



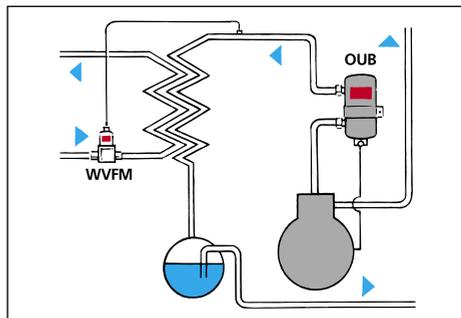
## Water valves

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## Application

WV pressure-operated water valves are used in refrigeration systems with water-cooled condensers to maintain constant condensing pressure under varying loads.

The water valves can be used for common refrigerants provided the operating range of the valves is not exceeded. The WVS can be used for R 717 (ammonia)



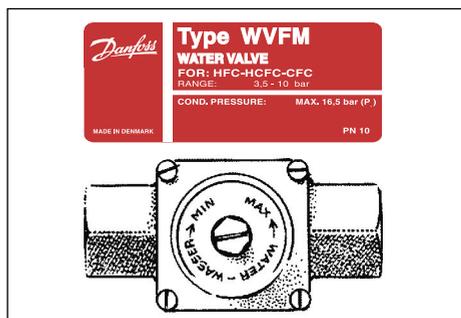
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## Identification

Danfoss water valve type WVFM consists of a valve body and bellows housing. The bellows housing carries a label giving valve type, operating range and max. permissible working pressure.

The label also indicates the max. permissible working pressure on the water side, given as PN 10 in accordance with IEC 534-4.

The direction in which the setting spindle must be turned for greater or lesser water quantity is given at the bottom of the valve.

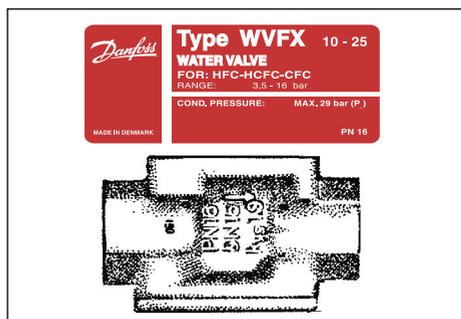


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Water valve type WVFX consists of a valve body with setting unit on one side and a bellows housing on the other.

The bellows housing carries a label giving valve type, operating range and permissible working pressure.

All pressures given apply to the condenser side. Moulded in on one side of the valve body are PN 16 (nom. pressure) and, for example, DN 15 (nom. diameter), together with  $k_{vs}$  1.9 (valve capacity in  $m^3/h$  at a pressure drop of 1 bar).



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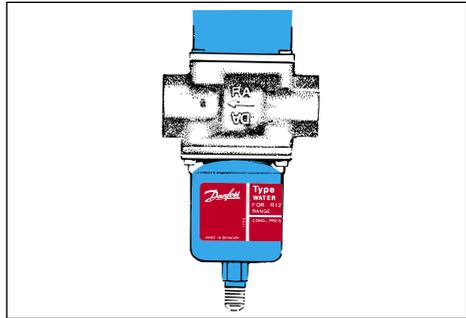
**Fitters notes****Water valves**

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RA and DA are moulded in on the opposite side of the valve body.

RA means "reverse acting" and DA means "direct acting".

When WVFx is used as a condensing pressure valve the bellows housing must always be mounted nearest the DA marking.



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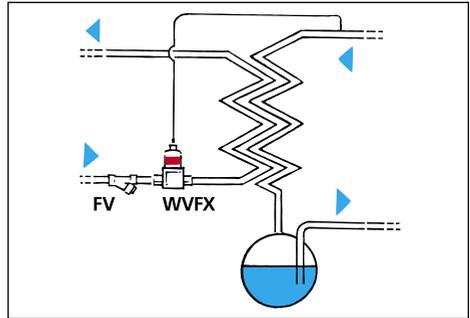
## Installation

WVFM and WVFX are installed in the water line, normally ahead of the condenser, with flow in the direction of the arrow.

It is a good idea to always install an FV filter ahead of the water valve to exclude dirt from the moving parts of the valve.

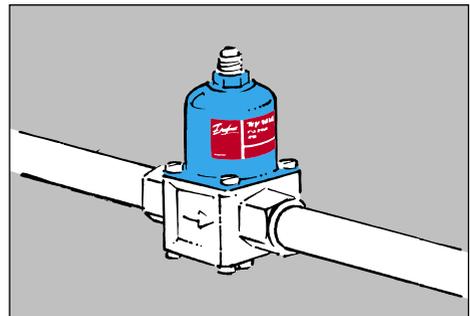
To prevent vibrations from being transmitted to the bellows housing the housing must be connected to the discharge line after the oil separator, via a capillary tube.

The capillary tube must be connected to the top side of the discharge line to prevent the back-flow of oil and perhaps dirt.



