

# Planning Fundamentals

## Pressure reducing valve type 582

### Overview

#### Pressure reducing valve type 582



### 1. Product description

The pressure reducing valve type 582 reduces the outlet pressure to a pre-determined value.

#### Function

Pressure on the downstream side (outlet) acts against the spring force inside the valve and lifts the membrane until equilibrium is reached. Desired value of outlet pressure is regulated by adjusting spring force. Therefore pressure on the outlet pressure remains constant despite fluctuations upstream (inlet) since outlet pressure is not in direct relation to inlet pressure.

Pressure peaks on the inlet side are not affecting diaphragm movement, thus sensitive equipment downstream can be protected.

In order to increase set-pressure the spindle on top of the valve has to be turned clockwise, while counter-clockwise turning reduces set-pressure. Molded arrows indicating flow direction and handling facilitate operation. Pressure reducing valves are often used to protect tools downstream from overpressure.

#### Product features

- Pressure regulation even during operation possible
- Manometer optional for neutral and aggressive media
- Various connection options due to true union or spigot version
- Low pressure spring set available
- Easy on spare parts due to modular design, one part might fit more than one valve

### 2. Technical Basics

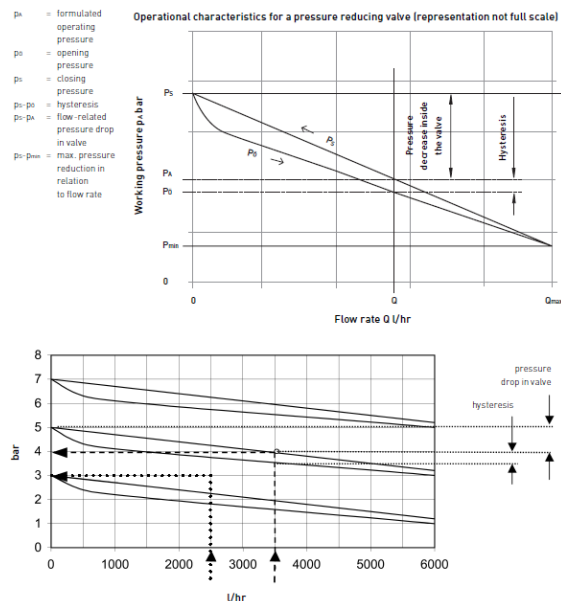
#### What is hysteresis?

Hysteresis is the difference between opening and closing pressure for a pressure regulating valve at a given flow rate  $Q$ . It is the result of frictional force on the cartridge, flow and spring forces. A small hysteresis will lead to increased accuracy in pressure regulation.

## Hysteresis type 582

Difference between opening and closing pressure: Approx. 0.1- 0.4 bar (1.5 – 5.8 psi)

## How to measure hysteresis?



Hysteresis curves obtained for a set-pressure (at the outlet) of 7, 5, 3 and 1 bar (both springs) as well as 3 and 1 bar (small spring only). The inlet pressure is held stable at 9 bar. Flow is steadily increased until the maximum is reached and decreased again. To determine hysteresis inlet and outlet pressure as well as flow rate are measured.

For the detailed characteristics please refer to Characteristics Valve type 582

## What is pressure drop?

Every piping system produces a pressure drop due to frictional forces acting on the pipe walls, fittings, valves, etc. This pressure drop is unwanted since it essentially is an energy loss for the system. The most important parameters when calculating pressure drop is the flow velocity and the fluid

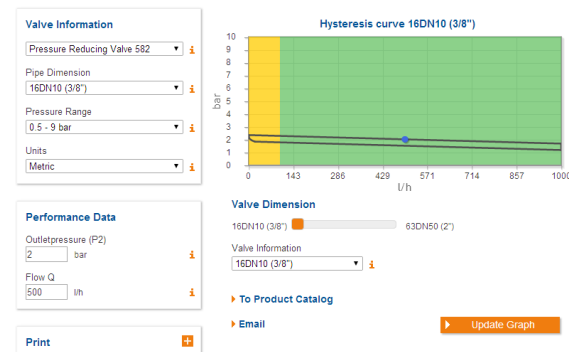
viscosity, although elements like valves can also increase energy loss. Therefore drag coefficients  $\zeta$  have to be taken into consideration, when planning a piping system.

