

# inta

## Pressure Reducing Valves

### PRV2233

## Installation and Maintenance Instructions



**kiwa**



**IT-TD-Ki0413  
KIP-087598**

\* Compliant with BS EN 1567 and certified Kiwa by RBM spA

In this procedure document we have endeavoured to make the information as accurate as possible.

We cannot accept any responsibility should it be found that in any respect the information is inaccurate or incomplete or becomes so as a result of further developments or otherwise.

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# inta

**Intatec Ltd**

Airfield Industrial Estate

Hixon

Staffordshire

ST18 0PF

Tel: **01889 272 180**

email: **sales@intatec.co.uk**

web: **www.intatec.co.uk**

## Introduction

This installation guide has been produced for the PRV2233 range of diaphragm pressure reducing valves

These instructions cover the installation, operation and maintenance. Please read the enclosed instructions before commencing the installation of this product, please note;

**We recommend that the installation of any Inta product is carried out by an approved installer.**

It is recommended, especially in hard water areas, that a water softener such as the ActivFlo or ActivFlo lite be fitted to reduce the risk of calcium deposits forming.

## Products

These instructions apply to the following pressure reducing valves;

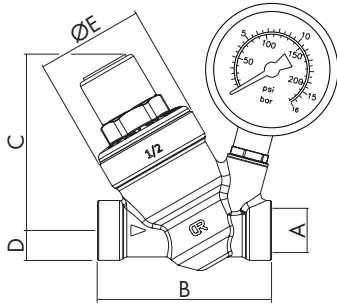
½" pressure reducing valve - female connections	PRV223305000.1
¾" pressure reducing valve - female connections	PRV223307500.1
15mm pressure reducing valve - compression connections	PRV22331500.1
22mm pressure reducing valve - compression connections	PRV22332200.1
28mm dial up pressure reducing valve - compression connections	PRV22332800.1
35mm dial up pressure reducing valve - compression connections	PRV22333500.1
42mm dial up pressure reducing valve - compression connections	PRV22334200.1
54mm dial up pressure reducing valve - compression connections	PRV22335400.1
1" dial up pressure reducing valve - screwed connections	PRV223310000.1
1¼" dial up pressure reducing valve - screwed connections	PRV223312500.1
1½" dial up pressure reducing valve - screwed connections	PRV223315000.1
2" dial up pressure reducing valve - screwed connections	PRV223320000.1
½" pressure reducing valve with gauge - female connections	PRV223305000G.1
¾" pressure reducing valve with gauge - female connections	PRV223307500G.1
15mm pressure reducing valve with gauge - compression connections	PRV223315010.1
22mm pressure reducing valve with gauge - compression connections	PRV223322010.1
28mm dial up pressure reducing valve with gauge - comp. connections	PRV22332810.1
35mm dial up pressure reducing valve with gauge - comp. connections	PRV22333510.1
42mm dial up pressure reducing valve with gauge - comp. connections	PRV22334210.1
54mm dial up pressure reducing valve with gauge - comp. connections	PRV22335410.1
1" dial up pressure reducing valve with gauge - screwed connections	PRV223310000G.1
1¼" dial up pressure reducing valve with gauge - screwed connections	PRV223312500G.1
1½" dial up pressure reducing valve with gauge - screwed connections	PRV223315000G.1
2" dial up pressure reducing valve with gauge - screwed connections	PRV223320000G.1

## Check Components

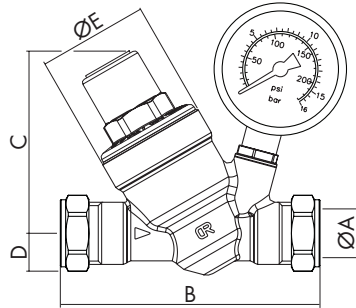
Before commencing remove all components from packaging and check each component with the contents list.

Ensure all parts are present, before discarding any packaging. If any parts are missing, do not attempt to install your Inta electronic tap until the missing parts have been obtained.

