

# Pressure Retaining Valve V786



## General

### Function

The V786 Pressure Retaining Valve serves to keep the working or system-related pressures constant, to balance out pressure pulsation and to reduce pressure peaks in chemical process systems. If the inlet pressure rises above the set value, the pressurized valve piston is lifted against the spring force. Consequently, the valve opens and there is a reduction of pressure in the outlet pipe. The valve closes as soon as the inlet pressure sinks below the pre-set spring tension.

The wide range of materials available for the housings (PVC-U, PP, PVDF) and the diaphragms (EPDM, EPDM-PTFE-coated) cover many areas of application for technically pure, neutral and aggressive fluids as well as ultra-pure water applications. For more information, please refer to the Georg Fischer Piping Systems List of Resistance. We recommend installing a strainer upstream to avoid any breakdowns.

### Special features

- All parts in contact with the medium are made of highly resistant plastics.
- The actuator is separated and hermetically sealed off from the flow section by the control diaphragm.
- The working pressure is set with an adjusting screw and locked with a locknut.
- The streamlined design of the housing makes for good flow rates.
- The large control surface and the spiral spring keep standard tolerances small.
- No auxiliary energy is required to operate the valve.
- The valve is largely maintenance-free and can be installed in any position.
- Valve can also be adjusted under working pressure.

# Technical data V786

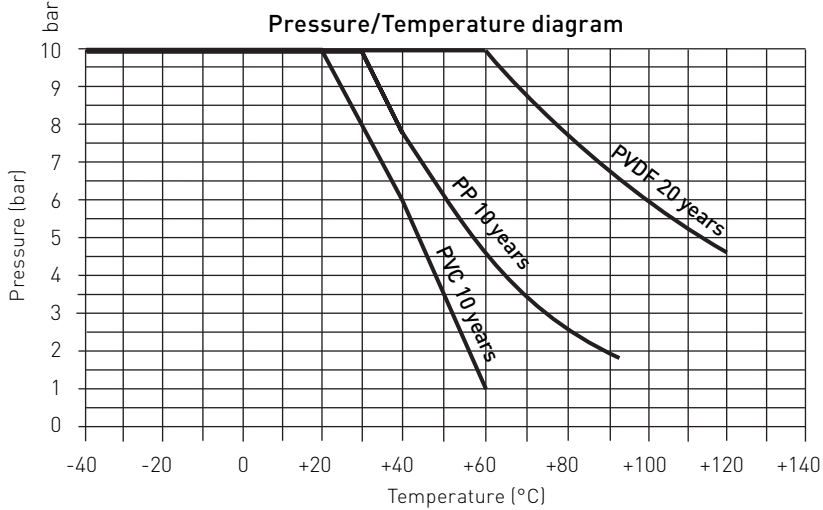
## Available materials

Valve housing: PVC-U, PP, PVDF  
 Diaphragm: EPDM, EPDM-PTFE-coated  
 Pressure range: DN 10–DN 25: 0.5–10 bar  
 DN 32–DN 40: 0.5–4 bar

## Allowable working temperature

PVC-U 0 to + 60 °C  
 PP -10 to + 80 °C  
 PVDF -40 to + 100 °C

## Working pressure



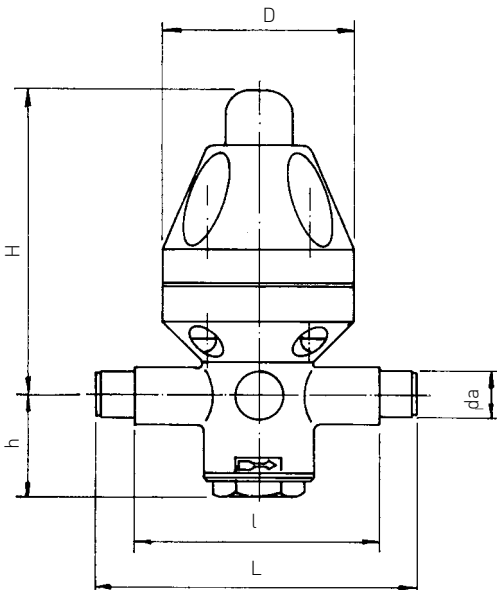
## Adjustment range for working pressure upstream of the valve

DN 10–DN 25: 0.5 to 10 bar  
 DN 32–DN 40: 0.5 to 4 bar

## Alternative DN 32–DN 40:

For pressures **greater than 4 bar**, the **pressure retaining valve V186** can be used.

