

**Wilo Triple Duty Valve / Triple Service Valve**

**Installation and operating instructions**

## 1 Description

The Triple Duty Valve (TDV) / Triple Service Valve (TSV) is a quiet operating heavy-duty valve which performs all of the functions normally required on the discharge side of Hydronic System Pumps.

The valve serves as a flow regulator and positive shut-off valve as needed for zoned pumping, parallel and standby pumping, and condenser water applications.

The valve's compact size helps to reduce space requirements while having multiple convenient connections for gauges.

## 2 Safety Instructions



### Safety Instructions

This safety alert symbol will be used in this manual and on the pump safety instruction decals to draw attention to safety related instructions. When used the safety alert symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED! FAILURE TO FOLLOW THE INSTRUCTIONS MAY RESULT IN A SAFETY HAZARD.

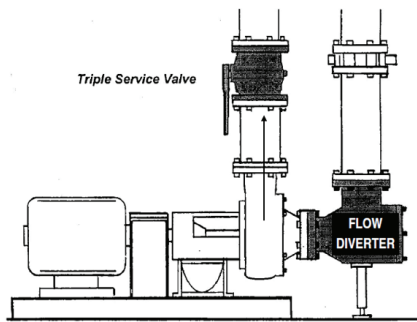
## 3 Operational Limits

Maximum Working Pressure:  
175 psi (12 bar) standard

Maximum operating Temperature:  
250°F (121°C)

## 4 Installation Instructions

1. Mount 1 1/2" through 8" valves in a vertical up or horizontal position with flow in the direction of the flow arrow which is cast on the side of each valve. Mount 10" through 12" valves in vertical position only.



Proper system installation. Note: Arrow indicates direction of flow



### CAUTION: Potential Triple Duty Valve Damage

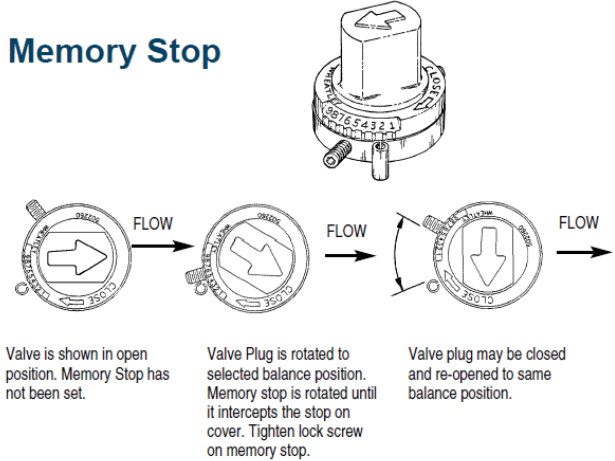
Improper valve orientation can cause damage to the Triple Duty Valve itself or improper system operation. Failure to follow this instruction can result in property damage and/or moderate personal injury.

2. Install valve in a location which allows easy access to operating wrench and flow meter connections.

3. Install with the equivalent of at least 10 diameters of straight pipe, sized to the TDV/TSV valve, upstream of the valve and the equivalent of at least 5 diameters of pipe downstream of the TDV/TSV valve.

4. Once a flow rate has been set, adjust the memory stop located on the stem of the TDV/TSV valve (see figure below for memory stop illustration and on tag attached to valve for adjustment instructions). The memory stop allows the valve to be closed and re-opened to the same balance position.

## Memory Stop



## 5 Flow Meter Operation

1. Remove caps from the metering connections at the HI and LO pressure taps.
2. Connect the high pressure hose (red) of the pressure gage to the HI pressure connection on the TDV/TSV valve and the low pressure hose (blue) to the LO pressure connection. Note: Hose ends require valve depressors to be connected. If valve depressor is not visible in hose end check opposite end of hose. Metering connection valves are opened automatically as the hose end is screwed on.
3. Prepare the pressure gauge as per instructions in the gauge kit.
4. The flow can be determined by reading the pressure indicated at the gauge, noting the valve opening from the plug position indicator and calibrated plate and transferring this data to a flow chart.

**IMPORTANT:** If system balancing at less than 50% stem rise and this is the primary balance valve, ASHRAE Standard 90.1 and Wilo recommend trimming the impeller to the necessary system design flow. This will reduce electrical energy consumption and comply with the National Energy Building Code Standard.

**IMPORTANT:** To avoid noise problems and possible damage to TDV/TSV valve, do not exceed 25 feet [7,6 m] of pressure drop across TDV/TSV valve.

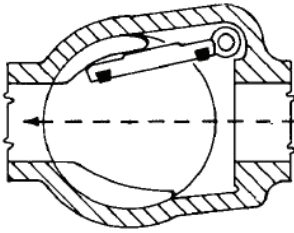
5. When flow readings are complete, follow directions supplied with the pressure gauge.
6. Replace metal caps on the metering connectors of the TDV/TSV valve.

## 6 TDV/TSV Design and Operation

The principle of operation for the TDV/TSV valve is extremely simple. When in the open position, the clapper swings out of the flow. If the flow stops, the spring allows the clapper to close. When closing the valve, a final "bumping" action with a wrench gives the final positive seal closure.

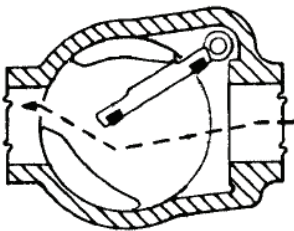
## 6.1 Open Position

With the plug in the open position, the clapper operates as an efficient check valve. The clapper being hinged at an angle provides 90% less dead weight to minimize clapper slam and chatter. See figure below.



