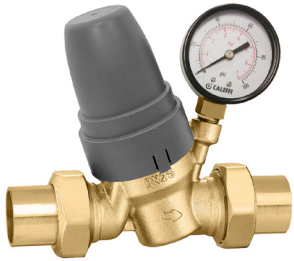
PresCal™ Pre-adjustable pressure reducing valves

535H Series

Installation, commissioning and servicing instructions



All models come with UV outdoor protective cover as pictured here.

ASSE 1003
NSF/ANSI/CAN 61
NSF/ANSI/CAN 372

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.

The PresCal™ 535H series pressure reducing valves, ideal for residential and commercial applications, feature a dial indicator with direct readout allowing easy pressure pre-adjustment. After installation, the valve will control at the pre-adjusted pressure setting.

The valve is constructed of DZR low-lead forged brass and incorporates a unique noise reducing and high flow seat design, is 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.

The valve complies with standards ASSE 1003, CSA B356, NSF/ANSI/CAN 61 (180 °F/82 °C Commercial Hot), NSF/ANSI/CAN 372 and codes IPC, IRC, UPC and NPC certified by ICC-ES. The valve is also plenum rated: compliant with the requirements of standard UL 2043, without the outdoor protective cover.

Product range

5353H Series	Pre-adjustable pressure reducing valve with or without pressure gauge and NPT female threaded union connections, sizes ½", ¾", 1", 1¼", 1½" and 2".
5355H Series	Pre-adjustable pressure reducing valve with or without pressure gauge and PEX expansion union connections, size ¾" and 1".
5356H Series	Pre-adjustable pressure reducing valve with or without pressure gauge and union press connections, sizes ½", ¾", 1", 1¼", 1½" and 2".
5357H Series	Pre-adjustable pressure reducing valve with or without pressure gauge and union PEX crimp connections, sizes ¾" and 1".
5359H Series	Pre-adjustable pressure reducing valve with or without pressure gauge and union sweat connections, sizes ½", ¾", 1", 1¼", 1½" and 2".
NA5398H Series	Pre-adjustable pressure reducing valve with or without pressure gauge, body only, connections field installed, sizes ½", ¾", 1", 1¼", 1½" and 2".

Scan to view · 535HA PRV
Installation Tip

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 535H series 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 535H PRV, take the necessary precautions to ensure that such temperatures do not endanger people.

WARNING: The outer surface of the device, especially in polymer type components, must not come into contact with any chemical substance, either on purpose or accidentally. The system fluid and any chemical additives used within the water piping system – whether for washing or as protection – must be compatible with the materials used to make the device and with the function it performs.

WARNING: Caleffi shall not be liable for damages resulting from stress corrosion, misapplication or misuse of it's 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 535H, 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 consequence 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 535H, prendre les precautions nécessaires afin de s'assurer que de tells températures ne compromettent pas les gens.

AVERTISSEMENT: La surface extérieure de l'appareil, en particulier les composants de type polymère, ne doit pas entrer en contact avec des substances chimiques, que ce soit volontairement ou accidentellement. Le produit et les additifs chimiques utilisés dans les canalisations d'eau - que ce soit pour le lavage ou la protection - doivent être compatibles avec les matériaux utilisés pour la fabrication de l'appareil et avec la fonction qu'il remplit.

AVERTISSEMENT: Caleffi ne sera pas responsable des dommages résultant de la corrosion sous tension, d'une mauvaise application ou d'une mauvaise utilisation de ses produits.

LAISSEZ CE MANUEL AVEC L'UTILISATEUR

Technical specifications

Materials:	- Body:	DZR low-lead* brass CR EN 1982 CC768S
	- Housing:	glass reinforced nylon PA66M40/1
	- Outdoor protective cover:	UV stabilized ABS, gray
	- Control stem:	DZR low-lead brass CR EN 12164 CW724R
	- Moving parts:	DZR low-lead brass CR 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 cartridge:	PPSG40

* Meets the "lead free" requirement of Section 1417 of the Safe Drinking Water Act (SDWA). This product has a weighted average lead content of less than 0.25% for its wetted surfaces contacted with consumable water.

