

# DRV, DRVM, DRVN, DRVMN Series

Pressure reducing valves

## Technical Data Sheet



## Description

The **DRV, DRVM, DRVN, DRVMN Series** 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. Polymer valve seat. Pressure gauge connection: G1/4". Max. inlet pressure: 25 bar. Adjustable downstream pressure: 1.5÷6 bar. Can be used for water, air and neutral gases up to 60°C, in accordance to DVGW up to 30°C. Pressure drops less than 1.3 bar at characteristic flow rate.

Noise < 20 dB - Class 1 according with **DIN 52218. LAG (DN 15-32)**

**Compliant with DVGW, SVGW.** Metallic materials in accordance with **UBA LIST.**

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 Series** pressure gauge (Scale 0-6 bar).

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

### R/DRV

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



Type	Part No.	DN	Weight (Kg)
R/DRV	0599001	1/2" MM	0,1
R/DRV	0599002	3/4" MM	0,2
R/DRV	0599003	1" MM	0,3
R/DRV	0599004	1.1/4" MM	0,5
R/DRV	0599005	1.1/2" MM	0,7
R/DRV	0599006	2" MM	1,1

### GRDRV

Spare regulator unit complete with cartridge, diaphragm and O-Ring for **DRV Series** pressure reducing valves.



Tipo	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 adjustable with a 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: G1/4". Maximum inlet pressure: 25 bar. Adjustable downstream pressure: 1,5 and 6 bar. Max. operating temperature: 30°C. Can be used for water, air and neutral gases. Noise < 20 dB - Class 1 according with **DIN 52218**  
**Compliant with DVGW.** Metallic materials in accordance with **UBA LIST**.

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 Series** pressure gauge (Scale 0÷6 bar).

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

### Technical features: DRV and DRVN

Maximum upstream pressure	25 bar
Downstream pressure (outlet)	1,5÷6 bar
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 DRVN	30°C
Maximum operating temperature DRV	60°C (30°C DVGW)

### Design features: DRV and DRVN

Body	Sand blasted CW617N
Cap	Sand-blasted/(DRV) CW617N, Reinforced polymer (DRVN)
Plug	Brass CW617N
Inlet/outlet connections	Brass CW617N
Diaphragm	NBR reinforced with nylon fabric compliant with KTW and W270 - KTW
Seal and O-Ring	NBR - KTW - W270
Spring	Galvanized steel
Adjusting screw and lock nut	Brass CW617N
Filters	Stainless steel

## 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 only for water but also for air and non-aggressive gases.

## Operation

The **DRV, DRVM, DRVN, DRVMN Series** pressure reducing valves are 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.