## Dimensions and weight V786



da	DN	L: PVC-U cement spigots PP/PVDF fusion spigots	L: PVDF-HP/PP butt fusion spigots BCF/IR	l	H	h	D
16	10	134	-	102	138	38	83
20	15	134	172	102	138	38	83
25	20	154	190	110	205	55	112
32	25	154	190	110	205	55	112
40	32	224	262	162	248	85	165
50	40	224	262	162	248	85	165

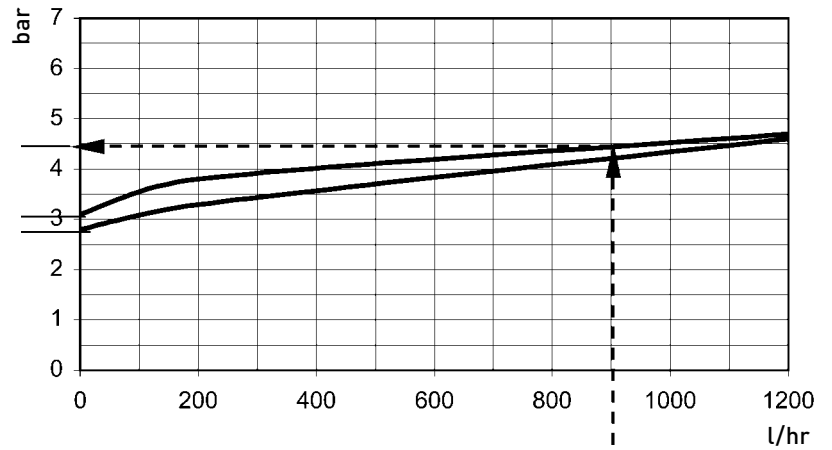
da	DN	Weight (kg) PVC-U	PP	PVDF
16	10	0.62	0.45	0.64
20	15	0.62	0.45	0.68
25	20	1.70	1.28	1.89
32	25	1.70	1.28	1.91
40	32	4.84	3.48	6.30
50	40	4.84	3.46	6.24

Cement and fusion spigots according to DIN/ISO

The valve characteristics diagram shows the primary or working pressure  $p_A$  in bar in relation to the flow rate  $Q$  in l/hr.

The parameter is the set pressure  $p_E$  at  $Q = 0$  l/hr. The curve indicates the opening pressure progression. The characteristics apply to water at +20 °C.

Working pressure  
Opening pressure  
Closing pressure

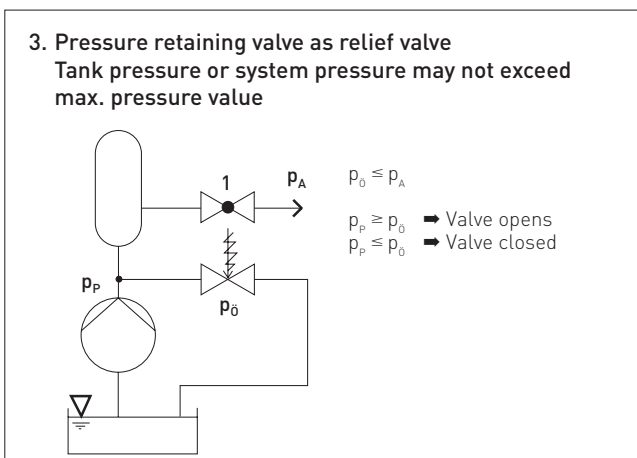
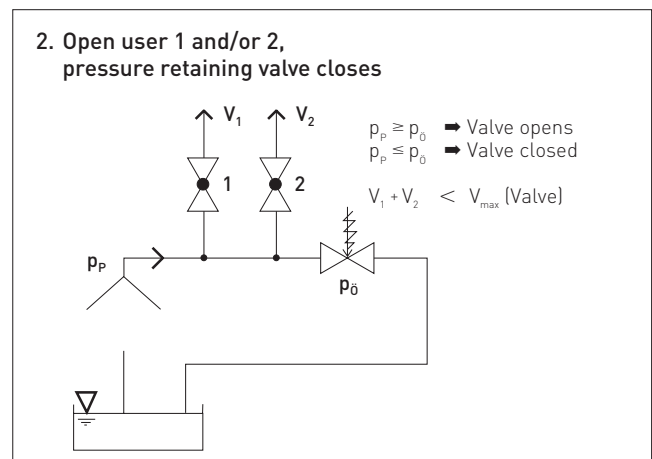
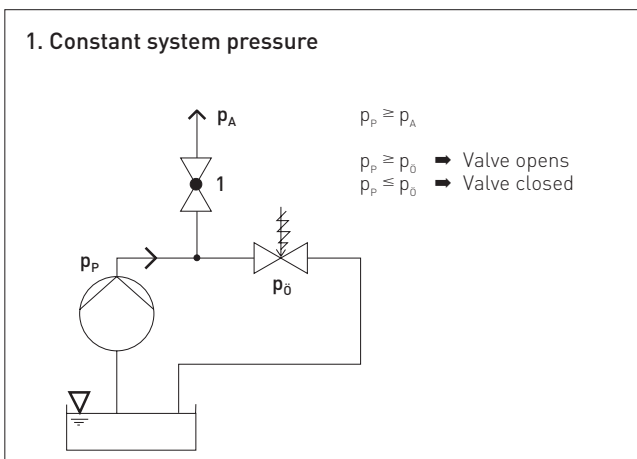


**Example:**

A valve XY is adjusted at 3 bar. If the flow is increased to 900 l/hr, the input pressure increases to 4.5 bar. According to the characteristics, the following values apply:

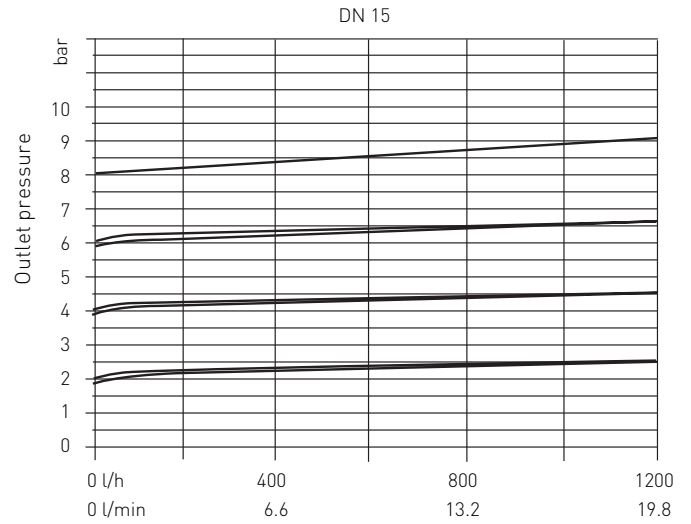
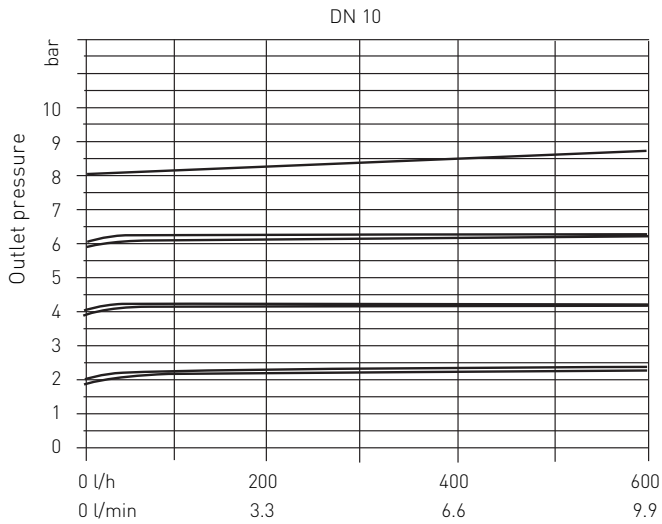
- Working pressure approx. 4.5 bar
- Opening pressure approx. 3.1 bar
- Closing pressure approx. 2.8 bar

**Installation examples for pressure retaining valves:**

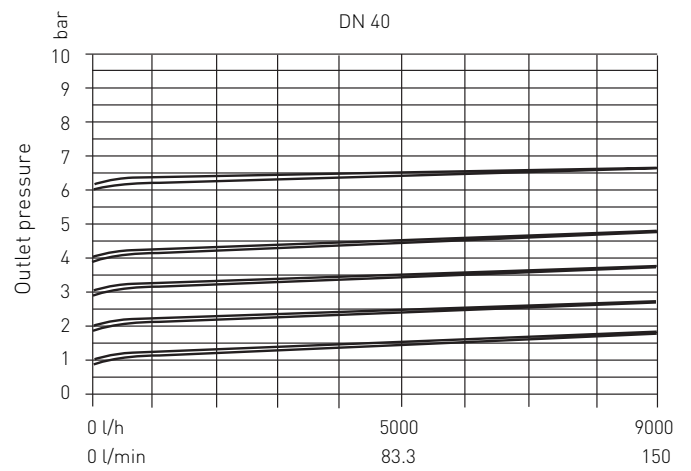
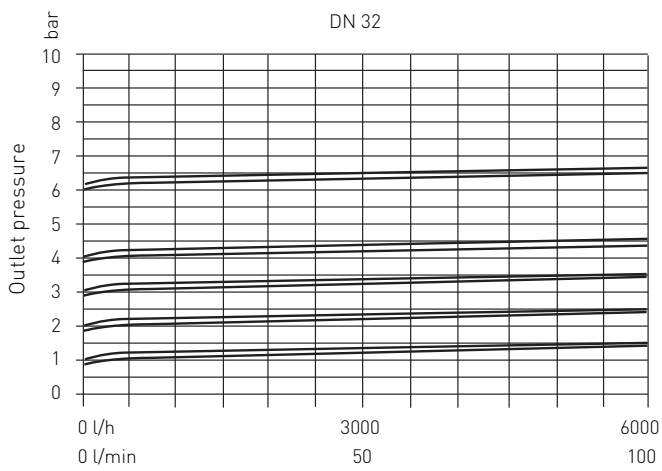
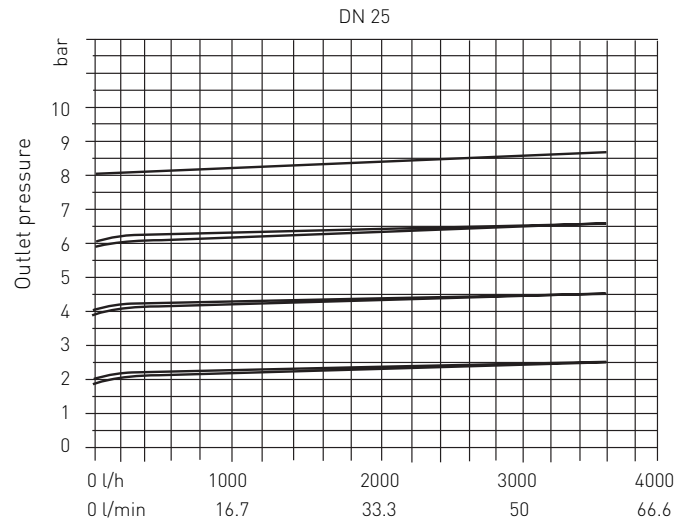
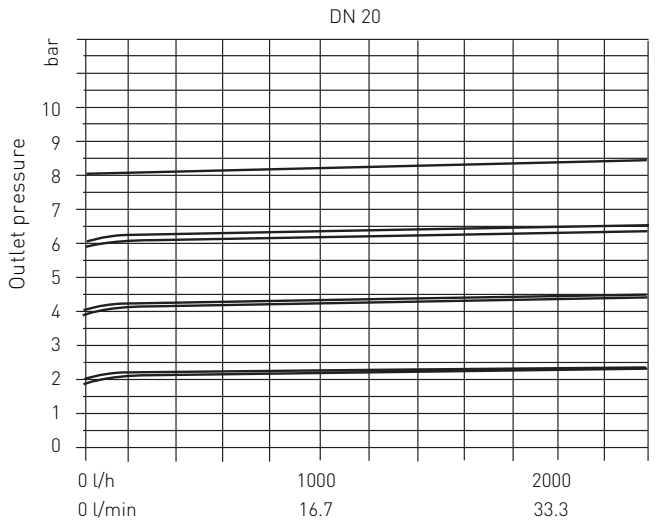