Max working pressure:	300 psi (2000 kPa)
Downstream pressure setting range:	15 - 90 psi (100 - 600 kPa)
Factory setting:	45 psi (300 kPa)
Max. working temperature:	180 °F (80 °C)
Pressure gauge scale:	0 - 100 psi (0 - 700 kPa)
Filter mesh size:	0.51 mm (35 mesh)
Suitable fluids:	water
Flow rates at 6 fps (gpm):	½": 7.3; ¾": 12.5; 1": 19.0; 1¼": 34.0; 1½": 44.0; 2": 70.0

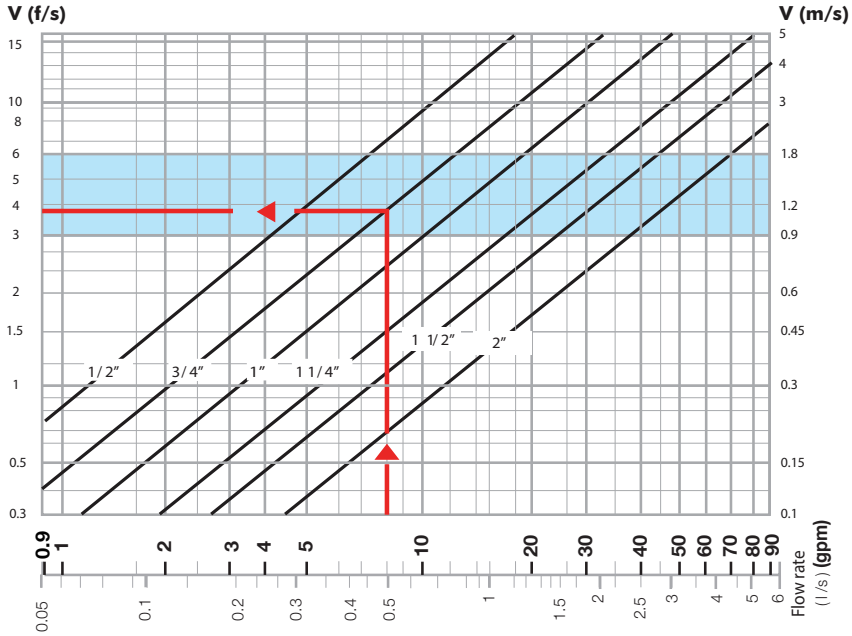
Main connections:	-NPT female and sweat union	½", ¾", 1", 1¼", 1½" and 2"
	-Press union	½", ¾", 1", 1¼", 1½" and 2"
	-PEX expansion union	¾" & 1"
	-Press and PEX crimp union	¾" & 1"
Lay length (press):	size ¾": 4¼"; size 1": 5¾"; size 1¼": 7"; size 1½": 9 7/8"; size 2":11"	
Pressure gauge connection:		1/8" NPT female

