

PresCal™ Compact pressure reducing valves

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Function

Pressure reducing valves are devices which, when installed in water systems, reduce and stabilize the pressure of the water entering from the water supply main. This pressure, in general, is too high and variable for domestic systems to operate correctly.

The PresCal™ Compact 533H series pressure reducing valve, ideal for small system applications, is constructed of a DZR low-lead forged brass body and incorporates a unique noise reducing and high flow seat design. It is easily serviced with a replaceable cartridge and has an integral stainless steel filter (35 mesh), helpful for water systems that may contain sediment or debris. A tamper-resistant cap is included to replace the standard cap to hide the adjustment screw to help prevent set point tampering.

The valve is ICC-ES certified to ASSE 1003, CSA B356, NSF/ANSI 61 (180°F/82°C Commercial Hot), NSF/ANSI 372, low lead laws and listed by ICC-ES. It meets codes IPC, IRC, NPC and UPC for use in accordance with the US and Canadian plumbing codes.

Product range

5333H Series	PresCal Compact pressure reducing valve with or without pressure gauge, connections NPT female threaded union inlet and NPT female outlet.....	sizes ½" and ¾"
5336H Series	PresCal Compact pressure reducing valve with or without pressure gauge, connections press union inlet and NPT female outlet.....	sizes ¾"
5337H Series	PresCal Compact pressure reducing valve with or without pressure gauge, connections PEX crimp union inlet and NPT female outlet.....	sizes ¾"
5338H Series	PresCal Compact pressure reducing valve with or without pressure gauge, connections PEX expansion union inlet and NPT female outlet.....	sizes ¾"
5339H Series	PresCal Compact pressure reducing valve with or without pressure gauge, connections sweat union inlet and NPT female outlet.....	sizes ½" and ¾"

Technical specifications

Materials

- Body: DZR low-lead forged brass EN 12165 CW724R
- Cover: glass reinforced nylon PA6G30
- Control stem: stainless steel EN 10088-3 (AISI 303)
- Moving parts: DZR low-lead brass EN 12164 CW724R
- Diaphragm & seals: peroxide-cured EPDM
- Compensation piston rings: PTFE
- Filter: stainless steel EN 10088-3 (AISI 304)
- Seat: stainless steel EN 10088-3 (AISI 303)
- Shuttle: PP5G40

Performance

Suitable fluids:	water
Downstream pressure setting range:	15 - 80 psi (1 - 5.5 bar)
Factory setting:	45 psi (3 bar)
Max working pressure:	250 psi (17.25 bar)
Max. working temperature:	180°F (80°C)
Pressure gauge scale:	0 - 100 psi (0 - 7 bar)
Filter mesh size:	0.51 mm (35 mesh)

Certifications

1. Complies with codes IPC, IRC, UPC and NPC. ICC-ES certified to ASSE 1003, CSA B356 (R2015), and NSF/ANSI 61 (180°F/82°C Commercial Hot), file PMG-1356.
2. NSF/ANSI 372, Drinking Water System Components-Lead Content Reduction of Lead in Drinking Water Act, California Health and Safety Code 116875 S.3874, Reduction in Drinking Water Act, Vermont Act 193 - The Lead in Plumbing Supplies Law and Maryland's Lead Free Law HB.372, certified by ICC-ES, file PMG-1360.
3. PEX crimp fittings certified to ASTM F 1807.
4. PEX expansion fittings certified to ASTM F 1960.

