

PresCal™ Compact pressure reducing valve

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533H Series

Installation, commissioning and servicing instructions



NSF/ANSI/CAN 61

Function

Pressure reducing valves are devices which, when installed on 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.

PresCal™ Compact 533H series pressure reducing valves, 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 can be easily serviced with a replaceable cartridge and has an integral stainless steel filter (35 mesh), suitable for water systems that may contain sediment and debris. A tamper-resistant cap is included to replace the standard cap to hide the adjustment screw to prevent set point tampering.

The valve complies with NSF/ANSI 61 (180°F/82°C Commercial Hot) as certified by ICC-ES, and complies with NSF/ANSI 372, low lead, and codes IPC, IRC, NPC and UPC for use in accordance with the US and Canadian plumbing codes, as certified by ICC-ES.

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"



SAFETY INSTRUCTION



This safety alert symbol will be used in this manual to draw attention to safety related instructions. When used, the safety alert symbol means.

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED! FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN A SAFETY HAZARD.



WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.



CAUTION: All work must be performed by qualified personnel trained in the proper application, installation, and maintenance of systems in accordance with all applicable codes and ordinances.



CAUTION: If the PresCal 533H series compact pressure reducing valve is not installed, commissioned and maintained properly, according to the instructions contained in this manual, it may not operate correctly and may endanger the user.



CAUTION: Make sure that all the connecting pipework is water tight.



CAUTION: When making the water connections, make sure that the connecting pipework is not mechanically over-stressed. Over time this could cause breakages, with consequent water losses which, in turn, could cause harm to property and/or people.



CAUTION: Water temperatures higher than 100°F (38°C) can be dangerous. During the installation, commissioning and maintenance of the 533H PRV, take the necessary precautions to ensure that such temperatures do not endanger people.

Caleffi shall not be liable for damages resulting from stress corrosion, misapplication or misuse of its products.

Leave this manual for the user

CONSIGNE DE SÉCURITÉ



Ce symbole d'avertissement servira dans ce manuel à attirer l'attention sur la sécurité concernant instructions. Lorsqu'il est utilisé, ce symbole signifie.

ATTENTION! DEVENEZ ALERTE ! VOTRE SÉCURITÉ EST EN JEU ! NE PAS SUIVRE CES INSTRUCTIONS PEUT PROVOQUER UN RISQUE DE SECURITE.



AVERTISSEMENT: Ce produit peut vous exposer à des produits chimiques comme le plomb, qui est connu dans l'État de Californie pour causer le cancer, dommages à la naissance ou autre. Pour plus d'informations rendez-vous www.P65Warnings.ca.gov.



ATTENTION: Tous les travaux doivent être effectués par du personnel qualifié formé à la bonne application, installation et maintenance des systèmes conformément aux codes et règlements locaux.



ATTENTION: Si le réducteur de pression, Série 533H, n'est pas installé, mis en service et entretenu correctement, selon les instructions contenues dans ce manuel, il peut ne pas fonctionner correctement et peut mettre en danger l'utilisateur.



ATTENTION: S'assurer que tous les raccordements sont étanches.



ATTENTION: Lorsque vous effectuez les raccordements d'eau, assurez-vous que la tuyauterie reliant réducteur de pression n'est pas mécaniquement des overstressed. Au fil du temps, ceci pourrait causer des ruptures, avec pour conséquence des pertes en eau qui, à leur tour, peuvent causer des dommages à la propriété et/ou les gens.



ATTENTION: les températures de l'eau supérieure à 100°F (38°C) peut être dangereux. Au cours de l'installation, mise en service et l'entretien de le réducteur de pression, Série 533H, prendre les précautions nécessaires afin de s'assurer que de tels températures ne compromettent pas les gens.

LAISSEZ CE MANUEL AVEC L'UTILISATEUR

Caleffi ne pourra être tenue responsable des dommages résultant de la corrosion, d'une mauvaise utilisation ou une mauvaise utilisation des produits.

