

# Instruction Manual

## Flanged End Swing Check Valve

CS150CK / CS300CK

HIM-144 Version: A

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		Date	May.16.2011
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## 1. INTRODUCTION AND SAFETY INFORMATION

### 1.1 INTRODUCTION

This manual has been prepared to serve as a guide to insure continuous satisfactory service and assist in restoring a valve to proper working condition.

It covers Class 150/300 flange end, cast steel check valves. The installation, storage, operation, disassembly / reassembly inspection and repair, service problems, maintenance and preventive maintenance covering these check valves are also included in this manual.

Prior to performing any work on these check valves, it would be useful to have a general understanding of their construction.

Swing Check valve based on the flow of medium itself open and close automatically to prevent the flow backwards.

### 1.2 SAFETY INFORMATION

The following general safety notices supplement the specific warnings and cautions appearing elsewhere in this manual. They are recommended precautions that must be understood and applied during operation and maintenance of the equipment covered herein.

- a. Do not attempt to disassemble a check valve while there is pressure in the line. Make sure both upstream and downstream pressures are removed. Disassemble with caution in the event all pressures have not been relieved.
- b. To prevent check valve distortion, inefficient operation, or early maintenance problems, support piping on each side of the check valve.

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## 2. STORAGE AND PREPARATION

### 2.1 STORAGE

#### 2.1.1 Temporary Storage

If the check valve is to be stored before installation, the following should be observed.

- a. Keep the check valve wrapped and protected as shipped from the manufacturer.
- b. Do not remove the plastic bag or protective end covering until the check valve is ready for installation. This will reduce the possibility of foreign material damaging internal check valve components.
- c. Check valve stored outdoors should be positioned such that water dose not accumulate in the valve body.

#### 2.1.2 Long Term Storage

If the check valves are to be stored more than of one year, they should be prepared in the following manner.

- a. Store the check valve in a dry area or protect the cavity by applying a preservative coating.
- b. Do not remove the protective end covering. (If any)
- c. Check valve which will remain in storage for an excessive period of time should have a preservative applied to the external surface.
- d. Do not store the valves outdoors.

### 2.2 PREPARATION

- a. Remove the end protection. (If any)
- b. Prior to shipment from the manufacturer, a preservative may have been applied to the inner body of the check valve.  
This preservative maybe removed with a solvent.
- c. The inside of the check valve should be inspected and blown out with compressed air. As far as possible adjacent piping must be clean and free from debris to prevent early foulness of the check valve.
- d. To prevent check valve distortion, inefficient operation or early maintenance problems, support piping on each side of the check valve.
- e. Install the check valve according to the flow indicator on the body.

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### 3. INSTALLATION AND OPERATION

#### 3.1 INSTALLATION

##### Flange Ends

Bolting and gasket material should be compatible with the valve's body material and pressure. Care should be taken that flanges are strait and parallel. Bolts should be evenly tightened in a star pattern. This will ensure a uniform gasket loading.

Direction: The flow of the medium based on the arrowhead on the valve body.

#### 3.2 OPERATION

The Swing Check valve's operation is automatic and requires no assistance. When the flow exerts sufficient pressure against the disc to overcome the disc's weight, the disc which is set on a hinge, lifts allowing the flow to continue through the piping system. As the pressure decreases the disc lowers until its own weight forces it to seat. This prevents the possibility of a reversal in the flow.

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## 4. MAINTENANCE AND REPAIR

### 4.1 INSPECTION AND MAINTENANCE

The maintenance when it works

The leakage on the connection between body and bonnet

Cause: After a cycle of use, the preload between body and bonnet was reduced. As a result of the pressure on gasket was reduced, there will be leakage.

Approach: Select a suitable wrench locks the bolts between body and bonnet, and then the pressure on gasket was increased, the sealed effect between body and bonnet was well to prevent the leakage.

The approach can carry on termly.

Repair

After a cycle of use, there still be leakage after above approach, it should be repaired.

The leakage on the connection between body and bonnet

Method: Change the gasket

a. Teardown

- (1) Take the bolts between body and bonnet down.
- (2) Take the gasket out

b. Fixing

- (1) Put a new gasket into the body smoothly.
- (2) Put the bonnet on the body, and then lock the bolts, finish both sides.

The leakage check

After repaired, should carry on the leakage check, there still be leakage, we should carry on the maintain as above.

### 4.2 TROUBLE-SHOOTING

The following chart will cover the various problems which are common to most check valves.

The information provided will aid in isolating and correcting these problems.

PROBLEM	PROBABLE CAUSE	SOLUTION
Leakage	a. Bolts are loose b. Gasket is damaged c. Body flange face damaged	a. Tighten to values listed in Table 2. b. Disassemble and install a new gasket c. Repair and install a new gasket
Disc Damaged	d. Internal components are damaged or worn	d. Inspect internal components and repair as required

Table 1 - Trouble-Shooting

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#### 4.3 DISASSEMBLY

##### **WARNING**

To prevent injury ensure that all pressure is removed from the valve both upstream and downstream before disassembly.