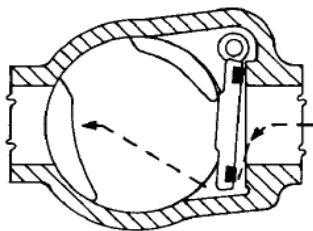
## 6.2 Balancing

The plug holds the clapper at the selected flow requirement for balancing. See figure below.



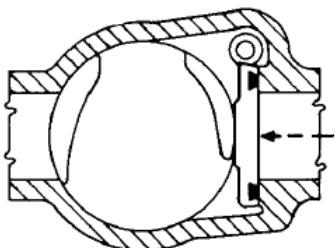
## 6.3 Closed Downstream

As the plug is rotated toward the closed position, the downstream part closes first. This equalizes the pressure so the clapper closes with little resistance. See figure below.



## 6.4 Positive Seal Closure

Final closing is accomplished by the plug camming against the back of the clapper. See figure below.



## 7 Service and Maintenance Instructions

The TDV/TSV valve requires no day-to-day maintenance or lubrication, but it is suggested that the valve be operated once a month to assure it is in operable condition.

### 7.1 Leaking In Plug Position or as a Check



#### **WARNING: Potential Burn Hazard** Imminently Hazardous Situation!

Hot fluid leaking from valve can cause burns. Avoid contact with leaking fluid while servicing valve. Failure to follow this instruction can result in serious personal injury or death and property damage.

If at any time it is suspected that the valve is leaking either in the plug position or as a check it is possible that foreign particles are trapped between the mating faces of the seal and seat, and are preventing tight seal action.

Cycle the valve from full open to full close. This will cause a jetting action that will wash away foreign particles that may be trapped.

Also, cycling the valve will usually squeeze any build-up away from the seat mating faces and allow tight shut-off again.

### 7.2 Leaking In Closed Position

It is not uncommon to discover that when a TDV/TSV valve has been reported leaking in the closed position, that the valve is actually not completely closed.

The cam-based design of the TDV/TSV valve makes it almost impossible to over-close. The TDV/TSV is designed to close at an approximate 90 degree rotation of the plug stem.

To close the valve, rotate the stem one quarter turn and tighten.

A TDV/TSV wrench is specially suited for the cam-based design of the valve to assure a positive closure.

The most satisfactory closure is accomplished by turning the plug to a tight fit and then "bumping" the plug lightly using the TDV/TSV wrench. The use of cheater or a handwheel should not be necessary.

### 7.3 Continued Leaking

If the above procedures have been completed and a tight seal is still not apparent, the valve should be disassembled and inspected for damage of the clapper seal and seat face, or for excessive wear of the clapper pin and pin hanger supports.



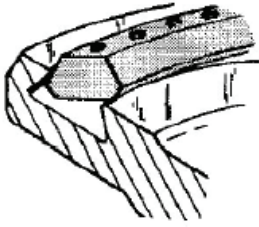
#### **WARNING: Potential Burn Hazard** Imminently Hazardous Situation!

Hot system fluid can be hazardous. Isolate the TDV/TSV Valve from the system with shutoff valves or drain the system. Allow isolated system and TDV Valve to cool to approximately 100°F [38°C]. Reduce isolated system pressure to zero. Leave drain open. Failure to follow this instruction can result in serious personal injury or death and property damage.

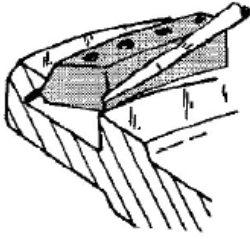
### 7.4 Clapper Seal Repair

HVAC TDV/TSV valves are equipped with Buna-N clapper seals. If the clapper seal is damaged, they can be replaced by removing the clapper and installing a new seal.

1. Place the outer edge of the seal into the clapper groove as shown. See figure below.

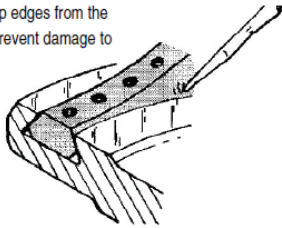


2. Using a blunt screwdriver, force the inside lower edge of the seal into the clapper groove. See figure below.



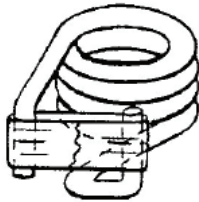
3. While working the seal in, maintain force on the portion of the seal that has been installed. This will prevent elongation and excessive build-up of closing portion. See figure below.

Remove all sharp edges from the Screwdriver to prevent damage to the seal

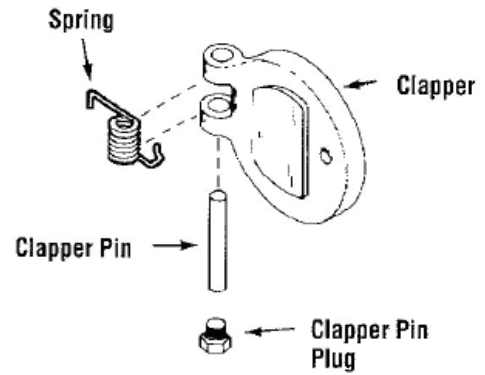


## 7.5 Clapper Seal Replacement

1. Position clapper firmly against the seat face.
2. Pre-load spring and bind using filament tape. See figure below.



3. Take the clapper pin with the extension screw and insert the pin into the spring and support hangers. See figure at right.



4. When holding the clapper firmly against the seat, the clapper pin must move freely into position.
5. Remove the extension screw, replace the clapper pin plug, and cut the filament tape to free the spring.
6. Check the clapper for free movement by opening and closing the clapper by hand.
7. If movement is free, complete the valve assembly.

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