

# Pressure reducing valves Series DRV/DRVM - DRVN/DRVMN



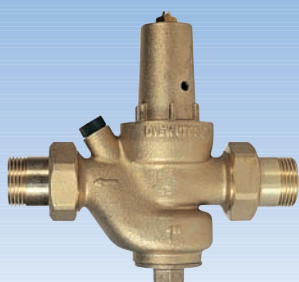
## Main features

Pressure reducing valves serve to reduce the pressure of the fluid downstream and to keep it at a constant level by varying its pressure drops.

- Available in a 1/2" - 2" DN threaded version with an adjustment range from 1.5 - 6 bars
- Used for water, air and non-aggressive gases.

## Description

The **series DRV, DRVM, DRVN, DRVMN** pressure reducing valves are devices capable of reducing the pressure of the fluid downstream to a desired level and keeping it constant even in the presence of major variations in the flow rate and/or pressure upstream, by modifying its pressure drops.

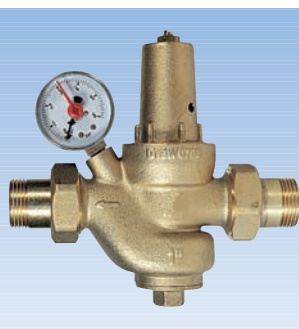


### DRV

Diaphragm pressure reducing valve with compensated seat and complete with unions. CW617N brass body and cap. Stainless steel strainer. Plastic valve seat. Interchangeable filter-regulator unit. Max. inlet pressure: 25 bars. Adjustable downstream pressure: 1.5 - 6 bars. Can be used for water, air and neutral gases up to 30°C. Pressure drops less than 1.3 bars at characteristic DIN flow rate. Noise < 20 dB - **Class 1 in Germany**.

**Conforms with DVGW, SVGW, TIN, NF (only for DN 1/2" and 3/4").**

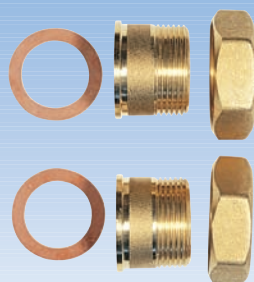
Type	Part no.	Dn	Weight (Kg)
DRV	0501115	1/2" MM	0,9
DRV	0501120	3/4" MM	1,2
DRV	0501125	1" MM	1,7
DRV	0501132	1.1/4" MM	3,1
DRV	0501140	1.1/2" MM	5,1
DRV	0501150	2" MM	6,3



### DRVM

Like DRV, but with M1-ABS50 pressure gauge (Scale 0 – 6 bars).

Type	Part no.	Dn	Weight (Kg)
DRVM	0501315	1/2" MM	0,9
DRVM	0501320	3/4" MM	1,3
DRVM	0501325	1" MM	1,8
DRVM	0501332	1.1/4" MM	3,5
DRVM	0501340	1.1/2" MM	5,1
DRVM	0501350	2" MM	6,3



### RDRV

Spare unions complete with nut and seals for series DRV pressure reducing valves.

Type	Part no.	Dn	Weight (Kg)
RDRV	0599001	1/2" MM	0,1
RDRV	0599002	3/4" MM	0,2
RDRV	0599003	1" MM	0,3
RDRV	0599004	1.1/4" MM	0,5
RDRV	0599005	1.1/2" MM	0,7
RDRV	0599006	2" MM	1,1



### MDRV

Spare diaphragm for series DRV pressure reducing valves.

Type	Part no.	Dn	Weight (Kg)
MDRV	0599007	1/2" MM	0,005
MDRV	0599008	3/4" MM	0,005
MDRV	0599009	1" MM	0,005
MDRV	0599010	1.1/4" MM	0,015
MDRV	0599011	1.1/2" MM	0,025
MDRV	0599012	2" MM	0,035



## GRDRV

Spare regulator unit complete with cartridge, diaphragm and O-ring for series DRV pressure reducing valves.

