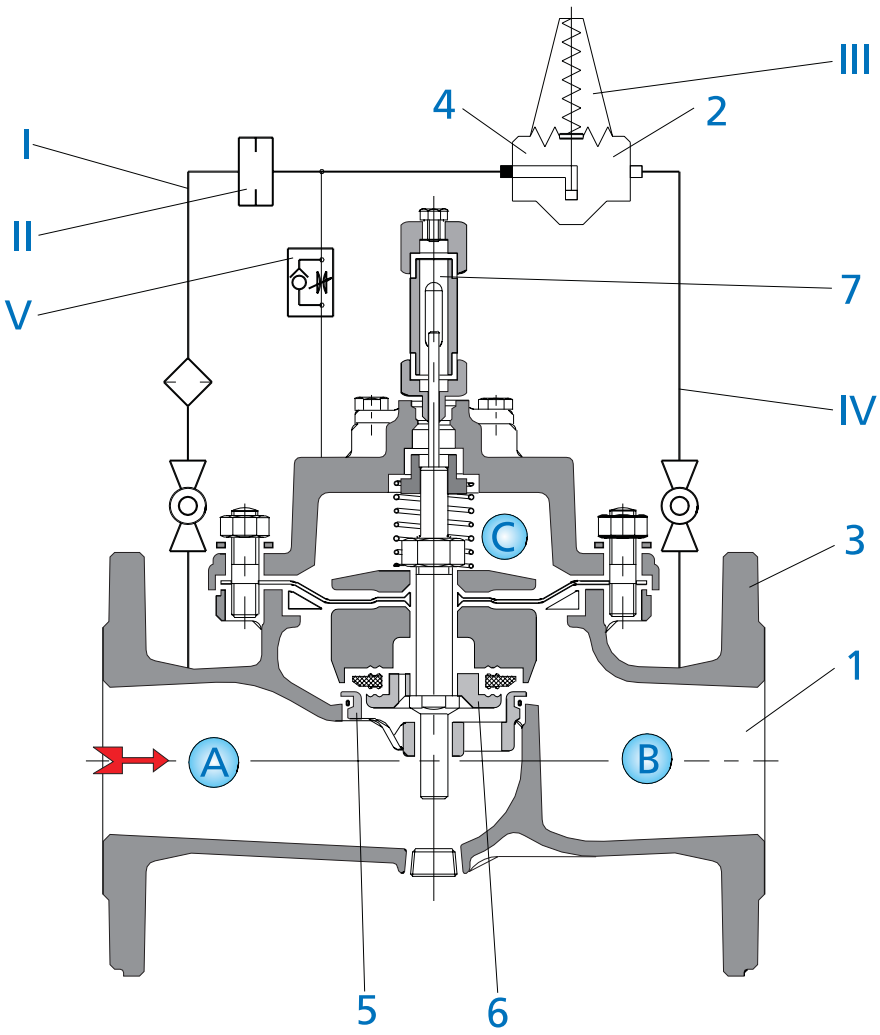
ERHARD VALVES

Pressure Reducing Valves DVP
Pilot controlled

ERHARD Pressure Reducing Valves DVP: Precision and Reliability



ERHARD Performance		Your Advantage
Sensitive and close control. Low head loss in fully open position.	1	Constant downstream pressure in water supply systems. Max. flow rate at constant downstream pressure, e.g. for fire-extinguishing service.
Flow operated.	2	Safe operation, no energy supply needed.
High quality materials: body of SG ductile cast iron. Internal and external ***EKB*** epoxy coating.	3	Robust and reliable. High strength, long life. Efficient surface protection.
Pilot valve fo large range of downstream pressure: 1-20 bars.	4	Field approved.
Seat not subject to cavitation.	5	No wear and tear.
All internal parts accessible from above. Maintenance of pilot system without breaking supply.	6	Easy maintenance.
Position identified at a glance. Two pressure gauges with isolating valves.	7	Easy operation.

Perfomance

The pilot controlled ERHARD Pressure Reducing Valve is composed of main valve and pilot system.

The main valve concists of:

body, cover, plug with guide, diaphragm, and indicator.
When there is no line pressure, the main valve remains closed under the action of the internal spring and the dead weight of the plug. Valve operation is the result of three pressures interacting:

Upstream pressure acting on chamber „A“
Downstream pressure acting on chamber „B“
Control pressure acting on chamber „C“.

The pilot system includes:
Orifice **II**, upstream pipe branch **I**, pilot valve **III**, downstream pipe branch **IV**, and throttle valve **V**.

Pressure Reducing Valves reduce a variable upstream pressure to a constant supply pressure independence of the flow rate.