$p_A$  = working pressure  
 $p_P$  = pump pressure  
 $p_0$  = opening pressure

# Characteristics V786



Characteristics are valid for a flow rate of 2 m/s



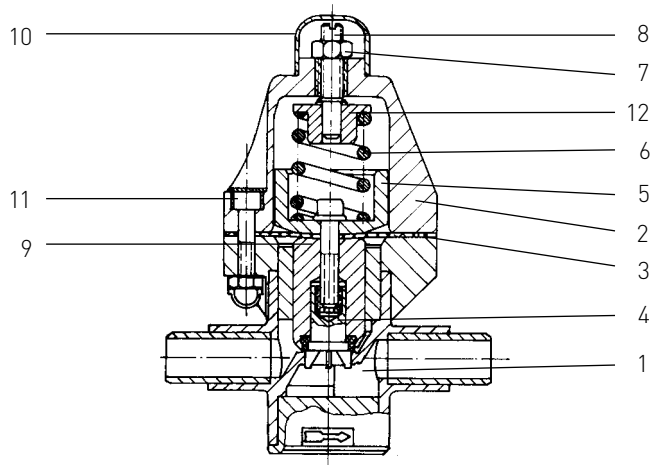
l/hr = Flow volume H<sub>2</sub>O

## Order number

DN	da	Adj. range in bar	PVC-U		PP		PP/IR spigots		PVDF-PTFE Standard	HP Version* BCF/IR spigots
			EPDM	PTFE	EPDM	PTFE	EPDM	PTFE		
110	16	0.5 - 9	199 041 090	199 041 096	199 041 102	199 041 108	-	-	199 041 114	-
15	20	0.5 - 9	199 041 091	199 041 097	199 041 103	199 041 109	199 041 431	199 041 437	199 041 115	199 041 198
20	25	0.5 - 9	199 041 092	199 041 098	199 041 104	199 041 110	199 041 432	199 041 438	199 041 116	199 041 199
25	32	0.5 - 9	199 041 093	199 041 099	199 041 105	199 041 111	199 041 433	199 041 439	199 041 117	199 041 200
32	40	0.5 - 4	199 041 094	199 041 100	199 041 106	199 041 112	199 041 434	199 041 440	199 041 118	199 041 201
40	50	0.5 - 4	199 041 095	199 041 101	199 041 107	199 041 113	199 041 435	199 041 441	199 041 119	199 041 202

\* PVDF - PTFE Standard with IR spigots on request. Flange and union versions on request

## Sectional drawing V786



## Parts

No.	Description
1.	Valve body
2.	Upper valve body
3.*	Diaphragm
4.*	Piston
5.	Compressor
6.*	Compression spring
7.	Lock nut
8.	Adjusting screw
9.	Cylinder screw
10.	Cap
11.	Hexagonal socket-head bolt with nut and covering cup
12.	Spring plate

\* Parts subject to wear or recommended spare parts

## Assembly instructions

1. Dismantle the upper valve body:
  - 1.1 Put the valve in an upright position
  - 1.2 Unscrew the cap (14)
  - 1.3 Undo the locknut (7) on the adjusting screw (8) and undo the adjusting screw until the compression spring (6) is fully released
  - 1.4 Remove the covering caps on the screws (11) of the upper body and undo the screws
  - 1.5 Lift the upper body (2) upwards and remove the spring plate (12) and the spring (6)
2. Dismantle the lower valve body and the diaphragm:
  - 2.1 Carry out steps 1.1 to 1.5
  - 2.2 Remove the complete piston (4) with the diaphragm (3) and the pressure plate (5) from the lower valve body (1)
  - 2.3 Clamp the piston in a vice so that the diaphragm is on top
  - 2.4 Undo the screw (9) and remove the pressure plate with the diaphragm

These steps are carried out in reverse order to reassemble!

