YAKACIK® VALF

PISTON VALVES

YVN - YVNB
YVMN - YVSN

2019 - 01

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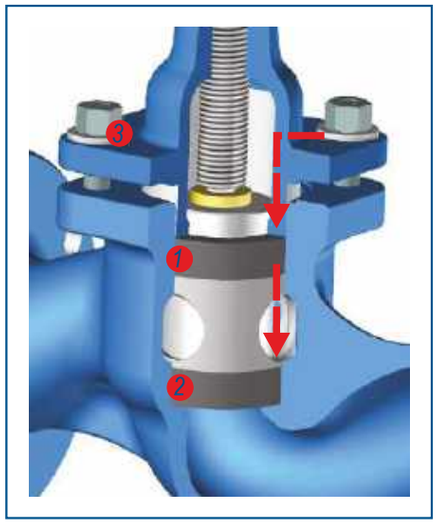
YAKACIK® VALF

Piston Valve Working Principle

Sealing System

- *Sealing system in the piston valve is enabled by a stainless steel piston and a couple of special elastic rings which surround the piston tightly.*
- *Sealing surface is the side surface of the piston. While upper ring provides sealing to atmosphere (outside), lower ring provides tightness in the line (inside).*
- *Leakproofing is provided by tightneinin the bonnet nuts acting axially to upper ring. The thrust is transmitted from upper ring to lower ring via lantern bushing. Special elastic rings are thereby compressed and transform this thrust into a radially acting pressure on the piston.*
- *Elastic rings, being supported against the wall of the valve body, surround the cylindrical piston surface thereby result in an outstanding sealing.*



1. *YX-GT upper ring*
2. *YX-GT lower ring*
3. *Belleville washer*

- *Layers of YX-GT rings press radially on the sealing surface of the piston*
- *Belleville washers compansate the pressure and temperature changes. Thereby, a spontaneous and permanent sealing is provided by itself.*

Is not affected by unexpected materials flowing in the fluid. No corrosion on the leakproofing surface.

- *There is no direct contact of the piston surface and the fluid. Therefore, there is no corrosion risk for the sealing surfaces. Only the bottom surface of the piston gets into contact with the fluid. This part is not related to the sealing performance.*
- *Unexpected materials in the medium do not harm a piston valve. When the valve is being shut and the piston enters the lower ring, it sweeps out any particles of sand, welding globules and other impurities existing in the medium. The possibility of damage to the sealing system by abrasive matter existing in the fluid; a well-known problem with seat valves, is eliminated with the piston valves. Fibrous and contaminated media can be reliably shut off without trouble.*
- *The piston valves of model YVN 15 to 50 have the same sealing system. There is no stuffing box with the ring.*
- *The balanced piston valves of model YVNB 65 to 200, have stuffing box with the ring. Easy operation is enabled thanks to pressure balance across the piston.*
- *Ring replacement takes short time, there is no need for difficult mechanical processes like seat grinding etc. for YAKACIK piston valves. A new valve is obtained just by replacing sealing rings. Since they are supported by stainless steel plate, rings have long service life.*

No environmental contamination Saves energy

- *YAKACIK piston valves, providing an outstanding leaktightness across both to atmosphere and to line, prevent environmental contamination. Toxic fluids remain in the piping system and are not allowed to diffuse into atmosphere.*
- *Piston valves save energy via preventing leakage of steam and other power transfer fluids to atmosphere.*

