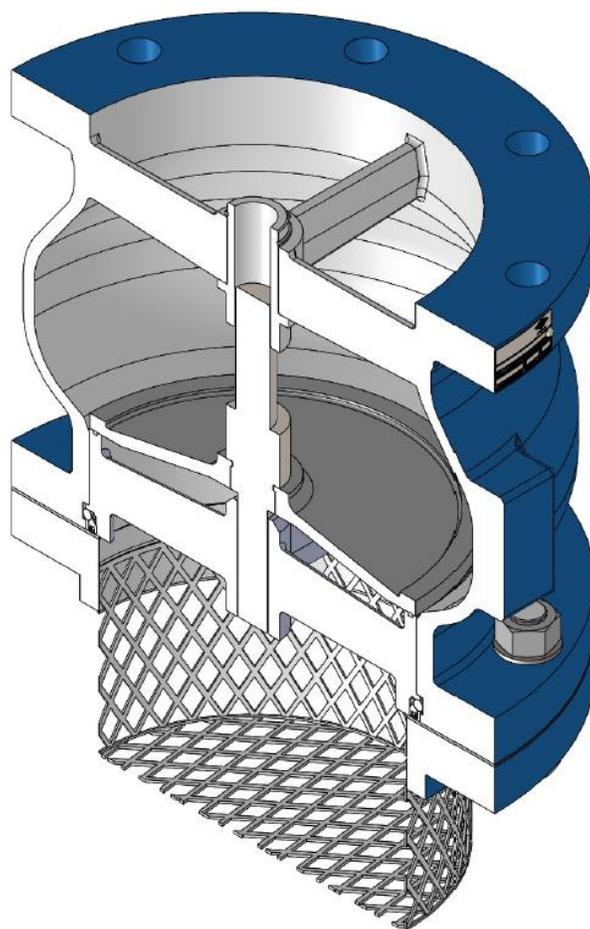


# APCO FFF-1400A FULL FLOW FOOT VALVES



Instruction **D12054**  
March 2023

## Instructions

These instructions are for use by personnel who are responsible for the installation, operation and maintenance of DeZURIK valves, actuators or accessories.

## Safety Messages

All safety messages in the instructions are identified by a general warning sign and the signal word CAUTION, WARNING or DANGER. These messages indicate procedures to avoid injury or death.

Safety label(s) on the product indicate hazards that can cause injury or death. If a safety label becomes difficult to see or read, or if a label has been removed, please contact DeZURIK for replacement label(s).

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### **⚠WARNING**

**Personnel involved in the installation or maintenance of valves should be constantly alert to potential emission of pipeline material and take appropriate safety precautions. Always wear suitable protection when dealing with hazardous pipeline materials. Handle valves which have been removed from service with suitable protection for any potential pipeline material in the valve.**

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## Inspection

Your DeZURIK product has been packaged to provide protection during shipment; however, items can be damaged in transport. Carefully inspect the unit for damage upon arrival and file a claim with the carrier if damage is apparent.

## Parts

Replaceable wear parts are listed on the assembly drawing. These parts can be stocked to minimize downtime. Order parts from your local DeZURIK sales representative or directly from DeZURIK. When ordering parts please provide the following information:

**If the valve has a data plate:** please include the 7-digit part number with either 4-digit revision number (example: 9999999R000) or 8-digit serial number (example: S1900001) whichever is applicable. The data plate will be attached to the valve assembly. Also, include the part name, the assembly drawing number, the balloon number and the quantity stated on the assembly drawing.

**If there isn't any data plate visible on the valve:** please include valve model number, part name, and item number from the assembly drawing. You may contact your local DeZURIK Representative to help you identify your valve.

## DeZURIK Service

DeZURIK service personnel are available to maintain and repair all DeZURIK products. DeZURIK also offers customized training programs and consultation services. For more information, contact your local DeZURIK sales representative or visit our website at [DeZURIK.com](http://DeZURIK.com).

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## Description

The FFF-1400A, Full Flow Foot Valve is a form of check valve installed at the bottom of the suction line and inside the wet well. These valves are utilized to maintain prime on a single centrifugal pump. When the pump is engaged, the FFF-1400A automatically opens and allows fluid to flow through the pump. When the pump is powered down, the FFF-1400A automatically closes and does not allow flow in the reverse direction.

## Handling and Storage

Lifting the valve improperly may damage it. Do not fasten lifting devices to piping or attached components. Lift the valve with slings, chains or cables fastened around the valve body, or fastened to bolts or rods through bolt holes in the flanges.

If installation will be delayed, refer to **Form 1454 – Recommended Long & Short-Term Storage Procedures**.