Please see individual parts for positions and assembly diagrams!

## Operating faults and possible causes

Fault	Cause	Correction
Valve not sealed at the diaphragm	Diaphragm not pressed on hard enough	Tighten screws (10)
Pressure falls below the set value	Piston base (2) not sealed	Check piston and piston base seal and possibly replace. Dismantle lower body 1.1-2.4
	Diaphragm (3) not sealed	Replace diaphragm, dismantle lower valve body 1.1-2.4
Medium leaks out at the adjusting screw	Diaphragm is faulty	Replace diaphragm, dismantle lower valve body 1.1-2.4

## Installation advice:

We recommend installing the fittings between 2 detachable pipe connections.

## Authorized Distributor:

**Aetna Plastics Corp. 1702 St. Clair Ave. Cleveland, Ohio 44114 • Tel: 800-634-3074  
216-781-4421 • Fax: 216-781-4474 • sales@aetnaplastics.com • www.aetnaplastics.com**

# Pressure Retaining Valve V186/V86



## General

### Function

The V186/V86 Pressure Retaining Valve serves to keep the working or system-related pressures constant, to balance out pressure pulsation and to reduce pressure peaks in chemical process systems. If the inlet pressure rises above the set value, the pressurized valve piston is lifted against the spring force. Consequently, the valve opens and there is a reduction of pressure in the outlet pipe. The valve closes as soon as the inlet pressure sinks below the pre-set spring tension.

When used as a bypass, it can also function as a relief valve to reduce pressure peaks. Due to the zero static design of the lower part, the valve is also suitable for use in ultra-pure water applications, as well as for technically pure, neutral and aggressive fluids. For more information, please consult the Georg Fischer Piping Systems List of Resistance.

### Special features

- Compact construction
- Good control characteristics
- Low maintenance due to uncomplicated design
- Control unit is hermetically separated from flow medium by standard EPDM or EPDM-PTFE-coated diaphragm
- Zero static lower body (V186)
- Mounting position depends on flow direction
- Valve mounting with threaded insert on lower body
- Adjustment range: 0.5–9 bar
- Valve can also be adjusted under working pressure

# Technical data V186/V86

## Available materials

Valve housing: PVC-U, PP, PVDF  
 Diaphragm: EPDM,  
 EPDM-PTFE-coated

## Pressure ranges:

DN 10–50 0.5–10 bar Series V186  
 DN 65–80 1.0–6 bar Series V86  
 DN 100 1.0–4 bar Series V86

## Connections

Cement or fusion spigot according to ISO/DIN.  
 Available with union or flange on request.