Technical specifications

Materials:	- Body:	DZR low-lead 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:	PPSG40

Max working pressure:	250 psi (17.25 bar)
Downstream pressure setting range:	15 - 80 psi (1 - 5.5 bar)
Factory setting:	45 psi (3 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)
Suitable fluids:	water

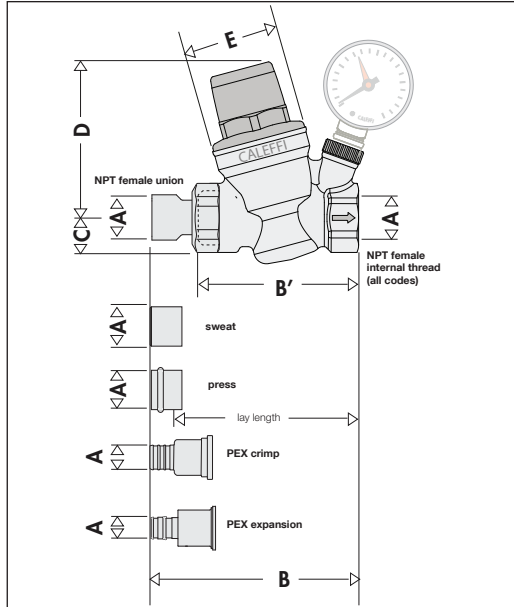
Main connections:	-NPT female union, sweat union inlet; and NPT female (FNPT) outlet	1/2"
	-NPT female union, sweat union, press union, PEX crimp union or PEX expansion union inlet; and NPT female (FNPT) outlet	1/2", 3/4"

Pressure gauge connection:	1/8" NPT female
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Approvals

1. Complies with codes IPC, IRC, UPC and NPC, ASSE 1003, CSA B356 (R2015), and standard NSF/ANSI 61 (180°F/82°C Commercial Hot), as certified by ICC-ES, file PMG-1356.
2. Complies with NSF/ANSI 372, low lead, as 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.

Dimensions



Code	A	B	B'	C	D	E	Wt (lb)			
533940HA	1/2" sweat	3 5/8"	2 15/16"	3/4"	3"	1 7/8"	1.1			
533941HA	1/2" sweat*	3 5/8"					1.2			
533340HA	1/2" FNPT	4 1/16"					0.9			
533341HA	1/2" FNPT*	4 1/16"					1.0			
533950HA	3/4" sweat	4"	3"				3/4"	3"	1 7/8"	1.3
533951HA	3/4" sweat*	4"								1.4
533350HA	3/4" FNPT	4 1/4"								1.1
533351HA	3/4" FNPT*	4 1/4"								1.2
533650HA	3/4" press	4 1/4"								1.5
533651HA	3/4" press*	4 1/4"								1.6
533750HA	3/4" PEX crimp	4 9/16"								1.7
533751HA	3/4" PEX crimp*	4 9/16"								1.8
533850HA	3/4" PEX expansion	4 15/16"		1.7						
533851HA	1/2" PEX expansion*	4 15/16"		1.8						