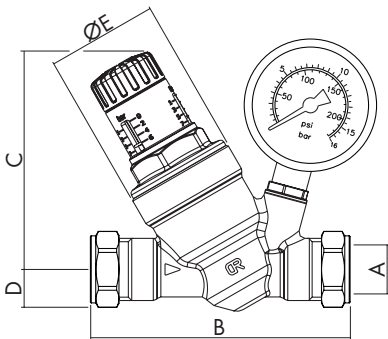
## Dimensions



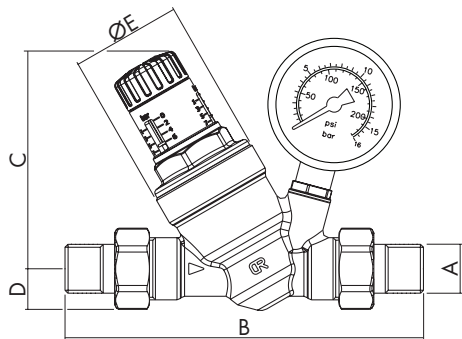
A	B	C	D	E
1/2"	75	76	18	46
3/4"	78	77	16	46



A	B	C	D	E
15	103	75	19	46
22	107	77	19	46



A	B	C	D	E
28	131	134	25	61
35	138	137	28	61
42	148	142	30	61
54	155	146	38	61



A	B	C	D	E
1"	199	134	24	61
1 1/4"	217	138	30	61
1 1/2"	236	144	37	61
2"	269	146	47	61

Diagrams show models with pressure gauges which should be considered when siting the valves.

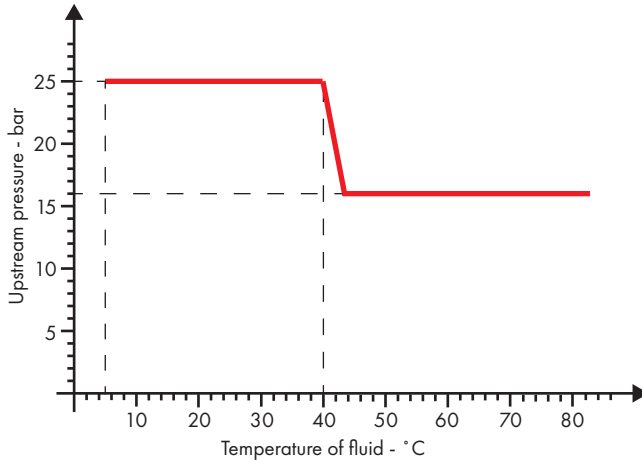
## **Materials**

Body	DZR Brass - BS EN 12165 CW602N
Metal internal components	DZR Brass - BS EN 12164 CW602N
Cartridge	POM
Filter	AISI 302
Stem	DZR Brass - BS EN 12164 CW602N
Seals	Polymer - EPDM
Exterior polymer components	Nylon 6 with 30% glass fibre

## **Technical Specification**

Compatible fluid	Water
Nominal pressure	PN25 @ 40 °C / PN16 @ 80 °C
Maximum upstream pressure	25 bar @ 40 °C / 16 bar @ 80 °C
Adjustable downstream pressure	0.8 to 7 bar (80 to 700 kPa)
Factory setting	3 bar
Maximum operating temperature	80 °C
Threaded connections	BS EN ISO 228
Pressure gauge connection	Female G¼

## Pressure- Temperature Chart



### Description

The Inta PRV2233 are diaphragm type pressure reducing valves with inspectionable and easily removable internal cartridge complete with removable filter.

The cartridge has a compensated seat where upstream pressure variations do not affect the adjustment of the downstream pressure.

In addition the Inta PRV2233 dial up PRV is equipped with a graduated knob to carry out the calibration, without the need of a pressure gauge and tools.

### Use

PRV2233 pressure reducing valves are intended to be used in plumbing, heating and sanitary systems, in particular they can be used for the final reduction of pressure to the utility.

### Selection

The Inta PRV2233 pressure reducing valve are intended to be used in the plumbing, heating and sanitary systems with an upstream pressure below 16 bar.

The pressure reducing valve is pre-set in the factory with a output pressure of  $P = 3 \text{ bar}$  (300 kPa).