## Installation

The valve is installed in the vertical position with the direction of flow upwards. The valve is normally closed and will automatically open when the centrifugal pump starts, and closes when the pump stops running. This will maintain a flooded section and therefore keep the pump primed.

- Before installation, remove foreign material such as weld spatter, oil, grease and dirt from the pipeline.
- Prepare pipe ends and install valves in accordance with the pipe manufacturer's instructions for the joint used.

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### **NOTICE**

**Do not deflect the pipe-valve joint. Minimize bending stresses in the valve end connection with pipe loading.**

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- Tighten the flange bolts or studs in a crisscross pattern

## Fusion Bonded Epoxy Coated Valves

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### **NOTICE**

**Valves with fusion bonded epoxy coated exterior paint require flat washers to be installed under the flange nuts when installing the valve to the pipeline flange to prevent the coating from cracking or chipping.**

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## Maintenance

### *Disassembly Procedure*

See Figure 1 for part identification.



#### **WARNING!**

**Removing the valve while the pipeline is under pressure can cause personal injury or equipment damage. Relieve pipeline pressure before removing the valve.**

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1. Relieve the pressure in the pipeline and remove the valve.
2. Lay valve down with Strainer (S50) facing up.
3. Remove Strainer Screws (S16) that hold Strainer (S50) to Body (S01).
4. Remove Seat Retaining Screws (S07) to allow Seat Retaining Balls (S06) to retract from the groove.
5. Remove Seat (S02) and Plug (S03). In some cases, it may be necessary to use penetrating oil or rust solvent to loosen the rust that may have formed between the body (S01) and seat (S02). Also, it may be helpful to rotate the seat in the body to break loose the seat retaining ball (S07).
6. Remove Bushing Retaining Ring (S11) and Bushing (S05).
7. Clean all surfaces before re-assembly. Replace all defective parts.

### *Assembly Procedure*

See Figure 1 for part identification.

1. Replace Bushing (S05) in Body (S01) and secure with Bushing Retaining Ring (S11).
2. Place new Resilient Seat (S08) in Seat (S02).
3. Insert Plug (S03) and Seat (S02) in Body (S01).
4. Place Seat Retaining Balls (S06) in groove and secure with Seat Retaining Screws (S07).
5. Install new Strainer Gasket (S15).
6. Secure Strainer (S50) to Body (S01) with Strainer Screws (S16), Strainer Nuts (S17) and Strainer Washers (S18).

### *Installing or Replacing the Resilient Seat (S08)*

Removing the Resilient Seat (S08) from the groove in Seat (S02) is very difficult to do without damaging the Resilient Seat (S08). Do not remove the Resilient Seat (S08) unless you need to replace it and have a new one on hand to install.

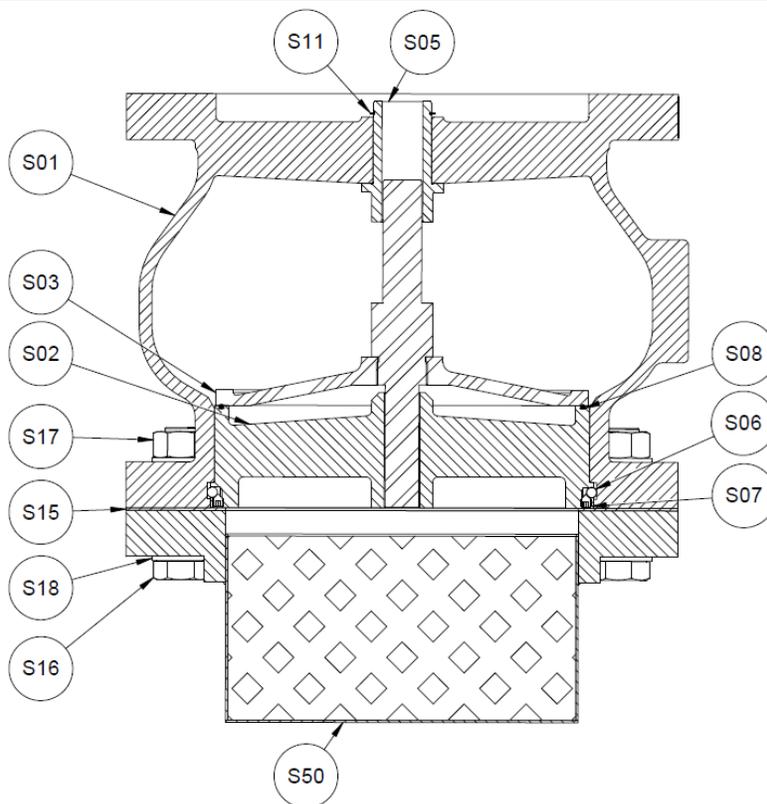
Installing the Resilient Seat (S08) is easiest when it is done in two stages, first by hand, then rolling a round tool to press the Resilient Seat (S08) completely into the groove in Seat (S02).