Type	Part no.	Dn	Weight (Kg)
GRDRV	0599025	1/2" MM	0,1
GRDRV	0599026	3/4" MM	0,1
GRDRV	0599027	1" MM	0,2
GRDRV	0599028	1.1/4" MM	0,3
GRDRV	0599029	1.1/2" MM	0,9
GRDRV	0599030	2" MM	1,0



## DRVN

**Patented** diaphragm pressure reducing valve with compensated seat, outlet pressure adjusting knob and external graduated scale for easy reading of set pressure. Complete with unions. Body of CW617N sand-blasted stamped brass. Stainless steel filter cartridge. Pressure gauge connection on both sides : 1/4". KTW certified materials in contact with fluids. Max. inlet pressure: 25 bars. Adjustable downstream pressure : 1.5 and 6 bars. Max. operating temperature : 30°C. Can be used for water, air and neutral gases. Noise < 20 dB - **Class 1 in Germany.**

**Conforms with DVGW.**

Type	Part no.	Dn	Weight (Kg)
DRVN	0502515	1/2" MM	0,6
DRVN	0502520	3/4" MM	0,9
DRVN	0502525	1" MM	1,3
DRVN	0502532	1.1/4" MM	2,1
DRVN	0502540	1.1/2" MM	3,4
DRVN	0502550	2" MM	4,2



## DRVMN

Like DRVN but with M3A-ABS50 pressure gauge (Scale 0 - 6 bars).

Type	Part no.	Dn	Weight (Kg)
DRVMN	0502615	1/2" MM	0,7
DRVMN	0502620	3/4" MM	1,0
DRVMN	0502625	1" MM	1,4
DRVMN	0502632	1.1/4" MM	2,2
DRVMN	0502640	1.1/2" MM	3,5
DRVMN	0502650	2" MM	4,3

**For a spare diaphragm for the DRVN-DRVMN DN 32 - 40 - 50 pressure reducing valves, order the code :**  
**0599110 for products manufactured up to 31/07/2007**  
**0599111 for products manufactured from 01/08/2007**

## Application

Pressure reducing valves are used :

### - In sanitary systems

- to keep the pressure of the water constant in the distribution network downstream of the valve
- to avoid excessive withdrawals of water by controlling the pressure at the tap
- to keep the water pressure constantly below the maximum value allowed

### - In compressed air systems

- to keep the pressure constant in the network, irrespective of the oscillations in the pressure supplied by the compressors

### - Downstream of storage tanks or cylinders

- to reduce and stabilize the pressure in the network, which is normally lower

The pressure reducing valves are used not for water but also for air and non-aggressive gases.

## Operation

The **series DRV, DRVM, DRVN, DRVMN** pressure reducing valves are of the compensated seat type. This means that as the inlet pressure acts on the two openings A and B (see Fig.1) having the same cross section, it is compensated and does not therefore result in any force on the pin-plug system when the opening angle of the valve is varied. The outlet pressure acts on the diaphragm and thus also on the pin-plug system, which is thus subjected to two contrasting forces: the force exerted by the outlet pressure, which tends to close the plug and the force exerted by the spring, which tends to open it. As a result, the compensated seat valve has an outlet pressure virtually insensitive to variations in pressure upstream.