### DRV

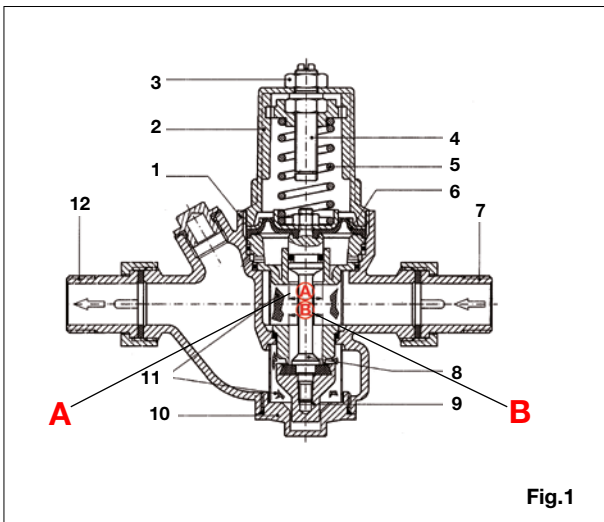


Fig.1

**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

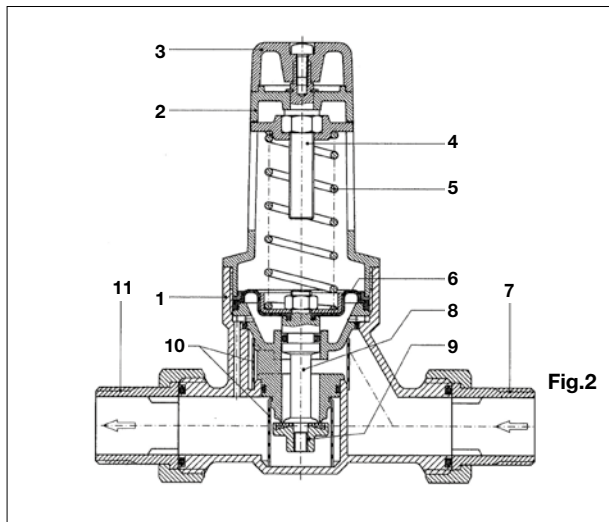


Fig.2

**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       |                      |

## Setting

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The difference between the downstream pressure  $P_2$  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  $P_2$ , you must regulate this to value  $P_2$  with no flow. At flow  $Q$ , the downstream pressure will be less than value  $P_2$  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  $P_2$  at a given flow rate  $Q$ , this pressure must be regulated to value  $P_2 + DP$  with no flow. At flow rate  $Q$ , the downstream pressure will be equivalent to  $P_2$ .

## Sizing

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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 bar (see air).

## Exemples of sizing

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### Example 1 (cavitation)

Pressure reducing valve with:  
Inlet pressure  $P_1=14$  bar  
Outlet pressure  $P_2=3$  bar

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

### Example 2 (flow rate)

DRV/N pressure reducing valve with:  
Inlet pressure (minimum)  $P_1=8$  bar  
Outlet pressure  $P_2=4$  bar  
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  $D_p=1.1$  bar  
DRV25/N  $Q = 50$  l/min  $D_p=0.68$  bar