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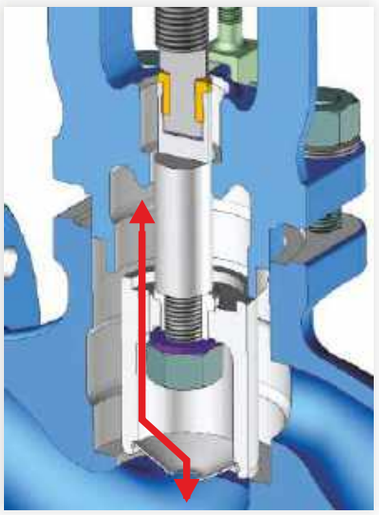
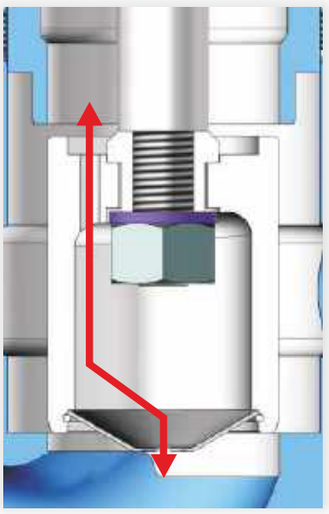
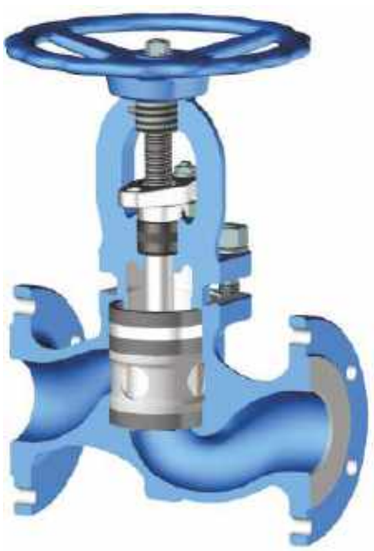
Balanced Piston Valves





Easy to operate:

For balanced piston valves, top and bottom surfaces of the piston are in contact with fluid. So, pressure force is balanced to some extent on the piston. No counter pressure is exerted during release or shut off operation. Only the friction force contributes to release or shut off effort.



Sealing System

❶ Spindle Sealing

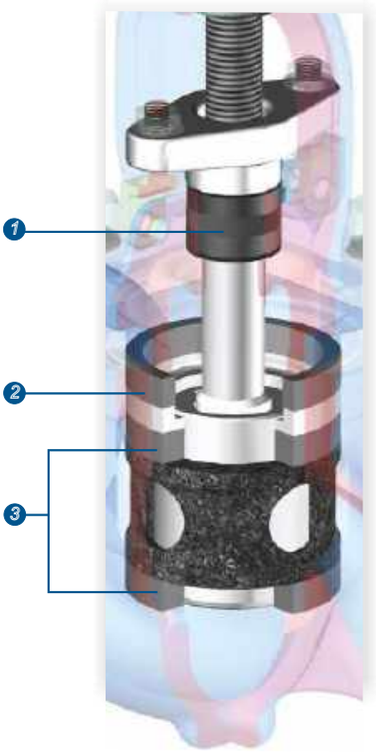
The sealing between spindle and atmosphere is provided by stuffing box composed of 3 pieces of YX-GT rings.

❷ Body Sealing

The sealing between body and atmosphere is provided by 1 piece of YX-GT ring located between body and bonnet.

❸ Inner Sealing

The inner sealing is provided by 2 pieces of specially manufactured YX-GT rings surrounding the piston elastically.



Maintenance Free

High temperature resistant Belleville washers, one located on the bonnet and the other located under the stuffing box nuts, create a constant thrust on the rings. This compensates pressure and temperature variations and avoids loosening due to abrasion. An outstanding maintenance free sealing is achieved for a long service life.

Balanced Piston Valve YVNB 65-200

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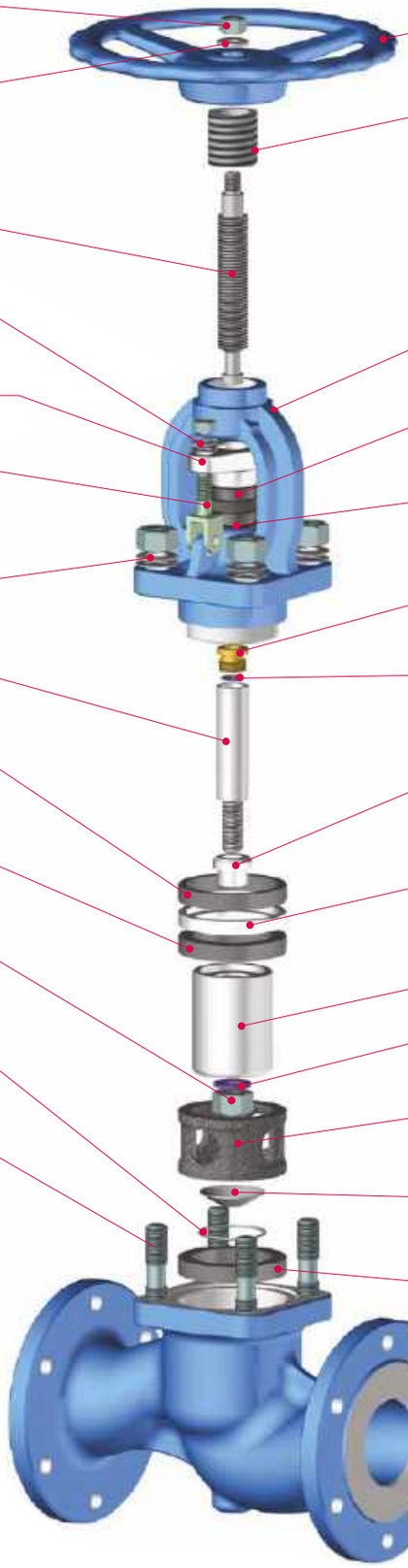