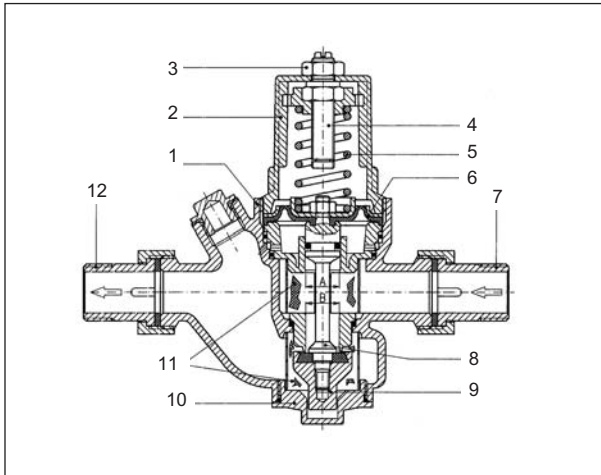
## Setting

The difference between the downstream pressure P2 measured with no flow and the same pressure measured at the generic flow rate Q represents the pressure drop DP of the pressure reducing valve. It depends on the flow rate, as indicated by the pressure drop diagrams. If you want the downstream pressure never to exceed a given value P2, you must regulate this to value P2 with no flow. At flow Q, the downstream pressure will be less than value P2 by an amount equivalent to the pressure drops DP. If the pressure reducing valve is installed to guarantee that the downstream pressure reaches a given value P2 at a given flow rate Q, this pressure must be regulated to value P2 + DP with no flow. At flow rate Q, the downstream pressure will be equivalent to P2.

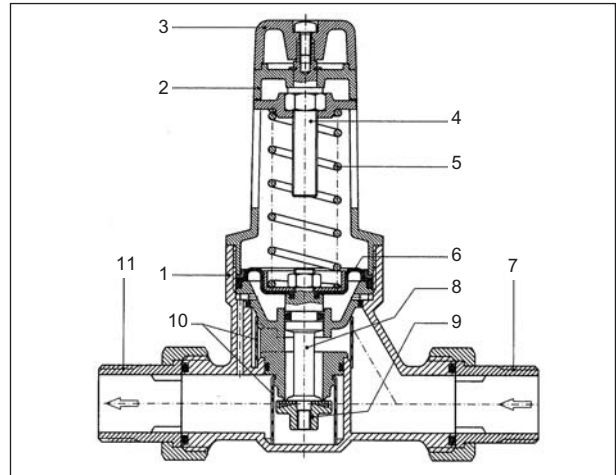
Technical characteristics of DRV and DRVN	
Max. upstream pressure	25 bars ( <i>approved DVGW 16 bar</i> )
Downstream pressure (outlet)	1.5 - 6 bars
Connections	M/M tailpiece
Downstream pressure adjustment (screw 4)	Clockwise rotation : increases pressure Anticlockwise rotation : decreases pressure
Downstream pressure gauge (DRV-M only)	Pressure gauge Ø50 scale 0 ÷ 6 bar
Maximum operating temperature	30 °C

Design characteristics of DRV and DRVN	
Body	Sand-blasted CW617N
Cap	Sand-blasted CW617N (DRV) - Reinforced resin (DRVN)
Plug	CW617N brass
Inlet/outlet connections	CW617N brass
Diaphragm	NBR reinforced with nylon fabric
Seal and O-Ring	NBR
Spring	Galvanized steel
Adjusting screw and lock nut	CW617 brass
Filters	Stainless steel