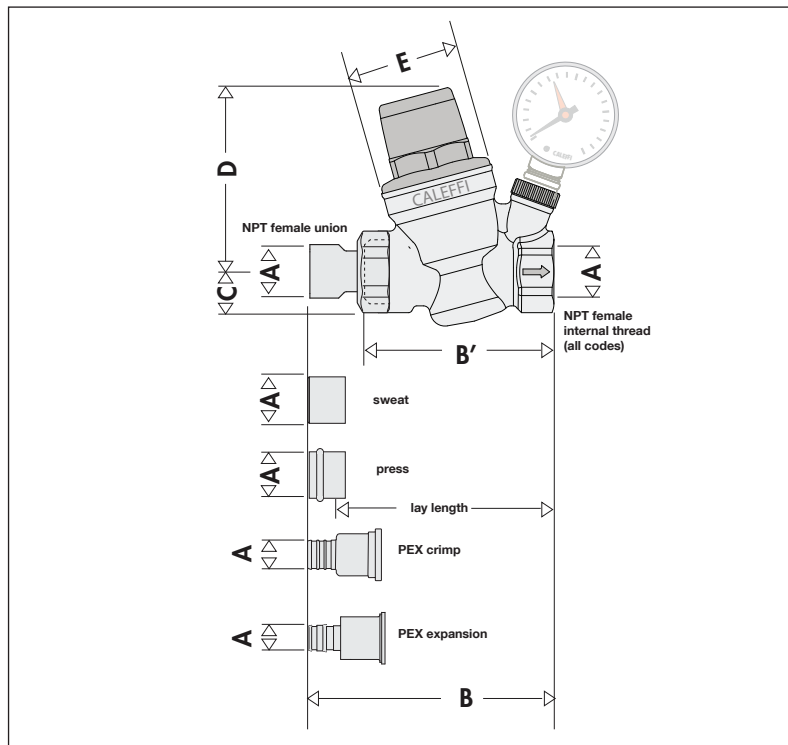
Connections

Main connections:

- NPT female union, sweat union inlet; and NPT female (FNPT) outlet.....½"
- NPT female union, sweat union, press union, PEX crimp union or PEX expansion union inlet; and NPT female (FNPT) outlet.....¾"

Pressure gauge connection: 1/8" NPT female

Dimensions

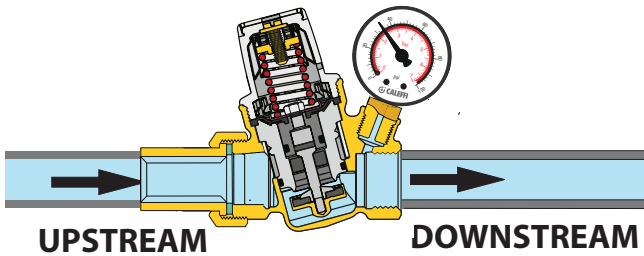


Code	Outlet Temp Gauge	A	B	B'	C	D	E	Lay length	Wt (lb)			
533940HA		½" sweat	3 5⁄8"	2 15⁄16"	¾"	3"	1 7⁄8"	3"	1.1			
533941HA	√	½" sweat	3 5⁄8"					3"	1.2			
533340HA		½" FNPT	4 1⁄16"					3 9⁄16"	0.9			
533341HA	√	½" FNPT	4 1⁄16"					3 9⁄16"	1.0			
533950HA		¾" sweat	4"	3"				¾"	3"	1 7⁄8"	3 ¼"	1.3
533951HA	√	¾" sweat	4"								3 ¼"	1.4
533350HA		¾" FNPT	4 ¼"								3 11⁄16"	1.1
533351HA	√	¾" FNPT	4 ¼"								3 11⁄16"	1.2
533650HA		¾" press	4 ¼"								3 ¼"	1.5
533651HA	√	¾" press	4 ¼"								3 ¼"	1.6
533750HA		¾" PEX crimp	4 9⁄16"								3 15⁄16"	1.7
533751HA	√	¾" PEX crimp	4 9⁄16"								3 15⁄16"	1.8
533850HA		¾" PEX expansion	4 15⁄16"								3 13⁄16"	1.7
533851HA	√	½" PEX expansion	4 15⁄16"								3 13⁄16"	1.8

Operating principle

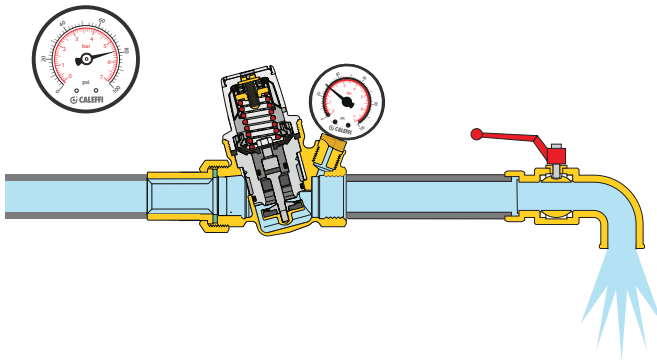
Operation of the pressure reducing valve is based on the balance between two opposing forces:

1. The force of the spring towards the opening of the valve.
2. The force of the diaphragm towards the closure of the valve.