The pilot valve responds to any slight fluctuations in the downstream chamber and thus governs the control pressure:

- When the downstream pressure in chamber „B“ drops below the pressure level set at the pilot valve, the pilot valve opens. The resulting pressure relief in chamber „C“ opens the main valve.
- When the downstream pressure in chamber „B“ exceeds the pressure level set at the pilot valve, the pilot valve closes. The resulting increase in pressure in chamber „C“ closes the main valve.

Thus the valve continuously maintains the constant downstream pressure set (P_d) within the given flow range (v=0.2 - 4m/s) with an accurcy of ± 5% of P_d.
If there is no consumption, the valve is 100% drop-tight (clean water provided). The downstream pressure will rise by approx. 1 bar under conditions between minimum an zero consumption.

Sizing, KVS and head-loss coefficients

The valve is not sized to the pipeline diameter but in accordance with the application and the maximum and minimum flow conditions.

Case A: $\Delta p \leq 1$ bar

If the differential pressure (Δp) required across the valve is smaller than 1 bar, the flow velocity (v) should be within the range of v = 0.2 - 2 m/s.

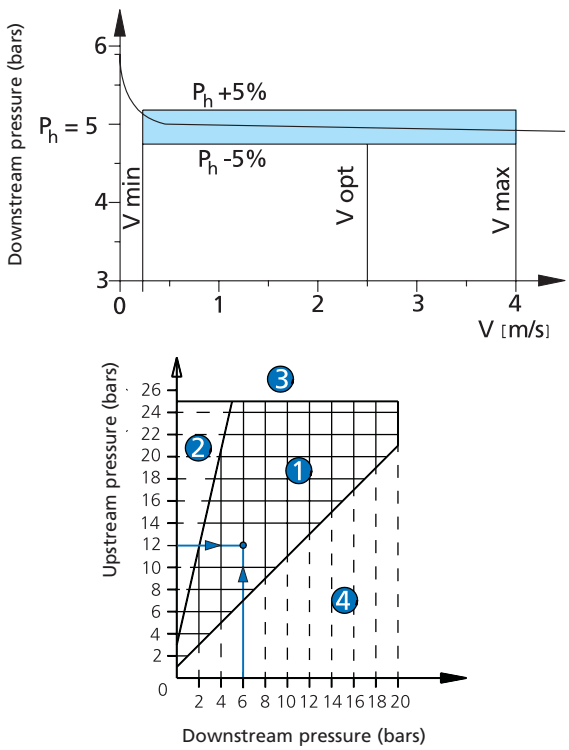
Case B: $\Delta p > 1$ bar

If the differential pressure (Δp) required exceeds 1 bar, the flow velocity (v) should be within the range of v = 0.4 - 4 m/s.

A minimum differential pressure of $\Delta p_{min.} \geq 0.5$ bar is necessary to ensure perfect performance of the flow-medium operated pressure reducing valves.

Example:

Standart Control Curve: Constant Downstream Pressure



Sizing example:

Hydraulic data:

Upstream pressure:	P_u	= 12 bar
Downstream pressure:	P_d	= 6 bar
Max. flow:	$Q_{max.}$	= 65 l/s
Min. flow:	$Q_{min.}$	= 8 l/s

Differential pressure: $\Delta p = P_u - P_d = 6 \Rightarrow$ case B.
Selected valve: ⇛ DN 150 (see flow table).
Cavitaition?: pressure correlation of the valve within field 1 ⇛ no cavitation.

Checking the valve for risk of cavitaion:

Field 1: Normal operation

Field 2: Excessive differential pressure (cavitaion). If necessary, arrange two valves in line.

Field 3: Inadmissible range of application.

Field 4: Physically impossible as upstream pressure is smaller than downstream pressure.

For differential pressures with slight cavitaion, the cavitaion-proof design has to used.

Sizing, KVS and head-loss coefficients

Recommendend flow rates in l/s (m³/h)		Flow	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150	DN 200	DN 250-800
Case A	$V_{min.}$ = 0.2 m/s	$Q_{min.}$	0.4 (1,5)	0.7 (2.5)	1.0 (3.6)	1.6 (5.8)	2.5 (9)	3.5 (12.6)	6.3 (22.7)	upon request
	$V_{max.}$ = 2 m/s	$Q_{max.}$	4.0 (15)	7.0 (25)	10.0 (36)	16.0 (58)	25.0 (90)	35.0 (126)	63.0 (227)	
Case B	$V_{min.}$ = 0.4 m/s	$Q_{min.}$	0.8 (3)	1.4 (5)	2.0 (7.2)	3.2 (11.6)	5.0 (18)	7.0 (25.2)	13.0 (46.8)	
	$V_{max.}$ = 4 m/s	$Q_{max.}$	8.0 (30)	14 (50)	20.0 (72)	32.0 (116)	50.0 (180)	70.0 (252)	130 (468)	

Fire-extinguishing service: During a short period of up to 6 m/s are admissible. Therefor valve need pressure difference of approx. 1,5 bars.