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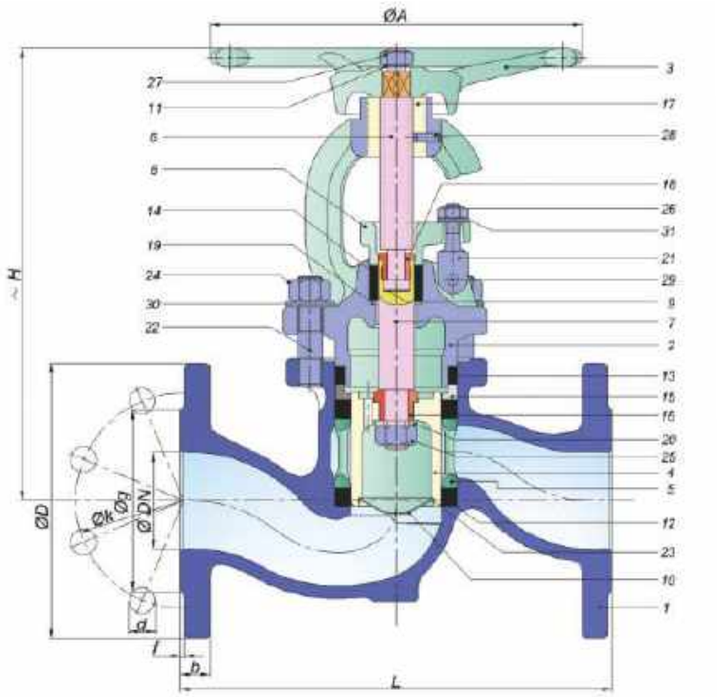

Balanced Piston Valves
DN 65 - 200
Type: YVNB Flanged

Material Type	Cast Iron	Ductile Iron	Cast Steel	Stainless Steel
Size	DN65-200	DN65-200	DN65-200	DN65-200
Pressure Class	PN16	PN25	PN40	PN40
Dimensions	DIN EN 558/1.serie	DIN EN 558/1.serie	DIN EN 558/1.serie	DIN EN 558/1.serie
Assembly	Flanged according to DIN EN 1092-2	Flanged according to DIN EN 1092-2	Flanged according to DIN EN 1092-1	Flanged according to DIN EN 1092-1
Temperature	-10°C +300 °C	-10°C +350 °C	-10°C* +400°C	-10°C* +400°C
Material Code	2	8	7	9
Order Code	YPG.2F.__.00	YPG.8F.__.00	YPG.7F.__.00	YPG.9F.__.00

Fluid Types

All kinds of fluids such as water, hot water, high temperature hot water, steam, thermal oil, LPG, fuel oil, pressurized air, etc.