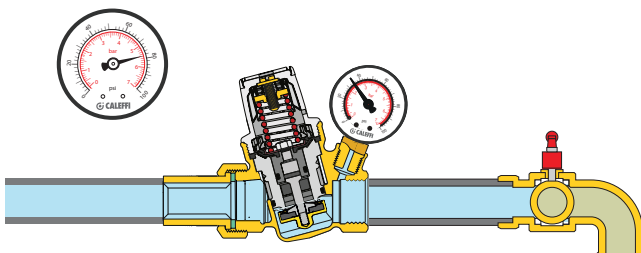
Operation with water flow

When a faucet is opened in the water system, the force of the spring becomes greater than that of the diaphragm; the shuttle moves downwards opening the valve to the flow of water. The greater the demand for water the lower the pressure under the diaphragm with a resulting greater flow of water through the valve.



Operation without water flow

When the faucet is closed, the downstream pressure rises and pushes the diaphragm upwards. As a result the shuttle closes the valve to the flow of water and maintains the pressure at the pressure setting. The slight difference between the force of the diaphragm compared to that of the spring causes the valve to remain closed.

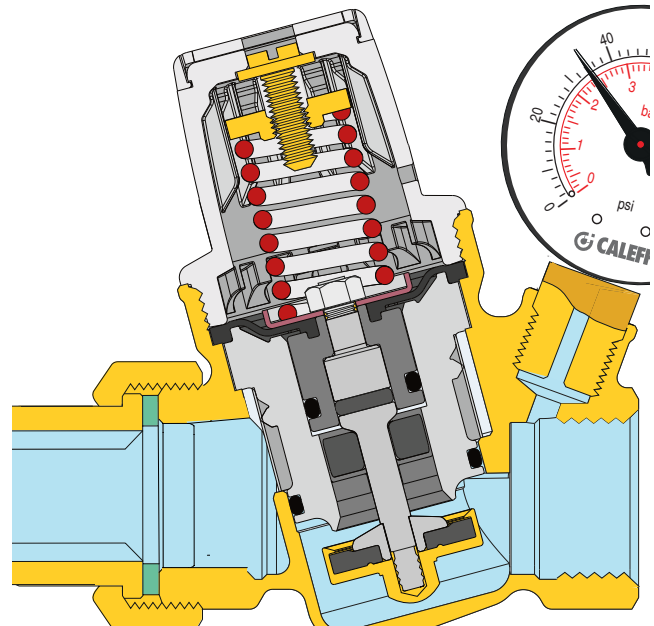


Construction details

Contoured diaphragm

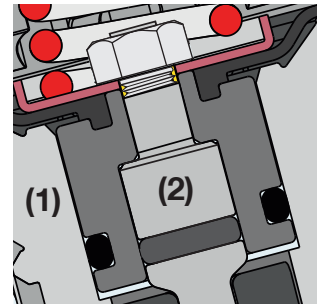
The diaphragm is designed with a special shape to assure more accurate pressure regulation in accordance with downstream pressure fluctuations.

This feature also extends the life of the valve, since the diaphragm is more resistant to sudden pressure fluctuations and to normal wear.



Non-stick materials

The central support assembly (1), containing moving parts, is made of plastic material with a low adherence coefficient. This minimizes the formation of lime scale, a common cause of flow inconsistencies.



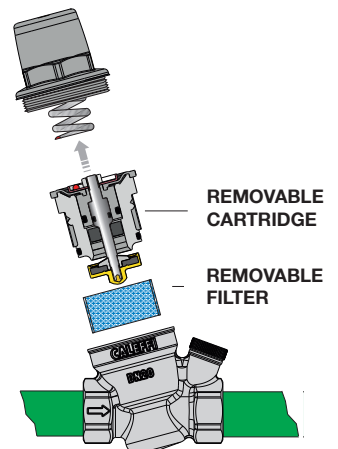
Stainless steel stem

The stainless steel stem (2) minimizes the harmful affects associated with the use of hard and aggressive water.

Removable cartridge

The cartridge containing the diaphragm, filter, seat and valve plug, shuttle and compensating piston is a pre-assembled self-contained unit with a cover, and can be removed to facilitate inspection and maintenance procedures.