The correct choice of number of pressure reducing valves necessary for the pressure reduction is important to avoid cavitation.

Cavitation can create excessive noise and vibration which can cause problems for the utilities and possible damage to the reducer itself.

Please refer to the dedicated section inside this IOM for the optimal choice of the number of reducers in relation to the pressure variation to be obtained.

## Operating Principles

With a design based on a compensated seat meaning that the set downstream pressure remains independent of upstream pressure variations.

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

- 1 the thrust of the spring towards the opening of the obturator.
- 2 the thrust of the diaphragm towards the closure of the obturator.

When the tap or shower valve is closed, the downstream pressure rises and pushes the diaphragm upwards.

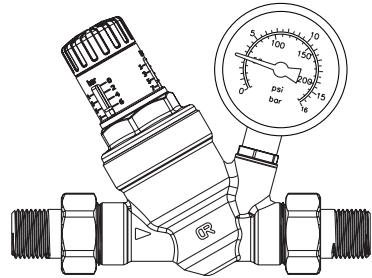
As a result the obturator closes the valve to the passage of water and maintains the pressure constant at the calibrated pressure.

The slightest difference in favour of the force exercised by the diaphragm, in relation to that of the spring, causes the device to close.

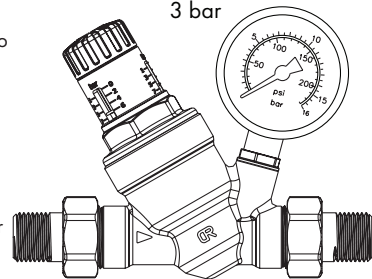
When a tap or shower valve is opened, the force of the spring becomes greater than that of the diaphragm; the obturator moves downwards opening the pressure reducing valve to the flow of water.

The greater the demand for water the lower the pressure under the diaphragm with a resulting greater flow of water through the valve.

Pressure steady at the set value for 3 bar



Pressure falls from 3 bar



## Setting the Downstream Pressure

The final setting of the pressure reducing valve must be conducted when the hydraulic circuit is completely full and all the outlets are closed except one.

With one outlet open it allows the downstream pressure to be measured and the valve can be adjusted to the required outlet pressure.

If no outlets are open it will only show the pressure coming into the valve, the upstream pressure.

All pressure reducing valves without an indicator are set by;

- Removing the indice.
- Using a suitably sized hexagonal wrench, connect with the inner ring nut turning it clockwise to increase the pressure and turning it anticlockwise to decrease the pressure.



## Setting the Downstream Pressure Continued

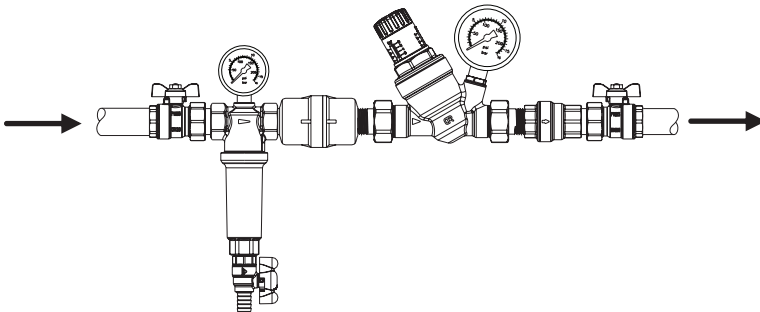
When fitting the pressure gauge do not fit the 'O' ring from the blanking plug, ensure a water tight joint is achieved.

All pressure reducing valves with an indicator are set by turning the plastic knob clockwise to increase the pressure and turning it anticlockwise to decrease the pressure.



## Installation

- it is recommended that isolating valves are installed upstream and downstream of the pressure reducing valve (PRV) to enable future maintenance to be carried out.

