



The Safety Valve Specialist



PRESSURE REDUCING VALVES

Ensure reliable and
stable pressure for
smooth-running
water systems



WRAS
APPROVED
PRODUCT

Pressure control: solving water system problems

The water systems in domestic, commercial and industrial properties can present unique problems and challenges as plumbing fittings become ever more sophisticated.

The water supply pressure in the UK can vary from 1bar to 20bar (or even higher in some low usage areas). The water pressure will also tend to vary through the day, for instance at high usage times (typically mornings and late afternoons) the pressure may drop by comparison with low water usage times (throughout the night, for example), when the pressure may increase dramatically.

Such periods of high pressure can cause several problems: excessive noise from high flow velocities, water hammer from quick closing taps or solenoid valves, plus the risk of water wastage is particularly great because higher pressure means higher flow rates.

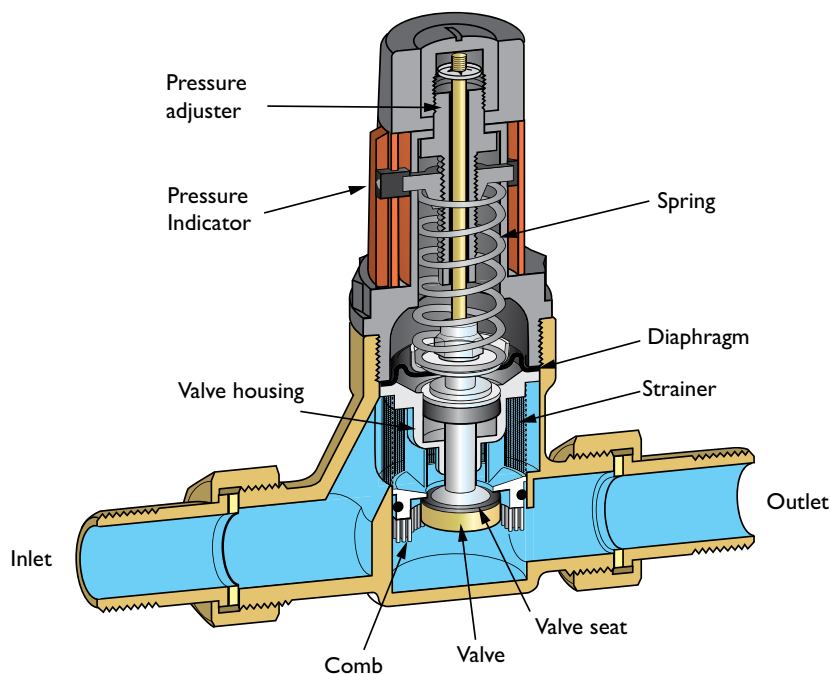
The water supply usually enters domestic dwellings beneath the kitchen sink so the first effect of high pressure is often experienced at that point; when the cold tap is turned on too quickly or too far, this creates a gush of water which hits the bottom of the sink and bounces back, soaking the user and creating a wet mess!

The best way to control high pressure is by installing a pressure reducing valve. These take a high pressure at the inlet, then the valve reduces it to a lower pressure at the outlet as desired, under both flow and no-flow conditions.



All Reliance pressure reducing valves are WRAS approved: this means that they have undergone independent third party testing to ensure that they comply with the current UK water regulations for pressure reducing valves. It also ensures that all materials used within the make-up of the valves have been verified as safe for potable water systems.

How do pressure reducing valves work?