## Cavitation

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

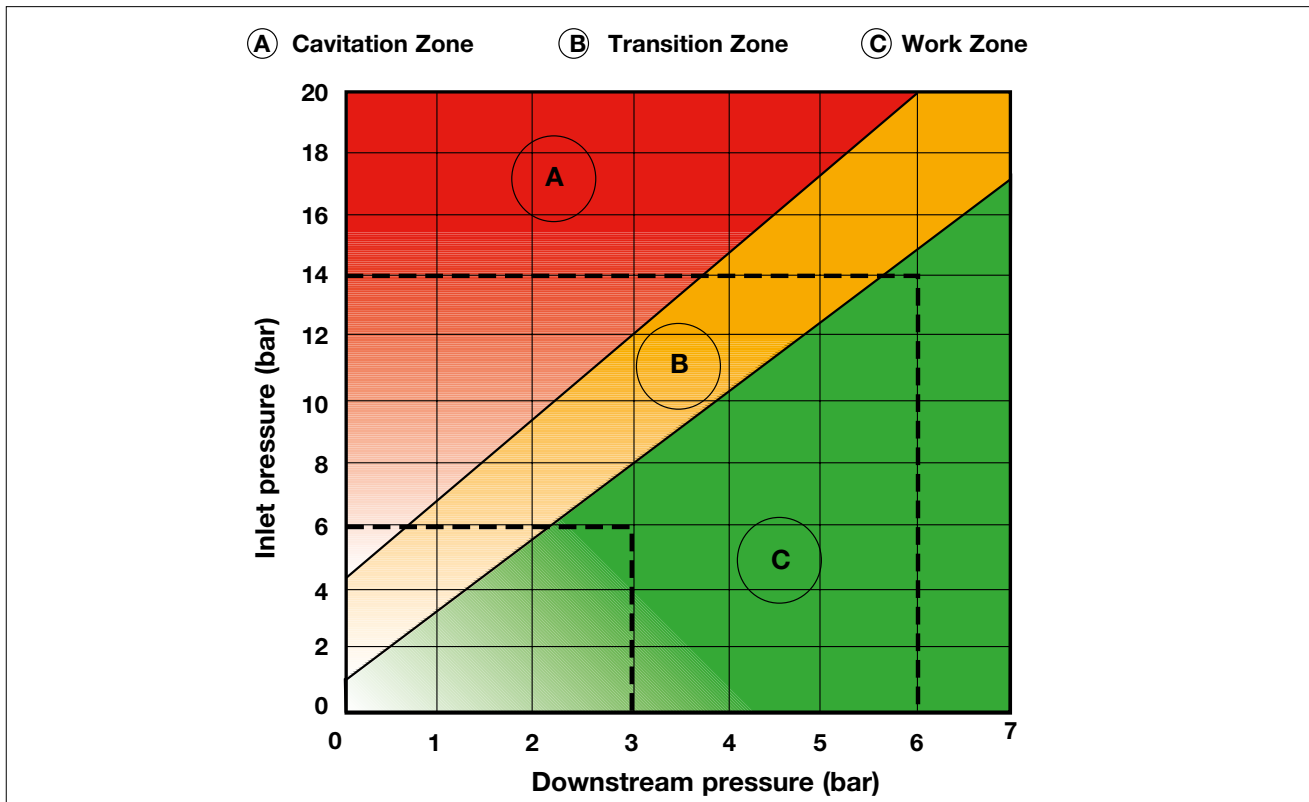
C zone: normal duty, no cavitation

B zone: medium duty, risk of cavitation

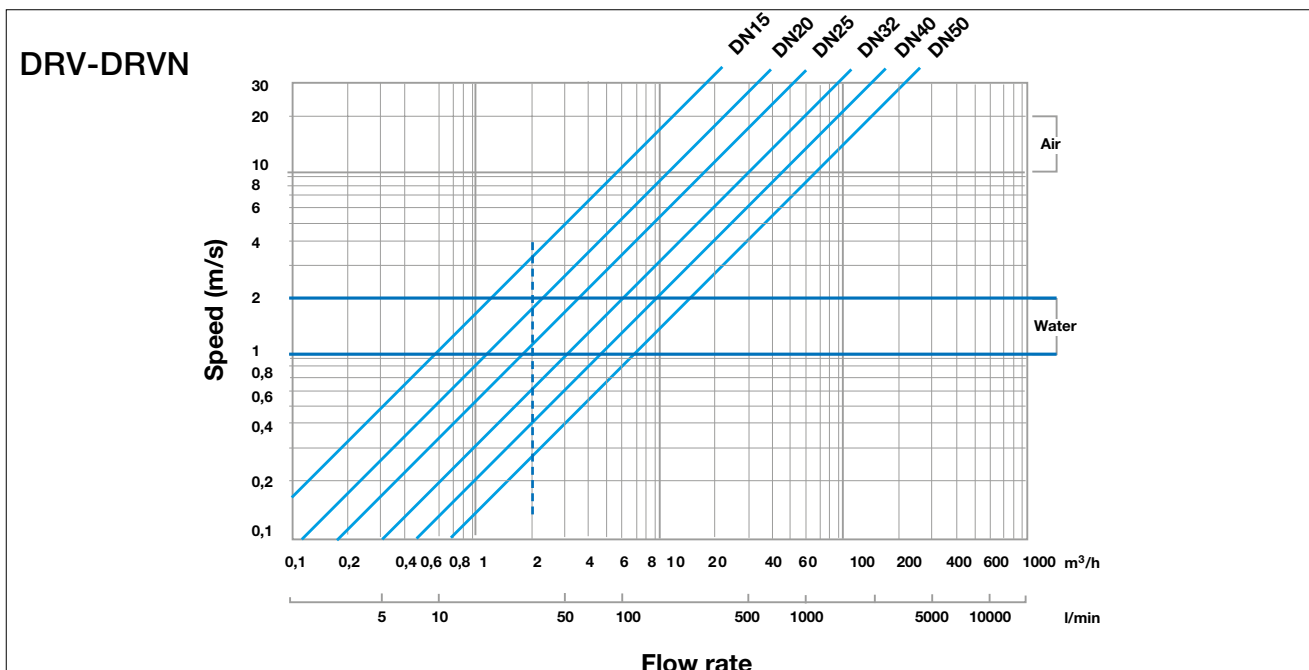
A zone: heavy duty, the pressure reducing valve shows cavitation.

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.