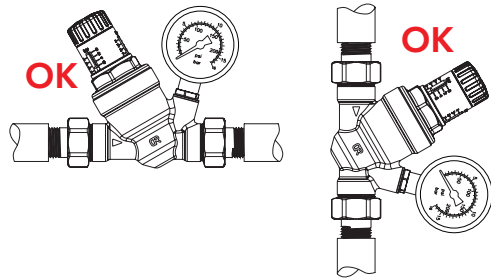


- it is recommended that a strainer or dirt collection device is installed upstream of the pressure reducing valve to prevent debris from entering the valve and causing damage.
- thoroughly flush the pipework prior to installing the pressure reducing valve.
- the valve must be installed with the flow direction arrow cast on the body pointing in the same direction as the flow through the system.
- set the PRV to the maximum pressure compatible with the system and fully open the downstream isolating valve and water outlet (tap or shower) to further clean the pipework.
- close all but one of the water outlet and set the PRV to the desired pressure shown on the pressure gauge by turning the plastic knob.
- open and close the water outlet several times to check the stability of the setting.
- if the system includes fitting or valves with an operating pressure lower than the upstream pressure of the reducer, always install a suitable safety valve to protect the equipment.

**WARNING:** When the system is closed, the pressure detected by the pressure gauge may be affected by the overpressure of the heating system; any adjustments must be performed when the system is running and at ambient temperature.

## **Orientation**

The pressure reducing valve can be installed in horizontal or vertical pipe as shown.

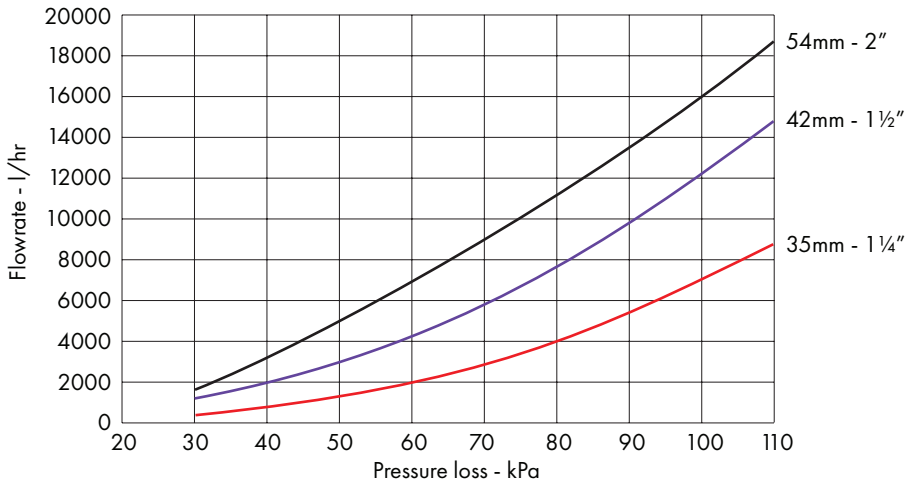
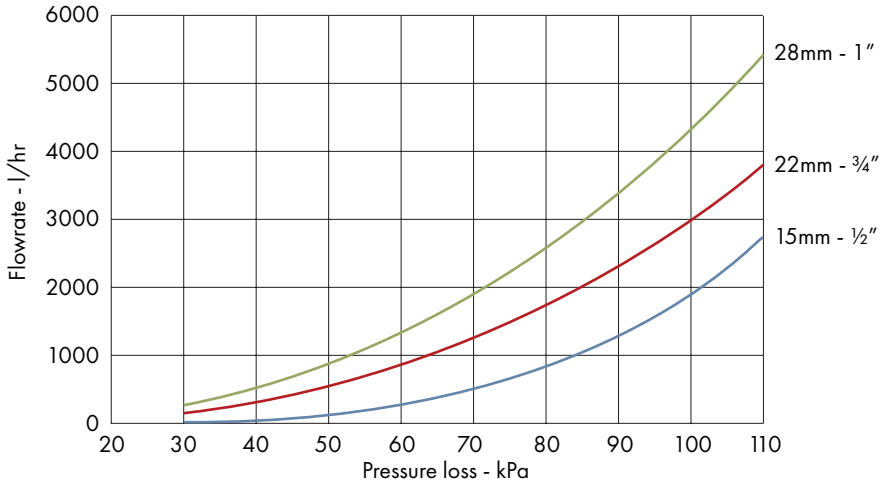


## Hydraulic Characteristics

Determination of the pressure loss in relation to the flow rate.