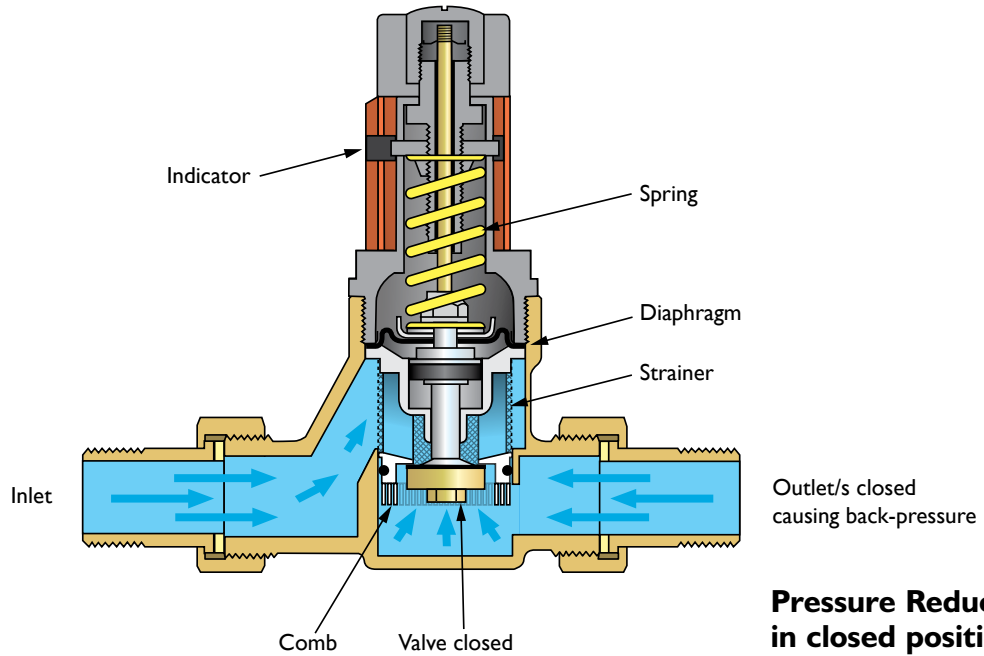
315i Valve

A pressure reducing valve is a valve which takes a high inlet pressure and reduces it to a lower outlet pressure. When it does this under both flow and no-flow conditions, the type of control is known as 'drop tight'. Reliance's pressure reducing valves use a balanced spring and diaphragm to control the downstream pressure.

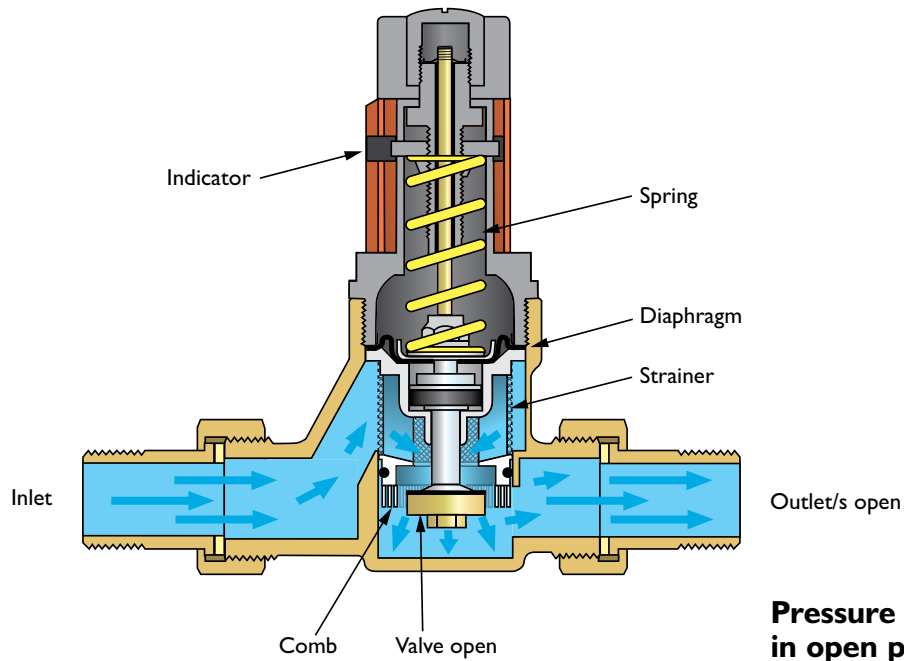
This 'drop tight' feature is one of the most important criteria for any pressure reducing valves, as this stops the pressure from 'creeping' - a term which is used when an increase in the downstream pressure occurs under no flow conditions. A valve which will allow this 'creep' cannot be known as 'drop tight' or in fact a true pressure reducing valve, as it will

eventually allow the pressure to creep up to equal the upstream pressure, which can cause significant problems and essentially negates the point of using a pressure reducing valve in the first place.

The diaphragm effectively separates all of the water contact parts and the pressure from the water supply away from the control spring and associated mechanism. The body is then protected from debris by the use of a stainless steel strainer (as shown in the cutaway drawing below).



Under no flow conditions the downstream pressure puts back-pressure on the seat and diaphragm of the valve, which in turn overcomes the spring pressure. This means the seat moves up, forcing it to seal against the diaphragm, therefore not allowing the downstream pressure to increase.



Under flow conditions the back pressure against the seat is reduced thus allowing the seat to open and water to flow through the valve.

Unique Cartridge Design



All Reliance pressure reducing valves use a cartridge system. The cartridge houses all working components of the pressure reducing valves: strainer, spring, diaphragm and seat. The cartridge format makes servicing or replacement of the valves as simple as possible.

