

**Pre-adjustable pressure reducing valve with self-contained cartridge**

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**5350..H AUS series**

**Installation, commissioning and servicing instructions**

**Function**

Pressure reducing valves are devices which, when installed on private water systems, reduce the pressure entering from the public mains. This incoming pressure is generally too high and variable for direct application to domestic systems. These valves can also be used to control inlet pressure to hot water storage and to control the hot and cold inlet pressure in large installations. The Caleffi 5350..H series meet the requirements of "AS1357.2:2005 Valves primarily for use in warm and hot water systems - P. 2: Control valves".



**Product range**

**5350..H AUS**

- 535040/1H AUS DN 15 (1/2")**
  - 535050/1H AUS DN 20 (3/4")**
  - 535060/1H AUS DN 25 (1")**
  - 535070/1H AUS DN 32 (1 1/4")**
  - 535080/1H AUS DN 40 (1 1/2")**
  - 535090/1H AUS DN 50 (2")**
- Male union connections (ISO 7/1)



**Technical specifications**

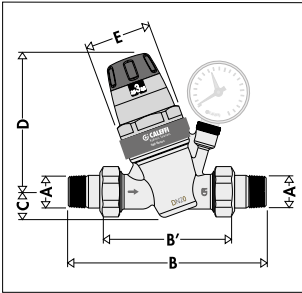
**Materials**

Body:	dezincification resistant alloy <b>CR</b> EN 12165 CW724R
Cover:	PA6G30
Control spindle:	stainless steel EN 10088-3 (AISI 303)
Moving parts:	dezincification resistant alloy <b>CR</b> EN 12165 CW724R
Membrane:	EPDM
Seals:	EPDM
Strainer:	stainless steel EN 10088-2 (AISI 304)
Seat:	(DN 15–25) PPSG40 (DN 32–50) stainless steel EN 10088-3 (AISI 303) PPSG40
Cartridge:	

**Performance**

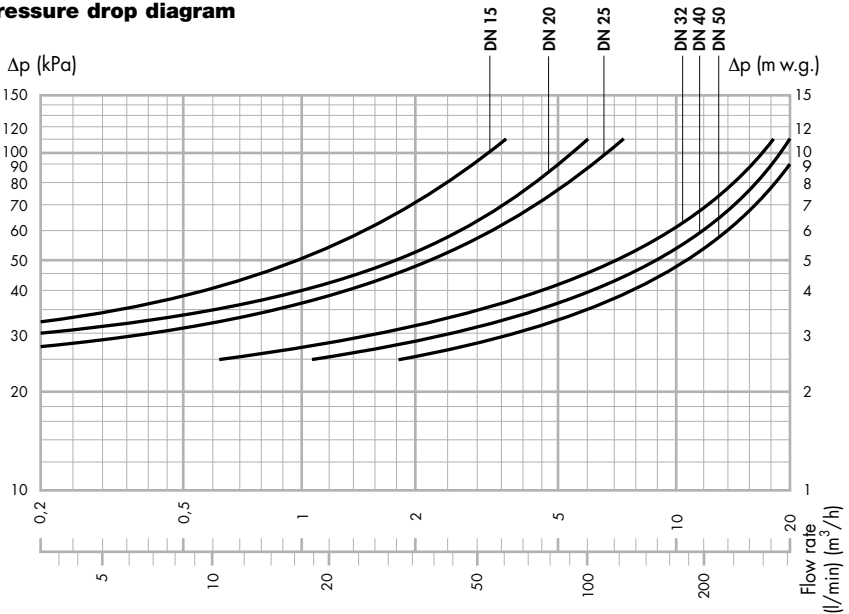
Max. pressure upstream:	2000 kPa
Downstream pressure setting range:	100–600 kPa
Factory setting:	300 kPa
Max. working temperature:	80 °C
Pressure gauge scale:	0–1000 kPa
Filter mesh size Ø:	(DN 15–DN 25) 0,51 mm (DN 32–DN 50) 0,65 mm
Medium:	water
Flow rate:	see graph
Complies with:	AS 1357.2