Approvals

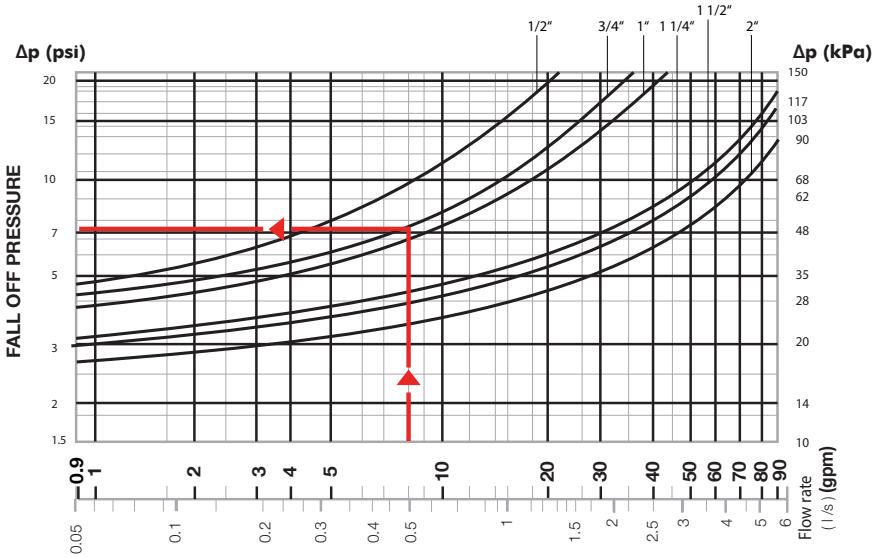
1. Complies with codes IPC, IRC, UPC and NPC. ICC-ES certified to ASSE 1003, CSA B356.
2. Complies with NSF/ANSI/CAN 61 (180 °F/82 °C Commercial Hot), as certifed by ICC-ES, file PMG-1356.
3. Complies with NSF/ANSI/CAN 372, Drinking Water System Components- Lead Content Reduction of Lead in Drinking 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, as certified by ICC-ES, file PMG-1360.
4. PEX crimp fittings certified to ASTM F 1807.
5. PEX expansion fittings certified to ASTM F 1960.
6. Plenum rated: Evaluated in accordance with the standard UL 2043 and was found compliant with the standard's requirements, without the outdoor protective cover.

Hydraulic characteristics

Graph 1 (Maximum velocity for sizing)



Graph 2 (Pressure drop)



Reference values: **Upstream pressure = 116 psi (800 kPa)**
Downstream presssure = 43 psi (300 kPa)

Sizing procedure

Maximum flow velocity is recommended to be kept within 3 to 6 f/s when calculating the correct pressure reducing valve size. This will prevent noise in the pipes and rapid wear of appliances. Minimum flow velocity to prevent excessive wear on the valve and to reduce the chance of noise due to low flow is 1 f/s.

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 maximum flow velocity of between 3 and 6 f/s (blue band).

Example:
For 8 gpm, select the ¾" 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). Make sure the falloff pressure (pressure drop) of the chosen valve, at the specifed flow rate, will result in the valve supplying the required pressure to the system fixtures.

	Design Flow Rate					
Size	½"	¾"	1"	1¼"	1½"	2"
gpm	4 to 7.3	7 to 12.5	10 to 19	17 to 34	24 to 44	37 to 70

Installation

Each 535H PRV comes with a snap-on protective cover which is designed to resist UV rays, for outdoor locations, and to provide a significant level of protection against dust, dirt and water. It does not protect against freezing; do not mount the valve in locations where it may freeze. Protective cover not approved for use in plenum installations.

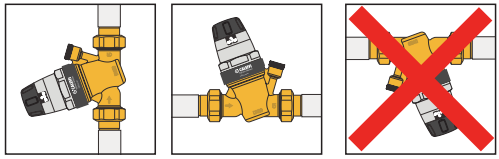
Before following the numbered steps listed, the installer must:

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 the 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) Close the downstream shut-off valve.
5) This mechanical pre-adjustment system, with the operating knob and pressure indicator visible from both sides, allows the pressure reducing valve to be set to the required value in the system prior to installation. The pressure indicator features incremental step movement, so that the pressure can be adjusted continuously and the value displayed at 15 psi increments.
6) Remove the UV outdoor protective cover before step 7. It has 2 clips at the bottom edge which holds it in place. Pull the clips outward slightly with your fingers and pull the cover off.
7) Set using the operating knob on the upper part of the valve. The pressure reducing valves are factory set to a pressure of 45 psi.
8) Because the pre-adjustment dial displays in 15 psi increments, the optional downstream outlet pressure gauge can be used to show the exact outlet pressure, which is especially useful for applications requiring this precision.
9) After installation, the internal mechanism will automatically control the pressure, until the set value has been reached.
10) Reinstall the UV outdoor protective cover, recommended for non-freezing outdoor climates.
11) Slowly reopen the downstream shut-off valve.