Each pressure reducing valve cartridge can be removed for servicing of the integral stainless steel strainer, which is situated at the base of the cartridge to protect the seat of the valve. If unprotected, debris could cause poor flow rates and even hold the seat in the open position thus preventing the pressure reducing valve from working properly. As all working components are incorporated in the one-piece cartridge, it continues to ensure that the set pressure is kept whilst servicing is being undertaken. Other valves may need to be re-commissioned after each service or, if they include several different components, it is easy for these to be misplaced. The cartridge system means complete replacement cartridges can be used for maintenance or repair, which minimises site down time and means only one spare cartridge needs to be held in stock rather than several small components.

Some pressure reducing valves can be extremely noisy and cause annoyance, but each Reliance pressure reducing valve has been checked to ensure that any noise created does not exceed the 20dB limit: this is classed as a whisper on a decibel scale. Low noise is incorporated within the valve design so they comply with the European standard Class I BSEN 1567. The base of the cartridge has been specifically designed so that water will disperse, and thereby minimise noise. The comb also has a second significant purpose: by dispersing the water passing through the valve it alters the water flow turbulence, and this in turn reduces cavitations on the body of the valve.



RWC-Syr

Reliance has worked in partnership with the German manufacturer Syr for over 30 years and during these many years of experience we have built up a long lasting and productive relationship. Syr sets high standards: never content with current solutions, they are always pushing for a new improvement – something even easier to install or more closely satisfying customer requirements. All valves are 100% tested to ensure quality is set to the highest standard. Both Reliance and Syr are ISO-9001 registered, which ensures systems are in place and followed to maintain quality at the highest standard.

How to size a PRV

This is predominantly based on two different criteria: application and flow rates.

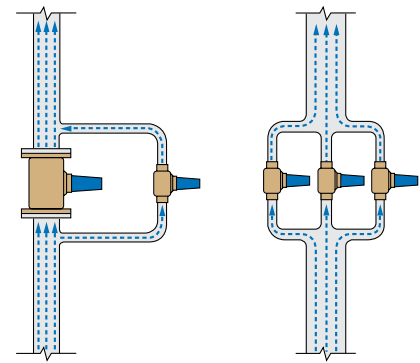
Application describes the type of property the valve is to be used in: whether it is commercial/industrial or a domestic installation.

Flow rate is the most important factor for sizing a pressure reducing valve. Sizing a valve incorrectly can cause several problems; if oversized the valve seat may open for a very small flow rate, which may occasionally be acceptable but over a long period of time can result in a wire drawing across the valve seat. A wire drawing occurs when the valve disc and seat position operate close to the shut-off point of the valve for extended periods of time. This then means the water flow scores a pathway in the seat material which remains when the valve closes tight to the shut-off position and allows a little flow and pressure to creep through the valve.

To calculate the flow rate you must work out how many outlets are required and what the combined maximum flow rate for these will be. You can then use the table to ascertain which size valve is required.

Pressure Reducing Valve Sizing Guide		
	Residential Building	Commercial Building
Size DN	Max flow rate Vs	Max flow rate Vs
15	0.5	0.5
20	0.8	0.9
25	1.3	1.5
32	2	2.4
40	2.3	3.8
50	3.6	5.9
65	6.5	9.7
80	9	15.3
100	12.5	23.3
125	17.5	34.7
150	25	52.8
200	40	92
250	75	139

For larger commercial applications various sizing solutions can be used: for example, if the flow rate is lower at some times than at others then using several smaller size PRVs in parallel may be more practical, or use one smaller valve as a bypass thus allowing water to flow easily through the valve when the flow rate is lower than normal, without causing either wire drawings or creating noise across the valve, as previously mentioned.