P.No	Part Name	Cast Iron	Ductile Iron	Cast Steel	St. Steel	St. Steel
1	Body	GJL 250	0.7040	1.0619	1.4308	1.4408
2	Upper Bonnet	GJL 250	0.7040	1.0619	1.4308	1.4408
3	Hand Wheel	GJL 200	GJL 200	GJL 200	GJL 200	GJL 200
4	Piston	1.4016	1.4016	1.4016	1.4308	1.4408
5	Lantern Bush	GJL 200 + Phosphate	GJL 200 + Phosphate	GJL 200 + Phosphate	1.4308	1.4408
6	Valve Spindle	St-42	St-42	St-42	1.4301	1.4401
7	Piston Shaft	1.4021	1.4021	1.4021	1.4301	1.4401
8	Gland Retainer	0.7040	0.7040	0.7040	1.4308	1.4408
9	Piston Shaft Washer	1.4301	1.4301	1.4301	1.4301	1.4301
10	Piston Box	1.4301	1.4301	1.4301	1.4301	1.4401
11	Lock Washer	55Si7	55Si7	55Si7	A2-70	A2-70
12	Valve Ring	Graphite	Graphite	Graphite	Graphite	Graphite
13	Bonnet Ring	Graphite	Graphite	Graphite	Graphite	Graphite
14	Stuffing Ring	Graphite	Graphite	Graphite	Graphite	Graphite
15	Thrust Piece	GJL 200 + Phosphate	GJL 200 + Phosphate	GJL 200 + Phosphate	1.4308	1.4408
16	Piston Shaft Bushing	1.4021	1.4021	1.4021	1.4301	1.4401

P.No	Part Name	Cast Iron	Ductile Iron	Cast Steel	St. Steel	St. Steel
17	Screw Bushing	Ms-58	Ms-58	Ms-58	Ms-58	Ms-58
18	Double Piece Nut	Ms-58	Ms-58	Ms-58	1.4301	1.4301
19	Stuffing Washer	St-37+Gal.	St-37+Gal.	St-37+Gal.	1.4301	1.4401
20	Piston Washer	Ms-58	Ms-58	Ms-58	1.4301	1.4401
21	Fork Bolt	St-42	St-42	St-42	1.4301	1.4401
22	Stud	8.8+Gal.	8.8+Gal.	8.8+Gal.	A2-70	A2-70
23	Piston Ring	1.4301	1.4301	1.4301	1.4301	1.4301
24	Nut	8.8+Gal.	8.8+Gal.	8.8+Gal.	A2-70	A2-70
25	Left Handed Nut	A2-70	A2-70	A2-70	A2-70	A2-70
26	Nut M10	8.8+Gal.	8.8+Gal.	8.8+Gal.	A2-70	A2-70
27	Nut	8.8+Gal.	8.8+Gal.	8.8+Gal.	A2-70	A2-70
28	Pin 6x15	St-42+Gal.	St-42+Gal.	St-42+Gal.	A2-70	A2-70
29	Sloted pin 8x22	8.8	8.8	8.8	1.4301	1.4301
30	Belleville Washer	50CrV4	50CrV4	50CrV4	A2-70	A2-70
31	Belleville Washer (20/10.2x11)	50CrV4	50CrV4	50CrV4	A2-70	A2-70

DN			Dimensions			Assembly size																		
						PN16							PN25							PN40					
mm	inch	Type	L	H	A	D	b	g	Hole Nr.	d	k	f	D	b	g	Hole Nr.	d	k	f	D	b	g	Hole Nr.	d	k	f
65	2 1/2"	YVNB 65	290	306	250	185	20	122	4	19	145	3	185	20	118	8	19	145	3	185	22	122	8	18	145	2
80	3"	YVNB 80	310	327	250	200	22	138	8	19	160	3	200	22	132	8	19	160	3	200	24	138	8	18	160	2
100	4"	YVNB 100	350	374	280	220	24	158	8	19	180	3	235	24	156	8	23	190	3	235	24	162	8	22	190	2
125	5"	YVNB 125	400	447	320	250	26	188	8	19	210	3	270	26	184	8	28	220	3	270	26	188	8	26	220	2
150	6"	YVNB 150	480	477	360	285	26	212	8	23	240	3	300	26	211	8	28	250	3	300	28	218	8	26	250	2
200	8"	YVNB 200	600	561	400	340	30	268	12	23	295	3	360	30	274	12	28	310	3	375	34	285	12	30	320	2

