maintained properly, can cause serious injury or death and damage to equipment and property. Not taking proper precautions and failing to perform routine maintenance and inspections can also contribute to loss of well control, and such loss could cause serious injury or death and damage to equipment and property.

**ALL OPERATORS AND MAINTENANCE PERSONNEL SHOULD BE THOROUGHLY TRAINED IN THE SAFE OPERATION, MAINTENANCE, AND INSPECTION OF THIS EQUIPMENT.**

## 2.1 Dart Check Valve Description

The MSI Dart Check Valve is used to prevent back-flow in high pressure fluid systems. Fluid flow through the inlet towards the outlet pushes against the dart, compressing the spring and opening the valve. When the flow stops, or if fluid tries to flow from the outlet to the inlet, the spring expands, pushing the dart against the sealing surface and closing the valve.

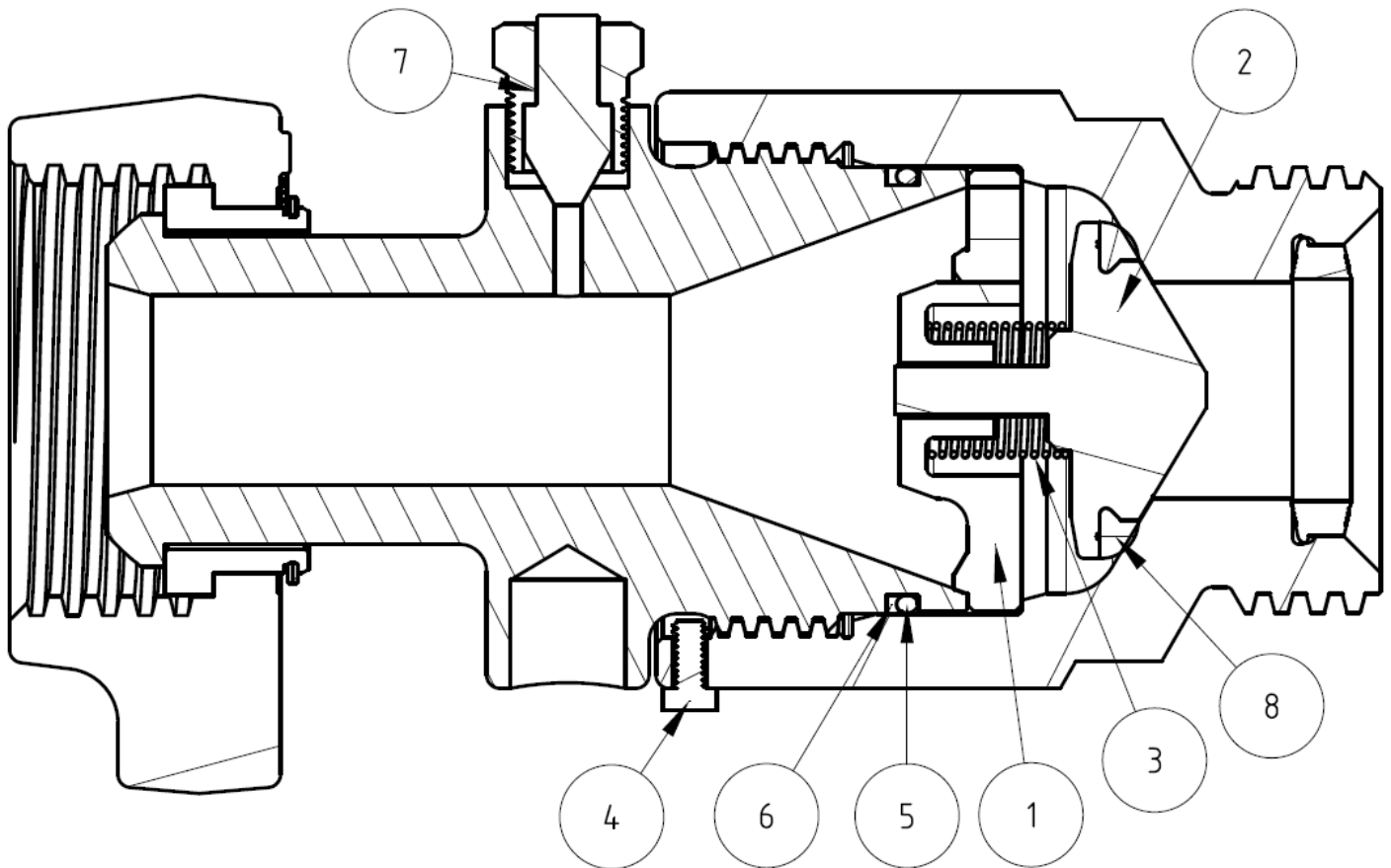
*Note: This product is available with a variety of end connection orientations, so the inlet and outlet sides are indicated by an arrow machined onto the body of the check valve as shown below.*