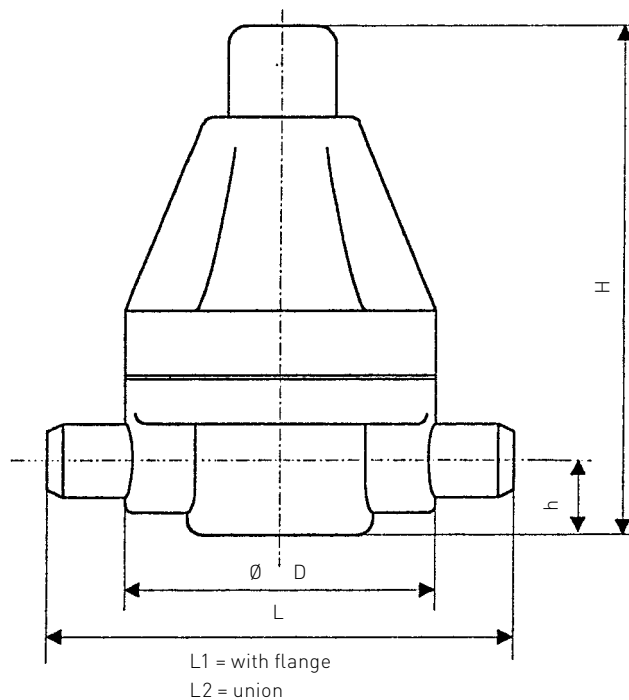
## Allowable working temperature

PVC 0 to + 60 °C  
 PP –10 to + 80 °C  
 PVDF –20 to + 100 °C

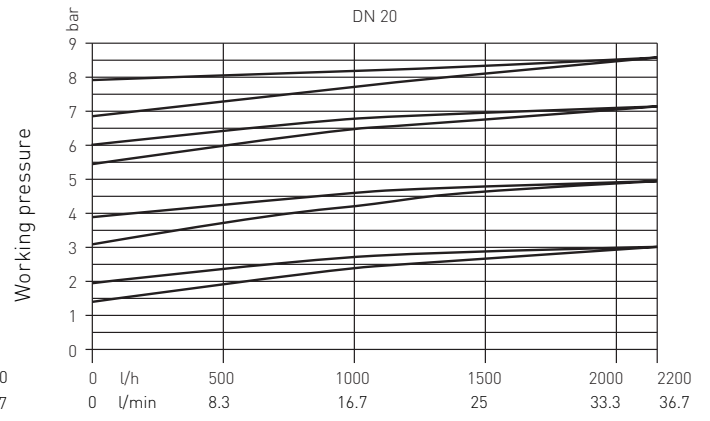
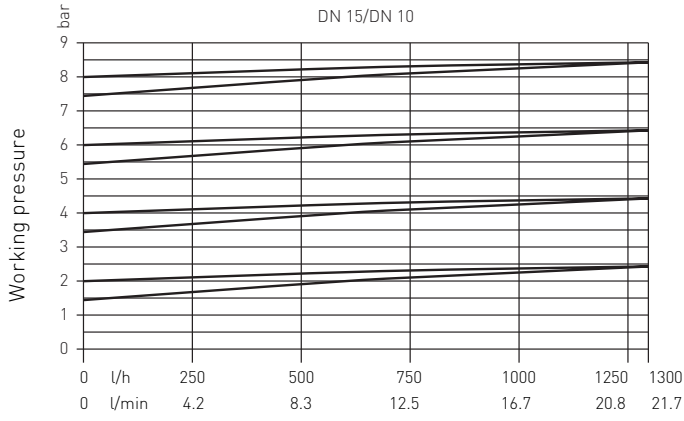
## Dimensions and weight V186/V86

DN	L: PVC-U cement spigots PP/PVDF fusion spigots		PVDF-HP/PP butt fusion spigots BCF/IR	L1	L2	Ø D	h
10	134		–	140	154	83	20
15/20	134		158	140	154	83	20
25	174		198	180	185	112	27
32	174		202	230	248	165	43
40	224		256	230	248	165	43
50	244		256	250	252	165	43
65	284		284	290	280	180	230
80	360		360	310	–	250	320
100	380		380	390	–	250	415

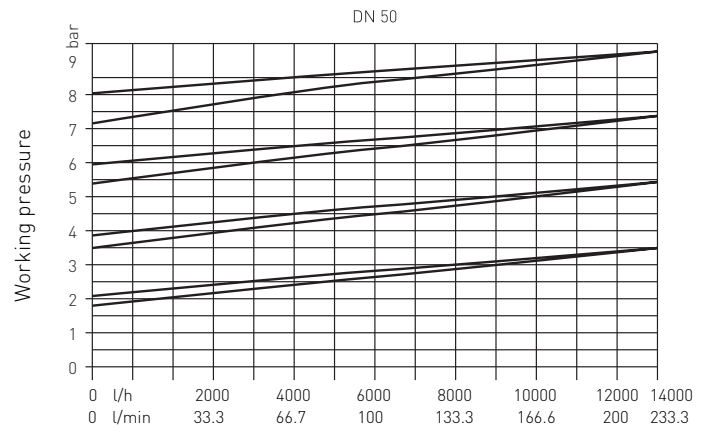
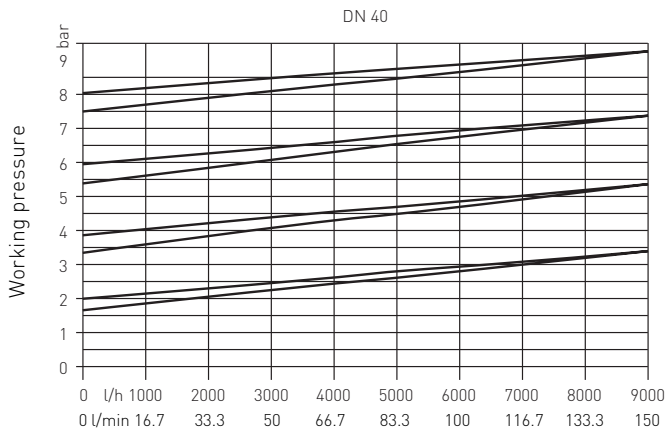
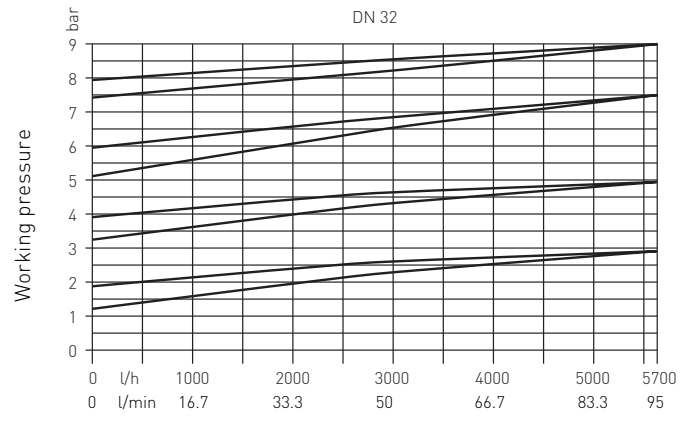
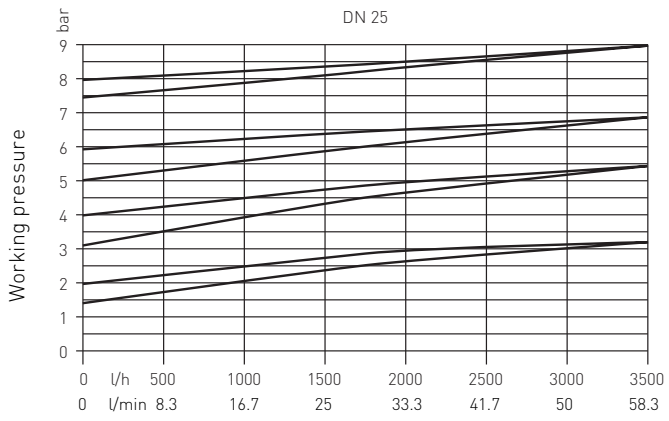
DN	H	Weight PVC-U (kg)	Weight PP (kg)	Weight PVDF (kg)
10	137	0.4	0.3	0.6
15/20	137	0.4	0.3	0.6
25	199	1.2	0.9	1.6
32	199	1.2	0.9	1.6
40	290	6.4	4.4	8.0
50	290	6.5	4.5	8.2
65	275	7.7	5.9	8.6
80	410	17.7	12.9	22.3
100	485	19.6	14.5	24.6