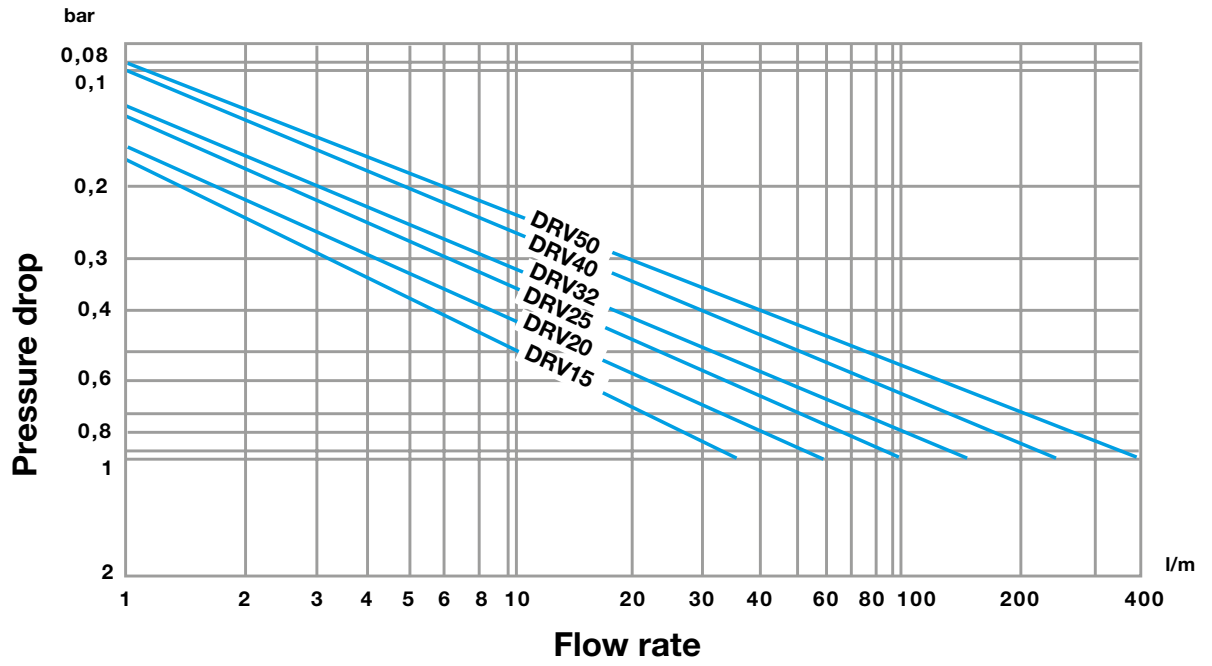
## Cavitation diagram



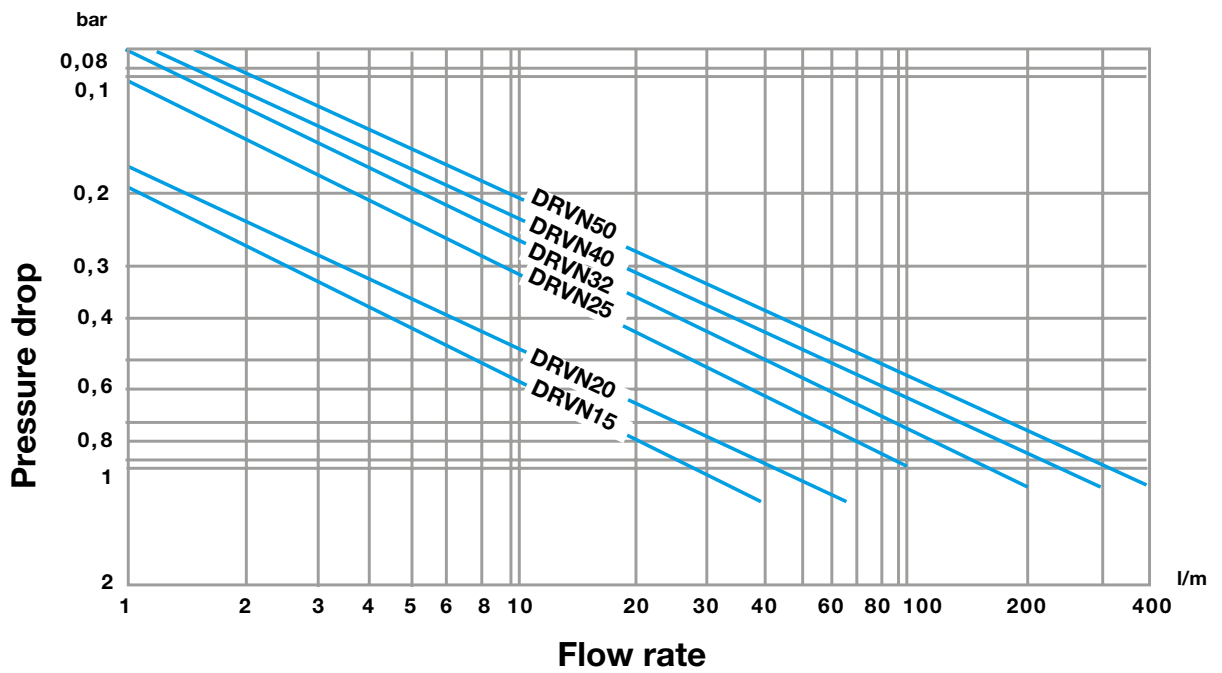
## Charts



### DRV

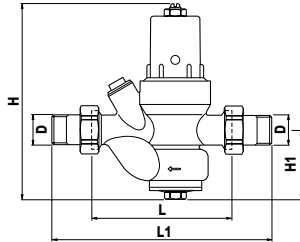


### DRVN



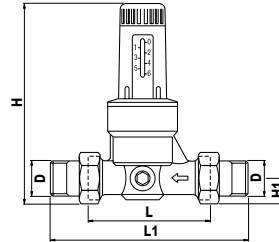
## Overall dimensions (mm)

### DRV-DRVM



DN	L	L1	H	H1
1/2"	97	152	136	48
3/4"	110	171	155	58
1"	114	175	176	66
1.1/4"	140	211	227	75
1.1/2"	159	245	253	82
2"	175	261	263	88

### DRVN-DRVMN



DN	L	L1	H	H1
1/2"	84	135	113	16,5
3/4"	94	151	133	20,5
1"	104	161	140	26
1.1/4"	109	175	192	29,5
1.1/2"	134	214	200	36
2"	144	224	205	42

## Specification text

### DRV Series

Diaphragm pressure regulator with compensated seat complete with tailpiece WATTS brand **DRV Series**, with threaded union G1/2 "-2" (male). Brass body CW617N. NBR membrane with nylon insert. Stainless steel internal filter. Pressure gauge connection: G1/4". Noise: <20db Class 1 in Germany. PN 25 bar. Adjustable downstream pressure: 1.5-6 bar with calibration screw. Maximum operating temperature: 60°C (30°C DVGW). **Compliant with DVGW, SVGW.**

### DRVM Series

Diaphragm pressure regulator with compensated seat complete with tailpiece WATTS brand **DRV Series**, with threaded union G1/2 "-2" (male). Model with pressure gauge M1-ABS50 series scale 0-6 bar. Brass body CW617N. NBR