## Dimensions



DN	A	B	B'	C	D	E	Weight (kg)
15	1/2"	140	76	20,5	115	∅ 54	0,86
20	3/4"	160	90	20,5	115	∅ 54	1,02
25	1"	180	95	20,5	115	∅ 54	1,31
32	1 1/4"	200	110	40	178	∅ 73	2,78
40	1 1/2"	220	120	40	178	∅ 73	3,30
50	2"	250	130	40	178	∅ 73	4,41

## Pressure drop diagram



Under following conditions: Inlet pressure 800 kPa  
Outlet set pressure: 300 kPa

Flow rate (AS 1357.2):

DN 15	DN 20	DN 25	DN 32	DN 40	DN 50	
70 l/min	110 l/min	120 l/min	130 l/min	150 l/min	180 l/min	@ 100 kPa
130 l/min	200 l/min	210 l/min	230 l/min	250 l/min	270 l/min	@ 300 kPa
160 l/min	220 l/min	230 l/min	250 l/min	300 l/min	350 l/min	@ 600 kPa

## Installation

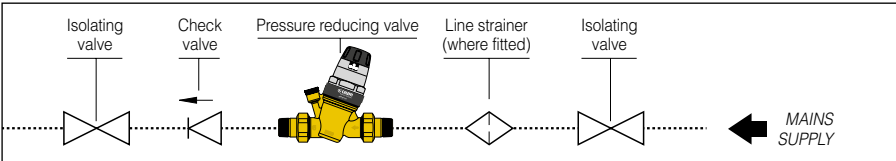
The pressure reducing valve has to be sized in accordance with the system design and the proper selection of the project flow rate, for avoiding any oversizing with possible malfunctioning.

The pressure reducing valve must be installed by a licensed plumber and in accordance with AS/NZS 3500, relevant local requirements and following these instructions.

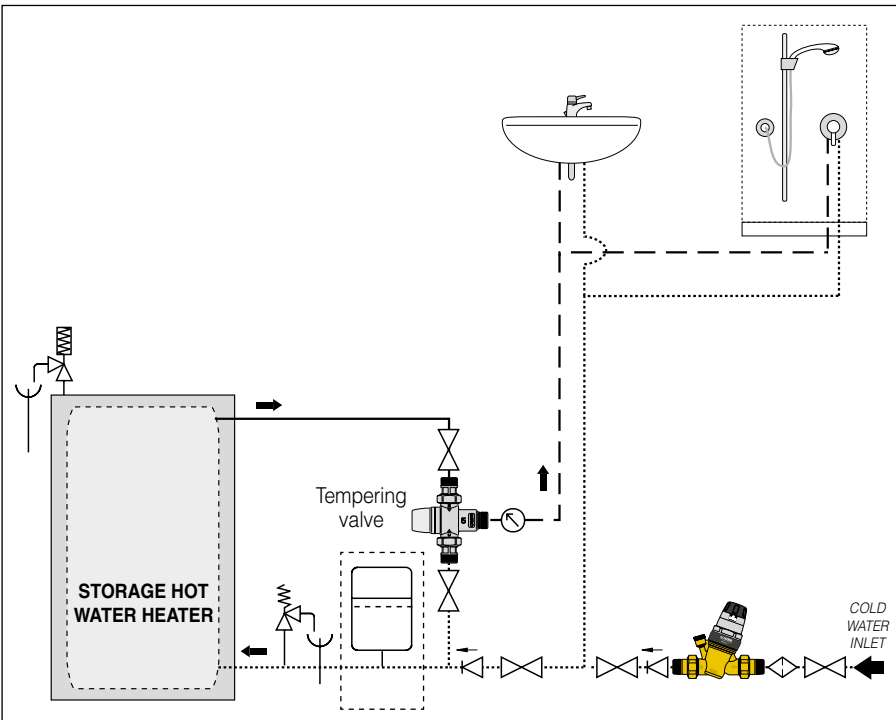
The installer must:

- ensure the reducing valve is compatible with any other equipment in the system it may interact with or come into contact with logistically;
- assess and acknowledge all hazards related to the use of the product, including leaks, by installing the unit properly;
- install shut-off valves fitted with pressure ports or similar equipment to measure the upstream pressure.

