The pressure reducing valve is able, by varying its pressure drops, to hold the downstream pressure of the fluid at a constant level against changes in the upstream pressure and flow rate. The pressure reducing valve is used:

- in water/plumbing systems: to hold a constant water pressure in the water supply main after the pressure reducing valve;
- in plumbing systems/sanitary appliances: to maintain the water pressure constantly below the max. permissible value;
- in water/plumbing systems: to save water. By controlling the pressure to the taps, excessive withdrawal of water from the taps is avoided;
- in compressed air systems: to keep the air pressure constant in the main, regardless of fluctuations in pressure supplied by the compressors;
- after tanks or storage cylinders: to reduce and stabilize the pressure in the main, which is normally lower.
The WATTS Cazzaniga pressure reducing valves Series DRV, DRV/N and DRVD are of balanced seat type. This means that the inlet pressure, when acting on the two openings A and B with the same section, is compensated. Therefore it does not exert any force on the pin-plug system when the degree of valve opening changes. Instead, the outlet pressure acts on the diaphragm and hence on the pin-plug system which, therefore, is subjected to two opposing forces, namely: the force exerted by the outlet pressure tending to close the plug, and the pressure exerted by the spring tending to open it. This results in the pressure reducing valve acting like a balanced seat type having the outlet pressure almost unaffected by variations in upstream pressure.

**SETTING**

The difference between the downstream pressure P2 measured with zero flow rate and the same pressure measured with a general flow rate Q represents the pressure drop DP across the pressure reducing valve. It depends on the flow rate as shown in the pressure drop diagrams.

If it is required for the upstream pressure not to exceed a given value P2, this should be adjusted to value P2 when the flow rate is zero. At flow rate Q, the downstream pressure will be below the value P2 by an amount equal to pressure drops DP.

When the pressure reducing valve is installed to ensure that the downstream pressure reaches a given value P2 at a certain flow rate Q, this pressure should be adjusted to value P2 + DP when the flow rate is zero. At flow rate Q the downstream pressure will be equal to P2.

**SIZING**

The valve selection criterion consists in determining the diameter so that the speed of the fluid does not reach excessive levels, at nominal flow rate, thus causing excessive pressure drops and noisy effluent which are transmitted to the supply main. The flow rate-speed diagrams provide a guide for selecting the valve diameter in the case of liquids (see water) or gases with pressures of 8 to 10 bar (see air).

**EXAMPLES OF SIZING**

**Example 1 (cavitation)**
Pressure reducing valve with:
- Inlet pressure P1 = 14 bar
- Outlet pressure P2 = 3 bar

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

**Example 2 (flow rate)**
Pressure reducing valve DRV/N with:
- Inlet pressure (min.) P1 = 8 bar
- Outlet pressure P2 = 4 bar
- Max. flow rate Q = 50 l/min

From the flow rate-speed diagram it can be seen that a diameter of 20 or 25 can be used. The pressure drop diagram shows that in the two cases:
- DRV20/N Q = 50 l/min DP = 1.1 bar
- DRV25/N Q = 50 l/min DP = 0.68 bar
CAVITATION

The cavitation diagram shows three zones of valve operation in relation to the upstream and downstream pressures, namely:
- zone C: normal duty, no cavitation
- zone B: medium duty, possible cavitation
- zone A: heavy duty, the valve cavitates.

Continuous operation in the red cavitation zone causes rapid deterioration of the internal parts. If the pressure reducing valve is to be used in the red zone, please contact the WATTS Cazzaniga Engineering Department.

APPLICATION

Water, air and neutral (non aggressive) gases.

APPROVALS

- DVGW approval (Arbeitsblatt W 375)
- LGA approval (DVR15 to 32) according to DIN 4109 class I (noise below 20 dB)
- SVGW approval (W/TPW101).
- TIN approval (Poland)
- CSTB approval (NF P 43-006) (DRV15, DRV20).
- KTW certification for all materials in contact with water.

Overall dimensions (mm)

Flow rate - Pressure drop diagram

Cavitation diagram

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**APPLICATION**
Water, air and neutral (non aggressive) gases.

**APPROVALS**
- DVGW approval (Arbeitsblatt W 375)
- LGA approval (DRV15/N to DRV32/N) according to DIN 4109 class I (noise below 20 dB)
- CSTB approval (NF P 43-006) (DRV15/N, DRV20/N).
- KTW certification for all materials in contact with water

**DRVN**
Diaphragm pressure reducing valve with single balanced seat. Ensures min. pressure drops with high flow rates.
Downstream pressure set by means of knob (3) with adjustment scale 1 to 6 bar.

**DRVNm**
Like DRVN, but with pressure gauge Ø50 for reading downstream pressure.

**DESIGN FEATURES**
- Body: Shot-blasted brass OT58
- Cap: Reinforced plastic
- Plug: Brass OT58
- Cap reinforced plastic
- Plug: Brass OT58
- Inlet / outlet connections: Brass OT58
- Diaphragm: NBR with nylon fabric
- Seal and O-ring: NBR
- Spring: Galvanized steel
- Setting screw: Brass OT58
- Filters: Stainless steel

**TECHNICAL CHARACTERISTICS**
- Max. upstream pressure: 25 bar
- Downstream pressure (outlet): 1.5 to 6 bar
- Connections: to M / M tailpiece
- Downstream pressure adjustment (knob 3): Clockwise rotation: increase in pressure
- Anti-clockwise: decrease in pressure
- Downstream pressure gauge (DRV/N only): Pressure gauge Ø50, scale 0 to 6 bar
- Max. operating temperature: 80° C