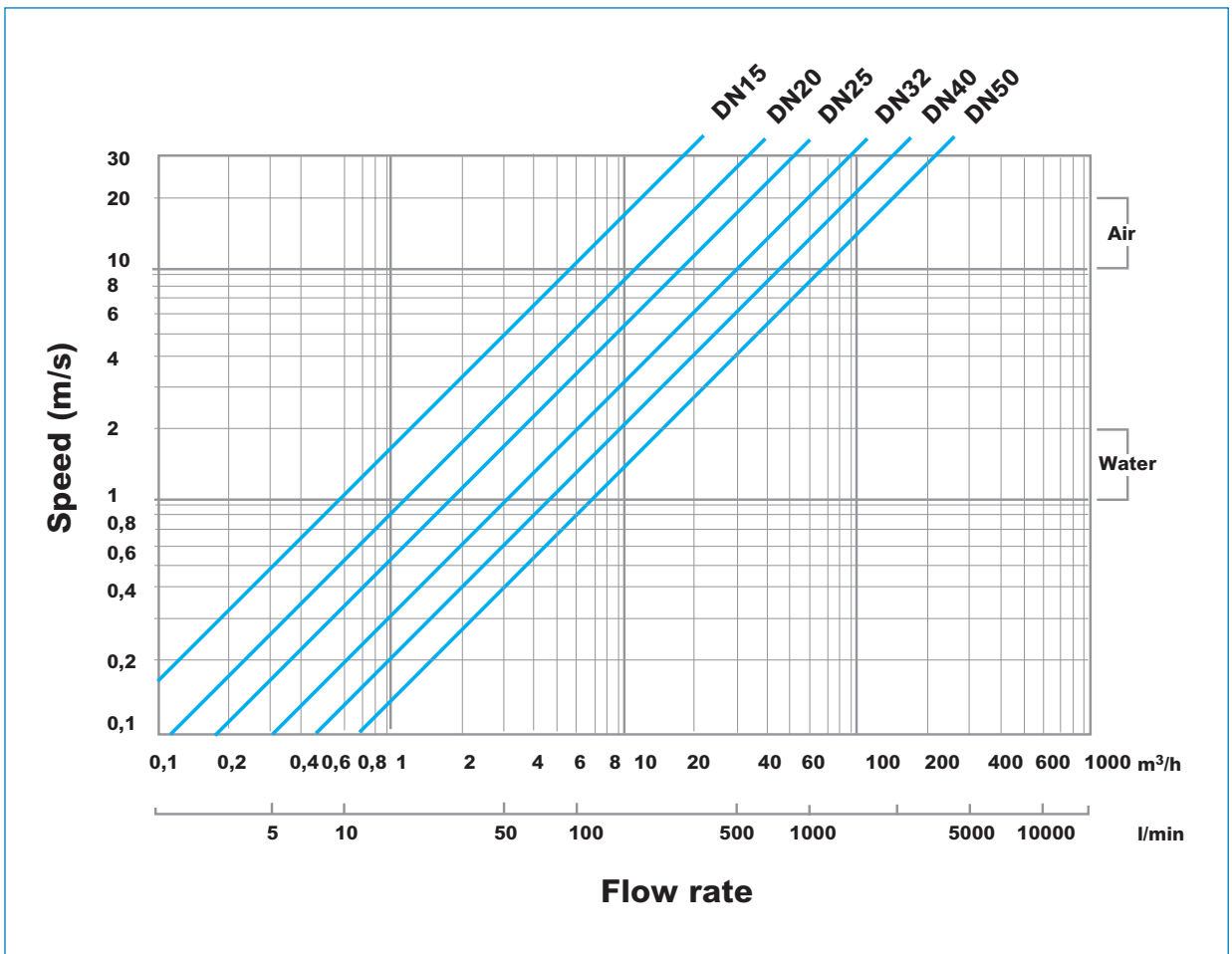


**DRV**

**Features :**

- |                 |                      |
|-----------------|----------------------|
| 1 Body          | 7 Inlet connection   |
| 2 Cap           | 8 Pin                |
| 3 Lock nut      | 9 Plug               |
| 4 Setting screw | 10 Guide bushing     |
| 5 Spring        | 11 Filters           |
| 6 Diaphragm     | 12 Outlet connection |

**DRVN**

**Features :**

- |                   |                      |
|-------------------|----------------------|
| 1 Body            | 7 Inlet connection   |
| 2 Cap             | 8 Pin                |
| 3 Adjustment knob | 9 Plug               |
| 4 Setting screw   | 10 Filters           |
| 5 Spring          | 11 Outlet connection |
| 6 Diaphragm       |                      |

**DRV - DRVN Flow rate/Speed Diagram**




## Sizing

The criterion for choosing the pressure reducing valve consists in determining the diameter in such a way that the speed of the fluid does not reach excessively high values, at the rated flow rate, causing excessive pressure drop and outflow noise transmitted to the distribution network. The flow rate-speed diagrams help you to choose the diameter of the pressure reducing valve in the case of liquids (see water) or gases at pressures of 8-10 bars (see air).