By-pass valve solution

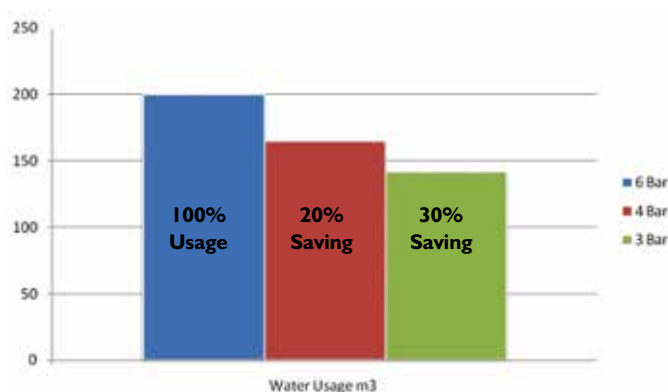
Multi-valve solution

Environmental Assessment Methods

breeam

BRE Environmental Assessment Method is a scheme which has been developed to assess the environmental performance of buildings. It has become a recognised scheme which sets the standard for good practice in sustainable design. BREEAM is used by some planning authorities as a condition of planning permission, which helps the local planning authorities to guarantee the build will have incorporated best environmental practice. BREEAM certified buildings are designed for lower energy use and water consumption. Local authorities have more to gain from this scheme since evidence shows that most sustainable developments not only have a lower impact on the environment through lower running cost and reduced carbon emissions, but even experience lower rates of crime and demonstrate improved health amongst residents (The Prince's Foundation for the Built Environment, Valuing Sustainable Urbanism Report, 2007). To meet the BREEAM requirements the contractor and architects must look at all aspects of the build, and for each applicable one they can gain BREEAM points for use of sustainable products or practice. All allocated points are then totalled to give a points rating based on the complete build, which is independently calculated, assessed and verified by a BREEAM approved assessor. More information about BREEAM is available at the website: www.breeam.org

The Code for Sustainable Homes (CSH) goes further than the standard building regulations but is completely voluntary, and is only intended to help promote higher standards in new properties, through reducing carbon emissions and creating homes that are more sustainable. It applies within England, Wales and Northern Ireland. The code measures the sustainability of the property by rating it against nine categories, one of which is water. The aim in this category is to reduce the consumption of potable water in the home from all sources, including borehole well water, through the use of water efficient fittings and appliances and water recycling systems. Each category has a certain number of credits available and assessment criteria to ascertain if the new property complies; this is usually carried out through the use of site records and visual inspections. Included in the water category is a section on Water Reduction Devices, which can help achieve lower flow rates as part of the water efficiency calculator. This is also covered within Part G of the Building Regulations, in which the calculation procedure must be carried out in line with the Water Efficiency Calculator For New Dwellings: www.communities.gov.uk/publications/planningandbuilding/watercalculator.



The average household of 2 adults and 2 children uses 200m³ of water a year. By installing a pressure reducing valve you can dramatically lower this usage, but still keep the same comfort level. For example, by reducing the incoming water pressure from 6 to 3 bar there is a 30% reduction in the water usage, as shown in the graph. This reduction in water usage means that home-owners will benefit from lower water bills, and may help to gain certification under BREEAM and CSH.

Easetet[®] 320 Domestic Pressure Reducing Valve

A high quality pressure reducing valve, designed for domestic applications, incorporating a unique easy-to-use 'lift and turn' adjustment mechanism.

Features and Benefits

- High flow rate design
- 'Lift and Turn' mechanism for ease of pressure adjustment
- One-piece Easetet cartridge
- Fully serviceable strainer



Product Range

Cold water up to 45°C

PRED 320 001 – 1/2" FBSP adjustable PRV 320F

PRED 320 005 – 3/4" FBSP adjustable PRV 320F

PRED 320 010 – 15mm adjustable PRV 320C

PRED 320 015 – 22mm adjustable PRV 320C

Hot water up to 80°C

PRED 320 050 – 1/2" FBSP adjustable PRV 320F

PRED 320 055 – 3/4" FBSP adjustable PRV 320F

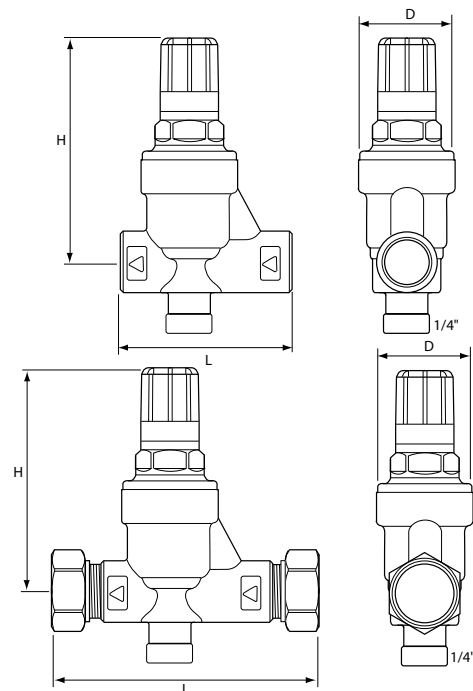
PRED 320 060 – 15mm adjustable PRV 320C

PRED 320 065 – 22mm adjustable PRV 320C

Materials

Body	DZR brass
Internal Components	DZR brass
Seals	NBR elastomer
Spring	Zinc plated spring steel
Strainer	Stainless Steel
Diaphragm	NBR elastomer nylon mesh
Cover	Glass filled nylon polymer

Dimensions



Size	L (mm)	H (mm)	D (mm)
DN15 FBSP	72	97	42
DN20 FBSP	74	97	42
15mm Comp	86	97	42
15mm Comp	88	97	42