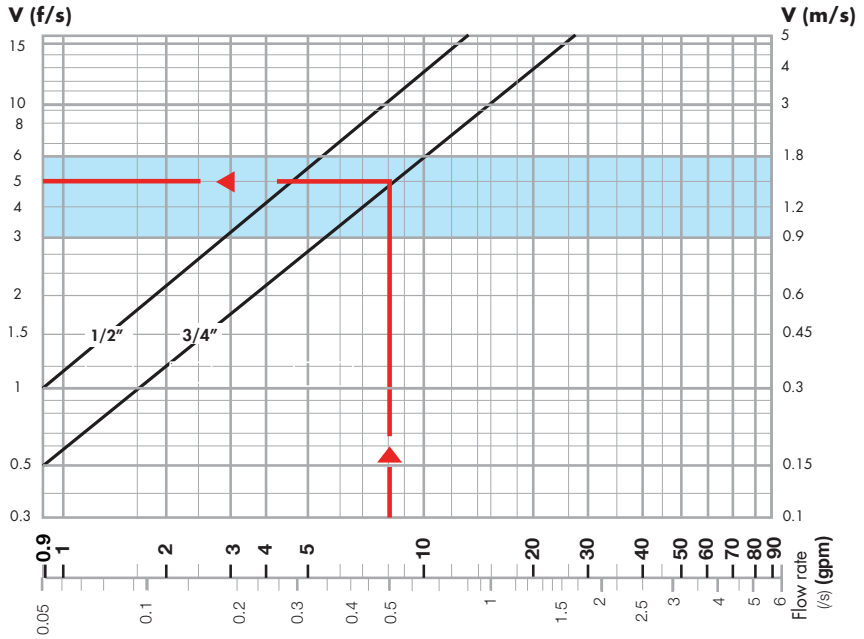
NOTE:

*Configuration includes factory supplied outlet pressure gauge. Models without gauge have a plugged gauge port.

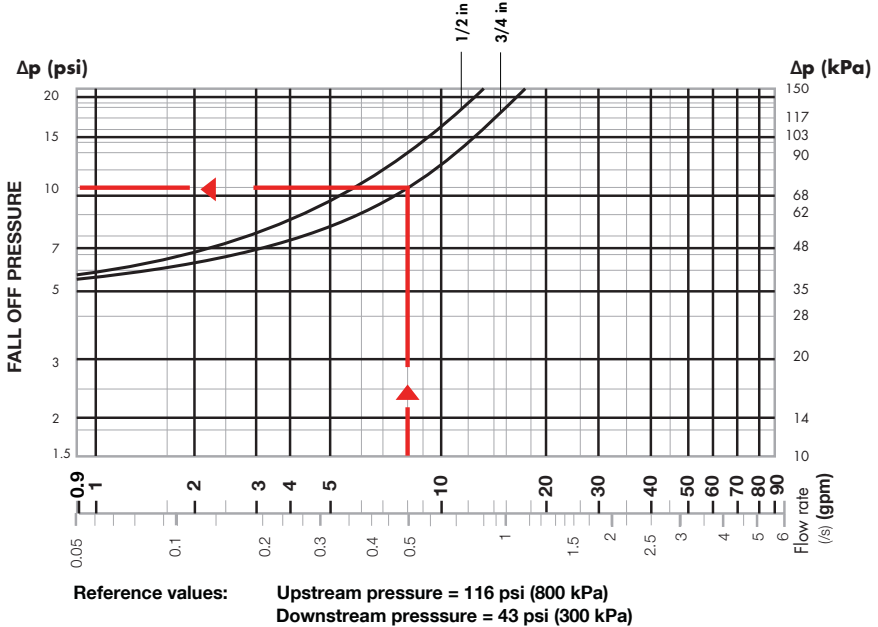
For press connection, lay length: size 3/4" - 3 1/4"

Hydraulic characteristics

Graph 1 (Flow velocity)



Graph 2 (Pressure drop)



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 appliances.

The correct diameter 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 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:

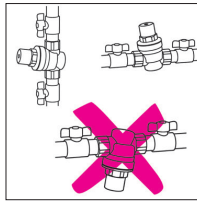
For 8 gpm the $\Delta p = 10$ psi (see arrow on graph 2).

	Design Flow Rate	
Size	1/2"	3/4"
gpm	3 to 5.6	5.6 to 10
l/s	0.2 to .35	.35 to .63

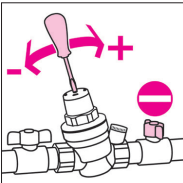
Installation

Before following the numbered steps listed, the installer must:

- a) Be sure this pressure reducing valve is compatible with the other equipment in the system that it may interact with or come into contact;
 - b) Assess and acknowledge all hazards related to the use of this product, including potential leakage, by installing this unit properly;
 - c) Install shut-off valve with pressure ports or similar equipment to measure the upstream pressure.
- 1) Turn all the faucets on before installing the pressure reducing valve, to flush the system and expel any air remaining in the pipes.
 - 2) Install shut-off valves upstream and downstream to facilitate maintenance operations.
 - 3) The pressure reducing valve may be installed on either vertical or horizontal pipe. However, it must not be installed upside down.



