



Enriching Lives

**INSTRUCTIONS
ON INSTALLATION,
OPERATION AND
MAINTENANCE FOR
KIRLOSKAR
SWING TYPE
FOOT VALVES**



KIRLOSKAR BROTHERS LIMITED

Established 1888

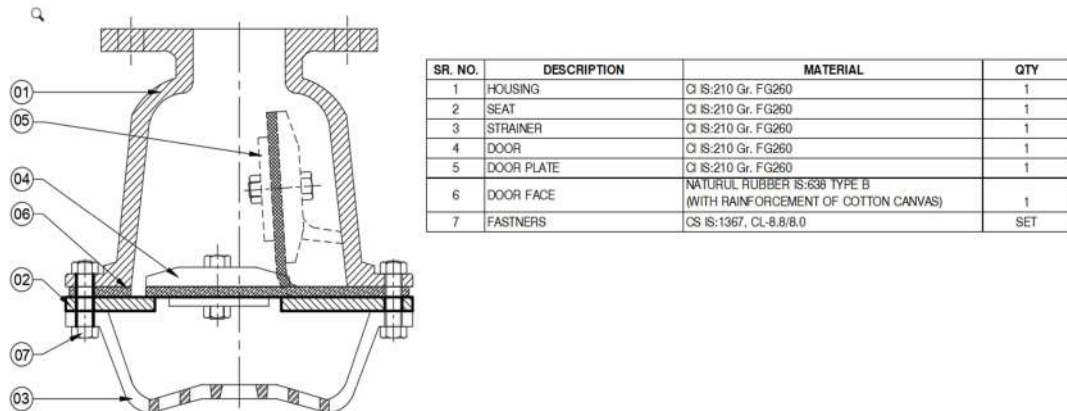
A Kirloskar Group Company

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KIRLOSKAR SWING TYPE FOOT VALVE

1. INTRODUCTION



Flanged End Foot Valve
Typical View
Figure 1.

A foot valve is generally placed at the lower end of the suction pipe of a centrifugal pump to prevent the suction pipe from emptying while the pump is at rest; consequently, when the pump is first started it does not have to exhaust the air from the suction pipe with the result that prompt starting of the pump is secured. Foot valve is particularly useful when the suction lift or vertical height of the pipe is considerable.

Kirloskar Foot Valves generally conform to IS:4038 standards for dimensions, materials of construction and constructional features. These Foot Valves are Rubber- Metal Seated.

2. INSPECTION ON RECEIPT, HANDLING, STORAGE & PRESERVATION

2.1 INSPECTION ON RECEIPT AND HANDLING

- At receipt of the product, ensure that there is no transit damages to the product received, especially on valve flanges, door faces etc.
- Also ensure that Parts and Accessories are received as per ordered scope of supply.
- Ensure that adequate numbers of fasteners for mounting accessories are received.
- While unloading the product, please use the provision of lifting made on the valve.
- Use the safe lifting devices (e.g. slings, hoists, hooks etc.) of adequate capacity.
- Do not pass the slings through the weak parts of the product / accessory (e.g. strainer – when it is assembled on the valve).
- The valve should be transported so that the rests on the horizontal floor properly.

- h. Support the valve properly during transportation to avoid toppling.
- i. Handle the product carefully – do not push, drag, drop from height.

If damages, short supply or wrong supply are observed, report the same immediately to the contact person mentioned in this manual.

2.2 STORAGE & PRESERVATION

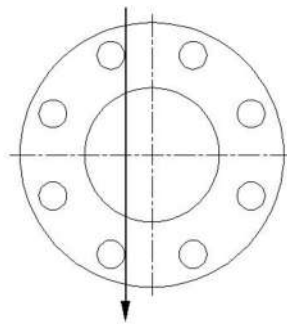
If the valve has to be stored at site before installation,

- a. Store it on horizontal level surface in dry and clean atmosphere.
- b. Store the products in well-covered sheds, protected from sun, rain and dust.
- c. In the instance if the valve is required to be stored for long duration, ensure that rust preventive should be applied on the machined corrodible surfaces.
- d. It is advisable to give a coat of grease on seat rings during the storage period. Keep the seat rings away dusty atmosphere.

