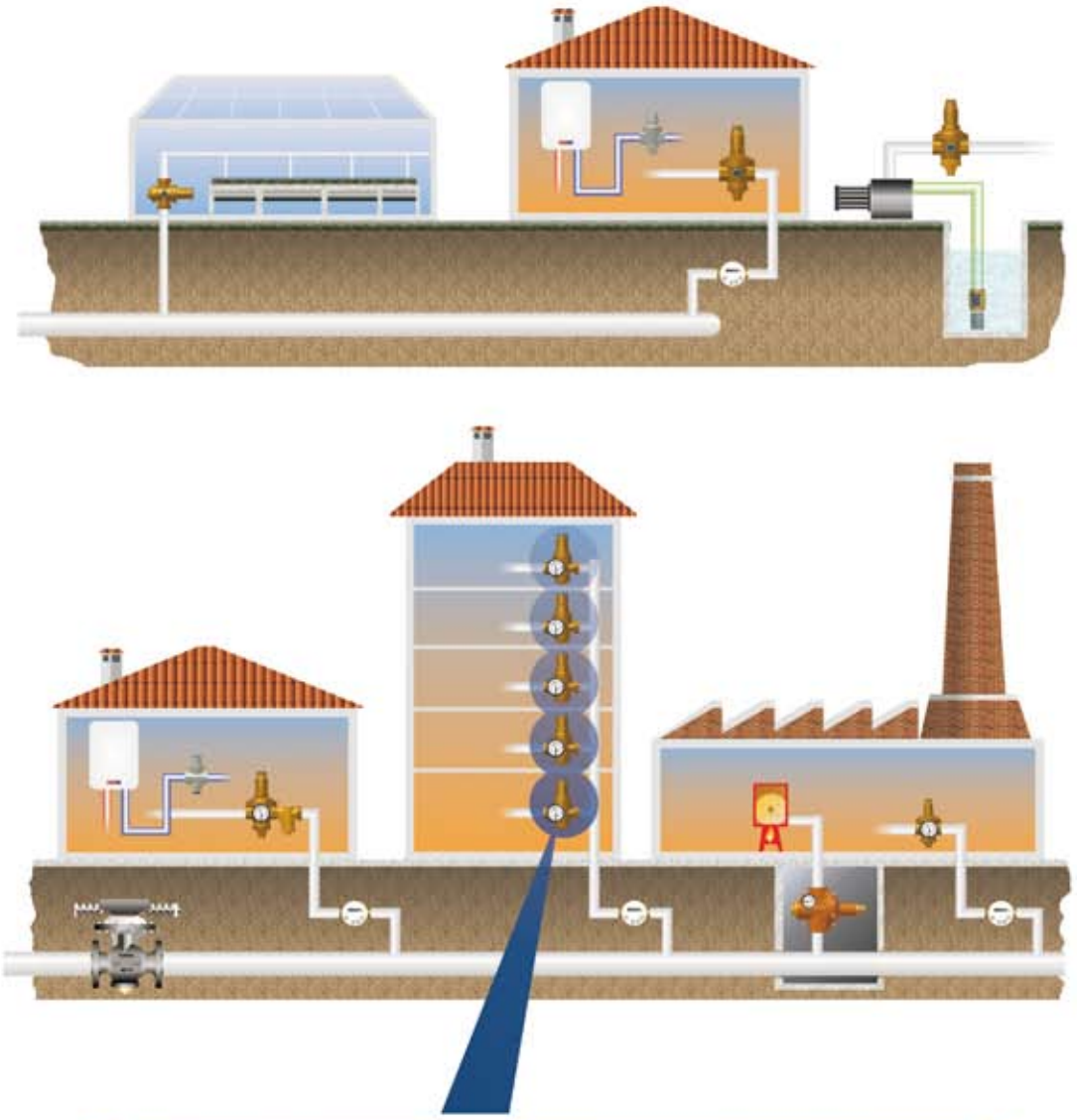
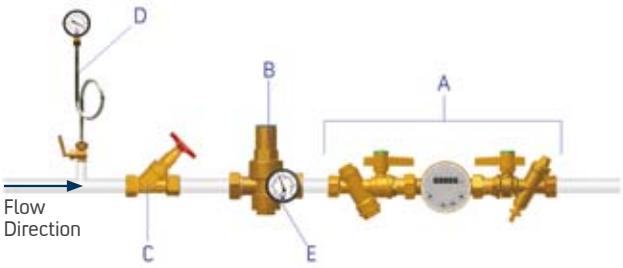
TEUTON PRESSURE REDUCING VALVES