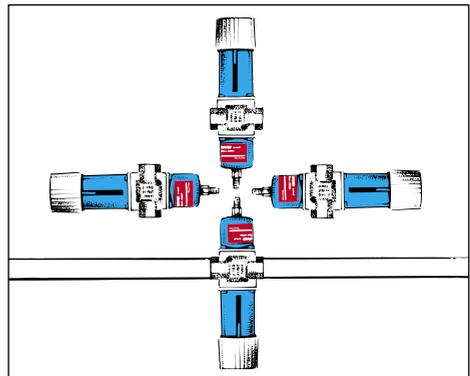
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WVFM and WVFX 32-40 water valves are normally installed with bellows housing upwards.



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WVFX 10-25 water valves can be installed in any position.



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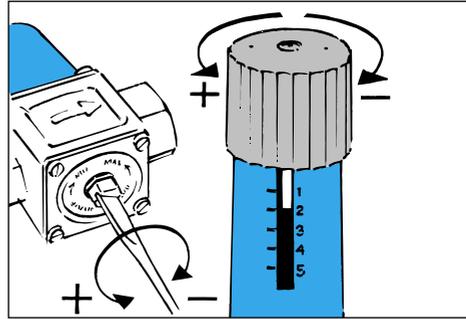
## Setting

WVFM and WVFX water valves must be set to obtain the required condensing pressure. Turning the setting spindle clockwise gives lower pressure, turning it counterclockwise gives higher pressure.

The scale marks 1 - 5 can be used for coarse setting. Scale mark 1 corresponds to about 2 bar, and scale mark 5 corresponds to about 17 bar.

Note that the valve setting range is given for when the valve begins to open.

The condensing pressure must increase by 3 bar to fully open the valve.

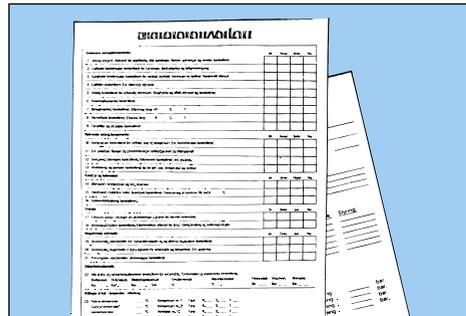


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## Maintenance

It is a good idea to include water valves in preventive maintenance because dirt (sludge) can collect around the moving parts of the valves.

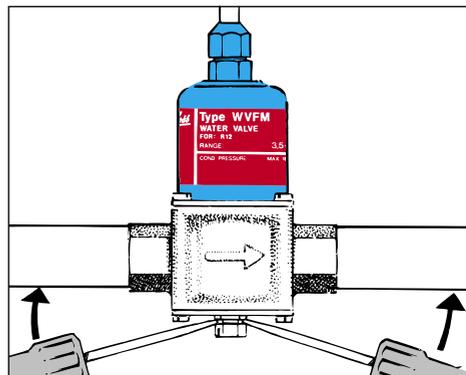
The maintenance routine can include flushing the water valves, partly to wash out impurities and partly to be able to “sense” whether the reaction of valves has become slower.



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Flushing a WVFM water valve is easiest to perform if two screwdrivers are inserted under the setting screw.

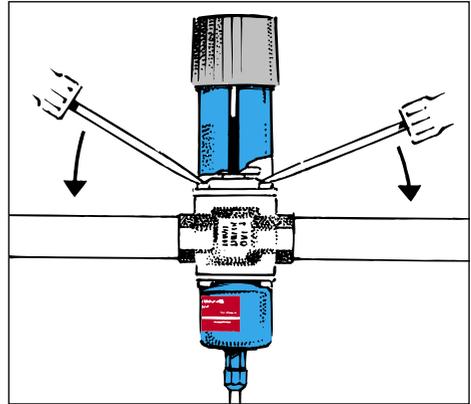
The screw can then be levered up to give greater water flow.



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WVFX valves can be flushed similarly using two screwdrivers inserted in the slots on each side of the setting unit (spring housing) and under the spring cup.

Levering the screwdrivers down towards the piping gives greater water flow.

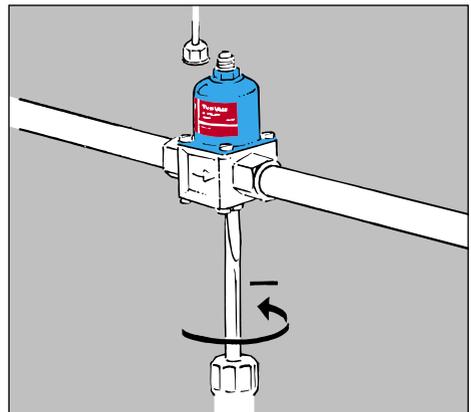


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If operating irregularities appear in a water valve, or if leakage occurs across the valve seat, dismantle the valve and clean it.

Before dismantling a valve, the pressure must always be relieved from the bellows housing, i.e. it must be disconnected from the refrigeration system condenser.

Before dismantling, screw the setting spring fully clockwise towards the lowest pressure setting. The O-ring and remaining seals must always be replaced after dismantling.