Approvals & Standards

WRAS 0605101

DVGW

BSEN 1567

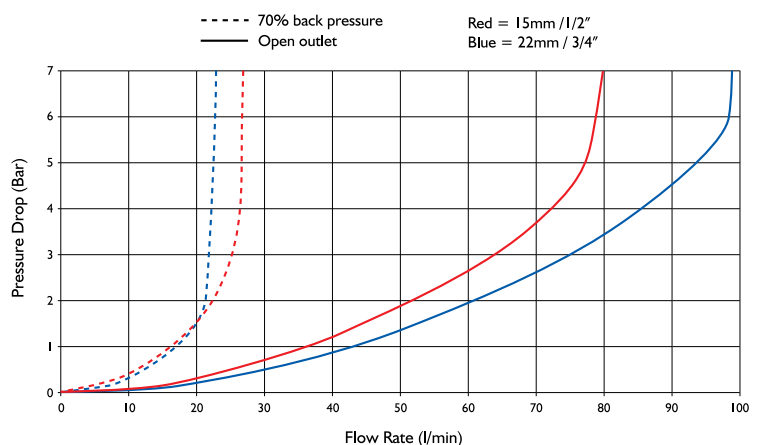
Specifications

Maximum working pressure	16bar
Adjustable set pressure	1.5-5.5bar
Pressure reduction ratio	10:1
Maximum working temperatures:	
Cold water version	45°C
Hot water version	85°C

Specify as

Product code: PRED 320 (select appropriate) WRAS approved pressure reducing valve with lift and turn adjustment mechanism, full flow strainer and all working components contained in a cartridge form with downstream test point, suitable for domestic applications.

Flow Characteristics



312compact Domestic Pressure Reducing Valve

Range of domestic pressure reducing valves, compact in design and suitable for various applications.

Features and Benefits

- Compact design
- Complete with gauge ports
- Cartridge
- Fully serviceable strainer



Product Range

- PRED 312 010 – 15mm Adj 1.5-6.0bar 312compact PRV
- PRED 312 015 – 22mm Adj 1.5-6.0bar 312compact PRV
- PRED 312 020 – 1/2" FBSP Adj 1.5-6.0bar 312compact PRV
- PRED 312 025 – 3/4" FBSP Adj 1.5-6.0bar 312compact PRV

Materials

Body	DZR brass
Internal Components	DZR brass
Seals	NBR elastomer
Spring	Zinc plated spring steel
Strainer	Stainless steel
Diaphragm	NBR elastomer nylon mesh
Cover	Glass filled nylon polymer

Approvals & Standards

WRAS
DVGW
BSEN 1567

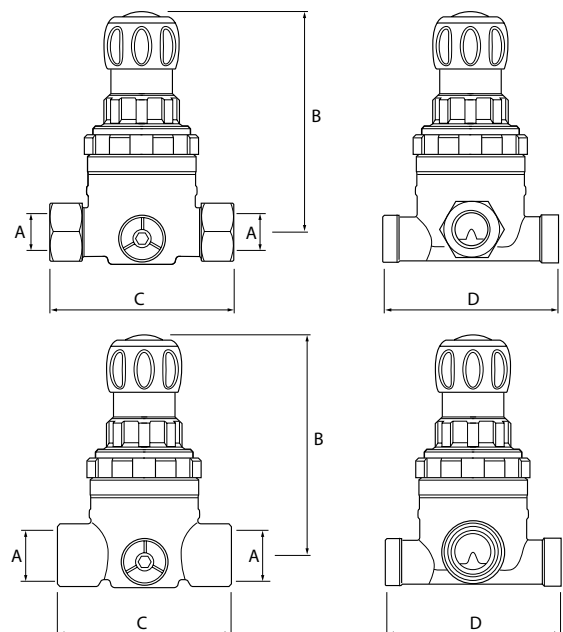
Specifications

Maximum working pressure	16bar
Adjustable set pressure	1.5-6.0bar
Pressure reduction ratio	10:1
Maximum Temperature	45°C