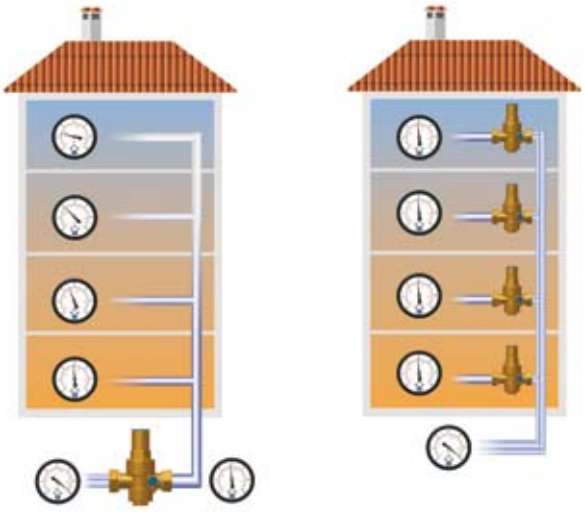


TEUTON PRESSURE REDUCING VALVES

The use of a pressure reducing valve is necessary for limiting the working pressure in pipelines for potable water distribution systems, if the maximum possible static pressure, at any point in the potable water supply system, can reach or surpass the relative maximum allowable working pressure, or if there are apparatus and equipment attached that function exclusively at lower levels of pressure. In particular, these valves are recommended if the static pressure at intake points is larger than 5 bars, if the difference between the upstream pressure and the required downstream pressure is higher than 75%, and if maintaining a stable pressure in hot and cold water systems is necessary.

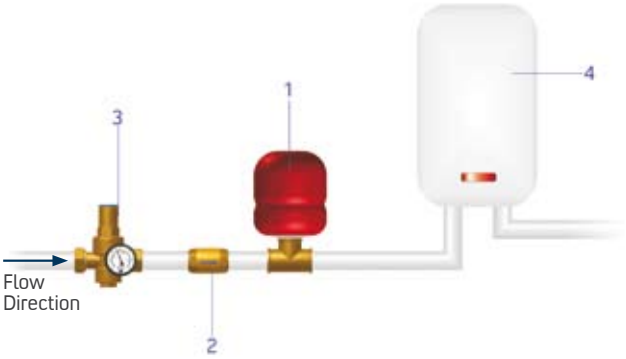


The installation of the pressure reducing valve “Teuton” in potable water supply systems (EN 806-2 §16)) is normally carried out on the downstream cold water pipe of the water meter assembly (A). For each pressure reducing valve (B), the water system should be set up for a shut off valve (C) a manometer (D) upstream that, in conjunction with a manometer (E) installed at the pressure inlets on the reducing valve’s body, facilitate adjustment and maintenance. Should a By-pass tube be necessary, it should also be fitted with a pressure reducing valve. In order to limit the effects of backpressures, it is advisable to install a tract of pipe, of five times the length of the nominal diameter of the device used, downstream to the pressure reducing valve.



In buildings with numerous floors, it is preferable to install lower-dimensioned pressure reducing valves for each floor instead of installing a single higher-dimensioned pressure reducing valve at the foundation of the building. It should in fact be taken into consideration that, in the ascension pipe distributing water to each floor, the water pressure drops.