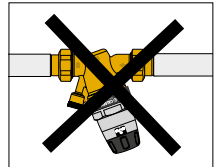
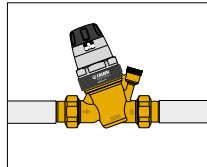
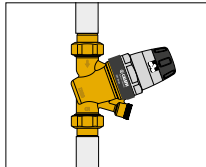
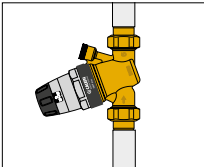
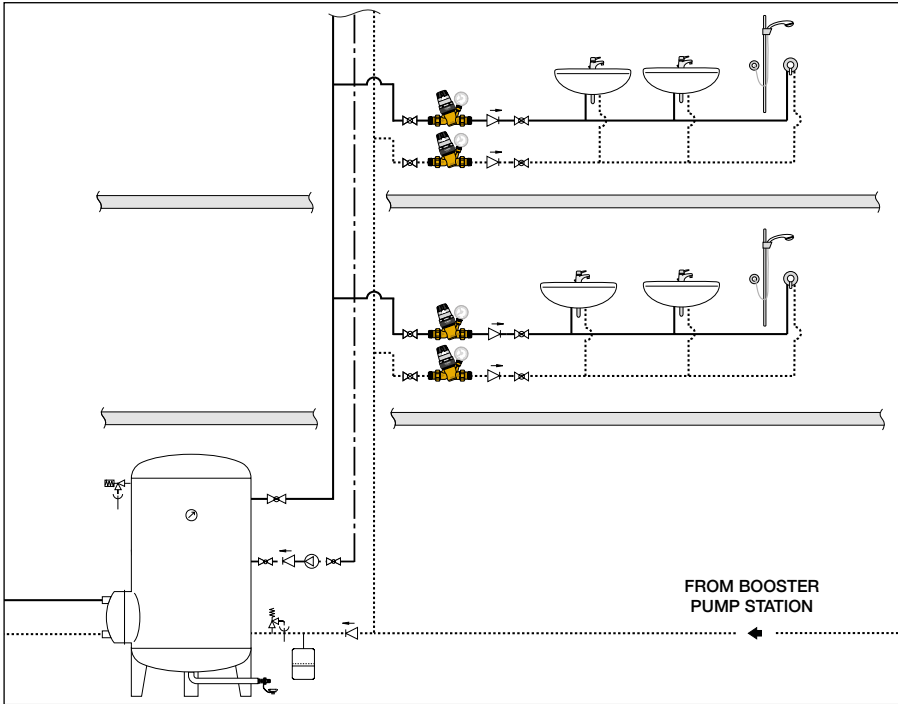
## Installation diagram



## System without recirculation



## Large system with recirculation

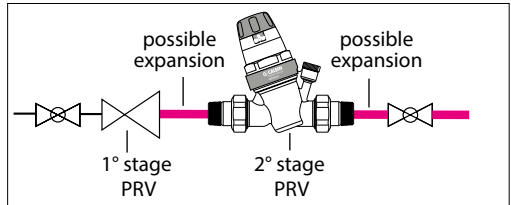
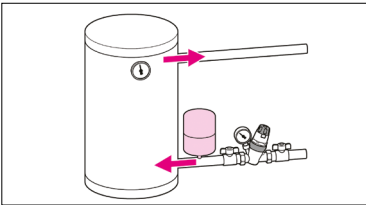