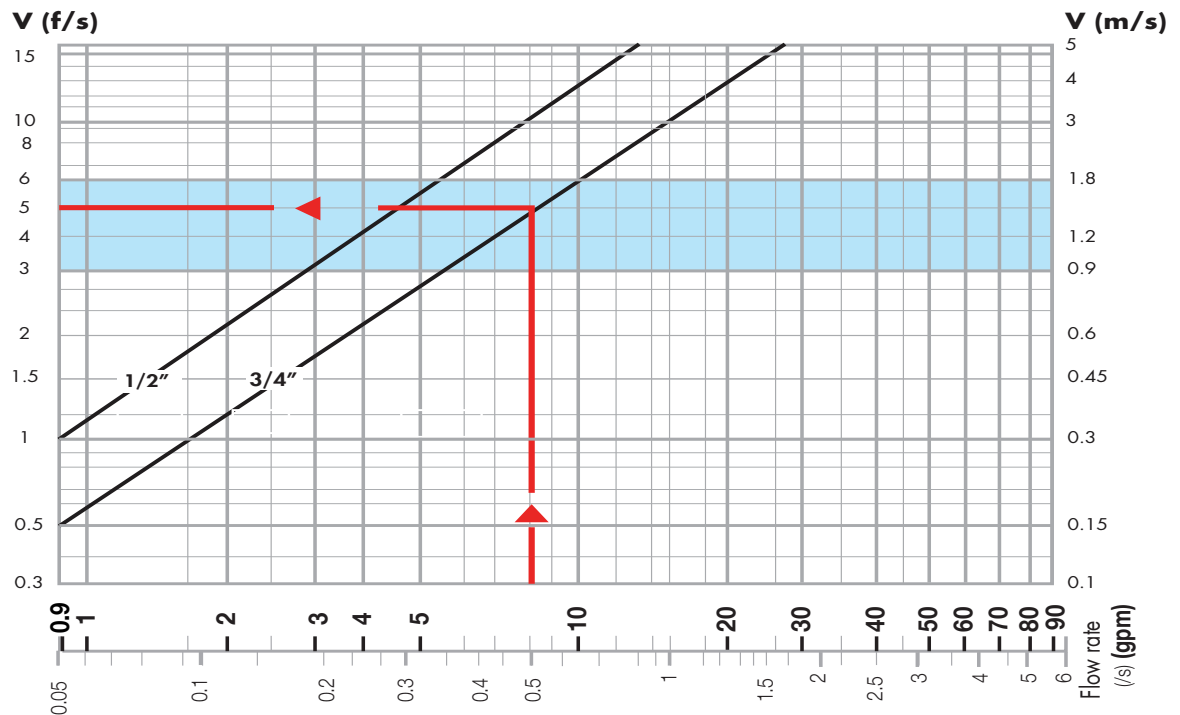
The special construction of the regulating element does not require any modification of the pressure setting, which may be left unchanged.