3. INSTRUCTIONS FOR INSTALLATION

CHECKS ON THE VALVE ASSEMBLY BEFORE INSTALLATION

- a. Before taking the Foot Valve for pipe installation, make sure that it is cleaned from inside and outside and there are no foreign or metallic objects sticking on to its sealing elements. Also clean the valve interior passages to remove any foreign matter & rust preventive on machined surfaces.
- b. Ensure that the entire rust preventive on the machined surface in the flow area is removed, before the valve is put in pipe-line.
- c. Note the marking details on valve body and valve pressure rating adequacy with respect to operating pressure. Also check direction of flow in the pipe-line and place the Foot Valve accordingly.
- d. Valves should be installed in the pipeline, only after verifying the sealing ability of valve. This can be done by examination of the seat surfaces for freedom from surface damages, scratch marks / dent marks as well as uniform mating of seating surfaces. If abnormalities of this type are observed, contact KBL.
- e. Foot Valve s are designed to generally operate in suction pipe lines or in suction side. Operate the Door of Foot Valve manually from Full Close to Full Open and Full Open to Full Close. Ensure that there is no undue resistance / friction in the operation.
- f. Before connecting valve & pipeline flanges, ensure that they do not have parallel, angular and radial gaps. While fitting the valve in pipeline, ensure that diagonally opposite bolts are simultaneously & uniformly tightened.
- g. Orientation of Hinge Pin of the valve, while fitting in the pipe-line must be horizontal. This can be ensured by checking verticality of edges of top & bottom drilled flange holes with a plumb line.



CHECKS FOR THE PIPE-LINE BEFORE INSTALLATION

- a. Clean the pipeline thoroughly so that it does not contain any solid matters which may damage the valve internals.
- b. Avoid parallel, radial and angular mismatch between connecting flanges of valve and the pipeline.
- c. Piping should be adequately supported and anchored (if required) in such a way that the piping system does not impose any forces & moments on the valve body and the hydraulic thrust arising due to valve closure is carried & sustained by valve supports. Valve flanges are not designed to carry any external loads and moments arising due to pipe expansions / contractions. It is advisable to use Flange Adapter Assembly, after the valve to facilitate valve dismantling and to prevent any undue loads being transmitted to valve flange.
- d. Ensure that pipeline flanges are parallel and are mating the valve flange without leaving any parallel, angular or radial gap between the flanges. Do not over-tighten the flange bolts / nuts to make the flanges parallel forcefully. That may develop undue stresses in the valve flanges & body leading their deformation & malfunctioning.
- e. Maximum flow velocity in the pipe-line should not exceed 4 m/s.
- f. The valves are mainly designed for handling clear water h maximum impurities of 5000 PPM.

4. COMMISSIONING

4.1 PRE-COMMISSIONING CHECKS

- a. Ensure manually that the valve operates smoothly.
- b. The entire pipe flange bolting is properly tightened.
- c. Surge protection devices (if any) are operative.

4.2 COMMISSIONING

- a. Charge the pipe-line with water.
- b. Ensure that there is no leakage through flange gaskets.

Now the valve is commissioned for its Operation.

5. OPERATION

As shown in Figure, the valve consists of a body, a disc, and a seat with a resilient seal. The valves are designed to prevent reverse flow and maintain a flooded suction when installed at the foot or end of the suction piping. The resilient seal provides drop tight shutoff and the strainer prevents debris from entering the valve and piping system. The seat and seal are rigidly held in the bottom of the valve. As the flow enters the valve from the bottom, the disc is lifted by the flow. Upon pump shut down, the return flow and weight of the disc close the valve rapidly and maintain the pump prime.

6. MAINTENANCE INSTRUCTIONS

Maintenance Check Points:

Sr.	Parameter to Check	Method of Checking	Weekly	During Overhaul
01	Leakage through valve seat	Visual / Feel		•
02	Noise / Vibrations while Opening or Closing the Valve	Feel		•
03	Condition of Door Face /slant faces – scratches, dent marks, intactness	Visual & feeler gauge		•
04	Condition of Hinge Pin	Visual		•

Kirloskar Foot Valves require very little maintenance if maintenance check point are attended to during periodic inspection & during overhaul. However, valves could malfunction in unusual conditions of usage, water contamination and may require maintenance as below:

7. TROUBLE SHOOTING OF KIRLOSKAR FOOT VALVE S

Sr.	Problem	Probable Reason	Action Required
01	Leakage through the valve seat	a. External object caught between door face & body ring. b. Worn out / Deformed or damaged seat ring / door face	a. Try to flush away the external object by creating flow to flush it away. If it does not work, open flanged joint to reach the object and remove it manually (**). b. Replace the Door face / Body ring
02	Leakage through side flanges	a. Inadequate tightening of flanged joint b. Damaged gasket c. Parallel / angular gap between valve and pipe flanges	a. Re-tighten the flanged joint b. Replace gasket (**) c. Remove parallel / angular gap between valve and pipe flanges (**)

IMPORTANT ():** All these procedures require emptying piping and removal of the valve from the pipeline.

(%%) : As the Body Rings / Door Faces require very precise machining for surface for mating surface finish, interference fit in their respective recesses and accurate mating, confirmation of blue match for leak-tight performance; we strongly recommend that this operation of Body Ring / Door Face Ring should be replaced at KBL factory only

8. RECOMMENDED SPARES FOR FOOT VALVES

Product Cross Sectional and General Assembly Drawing attached with this manual indicates the components of the respective valves, along with the recommended spares.

