



INDUSTRIAL VALVES MANUFACTURER

SHANGHAI YUANGAO VALVES INDUSTRY CO., LTD

Check Valves Installation, Operation & Maintenance Manual



API 600



API 6D



API 624



API 607



CE 1155



2014/68/EU



ISO 9001

SHANGHAI YUANGAO VALVES INDUSTRY CO., LTD.

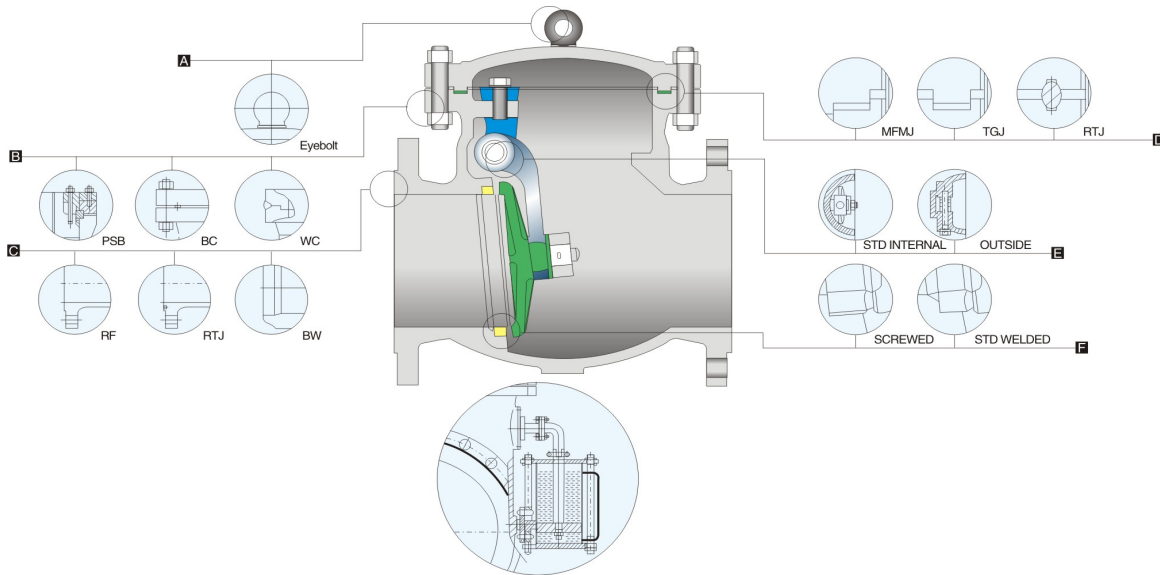
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1. Typical Swing Check valves

LEAD Standard Check valves are swing check valves used to prevent back flow. The fluid flow is in a straight line comparable to that in a gate valve. This valve is kept open by the flow. In the event of back flow or flow stoppage, the disc swings back to close automatically.



HCU weighted mechanical accumulator

This design can be used to either dampen or assist closing of the check valve disc depending on orientation. by using the hydraulic control unit to buffer action the disc, the valve opens at lower flow rates.

2. Valve Name Plate marking

- a. Every valve is provided with a stainless steel identification plate fixed to the Cover flange. The details on the identification plate are as follows:

 	LEAD VALVE (UK) LTD MANUFACTURING IN CHINA			
	TYPE	CHECK VALVE	SIZE	PRESSURE
	BODY	DISC	SEAT	
	B16.34	PSIG @ 100°F	S/N	

 	YUANGAO VALVES GROUP CO., LTD			
	TYPE		SIZE	PRESSURE
	BODY	BALL	SEAT	
	B16.34	PSIG @ 100°F	S/N	

Valves Shall not be used for more than the pressure indicated with temperature as indicated in identification plate.

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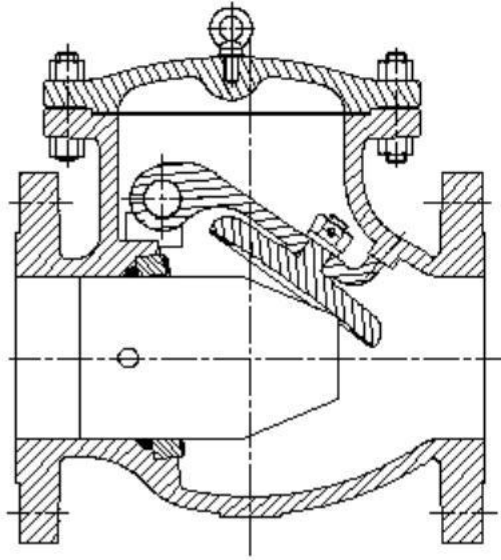
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3. Storage / Handling

- a. All Swing Check valves are shipped in the open position with the end flange protector in place. A stopper is provided to restrict the movement of the disc during shipment and handling (Refer fig).



- b. Valves shall be stored in a clean dry environment and suitably covered to prevent ingress of moisture and dust.
- c. All valves shall be handled with slings across the body of the valve. In large size check valves, lifting lugs are provided.

3.1 Planning & Responsibilities

When installing or maintaining valves.