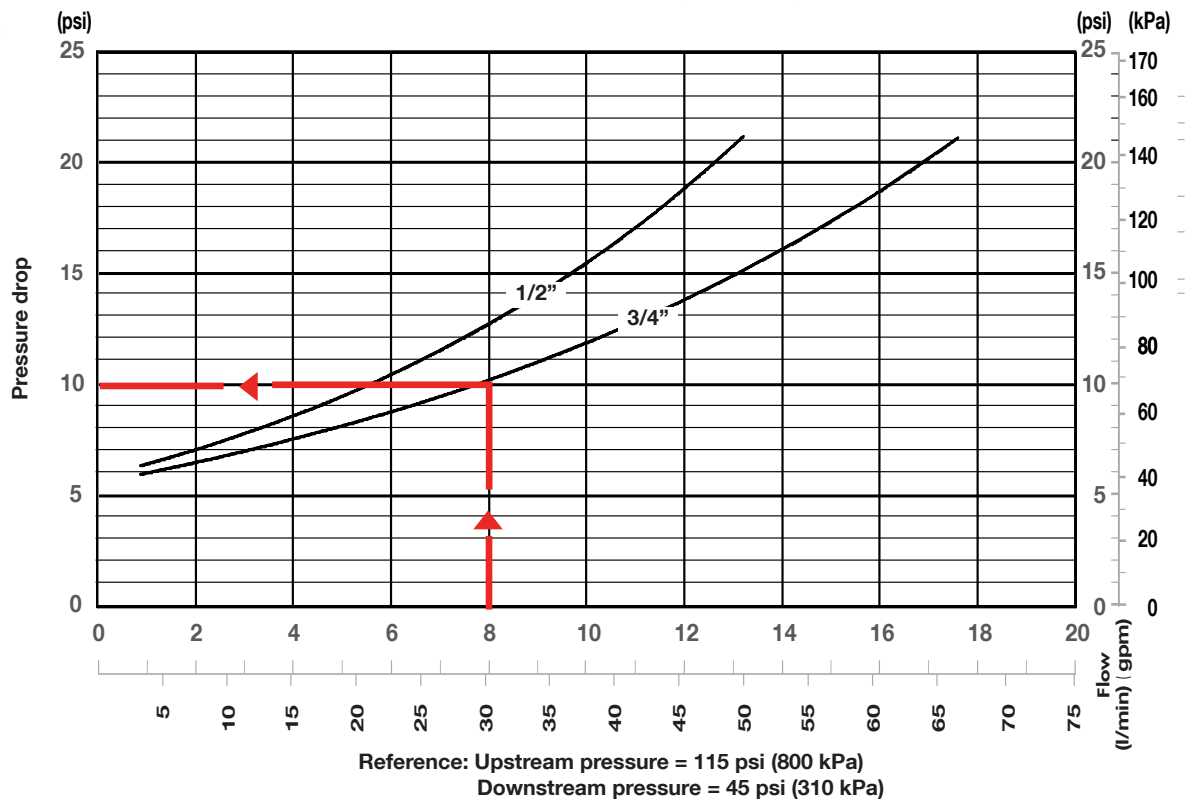
Compact dimensions

The "inclined" configuration makes the PresCal Compact 533H series pressure reducing valves compact for easy installation.

Graph 1 (Flow velocity)



Graph 2



Sizing procedure

Flow velocity is recommended to be kept within 3 to 6 feet per second when calculating the correct pressure reducing valve size. This will prevent noise in the pipes and rapid wear of fixtures. The valve will accurately control pressure down to a velocity of 1 fps.

The correct size of the pressure reducing valve is taken from graph 1 on the basis of the design flow rate taking into account an ideal flow velocity in the valve body of between 3 and 6 f/s (blue band).

Example:

For 8 gpm, select the 3/4" size valve (see arrow on graph 1).

The pressure drop is taken from graph 2 also on the basis of where the design flow rate intersects the curve for the valve size already selected (the downstream pressure falls by an amount equal to the pressure drop, with respect to the set pressure at no flow condition).

Example:

For 8 gpm the $\Delta p = 10$ psi (see arrow on graph 2).

Design Flow Rate		
Size	1/2"	3/4"
gpm	3 to 5.6	5.6 to 10
l/min	11 to 21	21 to 38

Setting

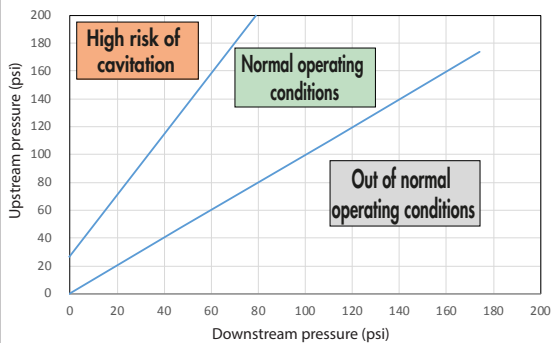
Using a flathead screwdriver turn the screw on top of the plastic cover. Turn it clockwise to increase the pressure and counter clockwise to decrease it.

PresCal Compact 533H series pressure reducing valves are factory set to 45 psi (3 bar).



Installation recommendations

Cavitation diagram



To minimize risk of cavitation, which can cause erosion in the valve seal, and vibration and noise, refer to the operating conditions noted in the above Cavitation diagram. The ideal upstream pressure to downstream pressure ratio is 2:1, and no more than 3:1. For example, upstream pressure 80 psi, downstream pressure 40 psi, pressure ratio is 80/40, 2:1. Under this condition the risk of cavitation is minimized. If the pressure ratio is in the High risk of cavitation range (see above chart), consider staging the pressure drop. For instance, break up a large system pressure drop, such as 200 psi to 50 psi (4:1 ratio) to 200 psi to 100 psi (2:1 ratio) for the first stage reduction, and 100 psi to 50 psi (2:1 ratio). Secure the upstream and downstream pipes with brackets per manufacturer instructions and local requirements to avoid generating and transmitting noise and vibration.

Installation recommendations

1. Installation below ground

Installation below the ground is not advisable.

2. Outdoor installation

Pressure reducing valves should not be installed outside the building unless properly protected from freezing and the weather.

3. Water hammer

Water hammer is a common reason for pressure reducing valve failures. Specific devices should be installed to absorb water hammer for systems with this risk.

Tamper-resistant cap:

The PresCal Compact 533H series comes with a standard gray snap-on cap which has a hole in the center to allow set point adjustment using a flathead screw driver. Also included is a black "tamper-resistant" cap, which can replace the standard cap, to hide the adjustment screw thus preventing set point tampering.