We strongly recommend to keep the spares handy all the time to be able to eliminate delays in attending the operation troubles and scheduled replacements / overhauls.

9. SAFETY INSTRUCTIONS FOR “KIRLOSKAR” MAKE VALVES TO BE FOLLOWED BY USER, AT SITE

[These Safety Instructions are the integral part of “Instruction Manual for Installation, Operation and Maintenance of Kirloskar Make Valves”]

PART – A: GENERAL INFORMATION & SAFETY REQUIREMENTS



1. The Products supplied by KBL have been designed with safety in mind. Where hazards can not be eliminated, the risk has been minimized by the use of guards and other design features. Some hazards can not be guarded against and the instructions below **MUST BE COMPLIED WITH** for safe operations. These instructions can not cover all circumstances; **USER** of the product is responsible for using safe-working practices at all times.
2. KBL product are designed for installation in designated area, which are to be kept clean and free of obstructions that may restrict safe access to the controls and maintenance access points.
3. Access to the equipment should be kept restricted to the personnel responsible for installation, operation and maintenance and they must be trained, adequately qualified and supplied with adequate tools for their respective tasks.
4. KBL requires that, all personnel that are responsible for installation, operation or maintenance of the equipment, have access to study the product instruction manual **BEFORE** any work is done and they will comply with all local and industry based safety instructions and regulations.
5. Personnel protection safety equipment must be worn where local rules apply.
6. Read the instruction manual before installation, operation and maintenance of the equipment.
7. Note that the limit of product application and permissible use of the product is according to the respective product design & testing standard

and product pressure rating. Operation of the equipment beyond these limits will increase risk from hazards and may lead to premature and hazardous failure of the valve / accessories.

8. Clear and easy access to all controls etc. must be maintained at all times. Hazardous or flammable materials must not be stored near valves unless safe areas or racking and suitable containers have been provided.
9. IMPROPER INSTALLATION, OPERATION OR MAINTENANCE OF THE KBL PRODUCT COULD RESULT IN INJURY OR DEATH.

PART – B: SAFETY INSTRUCTIONS WHILE HANDLING, STORAGE AND USAGE

1. For handling / lifting the valves, use devices of adequate capacities certified by competent authorities.
2. Before fitting the valve in pipeline, ensure that Pressure Rating of the valve is suitable for maximum working pressure / surge pressure that may arise in the pipeline.
3. During using the valve, ensure that approved technical rules & regulations e.g. trading regulations, regulations for prevention of accidents, steam boiler regulations, regulations of gas mains under high pressure, regulations for combustible fluids, local safety regulations etc. are followed.
4. During repairs / maintenance of the valve at site, the user shall take minimum following precautions:
 - a. Provide adequate working platform near the valve.
 - b. Make pipelines pressure less and harmless i.e. switch off the pumps, empty the pipelines, remove and switch-off all electric connections (in case of electric operated valves).
 - c. If work is carried-out in vicinity of the valve, which leads to dusty atmosphere (e.g. concrete work, masonry, painting, sandblasting etc.) the valve / valve components must be covered effectively.
 - d. Valve operator/Workmen/Supervisors have to ensure that, no any Body Part should be near Seat Ring or on seat ring when doors are in open position. It may cause serious injury due to quick / Sudden closing of valve Doors

10. ORDERING INFORMATION

(To be sent to the Contact Person mentioned in this manual)

Details required to be furnished while ordering Spares

- a. KBL Order Acceptance Number (O/A No. or Sale Order No.)
- b. Product Description – Type, Size, Pressure Rating etc.
- c. Product Serial No. (This is hard punch marked on Valve Flange)
- d. KBL SAP Product Code – This code is mentioned in the Invoice though which the product has been dispatched.
- e. KBL Cross Sectional Assembly Drawing No. for the product (if provided)

- f. Required Part Name & Part No. as shown in the Cross Sectional Assembly drawing.
- g. Material of construction of the required part, as that appears in the Cross Sectional Assembly drawing.

11. WARRANTY CLAUSE

Kirloskar Brothers Limited (KBL) warrants that the valve manufactured and supplied by KBL to be free from defects in material, workmanship and construction, when used in accordance with installation and technical instructions provided, for a period of twelve months from the date of commissioning of the equipment or 18 months from the date of dispatch of valve from its factory, whichever is earlier.

THIS WARRANTY DOES NOT APPLY TO VALVES WHICH ARE MISUSED, OR ABUSED, OR DAMAGED FROM INSTALLATION, OR NOT USED IN ACCORDANCE WITH KBL'S INSTRUCTIONS. NORMAL WEAR OF VALVES IS NOT INCLUDED IN THIS WARRANTY.