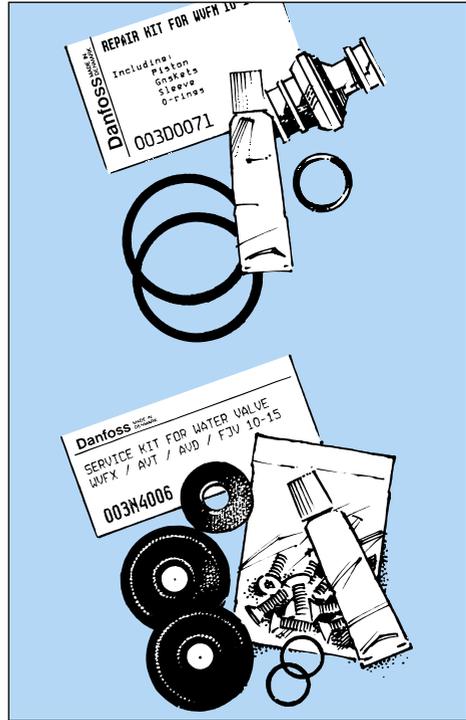
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## Spare parts

Spare parts for WVFM and WVFX water valves can be obtained from Danfoss:

- one bellows housing
- one service kit (containing spare parts, gaskets and grease for the water side of the valve).
- A gasket set is also supplied as a spare part for type WVFM.

The code numbers of spare parts and gasket sets are given in the spare parts catalogue\*.



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\*) Find spare part documentation on <http://www.danfoss.com>

## Fault location

Symptom	Possible cause	Remedy
<b>Condensing pressure too high, water-cooled condensers.</b>	WV water valve set for too high a pressure (water quantity too small).	Increase the water quantity by setting the water valve at a lower pressure.
	Filter ahead of WV water valve blocked.	Clean filter and flush water valve after opening it to allow full flow (two screwdrivers, see instruction).
	Leaking bellows in WV water valve.	Check bellows for leakage, using a leak detector if necessary. Replace bellows element. See spare parts catalogue*. There must be no pressure on bellows element during removal and refitting.
	Capillary tube between WV water valve and condenser blocked or deformed.	Check capillary tube for blockage or deformation. Replace capillary tube.
<b>Condensing pressure too low, water-cooled condensers.</b>	WV water valve closed because of defective upper diaphragm.	Check water valve for cracks in diaphragm. Replace diaphragm. See spare parts catalogue*. There must be no pressure on bellows element during removal and refitting.
	Water quantity too large.	Set WV water valve for smaller water quantity, i.e. higher pressure.
	WV water valve open because of defective lower diaphragm.	Check water valve for cracks in diaphragm. Replace diaphragm. See spare parts catalogue*. There must be no pressure on bellows element during removal and refitting.
<b>Condensing pressure hunts</b>	WV water valve cannot close because of dirt in the seat. Valve cone sticks because of dirt.	Check water valve for dirt and clean it. Replace parts as necessary. See spare parts catalogue*. There must be no pressure on bellows element during removal and refitting. Install a filter ahead of the water valve.
	WV water valve too large.	Replace water valve with a smaller size.

\*) Find spare part documentation on <http://www.danfoss.com>







## The Danfoss product range for the refrigeration and air conditioning industry

### Appliance Controls

General temperature controls for the home appliance industry. The product range comprises CFC-free electromechanical and electronic thermostats for refrigerators and freezers produced to customer specifications as well as service thermostats for all refrigeration and freezing appliances.

### Commercial Compressors

Large hermetic reciprocating and scroll compressor technologies for commercial air conditioning and refrigeration. The compressors and condensing units are used in a large array of applications in both businesses. This ranges from water chillers, large packaged air conditioners as well as medium and low temperature refrigeration systems for food storage and processing.

### Danfoss Compressors

Hermetic compressors and fan-cooled condensing units for refrigerators, freezers and light commercial applications such as bottle coolers and display counters. Danfoss also produces compressors for heating pump systems as well as 12 and 24 volt compressors for refrigerators and freezers used in mobile applications and solar power. The division has a leading position within energy utilisation, noise filtering and know-how about environment-friendly compressors.

### Refrigeration and air conditioning controls

A comprehensive and highly reputed range of self-acting valves, electronic valves and regulators as well as system protectors and line components for the refrigeration and air conditioning market. These products include thermostatic expansion valves, solenoid valves, thermostat and pressure controls, modulation pressure regulators, filter driers, shut-off valves, sight glasses, check valves, non-return valves and water valves. Decentralised electronic systems for full regulation and control of refrigeration applications are also developed and produced at Danfoss.

### Industrial Controls

Products and customer specific solutions for industrial monitoring and controls systems based on the principles of pressure and temperature measurement, electrical power and fluid control. Products include a wide range of automatic controls for process control and regulation such as contactors and motor starters, electrically, pneumatically and temperature activated valves as well as temperature and pressure transmitters and switches.