In order to guarantee a secure and economic functioning of the heating system, it is recommended to install a pressure reducing valve before the heating exchanger, which will maintain the minimum working pressure (automatic refill) required by the heating systems. The European Norm EN12828 §4.7.4. stipulates that, for this application, the supply system should be furnished with an expansion tank (1), a check valve (2) and a tract of pipe between the reducing valve (3) and the water heater (4), with a length equal to 5 times the nominal diameter of the pressure reducing valve used. These setups are necessary in order to avoid dangerous overpressure downstream from the reducing valve due to overheating of the water by the boiler.



COMPRESSED AIR

If the system uses compressed air instead of water, the recommended velocities are between 10 and 20 m/s and the subsequent flow capacity will be 10 times higher than that calculated for use with water.

CHOOSING A PRESSURE REDUCING VALVE

OR's pressure reducing valves should be chosen according to the maximum inlet pressure, the range of regulation of the valve itself and the flow rate required. Once the above three parameters are known, the respective flow capacity diagrams can be consulted in order to choose the most appropriate valve.
PLEASE NOTE: The diagrams show the average velocity of the fluid equal to 2 m/sec. As the velocity of the water passing through the pressure reducing valve increases, also the noise level of the plant increases, and it is thus recommended that a larger (thus less noisy) model be chosen when high acoustic comfort is an important factor (residential use). In any event, it is strongly recommend not to surpass 3 m/sec in order to prevent the cavitation phenomenon.

FUNCTIONING OF THE TEUTON PRESSURE REDUCING VALVE

The figures on the right show the structure of the Teuton pressure reducing valve. A flexible membrane "A" originates the movement of the obturator B as a consequence of the action of two opposing forces: from below, the water pressure in the pipeline downstream from the reducing valve, which tends to close the valve; and from above, the force of the spring appropriately loaded according to the desired working pressure to be maintained, which tends to open the valve. The valve opens, as illustrated in Figure 2, when, as a consequence of water supply to the taps, the pressure under the membrane drops and the force of the spring "C" prevails; thus the opening of the valve is proportional to the flow which passes trough the taps in that moment. As soon as the taps are closed and the water in the downstream tube reaches again a pressure capable of overcoming the force from the spring, the obturator goes up again, closing the valve. The pressure is set by screwing the regulator D that compresses the spring to larger or smaller extent.
The compensated seat with which the TEUTON pressure reducing valves are equipped makes sure that the preset value remains constant, even in conditions of strong inlet pressure variations reaching 40 bar: the inlet pressure pushes the obturator to an open position, but also acts upon the compensation chamber pin in the opposite direction, achieving a substantial balance.
The STAINLESS steel seal seat affords reliability, precision and durability even in the most extreme working conditions.