# Characteristics V186

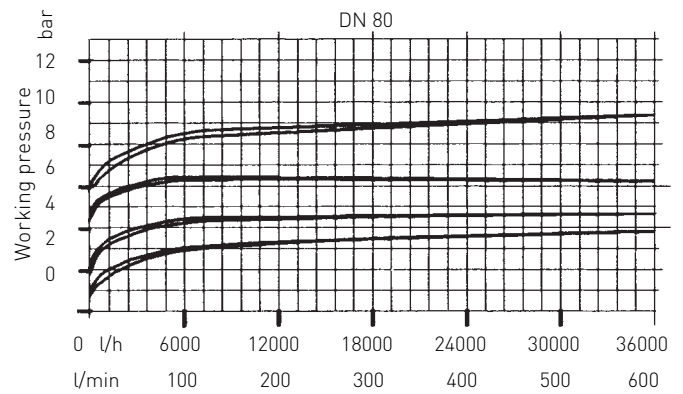
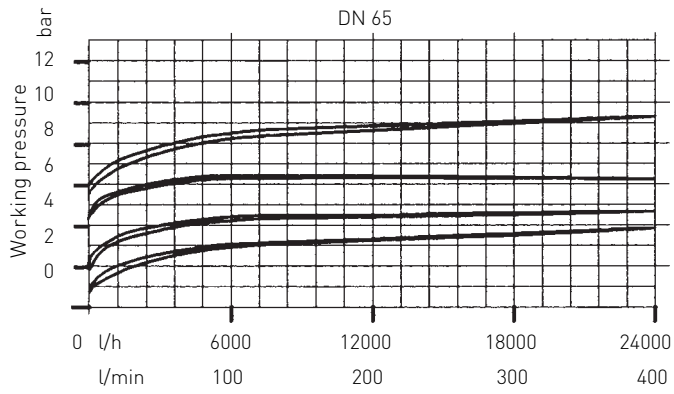