Any parts or other accessories not manufactured by Kirloskar Brothers Limited but supplied through KBL shall carry the warranty of the original manufacturer.

KBL'S SOLE LIABILITY UNDER THIS WARRANTY SHALL BE LIMITED TO EITHER REPLACING OR REPAIRING WITHOUT CHARGE, AT ITS FACTORY OR ELSEWHERE AT ITS DISCRETION, ANY VALVE NOT MEETING THIS WARRANTY, OR AT KBL'S OPTION, REFUNDING THE PURCHASE PRICE. KIRLOSKAR BROTHERS LIMITED SHALL IN NO EVENT BE LIABLE FOR ANY OTHER DIRECT OR ANY SPECIAL INDIRECT OR CONSEQUENTIAL DAMAGES OF ANY KIND UNDER THIS CONTRACT OR OTHERWISE.

Kirloskar Brothers Limited warranty does not cover and KBL makes no warranty with respect to any defects, failures, deficiencies, or errors which include but are not limited to: (a) Not timely reported to KBL; or (b) Due to misapplication, modification, disassembly or abnormal conditions or corrosive matters; or (c) Due to operation, either intentional or otherwise, in an improper manner; (d) damage during transit.

In case of delay of delivery due to lack of instructions from a customer or delay in accepting delivery by a customer, the period of 18 months shall be considered from the date of notification from Kirloskar Brothers Limited to customer that the valves are ready for dispatch.

The foregoing warranty constitutes KBL's sole liability.

THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

For Installation , Operation & Maintenance Manuals pl. refer following link :

www.kirloskarpumps.com → DOWNLOAD CENTRE → Product IOM Manual → Product Category → Valve

12. ENVIRONMENTAL ASPECT

Our products are designed and manufactured considering all environmental aspects to minimize impact on the environment. We ensure that the product supplied by us utilizes less energy during their life cycle and it does not emit any hazardous gas or cause any harm to any living being or to the environment.

User of this product is recommended to follow the operating instructions and maintain the product in periodic manner, in order to ensure that it always functions with optimum energy efficiency.

13. PRODUCT RECYCLE PROGRAM

As a commitment towards a greener future, conservation of natural resources and reduction of carbon foot print, Kirloskar Brothers Limited offers to take back/replace its used products once it has reached the end-of-life and ensure that it is recycled/ disposed in an environment friendly manner with the following objective.

- To facilitate our customers for recycling / safe disposal of 'end-of-life' product in environment friendly through a recycle program.
- To minimize the impact caused by product disposal on society / environment.
- To reuse the recyclable components as secondary source of raw material.
- To ensure implementation of control mechanism over third part for recycle/safe disposal of the waste generated.
- To offer or replace customer's existing product with more efficient and environment friendly product.

End of life of Kirloskar Brothers Limited product shall be considered, when a customer has declared that the product has become redundant (the product has become obsolete/unfit for use/non-functional and cannot be refurbished in consultation with Kirloskar Brothers Limited personnel) Or the customer wishes to replace the existing product for a shift in technology/for replacement of product by latest/advanced technology of more energy efficient friendly product.

As the product reaches its End-of-Life, the customer shall communicate the same through the Kirloskar Brothers Limited mail ID, cusotmercare.recycle@kbl.co.in or approach the nearest Customer Support Service/Regional Offices/ Authorized Dealer/Authorized Service Dealers who in turn shall communicate the same to Zonal Customer Support Service representative.

14. INTIMATING PRODUCT / PERFORMANCE COMPLAINT

(Information to be sent to the Contact Person mentioned in this manual)

While communicating product complaint, furnish following information to help us to resolve the problem promptly.

- a. KBL Order Acceptance Number (O/A No. or Sale Order No.)
- b. Product Description Type, Size, Pressure Rating etc.
- c. Product Serial No. (This is hard punch marked on Valve Flange)
- d. KBL SAP Product Code This code is mentioned in the Invoice though which the product has been dispatched.
- e. KBL Cross Sectional Assembly Drawing No. for the product (if provided)
- f. Exact nature of complaint

If the complaint is related to Short Supply, Wrong Supply, Transit Damage, it is necessary to communicate the Invoice Number which will help in tracking the cause of the problem.

AS A CONTINUOUS IMPROVEMENT PROCESS, THE CONSTRUCTION & ARRANGEMENT SHOWN IN DRAWING MAY DIFFER WITH ACTUAL PRODUCT.

In case if you need additional information or help, please contact:

Customer Support Cell
Kirloskar Brothers Limited
"Yamuna", Survey No.98/ 3 to 7,
Baner,
Pune- 411045
Toll free no: 1800-10-34443
e-mail: kirloskarvalves@kbl.co.in



Enriching Lives

KIRLOSKAR BROTHERS LIMITED

A Kirloskar Group Company

Established 1888

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OUR COMPANIES



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U.S.A.



South Africa



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