- 4) The PresCal 533H series compact pressure reducing valve is factory set to 45 psi (3 bar).
- 5) Set to another desired pressure by turning the screw on the top of the plastic cover, clockwise to increase the pressure setting and counter clockwise to decrease it. Use a pressure gauge to verify the desired pressure setting.



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.



- 7) After installation, the internal mechanism will automatically control the pressure, until the set value has been reached.
- 8) Slowly reopen the downstream shut-off valve.

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.

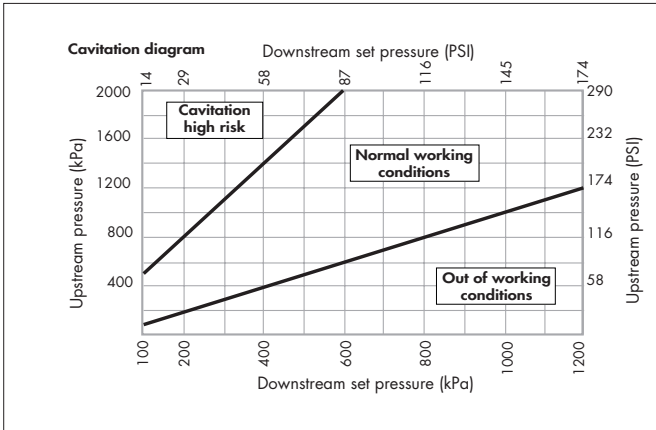
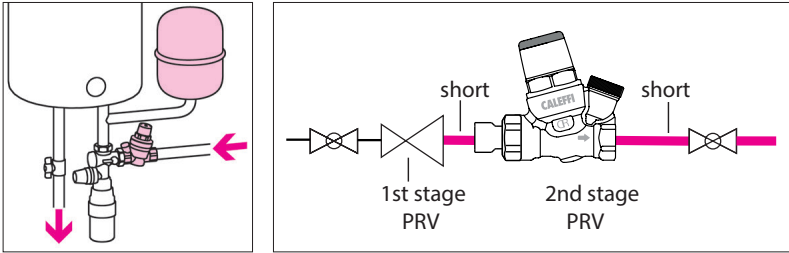
3. Water hammer

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.

Installation

When installing the pressure reducing valve upstream of a hot water tank, installing an expansion tank, or similar, is recommended to absorb the increase in pressure due to the thermal expansion of water.

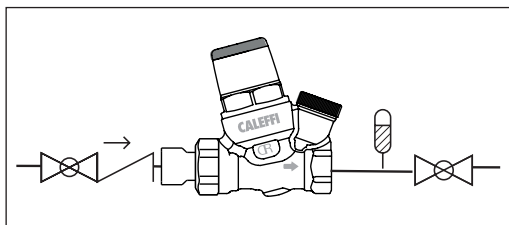
When installing in large buildings, short pipes or expansion valves, and/or similar equipment, is recommended to limit the increased pressure due to the thermal expansion of water caused by temperature changes downstream of the pressure reducing valve itself (or downstream of the first and second stage pressure reducing valves, if two are used).