Specify as

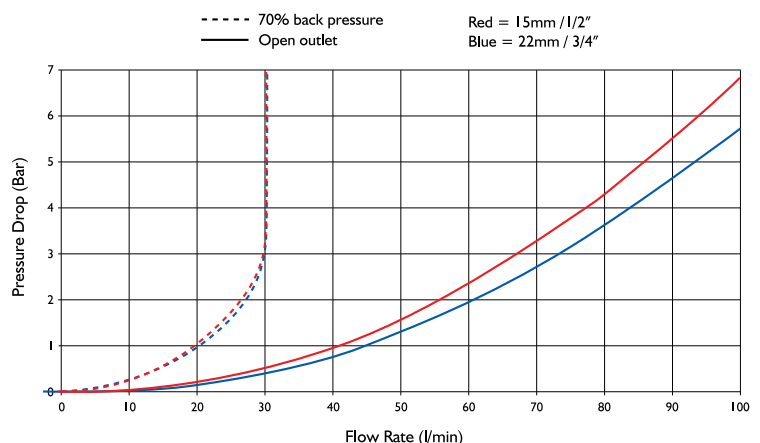
Product code: PRED 312compact (select appropriate) WRAS approved pressure reducing valve, and all working components contained in a cartridge form with two downstream test points, one either side, suitable for domestic applications.

Dimensions



Part Code	A	B (mm)	C (mm)	D (mm)
PRED 312 010	15mm	92	62	74
PRED 312 015	22mm	92	65	74
PRED 312 020	1/2" FBSP	92	72	74
PRED 312 025	3/4" FBSP	92	76	74

Flow Characteristics



315i Commercial Pressure Reducing Valve

A range of commercial pressure reducing valves, incorporating a unique indicator so the set pressure can be identified easily without the need for a pressure gauge.

Features and Benefits

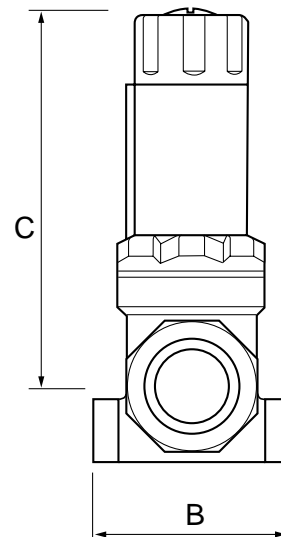
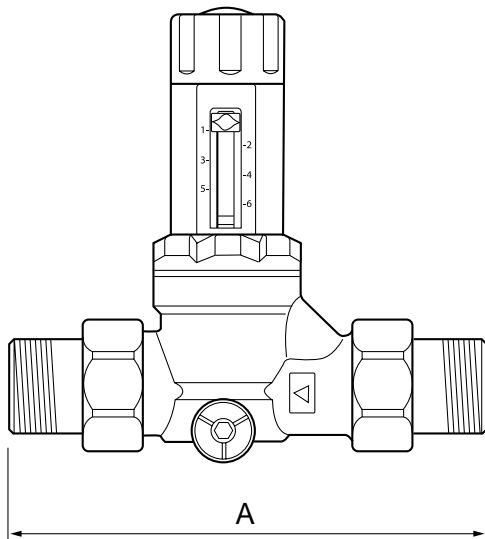
- Easy-to-read pressure indicator
- Robust design
- Fully serviceable strainer
- Suitable for hot and cold supplies

Product Range

- PRED 315 010 – ½" MBSP Adj 1.5-6.0bar 315i PRV
- PRED 315 020 – ¾" MBSP Adj 1.5-6.0bar 315i PRV
- PRED 315 030 – 1" MBSP Adj 1.5-6.0bar 315i PRV
- PRED 315 040 – 1¼" MBSP Adj 1.5-6.0bar 315i PRV
- PRED 315 050 – 1½" MBSP Adj 1.5-6.0bar 315i PRV
- PRED 315 060 – 2" MBSP Adj 1.5-6.0bar 315i PRV
- PRED 315 070 – 15mm Capillary Adj 1.5-6.0bar 315i PRV
- PRED 315 080 – 22mm Capillary Adj 1.5-6.0bar 315i PRV
- PRED 315 090 – 28mm Capillary Adj 1.5-6.0bar 315i PRV



Dimensions



Part Code	A (mm)	B (mm)	C (mm)
PRED 315 010	130	74	103
PRED 315 020	138	74	103
PRED 315 030	170	84	132
PRED 315 040	191	94	194
PRED 315 050	220	94	194
PRED 315 060	255	94	187
PRED 315 070	104	74	103
PRED 315 080	124	74	103
PRED 315 090	148	84	132

Materials

Body	DZR brass
Internal Components	DZR brass
Seals	EPDM
Strainer	Stainless steel
Diaphragm	EPDM
Cover	ABS

Specify as

Product code: PRED 315 (select appropriate)
 WRAS approved pressure reducing valve with full flow strainer and all working components contained in a cartridge form, with two downstream test points.
 Clear pressure indicator on side of cartridge.
 Suitable for commercial applications.