The values described in the diagram have been obtained with:

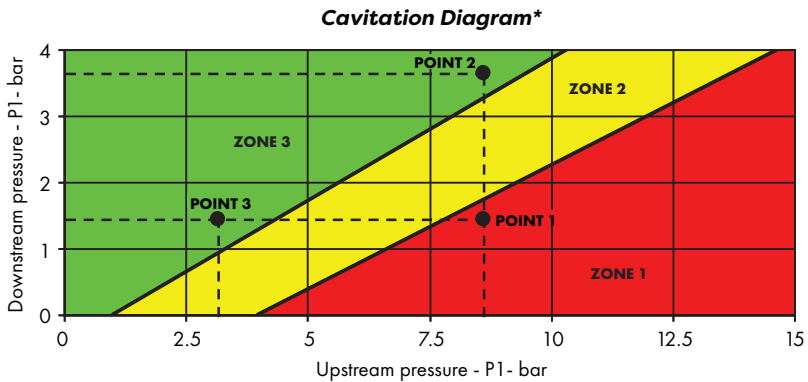
- an upstream pressure of 8 bar (800 kPa)
- the pressure reducer calibrated on 3 bar (300 kPa)



## Cavitation Diagram

In order to prevent cavitation, which can cause excessive noise, vibration and damage to the valve and downstream pipe, in certain pressure situations with high inlet pressures and low outlet pressures (high pressure loss) then a number of pressure reducing valves may be required.

The cavitation diagram shows three areas of operation depending upon the upstream and downstream (outlet) pressures.



- **ZONE 1:** Damage and Noise - The characteristics of cavitation are clearly audible and visible inside the pressure reducing valve and pipework. The valve should not be used under these conditions.
- **ZONE 2:** Critical Zone - Highlights the possibility of cavitation of occurring inside the pressure reducing valve or pipework. Using the valve under these conditions should be avoided and is not recommended.
- **ZONE 3:** Operating Zone - The pressure reducing valve works under its optimum conditions. The valve can safely be used under these conditions.

In order to avoid cavitation occurring the ratio between the maximum upstream pressure and the outlet pressure should not exceed a value of 2.5.

\* **NOTE:** The cavitation diagram has the sole purpose of supplying the technician with a quick reference for the system conditions to determine if cavitation will be present and the likely level.

A second PRV may be required to step down the upstream pressure and pressure loss avoiding cavitation.

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## **Cavitation Diagram Continued**

### **Example**

If the pressure reducing valve is used under the following conditions;

- Upstream pressure:  $P_m = 8.5$  bar
- Outlet pressure:  $P_v = 1.5$  bar

On the Cavitation Diagram these pressures correspond to **POINT 1** in **ZONE 1**.

Ratio  $P_m/P_v = 8.5/1.5 = 5.67$ .

### **Solution**

Use 2 pressure reducing valves in series.

First valve using the following conditions;

- Upstream pressure:  $P_m = 8.5$  bar
- Outlet pressure:  $P_v = 3.5$  bar

Pressure ration  $8.5/3.5 = 2.42 < 2.5$

On the Cavitation Diagram these pressures correspond to **POINT 2** in **ZONE 3**.

Second valve using the following conditions;

- Upstream pressure:  $P_m = 3.5$  bar
- Outlet pressure:  $P_v = 1.5$  bar

Pressure ration  $3.5/1.5 = 2.33 < 2.5$

On the Cavitation Diagram these pressures correspond to **POINT 3** in **ZONE 3**.

**NOTE:** The outlet pressure of the pressure reducing valve **MUST NEVER** be higher than the maximum pressure of components and outlets (tap and showers) downstream of the valve.

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Please leave this Manual for the User

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and click on Product Registration

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**Intatec Ltd**

Airfield Industrial Estate

Hixon

Staffordshire

ST18 0PF

Tel: **01889 272 180**

email: **[sales@intatec.co.uk](mailto:sales@intatec.co.uk)**

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