## Examples of sizing

### Example 1 (cavitation)

Pressure reducing valve with :

Inlet pressure  $P1 = 14$  bars  
Outlet pressure  $P2 = 3$  bars

From the cavitation diagram it can be seen that the pressure reducing valve is constantly working in the red zone. To avoid rapid deterioration, two pressure reducing valves could be used, one connected upstream to the other.

Upstream pressure reducing valve: pressure front from 14 to 6 bars (green zone).

Downstream pressure reducing valve: pressure front from 6 to 3 bars (green zone).

### Example 2 (flow rate)

DRV/N pressure reducing valve with :

Inlet pressure (minimum)  $P1 = 8$  bars  
Outlet pressure  $P2 = 4$  bars  
Maximum flow rate  $Q = 50$  l/min

From the flow rate-speed diagram, it can be deduced that a 20 or 25 diameter should be used.

From the pressure drop diagram, the following two cases emerge :

DRV20/N  $Q = 50$  l/min  $DP = 1.1$  bars  
DRV25/N  $Q = 50$  l/min  $DP = 0.68$  bars

## Cavitation

The cavitation diagram shows three operating zones of the pressure reducing valve plotted against the upstream and downstream pressures, namely :

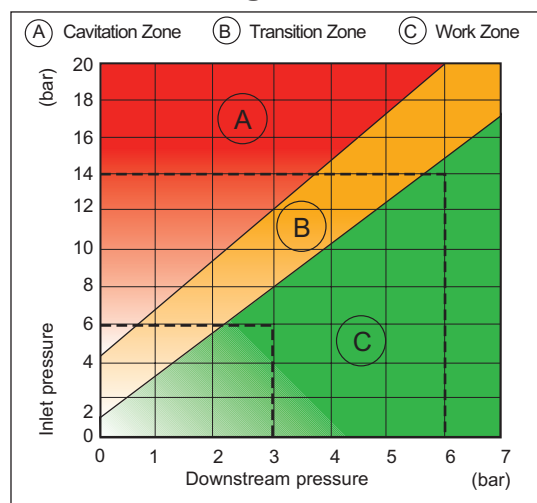
C zone : normal duty, no cavitation  
B zone: medium duty, risk of cavitation  
A zone: heavy duty, the pressure reducing valve shows cavitation.

Continuous operation in the red cavitation zone could cause rapid damage of the internal parts.

If the pressure reducing valve is to operate in the red zone, contact the Technical Department of Watts Industries Italia.