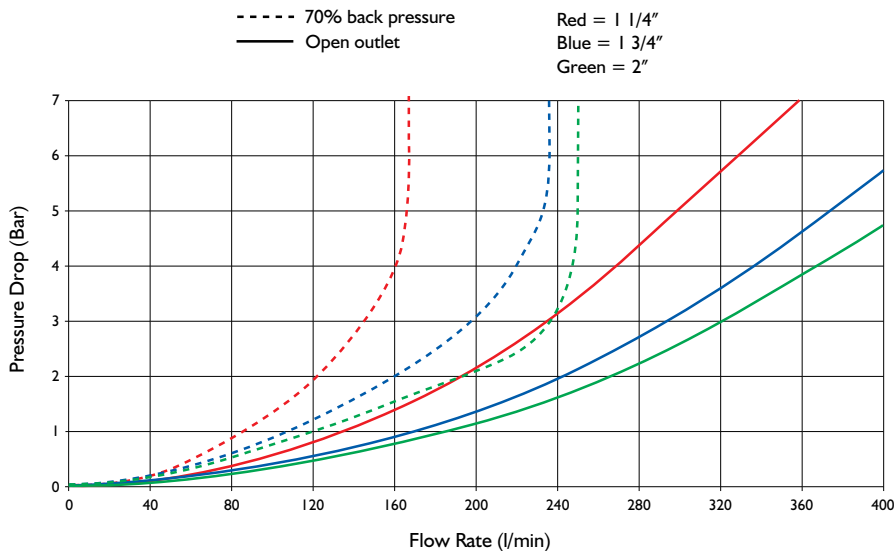
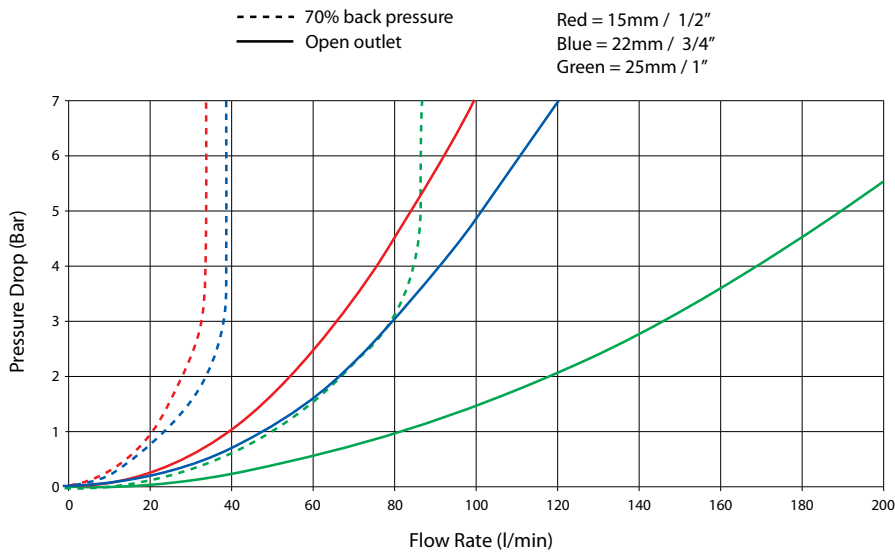
Approvals & Standards

WRAS
 DVGW
 BSEN 1567

Specifications

Maximum working pressure 25bar
 Adjustable set pressure 1.5-6.0bar
 Pressure reduction ratio 10:1
 Maximum temperature 70°C

Flow Characteristics



6247 Commercial/Industrial Pressure Reducing Valve

High flow rate pressure reducing valve, which provides accurate pressure control for commercial or industrial applications.

Features and Benefits

- Accurate pressure control
- Robust design
- One piece cartridge
- Upstream and downstream test points