Installation recommendations

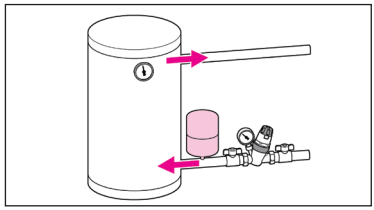
1. Outdoor installation
Pressure reducing valves should not be installed outside the building unless properly protected from freezing and the weather.

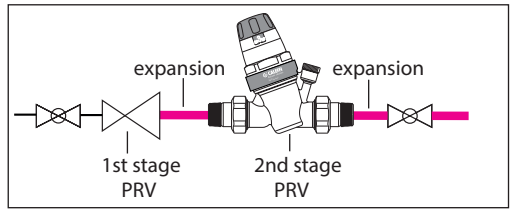
2. Each 535H PRV comes with a snap-on protective cover which is designed to resist UV rays, for outdoor locations, and to provide a significant level of protection against dust, dirt and water. It does not protect against freezing; do not mount the valve in locations where it may freeze. Protective cover not approved for use in plenum installations.

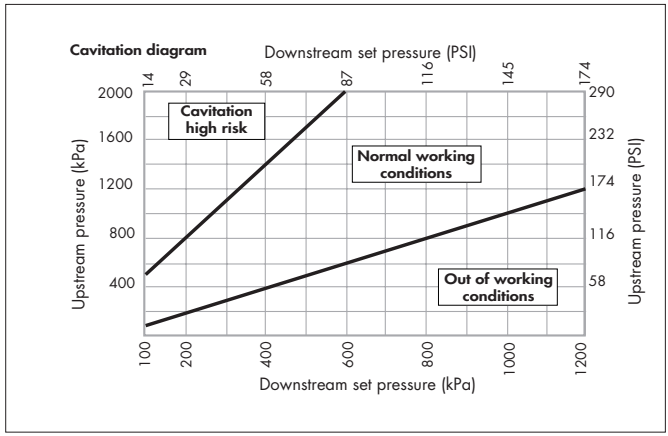
3. Water hammer
Water hammer is a common reason for pressure reducing valve failures. Specific devices should be installed to absorb water hammer for systems with this risk.

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).





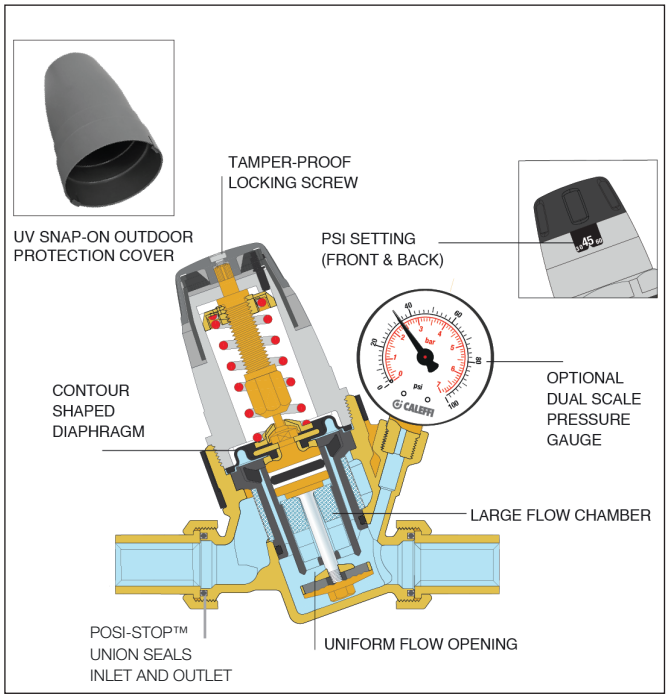


To minimize the risk of cavitation within the valve that may result in malfunctioning with erosion of the valve sealing area, vibrations and noise, it is highly recommended to refer to the working conditions represented in the above diagram. Due to the numerous factors and variable conditions experienced 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 58 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.

PVC jumper nipple with male union thread. The length of the jumper nipple matches the 535H valve face-to-face dimension, allowing the piping to be completed prior to the installation of valve and permitting quick change out from the jumper to the valve.