Characteristics are valid for a flow rate of 2 m/s



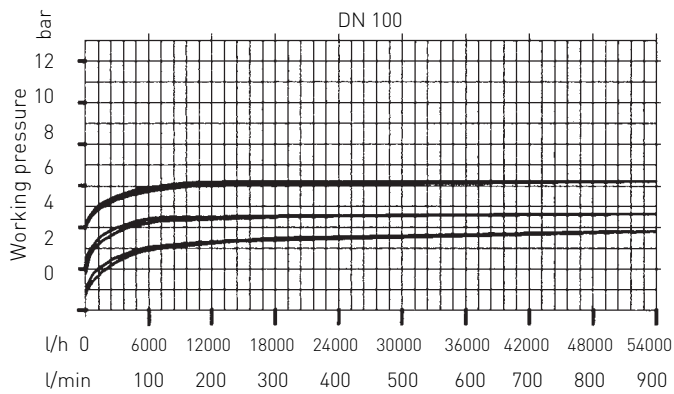
l/hr = Flow volume H<sub>2</sub>O

## Characteristics V86



Characteristics are valid for a flow rate of 2 m/s

l/hr. l/min = flow volume H<sub>2</sub>O



## Order number

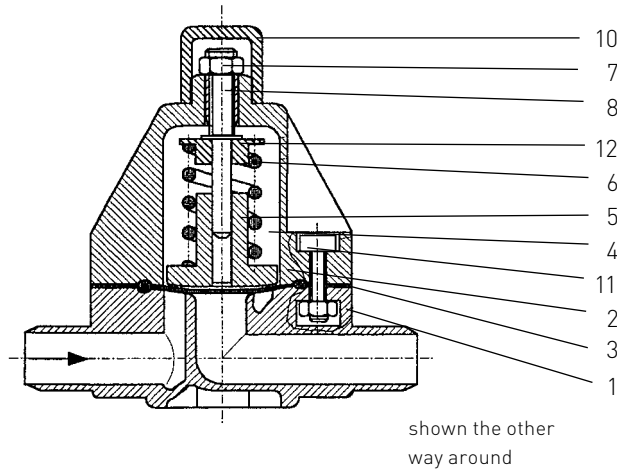
DN	d	Adj. range in bar	PVC-U		PP		PP/IR spigots		PVDF-PTFE Standard	PVDF-HPVersion* BCF/IR spigots
			EPDM	PTFE	EPDM	PTFE	EPDM	PTFE		
10	16	0.5 - 9.0	199 041 379	199 041 309	199 041 386	199 041 316	-	-	199 041 323	-
15	20	0.5 - 9.0	199 041 380	199 041 310	199 041 387	199 041 317	199 041 446	199 041 453	199 041 324	199 041 395
20	25	0.5 - 9.0	199 041 381	199 041 311	199 041 388	199 041 318	199 041 447	199 041 454	199 041 325	199 041 396
25	32	0.5 - 9.0	199 041 382	199 041 312	199 041 389	199 041 319	199 041 448	199 041 455	199 041 326	199 041 397
32	40	0.5 - 9.0	199 041 383	199 041 313	199 041 390	199 041 320	199 041 449	199 041 456	199 041 327	199 041 398
40	50	0.5 - 9.0	199 041 384	199 041 314	199 041 391	199 041 321	199 041 450	199 041 457	199 041 328	199 041 399
50	63	0.5 - 9.0	199 041 385	199 041 315	199 041 392	199 041 322	199 041 451	199 041 458	199 041 329	199 041 400
65	75	0.5 - 4.0	199 041 922	199 041 989	199 041 882	199 041 887	199 041 470	199 041 475	-	-
65	75	1.0 - 6.0	199 041 950	199 041 990	199 041 883	199 041 888	199 041 471	199 041 476	199 041 892	199 041 481
80	90	0.5 - 4.0	199 041 987	199 041 944	199 041 884	199 041 889	199 041 472	199 041 477	-	-
80	90	1.0 - 6.0	199 041 988	199 041 991	199 041 885	199 041 890	199 041 473	199 041 478	-	-
100	110	1.0 - 4.0	199 041 953	199 041 945	199 041 886	199 041 891	199 041 474	199 041 479	-	-

\* BCF fusion only possible up to DN 50 possible

PVDF - PTFE Standard with IR spigots on request

Flange and union versions on request

Sectional drawing V186 DN 10–DN 50

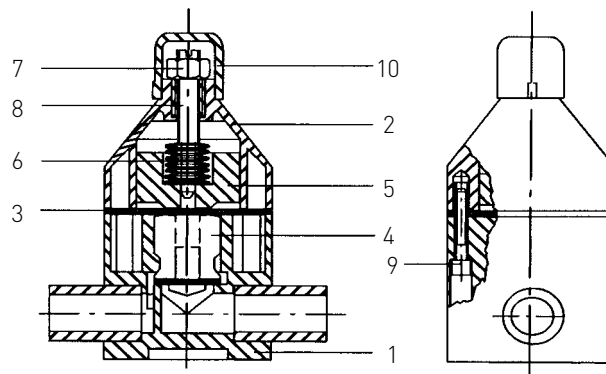


Parts V86/V186

No.	Description
1.	Valve body
2.	Upper valve body
3.*	Diaphragm
4.*	Piston
5.	Compressor
6.*	Compression spring
7.	Lock nut
8.	Adjusting screw
9.	Cylinder screw
10.	Cap
11.	Hexagonal socket-head bolt with nut and covering cup
12.	Spring plate

\* Parts subject to wear or recommended spare parts

Pressure retaining valve V86 DN 65–DN 100



Dismantling instructions

1. Dismantle the upper valve body:
  - 1.1 Put the valve in an upright position
  - 1.2 Unscrew the cap (14)
  - 1.3 Undo the locknut (7) on the adjusting screw (8) and undo the adjusting screw until the compression spring (6) is fully released
  - 1.4 Remove the covering caps on the screws (11) of the upper body and undo the screws
  - 1.5 Lift the upper body (2) upwards and remove the spring plate (12) and the spring (6)

Assembly is done in the reverse order!

Operating faults and possible causes

Fault	Cause	Correction
Valve not sealed at the diaphragm	Diaphragm not pressed on hard enough	Tighten screws (10)
Pressure falls below the set value	Piston base (2) not sealed	Check piston and piston base seal and possibly replace. Dismantle lower body 1.1-2.4
	Diaphragm (3) not sealed	Replace diaphragm, dismantle lower valve body 1.1-2.4
Medium leaks out at the adjusting screw	Diaphragm is faulty	Replace diaphragm, dismantle lower valve body 1.1-2.4

Installation advice:

We recommend installing the fittings between 2 detachable pipe connections.