Product Range

PRED 624 001 DN65 Adjustable 6247 PRV

PRED 624 002 DN80 Adjustable 6247 PRV

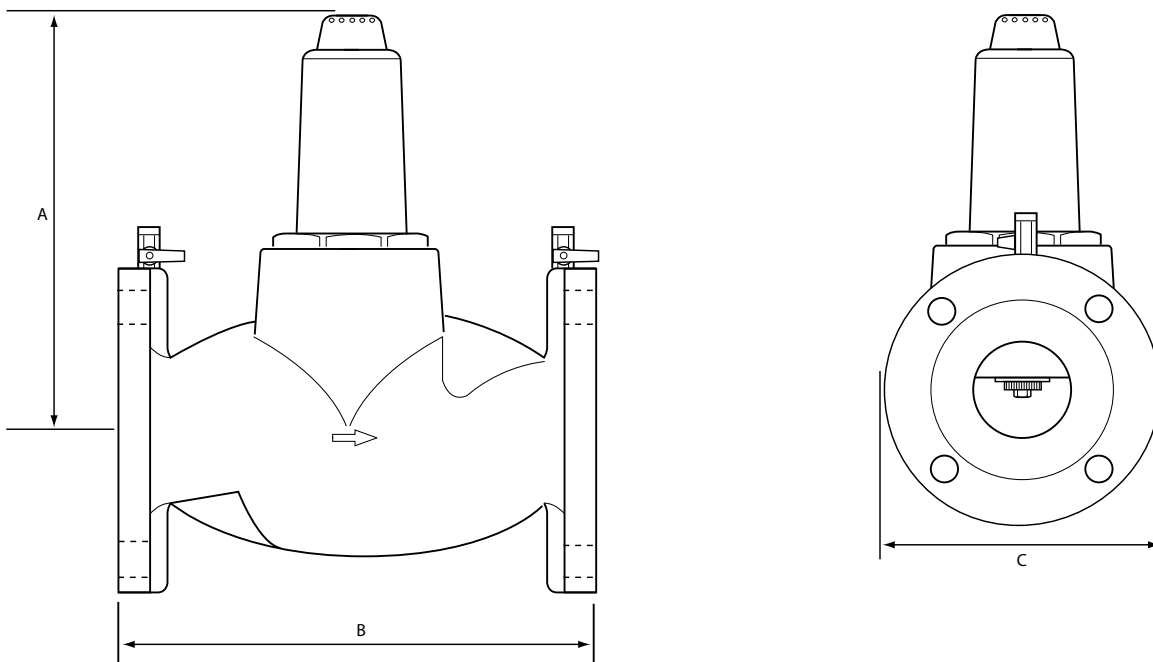
PRED 624 003 DN100 Adjustable 6247 PRV

Materials

Body	Bronze
Cover	ABS plastic
Seals	EPDM
Diaphragm	EPDM
Strainers	Stainless steel
Spring	Stainless steel



Dimensions



Part Code	A (mm)	B (mm)	C (mm)
PRED 624 001	283	290	185
PRED 624 002	283	310	200
PRED 624 003	283	350	220

Approvals & Standards

WRAS

DVGW

BSEN 1567

Specifications

Maximum working pressure 16bar

Adjustable set pressure 1.5-6.0bar

Maximum Temperature 45°C

Strainer 0.25mm

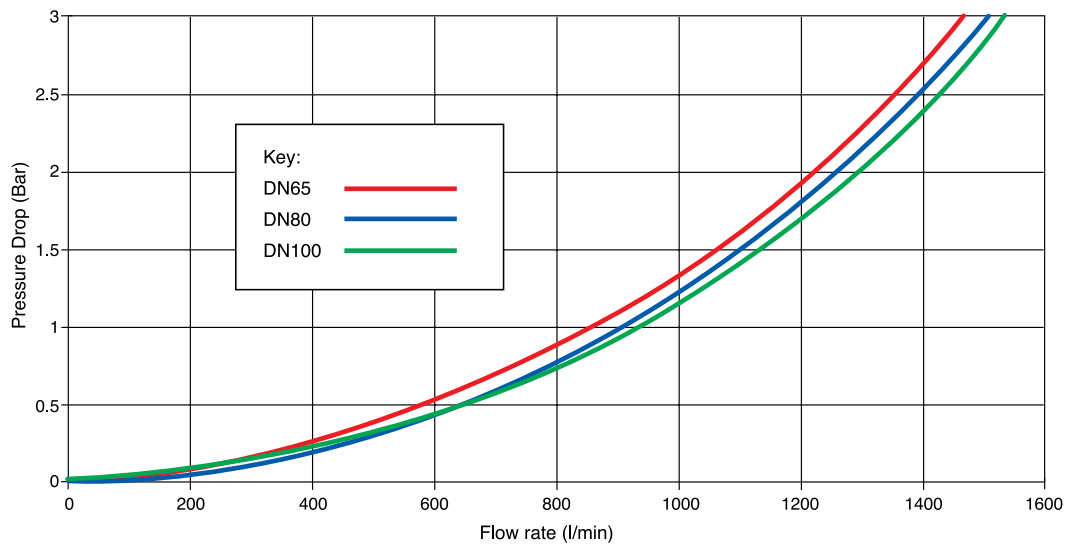
Flange PN16

Media Water/Compressed air

Specify as

Product code: PRED 624 (select appropriate) WRAS approved pressure reducing valve, with in-line cartridge and full flow coaxial strainers, and all working components contained in a single cartridge. PN16 Flanged.

Flow characteristics



PRESSURE REDUCING VALVES



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