1. Ensure the Resilient Seat (S08) groove in Seat (S02) is free of debris and place the Resilient Seat (S08) over the groove.
2. Press the Resilient Seat (S08) into groove by hand.
3. Roll a round tool along the Resilient Seat (S08) to seat the Resilient Seat (S08) uniformly into the groove.

**Operation**

Once the FFF-1400A is installed, it is recommended that the suction line is manually filled. Once the suction line is filled, operation of the FFF-1400A is automatic. The normally closed valve opens when the pump activates and provides draw. When the pump deactivates and pipeline pressure reverses, the valve automatically returns to the closed position leaving the pump primed.

**Drawing**



| <b>Item No.</b> | <b>Description</b>     |
|-----------------|------------------------|
| S01             | BODY                   |
| S02             | SEAT                   |
| S03             | PLUG                   |
| S05             | BUSHING                |
| S06             | SEAT RETAINING BALL    |
| S07             | SEAT RETAINING SCREW   |
| S08             | RESILIENT SEAT         |
| S11             | BUSHING RETAINING RING |
| S15             | STRAINER GASKET        |
| S16             | STRAINER SCREW         |
| S17             | STRAINER NUT           |
| S18             | STRAINER WASHER        |
| S50             | STRAINER               |

**Figure 1: APCO FFF-1400A Full Flow Foot Valve**

## Troubleshooting

| <i>Condition</i>  | <i>Possible Cause</i>   | <i>Corrective Action</i>  |
|---|---|---|
| Valve will not close.   | Plug stem may be worn and may have come out of the guide.               | Replace Plug.   |
| Valve leaks excessively from one side of the plug to the other. | Foreign matter or mineral deposits may be caught between plug and seat. | Remove foreign matter or deposits.                                |
|   | Seat is worn or damaged.  | Repair or replace seat ring.                                      |
| Valve will not open.  | Improper installation.  | Flow arrow on valve body should be pointing in direction of flow. |
| Valve leaks at flange joint.                                    | Loose flange bolting.   | Tighten flange bolting.   |
|   | Blown flange gasket.  | Replace flange gasket.  |
|   | Misalignment or damage to field piping and supports.                    | Adjust misalignment or repair piping or supports.                 |
|   | Damaged flange face/s or improper flange connections.                   | Repair flange, replace valve body or adjust flange connections.   |

## Limited Warranty

DeZURIK, Inc. ("Seller") manufactured products, auxiliaries and parts thereof that we manufacture for a period of twenty-four (24) months from date of shipment from Seller's factory, are warranted to the original purchaser only against defective workmanship and material, but only if properly stored, installed, operated, and serviced in accordance with Seller's recommendations and instructions.

For items proven to be defective within the warranty period, your exclusive remedy under this limited warranty is repair or replacement of the defective item, at Seller's option, FCA Incoterms 2020 Seller's facility with removal, transportation, and installation at your cost.

Products or parts manufactured by others but furnished by Seller are not covered by this limited warranty. Seller may provide repair or replacement for other's products or parts only to the extent provided in and honored by the original manufacturer's warranty to Seller, in each case subject to the limitations contained in the original manufacturer's warranty.

No claim for transportation, labor, or special or consequential damages or any other loss, cost or damage is being provided in this limited warranty. You shall be solely responsible for determining suitability for use and in no event shall Seller be liable in this respect.

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Your failure to give written notice to us of any alleged defect under this warranty within twenty (20) days of its discovery, or attempts by someone other than Seller or its authorized representatives to remedy the alleged defects therein, or failure to return product or parts for repair or replacement as herein provided, or failure to store, install, or operate said products and parts according to the recommendations and instructions furnished by Seller shall be a waiver by you of all rights under this limited warranty.

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The foregoing limited warranty shall be null and void if, after shipment from our factory, the item is modified in any way or a component of another manufacturer, such as but not limited to; an actuator is attached to the item by anyone other than a Seller factory authorized service personnel.

All orders accepted shall be deemed accepted subject to this limited warranty, which shall be exclusive of any other or previous warranty, and this shall be the only effective guarantee or warranty binding on Seller, despite anything to the contrary contained in the purchase order or represented by any agent or employee of Seller in writing or otherwise, notwithstanding, including but not limited to implied warranties.

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## Sales and Service

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