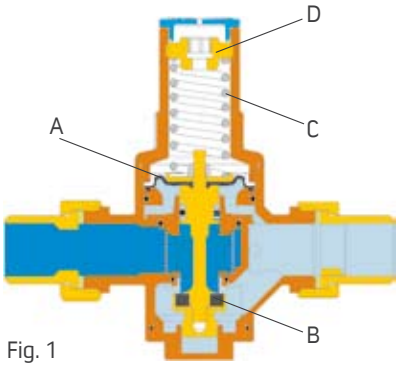


Fig. 1

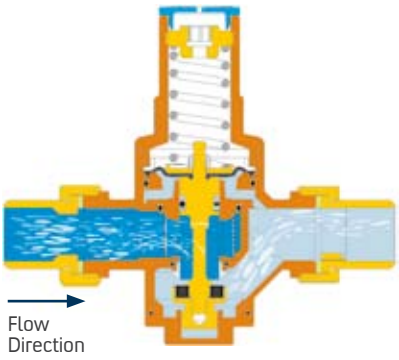


Fig. 2

The fully bored internal cavities have been designed to provide minimum flow resistance, eliminating phenomena, such as vibrations, load loss, or damage caused by cavitation, even when the flow rate is higher than 3.5 m/sec, and obtaining a noise level below 20 dB even at inlet pressures as high as 40 bar.
Both the spring and all the regulating elements are isolated from water and consequently are kept from technical/structural deterioration. The particular rubber mix of the compensation chamber's O-ring washers forestalls any risk of jamming, incrustation or sticking (made of special flexible anti stick-slip Perox EPDM elastomer).
The Diaphragm that actions the obturator's movement can sustain strong outlet backpressures up to 25 bar, whether they are pulsating (water hammers) or constant. The offset pre-convoluted diaphragm assures an extreme sensibility in regulation. Regulation is carried out with a regulator on the upper part of the valve that, when turned clockwise, increases the outlet pressure in compliance with the most recent European standards.
The Teuton pressure reducing valves are equipped with a 500 mk integrated square cell filter with an ample scope for fluid passage and a system for removal/replacement without the need to dismount the pressure reducing valve from the system. All Teuton pressure reducing valves are furnished with two test points for the reduced pressure.
The body in hot pressed brass, whose average thickness is equal to 3 mm, the internal head frame with supporting rib, the stainless steel seat and the sealing system combined with anti-extrusion used on the piston, render this pressure reducing valve ideal to work in situations with a continuous inlet pressures of up to 40 bar.

SETTING

1 - Prior to the installation, open all the taps to clean the system and expel any remaining air in the pipelines.
2 - Install the upstream and downstream shut off valves with a view to facilitating future maintenance tasks.
3 - Install the pressure reducing valve (ensuring its positioning is correct according to the arrow, which indicates the direction of the flow).
4 - Close the downstream shut off valve.
5 - Fix the preset values with the upper regulator. Remove the cover A and use regulator B to set the pressure: rotating clockwise will increase the pressure value; while rotating counterclockwise will decrease it.

6 - Control by reading the set pressure on a gauge. (The OR pressure reducing valves are factory preset at 3 bar).

MAINTENANCE

The cartridge containing the diaphragm, the filter, the seat, the obturator and the compensation piston can be removed in order to facilitate maintenance and filter cleaning tasks.
Maintenance and cleaning must be carried out periodically; at least once every 3 months, or in the event a reduction in the supply flow is noted.
If a new system is installed, it is advisable to clean the filter a few hours after first placing the system in operation, in order to clean out the typical residues due to the new piping installations. After cleaning the filter, verify carefully the lower seat's gasket, substituting it in case of any doubt. Prolonged inactivity of the pressure reducing valve might create dangerous bacterial growth. Therefore, should inactivity last for longer than four (4) days, the filter should be disinfected according to EN 805 §12.

CLEANING / REPLACEMENT OF THE FILTER

These tasks should be carried out every 1-3 years (depending on the local conditions) by qualified personnel. Close the upstream valve

Fig. 1 Remove the cover plug
Fig. 2 Completely unscrew the upper regulation screw until it comes out of the bonnet. Remove the spring.
Fig. 3 Disassemble the bonnet
Fig. 4 Remove the head frame and filtering cartridge, using pliers for the internal seeger rings.
Fig. 5 -6 Check and, if needed, clean the filtering cartridge or substitute the complete head frame with a new one.

Fig. 1 
Fig. 2 
Fig. 3 
Fig. 4 
Fig. 5 
Fig. 6 

In order to guarantee the seal and to ensure a durable product functioning, grease the O-rings lodged in the head frame.
ATTENTION! Only silicone oils and greases should be used for this task.
Proceed to reset the pressure reducing valve.

WATER HAMMERS

A sudden overpressure, also called "water hammer", is one of the most common causes of damage to pressure reducing valves. When installing a pressure reducing valve on systems which might be subject to this phenomenon, it is advisable to use devices especially designed to absorb the "water hammers".

PLEASE NOTE: Prior to installing a new pressure reducing valves, please pay particular attention to the information on the illustrated booklet packed with each OR pressure reducing valve.