membrane with nylon insert. Stainless steel internal filter. Noise: <20db - Class 1 in Germany. PN 25 bar. Adjustable downstream pressure: 1.5-6 bar with calibration screw. Maximum operating temperature: 60°C (30°C DVGW). **Compliant with DVGW, SVGW.**

### DRVN Series

Diaphragm pressure regulator with compensated seat complete with tailpiece WATTS brand **DRVN Series**, with threaded union G1/2 "-2" (male). Brass body CW617N. NBR membrane with nylon insert. Stainless steel internal filter. Noise: <20db Class 1 in Germany. DN 1/4 "pressure gauge on both sides. PN 25 bar. Adjustable downstream pressure: 1.5-6 bar with manual knob and external graduated scale. Maximum operating temperature: 30°C. **Compliant with DVGW.**

### DRVNM Series

Diaphragm pressure regulator with compensated seat complete with tailpiece WATTS brand **DRVN Series**, with threaded union G1/2 "-2" (male). Brass body CW617N. NBR membrane with nylon insert. Stainless steel internal filter. Noise: <20db Class 1 in Germany. Model with pressure gauge Series M3A-ABS50 scale 0-6 bar. PN 25 bar. Adjustable downstream pressure: 1.5-6 bar with manual knob and external graduated scale. Maximum operating temperature: 30°C.

**Compliant with DVGW.**

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