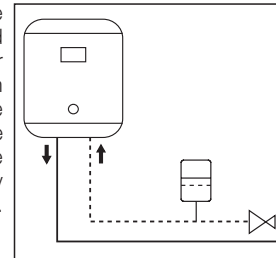


Troubleshooting

System failures are not always caused by the pressure reducing valve. Most frequently:

1. Increased downstream pressure in the presence of a water heater

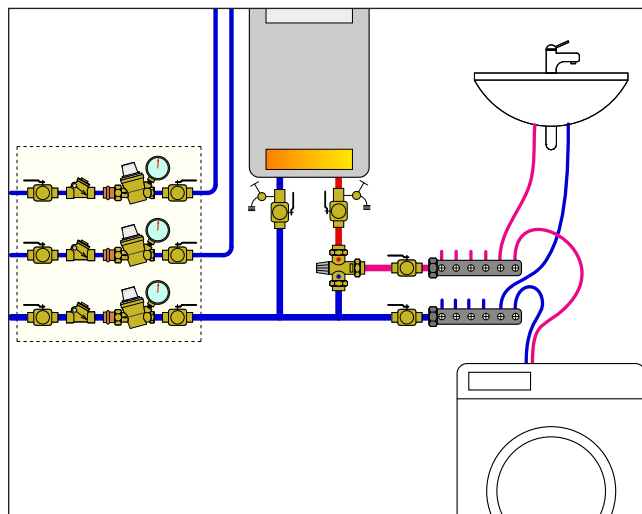
If the downstream pressure increases beyond the desired setting due to an inline water heater, install an expansion tank between the pressure reducing valve and the water heater to absorb the increased pressure, caused by water expansion from heating.



2. The pressure reducing valve does not maintain downstream setting value

If the pressure reducing valve does not maintain the downstream setting, it most likely is due to impurities accumulating on the valve seat, causing unnecessary flow to pass-through, increasing the downstream pressure. Proper maintenance and cleaning of the removable cartridge is recommended.

Application diagram



Replacement parts



ASSE 1003

NSF 61



Replacement valve body for PresCal Compact 533H series pressure reducing valve. Meets requirements of NSF/ANSI 372-2011. Certified to: ASSE 1003/ CSA B356, NSF 61 (180°F/82°C Commercial Hot), file PMG-1356. Low lead, by ICC-ES file PMG-1360.



Replacement cartridge for PresCal Compact 533H series pressure reducing valve.

533000H.....Fits 533H size 1/2" and 3/4" valves

533449HA1/2" body with 3/4" male union thread

533459HA.....3/4" body with 1" male union thread



Pressure gauge fits 533H series pressure reducing valves. Pressure range 0 to 100 psi (0 to 7 bar).

NA10273.....1/8" NPT male

SPECIFICATION SUMMARY

533H series

Compact pressure reducing valve with self-contained removable cartridge, certified by ICC-ES to ASSE 1003, CSA B356 (R2015), NSF/ANSI 61 (180°F/82°C Commercial Hot) and NSF/ANSI 372 Low lead compliance. Meets codes IPC, IRC, UPC and NPC for use in accordance with the US and Canadian plumbing codes. Sizes 1/2" with NPT female union or sweat union inlet connections and integral NPT female outlet, sizes 3/4" with NPT female union, sweat union, press union, PEX crimp union, or PEX expansion inlet connections and integral NPT female outlet connection. PEX crimp fittings must comply with ASTM F 1807. PEX expansion fittings must comply with ASTM F 1960. Dezincification resistant low-lead forged brass body (<0.25% Lead content) certified by and listed by ICC-ES. DZR low-lead brass internal moving parts. Cover in glass reinforced nylon PA6G30. Stainless steel filter, mesh size 0.51 mm (35 mesh). Peroxide-cured EPDM membrane and sealing gaskets. PTFE compensating piston rings. Maximum working temperature 180 degrees F (80 degrees C). Maximum upstream pressure 250 psi (17.25 bar). Downstream pressure setting range from 15 psi to 80 psi (1 bar to 5.5 bar). Self-contained cartridge removable for maintenance purposes. Equipped with operating knob with manual setting with adjustment screw. Provided with tamper-resistant cap for optional use. Provide with optional pressure gauge with 0 psi to 100 psi (0 bar–7 bar) pressure scale. Pressure gauge connection 1/8" NPT female.

We reserve the right to make changes and improvements to the products and related data in this publication, at any time and without prior notice.



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