KVS-values

DN	50	65	80	100	125	150	200
KVS (m³/h) 100% [1]	44	75	103	174	253	358	669

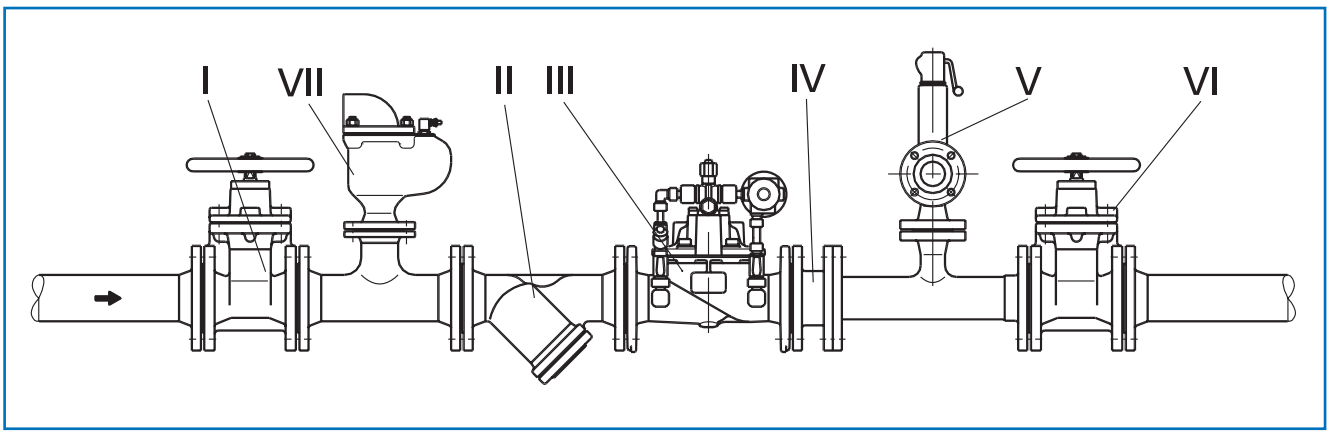
K coefficients

DN	200	150	125	100	80	65	50
K 100% [2]	5.6	6.2	6.0	5.2	6.1	5.0	5.0

1) The KVS-value shows how much water in m³/h will flow through a fully open valve at a temperature of 5° to 30 °C an a loss of 1 kp/cm² (0.981 bar).

2) The K value (100%) is the head loss coefficient of the valve in fully open position.

Recommended Installation



- Horizontal installation of the **ERHARD**-Pressure Reducing Valve **III.**
- Isolating Valve **I** and Strainer **II** (max. mesh size: 2 mm) upstream of the Pressure Reducing Valve.
- Dismantling Piece **IV**, Safety Valve **V** and Isolating Valve **VI** downstream of the Pressure Reducing Valve.
- Draining Device to be provided in the structure.

We recommend to use an Air Valve **VII** in case of:

- descending downstream main: downstream of the Pressure Reducing Valve.
- rising or horizontal upstream main: upstream of the Pressure Reducing Valve.

Available upon request:

I, VI **Isolating Valves** Multamed Gate Valve, Flanged Butterfly Valve, ECLS Wafer Type Butterfly Valve

II **Strainer**

III **Pressure Reducing Valve DVP**

IV **Dismantling pieces**

V **Safety Valves** (proportional and normal types)

VII **Air Valves** *TWIN-AIR*

ERHARD Pressure Reducing Valve DVP PN 10/16/25

pilot controlled, of SG ductile cast iron
Range of application: water max. 70° C

Size **DN**	Pressure rating **PN**	Max. working pressure = max. upstream pressure in bars	Range of downstream set pressure in bars [1]	Prod. no.
200 50 - 200 50 - 200 250 - 800	10 16 25	10 16 25 upon request	1-9 1-15 1-20	6000 5400 6000 5400 6001 5400