*For temperatures below -10°C, stud and nut material should be stainless steel

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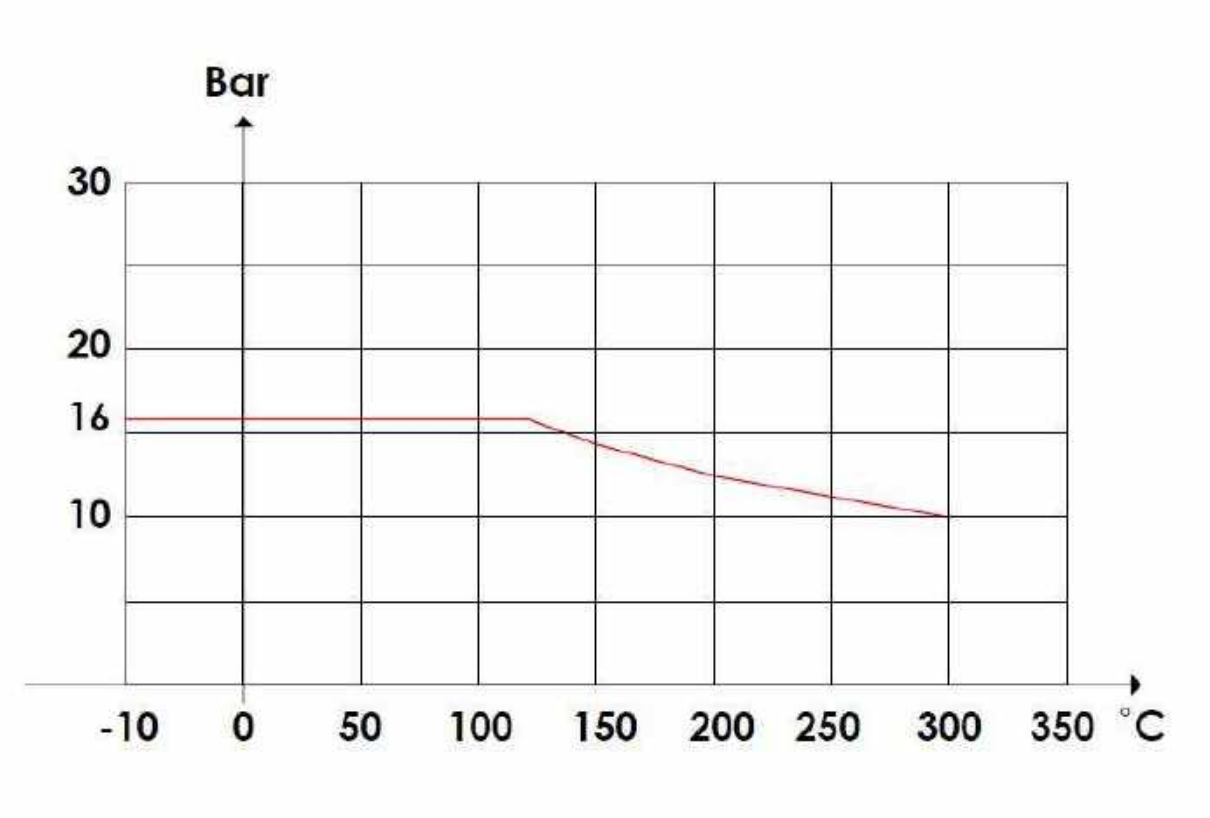
PISTON VALVE