## 3. Finding the Right Valve

The ideal valve size, which is detrimental for system performance, can be easily determined by entering a set of parameters (pipe size, desired outlet pressure, etc.) into the online tool. The valve sizing tool can be accessed under:

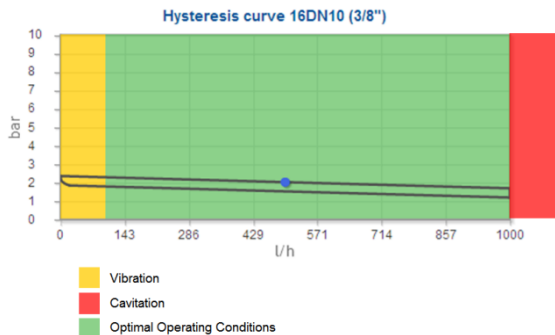
[www.gfps.com/prv](http://www.gfps.com/prv)

or by following the QR code:

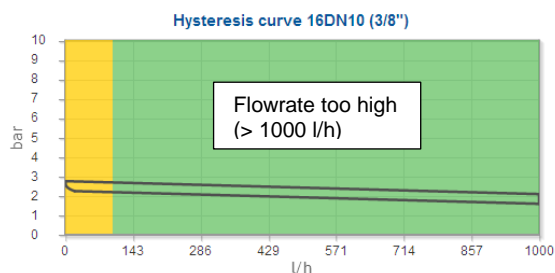


In case the online tool is not at hand, the right valve dimension can also be determined with the hysteresis curves. Diagrams are shown for a velocity up to 2m/s. In general a valve dimension equal to the pipe dimension is a good start point. Depending on pressure and flow rate, you will have the operating point somewhere on the curve. If this is not the case your operating conditions might be out of the valve size flow range (flow rate too high). Also if the operating point is at the first 10% of the

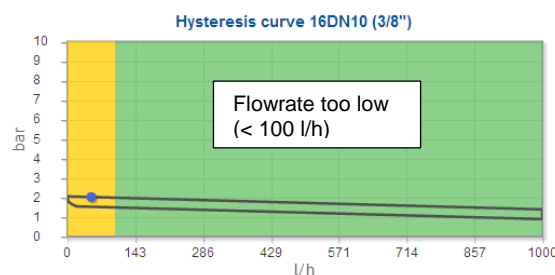
chart this condition is not ideal since vibrations may occur. In these cases different valve dimension have to be chosen for the application.



In case the flow rate is exceeding the maximum value (see graphic below) of the diagram the valve dimension is too small and the next larger valve should be taken into consideration, since the valve would most likely lead to cavitation.



In case the flow rate is too low (see graphic below) the valve is too large and therefore a smaller valve should be chosen for the application. Valves too small lead to vibrations and consequently reduce valve lifetime.



#### 4. Valve Handling

##### Instructions for installation

- Make sure pressure and flow rate are not exceeding valve specifications
- Check for damage before installation, do not install damaged valves
- Ensure a tension-free installation of the valve
- For an optimal flow rate the valve should be installed in an undisturbed area of the pipe and with a 10 x DN distance to manifolds, throttle, valves, etc.
- Please pay attention to the flow direction indicated by the arrow on the valve body
- We recommend installing a strainer upstream to avoid particles in the flow path

##### Instructions for maintenance

Pressure regulating valves of type 582 require very little maintenance after installation. Although, depending on flow medium sometimes cleaning is required. For detailed information please refer to the corresponding user manual.

GF suggest using an isolating valve for that purpose. GF piping systems offer a wide range of different isolating valves depending on your operating parameters.

## 5. Technical Details

### Dimensions

DN 10 - DN 50 (3/8" – 2")

### Pressure Rating

PN 10 @ +20°C (150 psi @ 68°F)

### Set-range

Standard: 0.5 - 9.0 bar (7 – 130 psi)

Optional: 0.3 - 3 bar (4 – 44 psi)

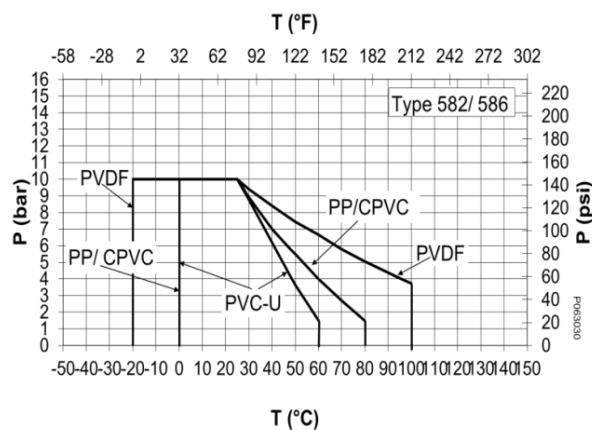
### Connection

Spigot version can be cemented or welded, while true Union version is compatible with all standard GF unions and inserts.

On request, various inserts from the GF range, e.g. transition to metal or PE, are available

### Pressure-/Temperature diagram

Below diagram is based on an entire life cycle of 25 years with water or similar media.