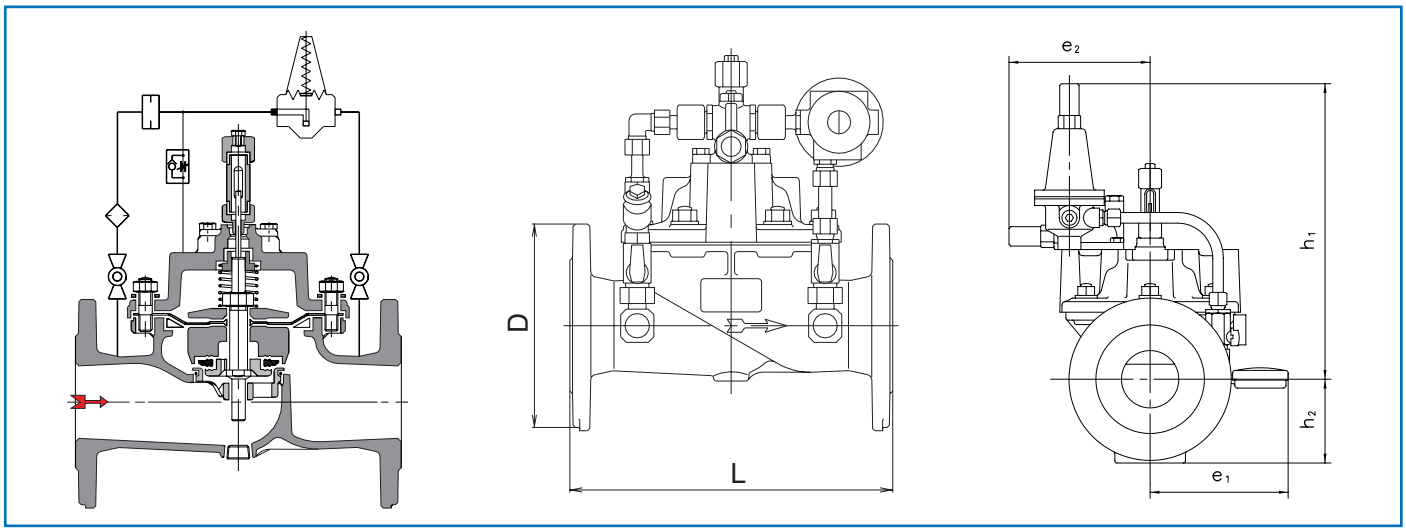
When placing the order, please specify min. an max. flow rate, max. upstream pressure and required range of dowbstream set pressures.

Flanges B, ISO 7005-2, Typ 21, DI, PN 10, PN 16, PN 25.

Materials and Equipment

Surface protection	EKB epoxy coating, blue
body and cover	SG ductile cast iron EN-JS 1040 [3]
Upper and lower part of plug/clamping ring	Lamellar cat iron EN-JL 1040[2] (GG-25) / bronze
Body seat and guide	Bronze
Sealing ring	EPDM
Diaphragm	Neoprene with fabric ply
Guide rod, bolts	Stainless steel
Pilot valve	Bronze / elastomer
Position indicator	Stainless steel / brass
Pilot circuit, fittings	Stainless steel / brass, nickel-plated
Ball valves, filter	Brass
Throttle valve [4]	Brass / stainless steel
Pressure gauges with isolating valves	Upstream, downstream
Upon request: cavitation-proof design	Lower part of plug: stainless steel, Sealing ring: PUR

ERHARD Pressure Reducing Valve DVP PN 10/16/25



Dimenions

Size[5] DN	Face-to-face dimension L mm	PN 10/16 D mm	PN 25 D mm	h_1 mm	h_2 mm	e_1 mm	e_2 mm	Weight ca. kg	Packing-dimensions l x w x h cm
50	230	165	165	225	85	195	135	17	50x40x40
65	290	185	185	245	95	155	155	23	50x40x40
80	310	200	200	265	105	165	156	28	50x40x40
100	350	220	235	290	115	180	170	36	50x40x40
125	400	250	270	385	130	190	170	49	80x50x40
150	480	285	300	430	145	205	185	72	80x50x40
200	600	340	360	730	175	215	215	116	90x50x70
250 - 800	upon request								

1) Downstream pressure adjustable at the pilot valve. For permissible diferential pressure, see „Sizing". Upon request: for downstream pressure ranges 0.2 - 2 bars abd 15 - 25 bars.

2) Corresponding to former DIN description 0,6125 (GG25).

3) Cast iron 450-10 toISO 1083 has similar properties as EN-JS 1050.

4) By means of thethrottle valve, the opening time of the main valve can be controlled within a certain range.

5) Larger sizes upon request.

On request, ERHARD Pressure Sustaining Valves, pilot controlled, ERHARD Flow Control Valves, and combinations of several functions in one valve.

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