- a. Conduct a risk assessment and eliminate or reduce hazards to an acceptable level.
- b. Follow safe systems of works.
- c. Observe all site health and safety rules.
- d. Due to the variety of duties in which this product can be employed, it is the end users responsibility to ensure the compatibility of the media with the material of construction of product for each specific application.
- e. Before equipment is installed in areas, which may be subject to extreme seismic activity, consult LEAD sales with data. (To be done at enquiry stage).

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3.2 Do's & Don'ts

- a. Wear all necessary protective equipment for conducting the work.
- b. Never remove or maintain a valve or joint unless the line has been fully de pressurized and drained.
- c. Ensure that the valves are used within the pressure temperature service conditions as per ASME B16.34 Sec 2. Also refer identification plate for pressure and temperature limits. In case of additional assistance, consult with LEAD.

4. Preparation for Installation

- a. The stopper, provided to restrict the movement of the disc during shipment and handling, shall be removed from the valve, before installation.
- b. When shipped, rust preventive oil is applied on the valve bore and other exposed machined surfaces. This can be removed with a commercial solvent if necessary.
- c. Check that the valve internals are clean and free of dirt, grit and other extraneous particles.
- d. In flanged end valves the raised face should be cleaned and free of any damage / score mark.
- e. In BW end valves ensure that the end preparation is in line with the mating part and free from any damage / nicks etc.
- f. Ensure that the pipeline has been flushed free of dirt, weld spatter etc before installation.
- g. Use proper gaskets and bolting as per the standard recommendations for installing the valves on the line.
- h. For BW end valves, field joints connecting valves & pipes shall be done by qualified welders using approved WPS/PQR to recognized standards like ASME Sec IX.

Warnings:

Ensure the stopper (provided inside the valve to restrict the movement of the disc during shipment and handling) is removed before installation.

All valves are pressure tested at the factory. Should customer desire a test before installation, ensure test pressures are as per the ASME B16.34 section 7 and API 598 requirements. Excessive clamping load shall be applied on body while testing.

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5. Installation

- a. Swing check valves shall be installed with the flow opening the disc. Arrow mark on the valve casting indicates the correct direction of flow.
- b. These check valves can be used in vertical lines or horizontal lines. In vertical lines, they shall be used for upward flow only.
- c. Installation of valves shall follow prevailing site standards. The following will also be considered.

d. Installation of valves with Flanged End Construction

- d1. The valve ends and the pipe ends / flanges should be aligned.
- d2. Pipe work in flanged construction shall have the correct gap to allow for the valve face-to-face and assembled gasket thickness.
- d3. Flange fasteners for end flanges shall be of the correct size, length and material for the service conditions. As a minimum the material shall be compatible to one used for valve Cover bolting.
- d4. Assemble all bolts and hand tight. Evenly tighten the bolts at diametrically opposite end to the correct torque required for the specific gasket material.

e. Installation of valves with BW End Construction

- e1. The valve ends and the pipe ends shall be aligned.
- e2. Pipe work in BW end construction shall also have the correct gap to allow the end-to-end dimension of the valve.
- e3. Correct welding material shall be used as per approved procedures for welding.

Warning:

Swing check valves must not be installed at the outlet of a reciprocating pump. The pulsating flow will destroy the sealing surfaces and valve internals.

6. Operation

Swing Check valves are kept open by flow. Gravity and reversal of flow, move the disc back to the seat, preventing back flow. These are self operated valves.

Warning:

In valves fitted with gasket with PTFE filler, which have been exposed to an external fire, it is recommended that the gasket be changed immediately before further use of the valve.

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For Ferritic steel materials (ASTM A105, ASTM A216 Gr. WCB, ASTM A216 Gr. WCC etc), if the lowest scheduled operating temperature is above 0°C, but due to climatic conditions (e.g., during startup) the valve is subjected to operating temperatures below 0°C, a lower pressure than the design pressure should be ensured until the metal temperature has risen above 0°C. This is to deal with risk of brittle failure.

7. Maintenance

LEAD Swing Check valves are of rugged construction. The following checks would help ensure good performance of the valve over an extended period.

7.1 Cover Gasket

In high temperature services, there is a possibility of creep in the Cover studs. Regular checking of the Cover – studs for tightness, would help prevent leakage through the Cover gasket. Tightening should be done evenly in a sequence of diametrically opposite nuts. The Tightening Torque for cover studs should be as follows

Stud Size, in	Thread Details	B7/ B16 / L7		B7M / L7M		B8 CL.2 / B8M CL.2	
		lbf.ft	Nm	lbf.ft	Nm	lbf.ft	Nm
3/8	16 UNC	20	27	16	20	20	27
7/16	14 UNC	30	40	25	35	25	35
1/2	13 UNC	55	75	45	60	45	60
9/16	12 UNC	65	90	55	75	65	90
5/8	11 UNC	100	135	80	110	85	115
3/4	10 UNC	190	260	145	200	150	205
7/8	9 UNC	290	390	210	285	200	270

8. Repair Kits

- a. Spares are available for all LEAD check valves, consisting cover gasket. This shall be supplied upon ordering.
- b. Dismantling of valves for attending for Cover gasket replacement shall be done under expert supervision, after depressurizing the line valve cavity and evacuating all line fluid from the valve.



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