*P* permitted pressure in bar, psi

*T* temperature in °C, °F

### Kv Values

KV100 @  $\Delta p = 1$  bar

CV100 @  $\Delta p = 1$  psi

DN [mm]	inch	d [mm]	K <sub>V100</sub>		
			[l/min]	[l/h]	[gpm]
10	3/8	16	45	2'700	11.9
15	1/2	20	48	2'850	12.5
20	3/4	25	112	6'700	29.5
25	1	32	129	7'730	34.0
32	1 1/4	40	254	15'240	67.1
40	1 1/2	50	293	17'590	77.4
50	2	63	319	19'170	84.4

### Standards

Tightness according to ISO 9393

Leak rate according to EN 12266

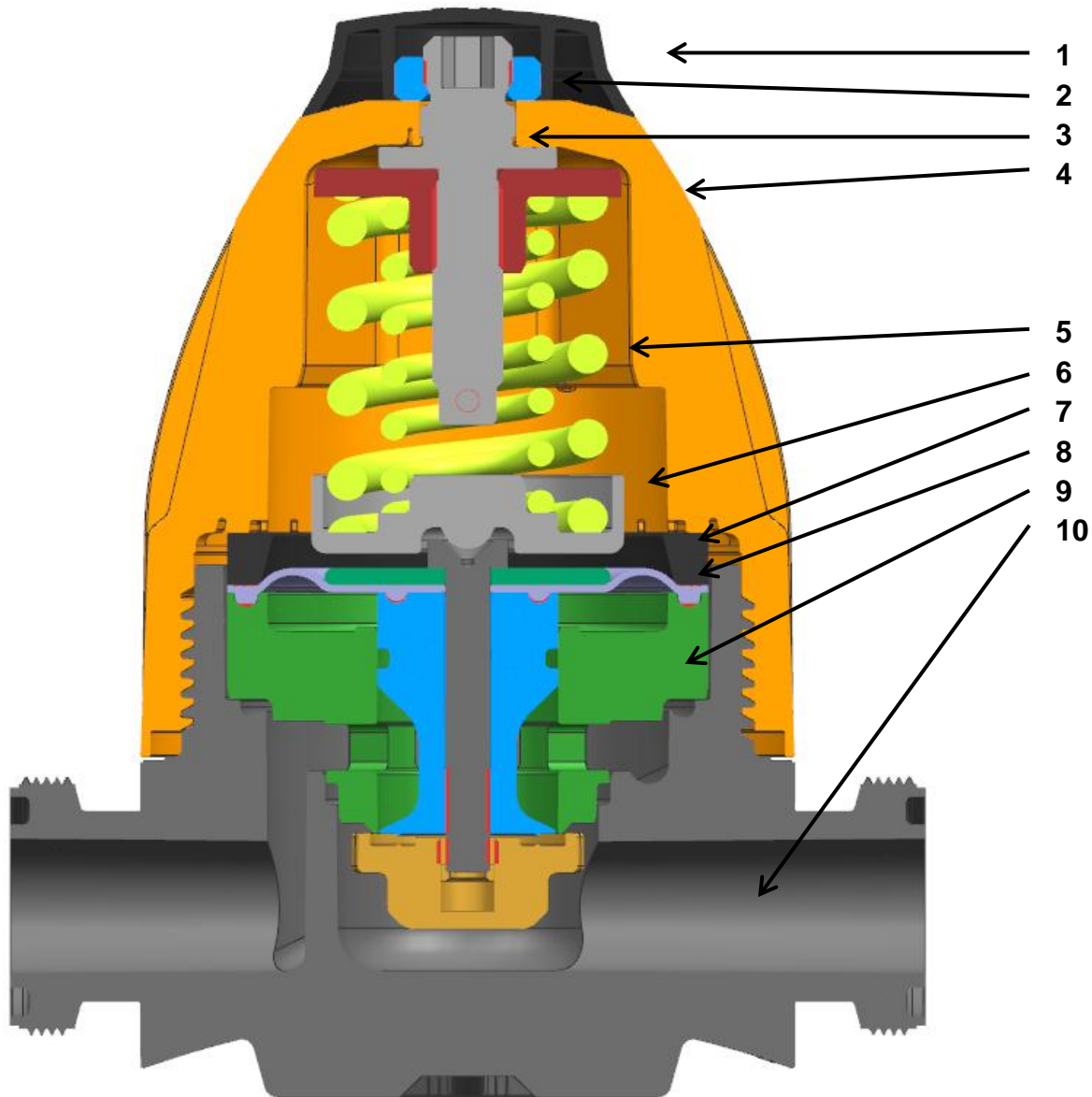
### Further information / Tips & Tricks

PRV type 582 can also be used in combination with check valves, which are a simple and effective way to prevent backflow.

This type of valve always needs backpressure to operate. Normally the piping system generates enough by itself. If trying to test with a small piece of pipe make sure to provide enough backpressure, e.g. a ball valve at the outlet.