**Flow rate - Pressure drop diagram**

**Overall dimensions (mm)**

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**Part No.**
DRVN
- 0502515: 1/2"MM
- 0502520: 3/4"MM
- 0502525: 1"MM
- 0502532: 1.1/4"MM
- 0502540: 1.1/2"MM
- 0502550: 2"MM

DRVNm
- 0502615: 1/2"MM
- 0502620: 3/4"MM
- 0502625: 1"MM
- 0502632: 1.1/4"MM
- 0502640: 1.1/2"MM
- 0502650: 2"MM
Diaphragm pressure reducing valve, single seated, with spring. Ensures min. pressure drops with high flow rates. Provided with upstream filter having ample surface and separate connection for easy cleaning. Downstream pressure set by means of screw (3). Fitted with by-pass valve, it allows freeing on the upstream main any overpressure at downstream side (generated, for example, by expansion of water in the water heaters).

**APPLICATION**
Water, air and neutral (non aggressive) gases.

**APPROVALS**
- ASSE, ANSI, CSA, UPC (USA) approvals

**TECHNICAL CHARACTERISTICS**
- Max. upstream pressure: 20 bar
- Downstream pressure (outlet): Adjustable 1.5 to 5 bar
- Upstream connection: to F threaded tailpiece
- Downstream connection: F threaded
- Downstream pressure adjustment (screw 3): Clockwise rotation: increase in pressure; Anti-clockwise pressure: decrease in pressure
- Max. operating temperature: 80° C

**DESIGN FEATURES**
- Body: Bronze
- Cap: Cast iron
- Plug: Stainless steel
- Inlet connection: Bronze
- Diaphragm: Nordel with nylon fabric
- Seal and O-ring: NBR
- Spring: Galvanized steel
- Setting screw and lock nut: Galvanized steel
- Filters: Stainless steel

**Overall dimensions (mm)**

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**Flow rate - Pressure drop diagram**
DRVD16
Flanged pressure reducing valve with single balanced seat and spring. Ensures min. pressure drops with high flow rates. Downstream pressure set by means of screw (9). Nodular cast iron body faced with epoxy resins.

DRVD25
Like DRVD16 but with max. inlet pressure: 25 bar.

DRVD40
Like DRVD16 but with max. inlet pressure: 40 bar.

APPLICATION
Water, air and neutral (non aggressive) gases.

PN: 16 bar
Pout: 1.5-6 bar
0504053 DRVD50/16 2" DN50
0504068 DRVD65/16 2½" DN65
0504083 DRVD80/16 3" DN80
0504103 DRVD100/16 4" DN100
0504128 DRVD125/16 5" DN125
0504153 DRVD150/16 6" DN150
0504203 DRVD200/16 8" DN200

PN: 25 bar
Pout: 1.5-6 bar
0504050 DRVD50/25 2" DN50
0504065 DRVD65/25 2½" DN65
0504080 DRVD80/25 3" DN80
0504100 DRVD100/25 4" DN100
0504125 DRVD125/25 5" DN125
0504150 DRVD150/25 6" DN150
0504200 DRVD200/25 8" DN200

PN: 40 bar
Pout: 1.5-6 bar
0504056 DRVD50/40 2" DN50
0504071 DRVD65/40 2½" DN65
0504086 DRVD80/40 3" DN80
0504106 DRVD100/40 4" DN100
0504131 DRVD125/40 5" DN125
0504156 DRVD150/40 6" DN150
0504204 DRVD200/40 8" DN200

Pout: 2-8 bar
0504054 DRVD50/16/2-8 2" DN50
0504069 DRVD65/16/2-8 2½" DN65
0504084 DRVD80/16/2-8 3" DN80
0504105 DRVD100/16/2-8 4" DN100
0504130 DRVD125/16/2-8 5" DN125
0504155 DRVD150/16/2-8 6" DN150
0504205 DRVD200/16/2-8 8" DN200

Pout: 4-12 bar
0504058 DRVD50/16/4-12 2" DN50
0504073 DRVD65/16/4-12 2½" DN65
0504088 DRVD80/16/4-12 3" DN80
0504108 DRVD100/16/4-12 4" DN100
0504133 DRVD125/16/4-12 5" DN125
0504158 DRVD150/16/4-12 6" DN150
0504204 DRVD200/16/4-12 8" DN200

TECHNICAL CHARACTERISTICS
Max. upstream pressure 16 - 25 - 40 bar (ND200 only up to 25 bar)
Downstream pressure (outlet) 1.5 to 6 bar (standard) 2 to 8 bar (optional) 4 to 12 bar (optional)
Downstream pressure adjustment Clockwise rotation: increase in pressure Anti-clockwise pressure: decrease in pressure
Connections Ranged according to UNI2223 (NP16 - 25 - 40) ND200 only NP16 and NP25
Pressure gauge connections G 1/4\" ND50 to ND65 G 3/8\" ND80 to ND200
Max. operating temperature 80° C

DESIGN FEATURES
Body Nodular cast iron GS400-15
Cap Nodular cast iron GS400-15
Plug (ND 50 to 100) (ND 125 to 200) Brass Galvanized steel
Seal NBR
Lip seal NBR
Seal ring Bronze
Guide bushings Bronze
Spring Faced steel
Settling screw and lock nut Galvanized steel
Finish Epoxy resins (blue RAL 5017)
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