Temperature Pressure Diagram



Pressure Class : PN16

Material : GJL 250

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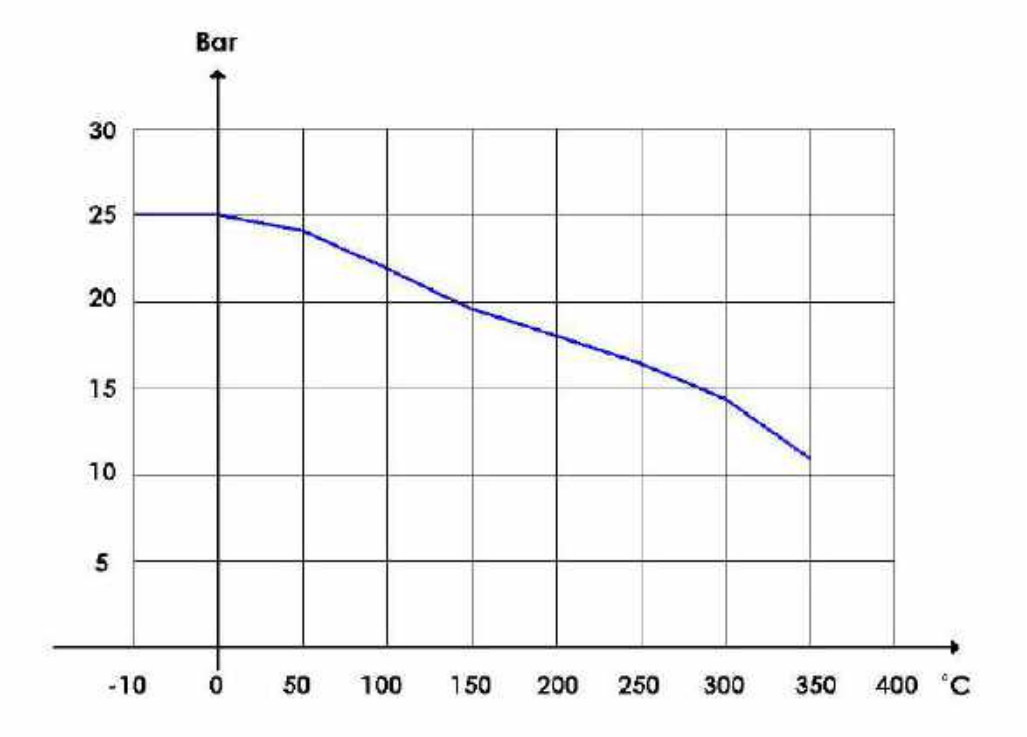
PISTON VALVE

Temperature Pressure Diagram



Pressure Class : PN25

Material : 0.7040

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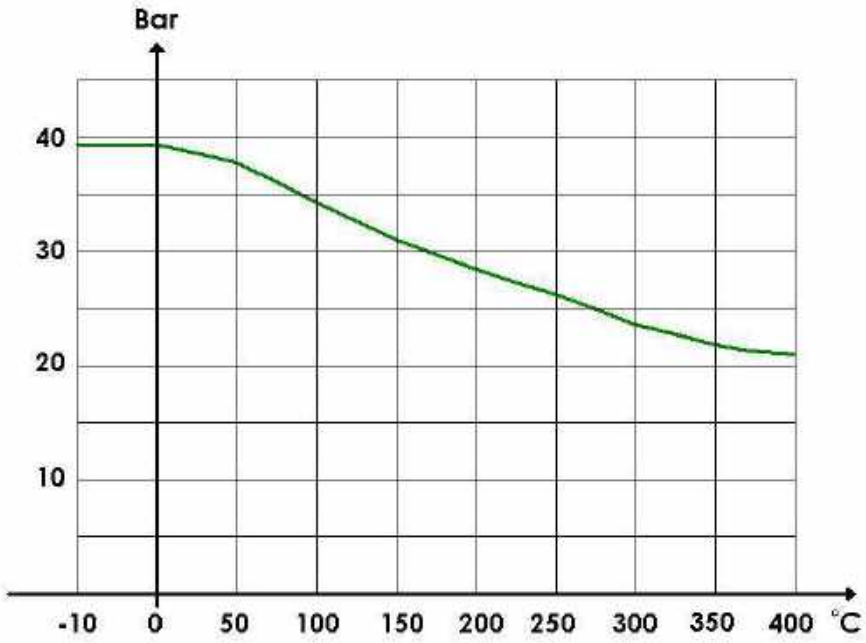
PISTON VALVE