Code	Description	Face-to-Face Dimension
NA11304	Jumper nipple for 535H ½" series	3"
NA11305	Jumper nipple for 535H ¾" series	3 9/16"
NA11306	Jumper nipple for 535H 1" series	3 ¾"
NA11307	Jumper nipple for 535H 1¼" series	4 5/16"
NA11308	Jumper nipple for 535H 1½" series	4 ¾"
NA11309	Jumper nipple for 535H 2" series	5 ¼"

Construction details



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 or good working order and service and clean the cartridge at least every 12 months.

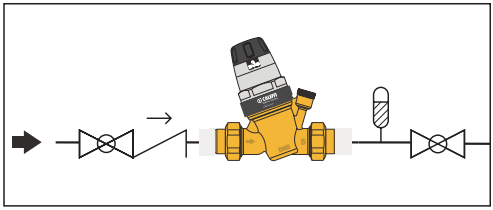
The cartridge, containing the diaphragm, strainer, seat, valve plug and compensating piston, is pre-assembled as a self-contained unit with a cover and can be removed for inspection and maintenance. When checking, cleaning or replacing the cartridge:

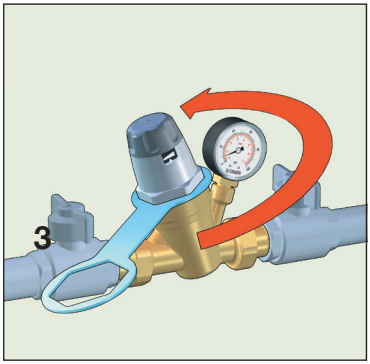
1) Shut off the inlet and outlet isolation valves.

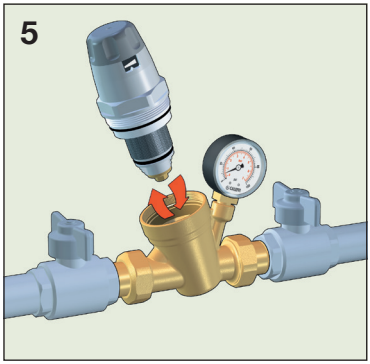
2) The downstream pressure setting can be left at the set value.

3) Remove the upper cover. This cover is integral with the cartridge.

4) Check and clean the filter.

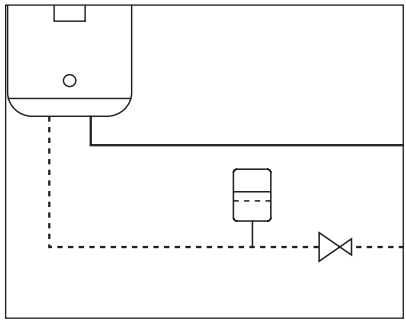






Troubleshooting

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.

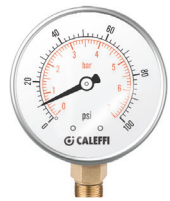
2.The pressure reducing valve does not maintain downstream setting value

If the pressure reducing valve does not maintain the downstream setting, it most likely is due to impurities acccumulating 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 cartridge for PresCal 535H series pressure reducing valve.

535006HA .....fits 535H ½", ¾" 1"
535009HA.....fits 535H 1¼", 1½", 2"



Pressure gauge fits 535H series pressure reducing valves. Pressure range 0 to 100 psi (0 to 7 bar).

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

Gauge port plug.

NA10438.....1/8" NPT male

Replacement UV outdoor protective cover for PresCal 535H series pressure reducing valve.

NA10811 .....fits 535H ½", ¾", 1"
NA10812.....fits 535H 1¼", 1½", 2"

LEAVE THIS MANUAL WITH THE USER.

Laissez ce manuel à la disposition de l'utilisateur.

CALEFFI
Hydronic Solutions

Caleffi North America, Inc.
3883 West Milwaukee Road
Milwaukee, WI 53208
T: 414.238.2360 F: 414.238.2366

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For Technical Support call 1-414-338-6338, or email techsupport.us@caleffi.com