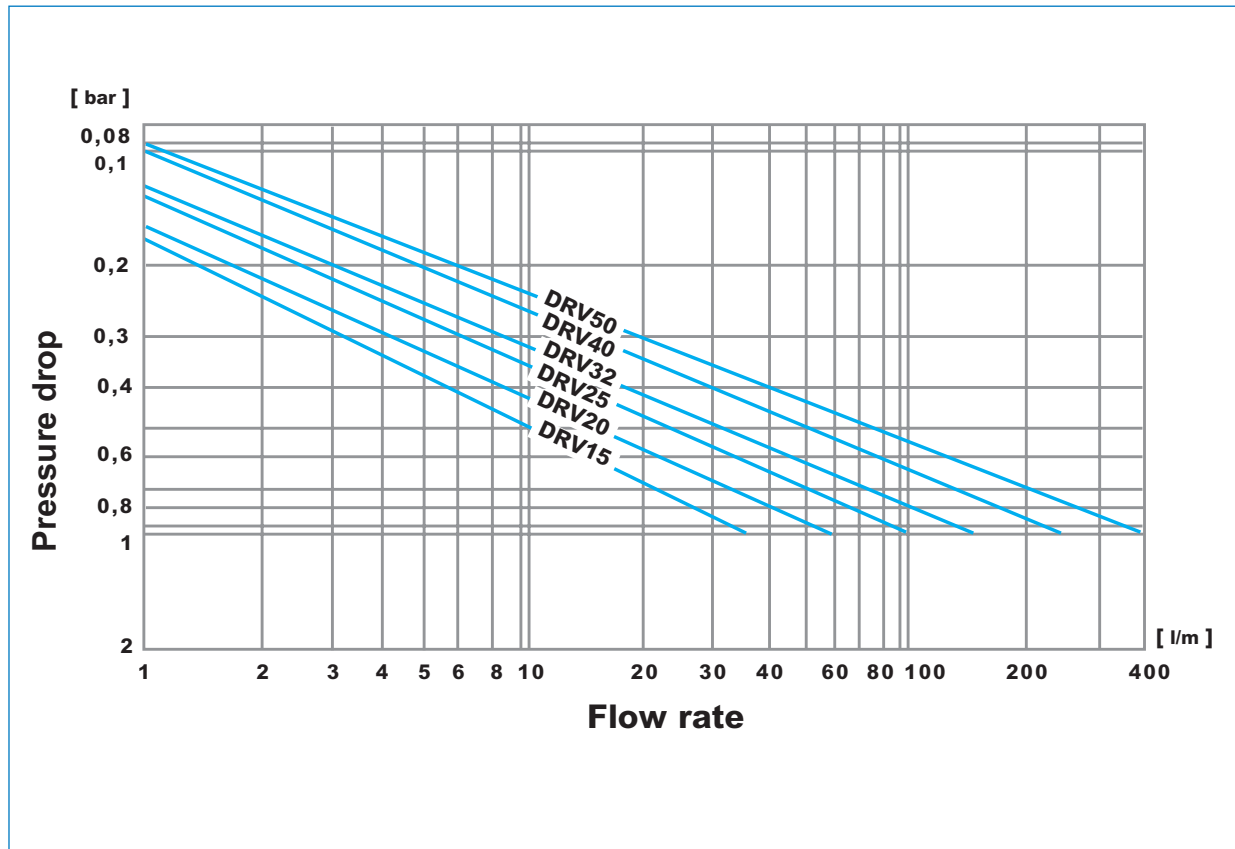
## Cavitation diagram



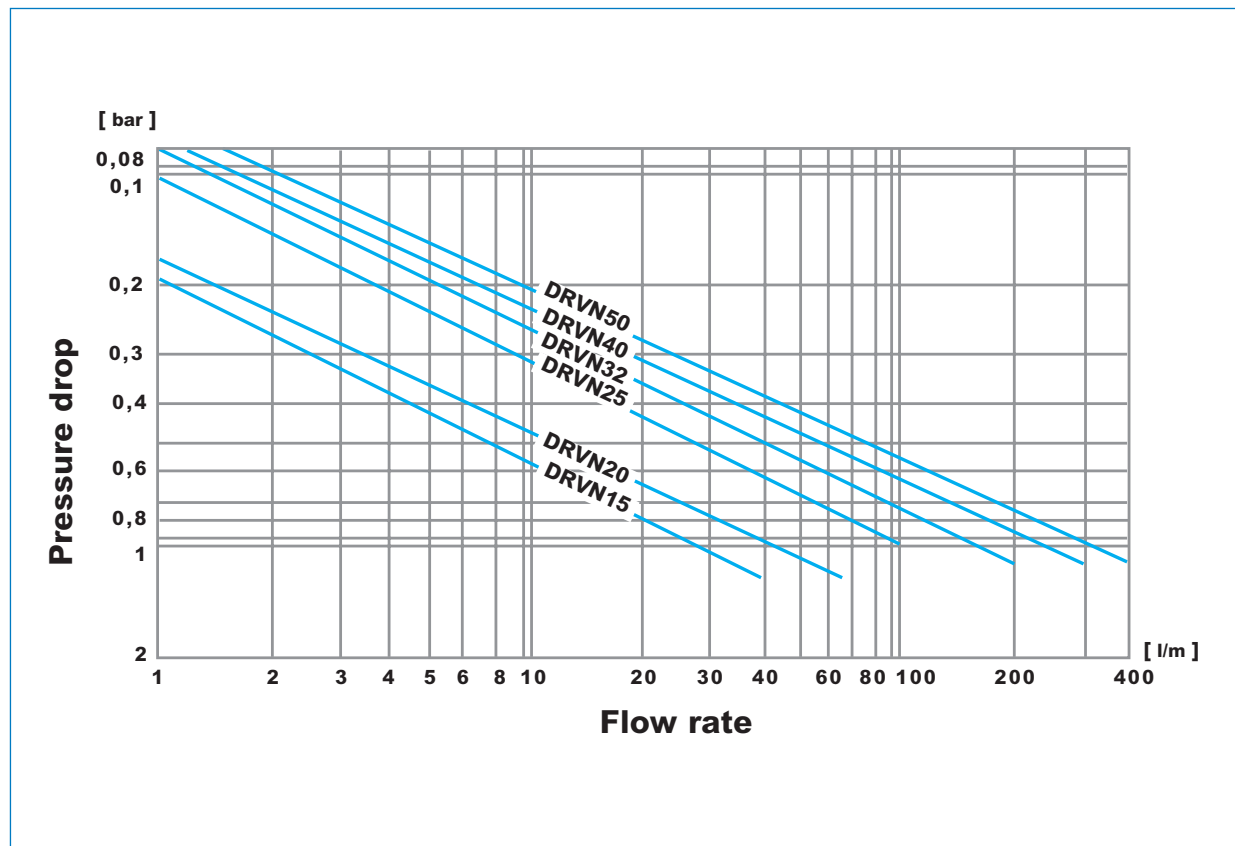
## Approvals

- DVGW approval (Arbeitsblatt W 375).
- LGA approval (DRV15 – 32 and DRV15/N - DRV32/N) in accordance with DIN 4109 class I (noise less than 20 dB).
- SVGW approval (W/TPW101).
- TIN approval (Poland).
- CSTB approval (NF P 43-006) (DRV15, DRV20 and DRV15/N, DRV20/N).
- KTW certification for all materials in contact with water.