- 1) Before installing the pressure reducing valve, open all the outlets to flush the system and expel any air left in the pipework.
- 2) Install shut-off valves upstream and downstream to facilitate maintenance operations.
- 3) The pressure reducing valve can be installed in either vertical or horizontal pipework. However it must not be installed upside down.
- 4) Close the downstream shut-off valve.
- 5) This mechanical pre-setting system with adjustment knob and pressure indicator visible on both sides makes it possible to set the reducing valve to the required value in the system before installation. The pressure indicator has an incremental movement, so that the pressure can be adjusted continuously, displaying the value at 50 kPa (0.5 bar) increments.
- 6) Calibration is carried out by means of the adjusting knob on the upper part of the device. The reducing valves are pre-set at the factory to a pressure of 300 kPa (3 bar).
- 7) In view of the pre-setting function, the installation of a pressure gauge downstream of the appliance is not essential.
- 8) After installation, the internal mechanism will automatically adjust the pressure until it reaches the required value.
- 9) Reopen the downstream shut-off valve slowly.

### Recommendation for installation conditions

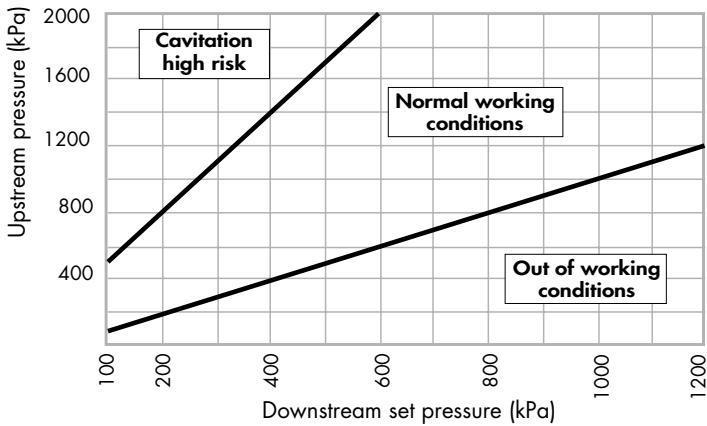
When installed upstream of a hot water tank, we recommend installing an expansion vessel or similar equipment to absorb the increase in pressure due to the thermal expansion of the water.

When installed in large buildings, adopt technical measures such as using short pipes or including expansion valves and similar equipment to limit the increased pressure due to the thermal expansion of the water caused by temperature changes downstream of the reducing valve itself (or downstream of the first and second stage reducing valves, if two are present).



### Cavitation diagram

Cavitation diagram



To minimize the risk of cavitation within the valve that may result in malfunctioning with erosion of 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 1000 kPa, set pressure 500 kPa, the pressure ratio =  $1000/500 = 2:1$ ). In these conditions, the possible risk of cavitation and malfunctioning is minimised, 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 1600 to 800 kPa and then 2nd stage from 800 to 400 kPa).

Pipework upstream and downstream of the pressure reducing valve shall be supported in accordance with the manufacturer's instructions, AS/NZS 3500 along with any other local authority requirements, to avoid the creation and transfer of vibration and/or noise into the installation.

The inlet strainer of the pressure reducing valve shall be periodically checked and cleaned, to minimize any partial or complete blockage which may limit the flow rate from the valve and/or create noise.

System flushing, cleaning and disinfection of the pipework to which the valve is installed shall be performed by suitably qualified persons in accordance with the system component manufacturer's instructions, AS/NZS 3500 along with any other applicable local authority requirements. Exceeding the maximum stated chemical concentrations and/or duration of exposure may negatively impact on the performance of the system and/or components installed such as the pressure reducing valve. Chemical dosed products must be chemically compatible with materials used for the construction of the pressure reducing valve, specified in its technical documentation.

### **Installation below ground**

If installing the 5350..H series valve underground, please ensure that steps are taken to protect the valve from becoming frozen in frost-prone areas.

Please allow yourself sufficient space to remove the cartridge should maintenance be required.

The reading of a gauge for setting purposes may be difficult and an alternate means of checking downstream pressure may be necessary.