Temperature Pressure Diagram



Pressure Class : PN40

Material : 1.0619

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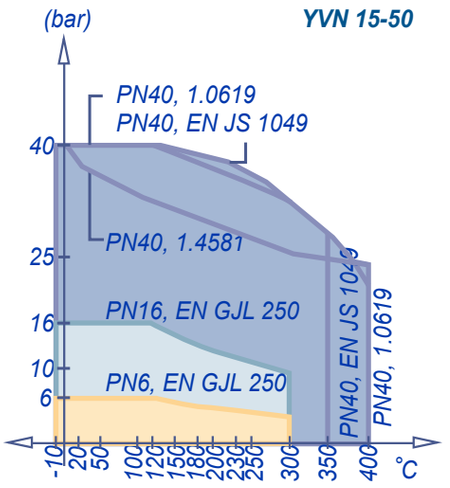
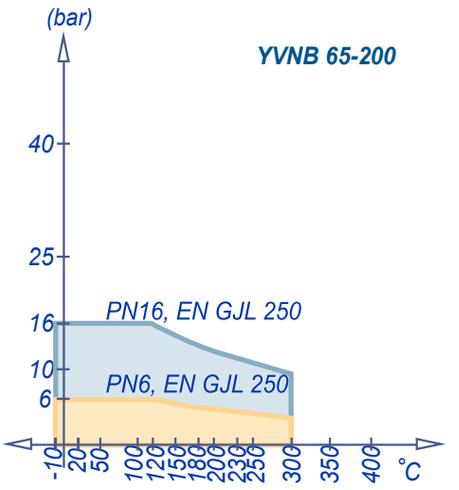
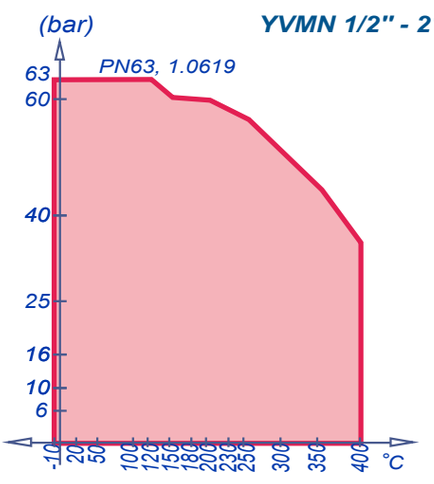
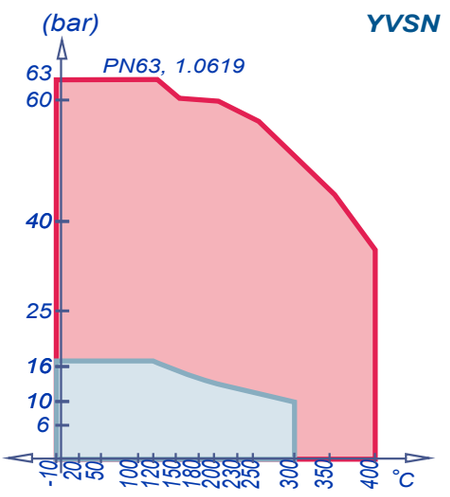
Pressure / Temperature Diagrams



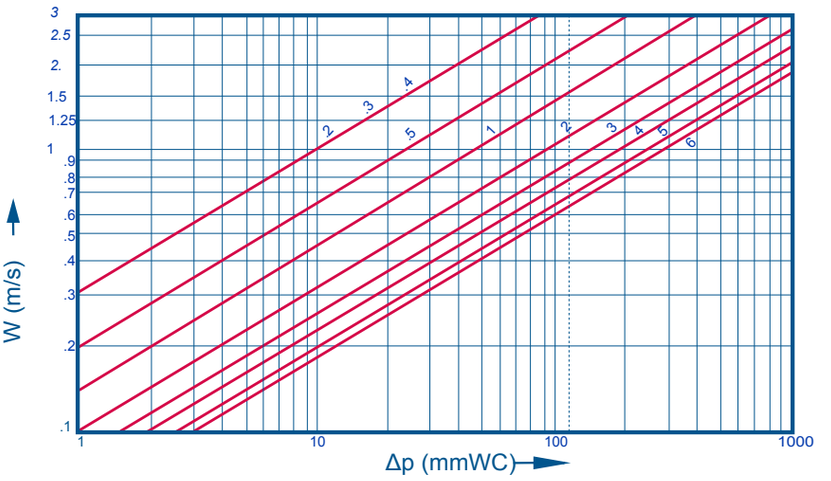






Pressure drop calculation in piston valves

DN	ξ	K_V
15	4	4,5
20	4	8
25	4	12,5
30	4	20,5
40	4	32
50	4	50
65	6	69
80	6	104
100	6	163
125	7,2	233
150	7,2	335
200	7,5	582



Pressure drop formula Δp= pressure drop (mmWC)

$$\Delta p = \xi \frac{W^2}{2g} \rho \ (mmWC)$$

$$\Delta p = \left(\frac{Q}{Kv}\right)^2 \times \frac{\rho}{1000}$$

ξ : zeta value
W : fluid velocity, m/s
2g : 20 m/s²
ρ : 1000 kg/m³
Kv : flow coefficient, m³/h. For Δp = 10 mWC
Q : flow rate, m³/h