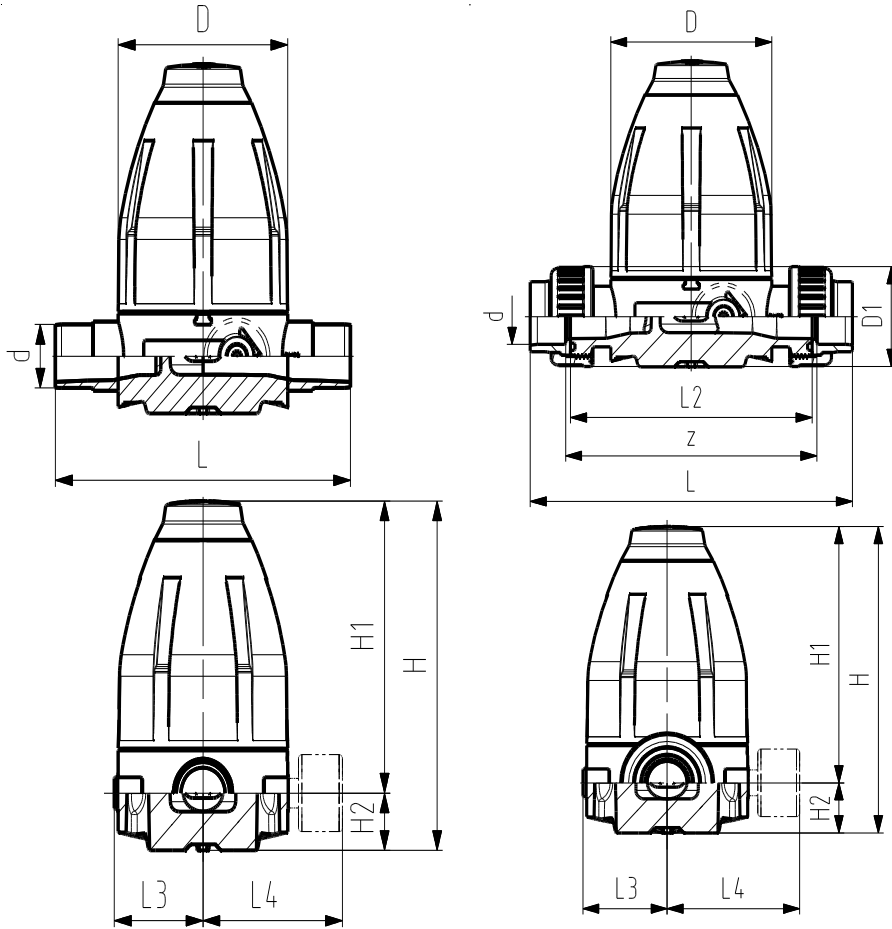
Please refer to [www.gfps.com](http://www.gfps.com) for more information

### Cross-sectional view



No.	Description	Material
1	Cover Cap	PE
2	Locking Nut	1.4301 (304 Stainless Steel)
3	Spindle	1.4305 (X8CrNiS18-9M; AISI 303)
4	Housing Top	PP-GF
5	Springs	Spring steel EN 10270-1 SH (C)
6	Pressure piece	1.4305 (X8CrNiS18-9M; AISI 303)
7	O-ring	EPDM or FPM
8	Membrane	EPDM coated with PTFE
9	Cartridge with Diaphragm	PVC-U, PVC-C, PP-H or PVDF
10	Body	PVC-U, PP, PVDF

## Dimensions



All Materials	d (mm)	DN (mm)	DN (inch)	D	H	H1	H2
	16   20	10   15	3/8   1/2	79	132	111	21
	25   32	20   25	3/4   1	100	177	148	29
	40   50	32   40	1 1/4   1 1/2	147	251	207	44
	63	50	2	147	251	207	44

All Materials if not indicated	d (mm)	DN (mm)	DN (inch)	L* PVC/ PP	L* PVDF	L2	L3	L4	z PVC/ PP	z PVDF
	16   20	10   15	3/8   1/2	134	150	120	42	77	126	130
	25   32	20   25	3/4   1	174	190	150	53	88	156	160
	40   50	32   40	1 1/4   1 1/2	224	240	205	76	111	211	215
	63	50	2	244	260	205	76	111	211	215

\* L for Spigot Version only

## Characteristics Valve type 582

The curves below are valid for the set range 0.5 - 9.0 bar (7 – 130 psi) and show the secondary or outlet pressure P2 over the flow Q in l/h. Parameter is the set pressure pE at Q = 0 l/h. The curves are valid for water at +20 °C for a flow velocity of 2 m/s. Special version set range 0.3 – 3 bar (4 – 44 psi) available on request.