To minimize the risk of cavitation within the valve that may result in malfunctioning with erosion of the valve sealing area, vibrations and noise, it is highly recommended to refer to the working conditions represented in the above diagram. Due to the numerous factors and variable conditions experienced such as system pressure, water temperature, air presence, flow rate and velocity, which may affect the behavior of the pressure reducing valve, it is advisable that the pressure ratio between the upstream pressure and the downstream set pressure is kept ideally to a value 2:1 and no greater than a value of 3:1 (For example, upstream 150 psi (10 bar), set pressure 75 psi (5 bar), the pressure ratio = $150/75 = 2:1$). In these conditions, the possible risk of cavitation and malfunctioning is minimized, however this does not exclude the possible effects of the many other variables within the system under operating conditions. If the pressure ratio exceeds the indicated limit, the system design pressure or use of 1st stage pressure reducing valves shall be reviewed (For example, 1st stage reducing pressure from 200 to 100 psi and then 2nd stage from 100 to 60 psi). Piping upstream and downstream of the pressure reducing valve shall be supported in accordance with the manufacturer's instructions, and any local authority requirements, to avoid the creation and transfer of vibration and/or noise into the installation.

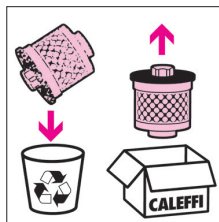
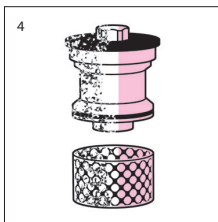
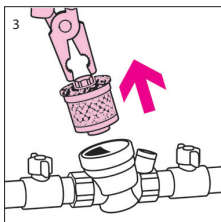
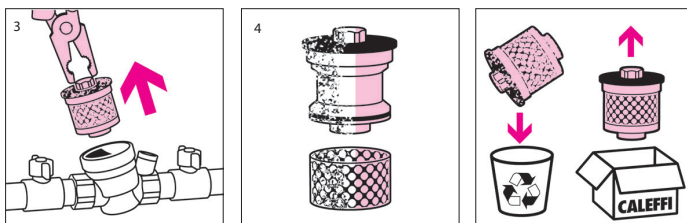
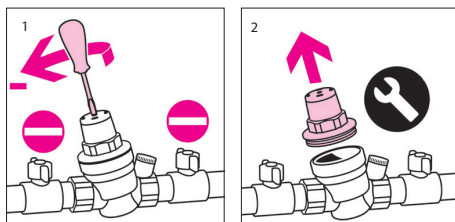
Maintenance

The pressure reducing valve must be checked and serviced to comply with applicable regulations. Even when installed, commissioned and serviced properly, the pressure reducing valve's internal components are subject to normal wear and tear, which may result in leaks and other malfunctions. Check for good working order. Service and clean the cartridge at least every 12 months.



The cartridge, containing the diaphragm, strainer, seat, valve plug and compensating piston, is pre-assembled as a self-contained unit, comes with a cover and can be removed for inspection and maintenance. When checking, cleaning or replacing the cartridge:

- 1) Shut off the inlet and outlet isolation valves. Unscrew the adjustment screw to take off the tension of the internal spring.
- 2) Remove the upper cover. This cover is not to be disposed.
- 3) Using pliers, pull out the cartridge.
- 4) If needed, the self-contained cartridge can be completely replaced, code 533000H. Install the new cartridge and previously removed upper cover.
- 5) Reopen the shut off valves and reset the pressure per instructions on page 8.



Troubleshooting

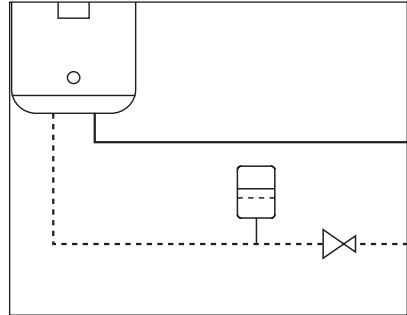
System failures are not always caused by the pressure reducing valve. Most frequently:

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.



Replacement parts



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



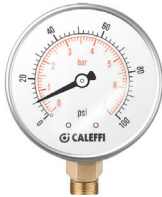
NSF/ANSI/CAN 61



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

533449HA1/2" body with 3/4" male union thread
533459HA.....3/4" body with 1" male union thread

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



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

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

LEAVE THIS MANUAL WITH THE USER



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