## SECTION 3 ASSEMBLY DETAILS

### 3.1 Bill of Materials

ITEM NO.	QTY.	DESCRIPTION	STD	H2S
1	1	DART CHECK VALVE, SPRING CUP/VALVE STOP	DCVC0003	
2	1	DART CHECK VALVE, DART 2"	DCVC0004	
3	1	VALVE SPRING	DCVC0005	
4	3	CAP SCREW 5/16"-18 X 5/8" GRADE 8	HC1011	
5	1	O-RING, DART BODY	OC0001	OC0002
6	1	PAR-BACK, DART BODY	OC0199	
7	1	BLANK PLUG ASSY, 9/16" AUTOCLAVE	UA0250	
8	1	VALVE INSERT, DART VLV	VC0823	



### 3.2 Assembly Steps

1. Secure the inlet side of the valve body to a work table with the internal cavity up.
2. Inspect dart (2) seal groove for burrs or sharp points that could damage the seal upon installation.
3. Slowly work the valve insert (8) into the dart (2) seal groove from the dart's tapered end. (May require clamping onto dart to hold in place, take care not to damage the stem with vice).
4. Set the dart (2) into the inlet side of the valve body with the stem sticking up.
5. Fit the spring (3) over the dart stem.

6. Apply a thin film of lubricant to the ID of the inlet side of the valve body and install the spring cup / valve stop (1), making sure that the spring (3) rests in the spring cup cavity.
7. Apply lubricant and install the 0.139" diameter o-ring (5) and back-up ring (6) into the OD groove of the valve body outlet side.
8. Apply anti-seize to the valve body outlet side threads then carefully insert into the valve body inlet side and tighten with a 1" diameter bar until snug.
9. Thread the 3 retaining cap screws (4) into the threaded holes on the valve body until they are snugly against the valve body outlet side.

### 3.3 Disassembly Steps

- Note: Disassembly of the dart check valve is basically the opposite of the assembly process. See steps outlined below:
  1. Secure the inlet side of the valve body to a work table with the body up.
  2. Back-out the 3 retaining cap screws (4) in the threaded holes on the valve body until they are no longer interfering with the threads on the valve body outlet side.
  3. Use a 1" diameter bar to unscrew the valve body outlet side from the valve body inlet side.
  4. Inspect the 0.139" diameter o-ring (5) and back-up ring (6) installed in the OD groove of the valve body outlet side and replace as needed.
  5. Remove the spring cup / valve stop (1)
  6. Remove the spring (3).
  7. Remove the dart (2) along with the insert (8).

### 3.4 Inspection

After degreasing the parts, visually inspect for abnormal wear, corrosion, erosion, or any other physical damage.

1. Inspect the threads, dart and seal insert and replace parts as necessary.
2. Replace the wing nut if any of the lugs are excessively deformed or damaged.

## Appendix A TROUBLESHOOTING

Listed below are some common conditions that may require trouble shooting and their possible causes:

### **No Flow / Flow Blocked**

- Ensure valve is installed with flow arrow pointing in the desired direction of flow.

### **Back Flow Observed**

- Missing or damaged dart seal insert.
- Missing or damaged spring.
- Corrosion on dart seal seating face.
- Debris preventing dart from closing fully.
- Insufficient back pressure to maintain dart seal.

### **Valve Body Output Side Rotates Relative to Input Side During End Connection Make-up**

- Cap screws not fully engaged to prevent body thread back-out.

### **Valve Body Output Side Will Not Unscrew From Input Side**

- Cap screws not backed out, still engaging with body threads.

### **Leakage Observed at Valve Body Interface**

- Missing or damaged valve body seal / back-up ring.



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