### DRVN flow rate - pressure drop diagram



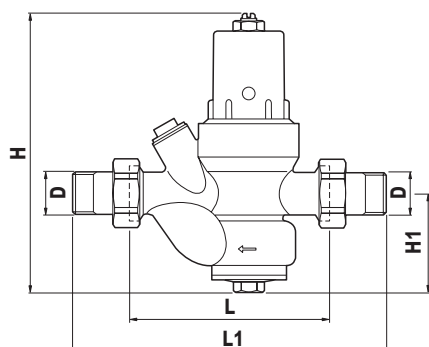
### DRVN flow rate - pressure drop diagram



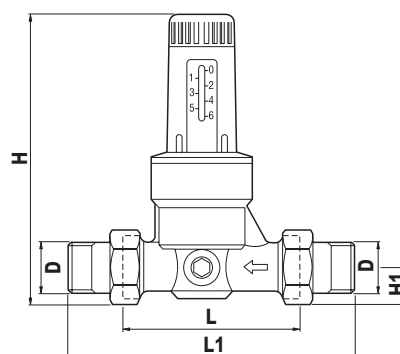
## Overall dimensions (mm)

8

### DRV/DRVM



### DRVN/DRVMN



DN	L	L1	H	H1
1/2"	97	152	135	48
3/4"	110	171	155	58
1"	120	191	182	66
1.1/4"	140	211	227	75
1.1/2"	160	246	255	82
2"	175	261	262	88

DN	L	L1	H	H1
1/2"	84	135	113	16,5
3/4"	94	151	133	20,5
1"	104	160	140	26
1.1/4"	109	175	192	29,5
1.1/2"	134	214	200	36
2"	144	224	205	42