- a. Match or mark flange with a metal tool or paint to clearly show the original position for reassembly.
- b. Caution should be taken when loosening body-cover bolting as pressure may still be present.
- c. Once assured there is no more pressure in the line, remove the cover bolting and lift the cover off the body.
- d. Remove the gasket from the valve body flange.
- e. If so equipped remove tack welds and bolts (for internally hung disc.). Remove the side plug. This will allow the hinge pin to be removed.
- f. Remove the hinge pin while supporting the disc and arm to prevent damage to the seating surface.
- g. To remove the disc from swing arm, remove the cotter pin and unfasten the disc nut.

#### 4.4 REASSEMBLY

- a. Thoroughly clean the valve interior and all components. Remove all scale, oil, grease, or other foreign material. Wipe the seating surface of the disc and valve seat with a solvent soaked cloth. Clean the body and cover flange surfaces and all bolting.
- b. Install the disc and secure it to the arm with the disc nut. Insert and secure a new pin. Do not use the old pin unless a new one is unavailable.
- c. Place the disc arm assembly in the valve and insert the hinge pin.
- d. Replace and secure the side plug, bolts and tack welds as required.
- e. Open the valve by lifting the arm. The action should be smooth and regular through full hinge pin rotation.
- f. Position a new gasket on the body flange aligned with the bolt holes. The gasket should not extend over the open body cavity. Do not reuse a gasket. The gasket may be coated with a light oil.
- g. Line up the body and cover holes. Make sure the gasket does not extend into any of the bolt holes. Install the cover bolting and tighten in a star pattern to evenly load the gasket to the torque values listed in Table 2. or Table 3.

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## 5. QUALITY ASSURANCE AND SERVICE

### 5.1 QUALITY ASSURANCE

OVC's warrants its products to be free from defects in material and workmanship for a period of eighteen (18) months from the date of shipment or twelve (12) months from the date of installation whichever comes first. This warranty is limited to the repair or replacement of the defective item providing that it was handled, installed, used and maintained in accordance with the manufacturer's recommendations and applicable standard industry practices. OVC will not be liable for any additional direct or indirect costs beyond the repair or replacement of the defective item.

This warranty is in lieu of any other warranty expressed or implied.

### 5.2 SERVICE

Manufacturer may provide field installation and debugging where contractually specified.

Manufacturer will follow up the quality of the valve provided and offer service in accordance with customer requirements.

## 6. TECHNICAL PARAMETERS

### 6.1 SPECIFICATION LIST

Type	
Technical Parameters	CS150CK / CS300CK
Nominal pipe size	DN50 ~ DN300, (2" ~ 12")
Nominal pressure	Class 150/300
Working temperature	-29°C ~ 425°C, (-20°F ~ 800°F)
Medium	Water, Steam, Oxygen, Vacuum, Chemical, Oil, Food Processing
Pressure test	API 598

Table 2 - Specification List

 "THE RIGHT CHOICE"		<b>Flanged End Swing Check Valve</b> <b>CS150CK / CS300CK</b>	<b>Version</b>	<b>A</b>
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## 6.2 BONNET BOLT TORQUE

NPS	DN	Bonnet Nut Torque			
		Class 150		Class 300	
		N-m	in-lb	N-m	in-lb
2"	50	78	690.4	78	690.4
2-1/2"	65	78	690.4	125	1106.3
3"	80	78	690.4	147	1301.1
4"	100	125	1106.3	147	1301.1
6"	150	125	1106.3	147	1301.1
8"	200	147	1301.1	244	2159.6
10"	250	244	2159.6	407	3602.2
12"	300	244	2159.6	610	5398.9

Table 3 – Bonnet Nut Torque

## 6.3 PRESSURE-TEMPERATURE RATINGS

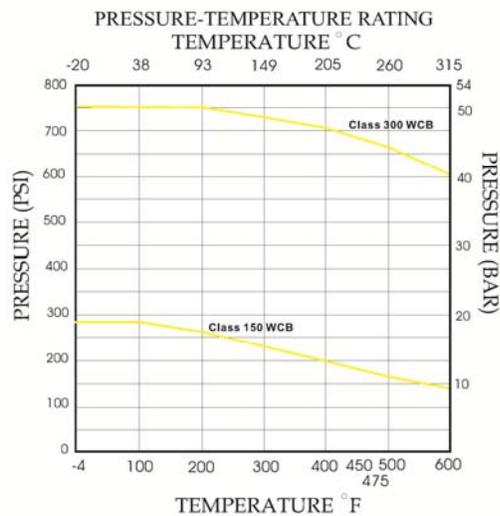


Table 4 - Pressure-Temperature Ratings