### **Water hammering**

This is one of the main causes of faults in pressure reducing valves. It is best to fit special devices to absorb water hammering when fitting pressure reducing valves in systems at risk.

#### **WARNING:**

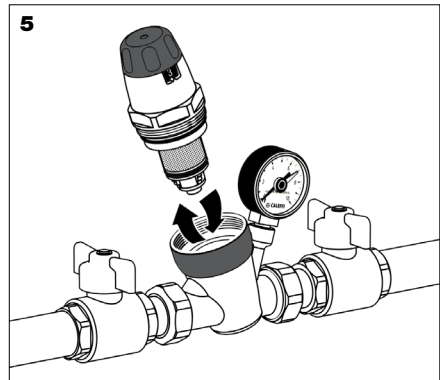
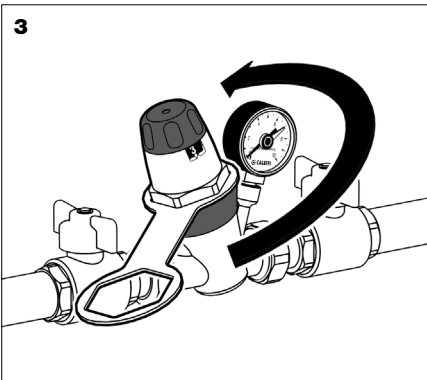


If it is **critical** to maintain the downstream pressure setting to protect equipment, as a safety measure, we recommend that a pressure, or safety, relief valve is installed downstream of the pressure reducing valve.

## Maintenance

The reducing valve must be checked and serviced in compliance with the provisions of applicable regulations. Even when installed, commissioned and serviced properly, the reducing valve's internal components are subject to normal wear and tear, which may result in leaks and other malfunctions. We advise that you check that it is in good working order and service and clean the cartridge at least every 12 months. For cleaning, inspection or replacement of the entire cartridge:

- 1) Shut-off the reducing valve.
- 2) The special construction of the regulating unit does not require any adjustment of the calibrated pressure, which can be left at the set value.
- 3)** Remove the upper cover, using a suitable spanner. The upper cover is integral with the internal regulating cartridge.
- 4) Check and clean the filter, present on 5350..H series.
- 5)** The whole self-contained cartridge can be refitted or replaced with a spare. When the cartridge is screwed back into the body, the pressure indication windows will return to the original position.
- 6) Reopen the shut-off valves. The pressure will return to the original set value.



## Trouble-shooting

### 1. Increased downstream pressure near a water heater

This problem is due to the water being heated by the water heater. There is no relief of the pressure because the reducing valve is correctly closed. The solution is to install an expansion vessel (between the heater and the reducer) to "absorb" the pressure increase or **an expansion control valve** to relieve the pressure.

### 2. The pressure reducing valve does not maintain its set pressure

In most cases this is the result of impurities that deposit on the valve seat causing leakage with a resulting increase in pressure downstream. The solution is to fit a filter upstream from the reducer and subsequently to maintain and clean the cartridge (see *Maintenance*).

**Safety**

If the pressure reducing valve is not installed, commissioned and maintained properly in accordance with the instructions contained in this manual, it may not operate correctly, and may cause damage to objects and/or persons.

Make sure that all the connections are water-tight.

When installing the pressure reducing valve, make sure not to over-tighten the connections to the valve, as, over time, a failure can occur with subsequent water leakage causing damage.

In the case of highly aggressive water, arrangements must be made to treat the water before it enters the pressure reducing valve, in accordance with current legislation. Otherwise, the pressure reducing valve may be damaged and not function correctly.

**Leave this manual for the user**

**AUSTRALIAN AGENT**

**All Valve Industries**

**Unit 2, 18-28 Sir Joseph Banks Drive  
Kurnell NSW 2231**

**Ph: (02) 8543 9811**

**Fax: (02) 8543 9822**

**Email: [info@allvalve.com.au](mailto:info@allvalve.com.au)**

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