YAKACIK® VALF

PISTON VALVES

YVN - YVNB
YVMN - YVSN

2019 - 01

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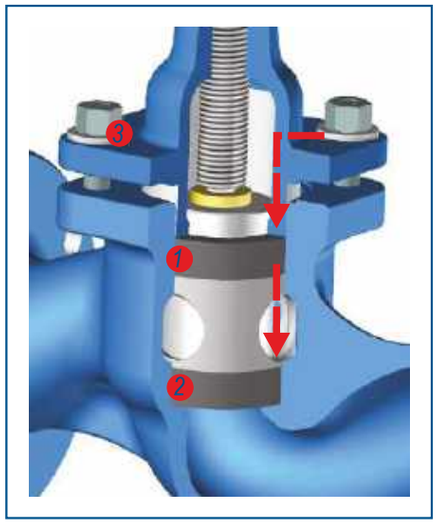
YAKACIK® VALF

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.*

Piston Valve
YVN 15-50

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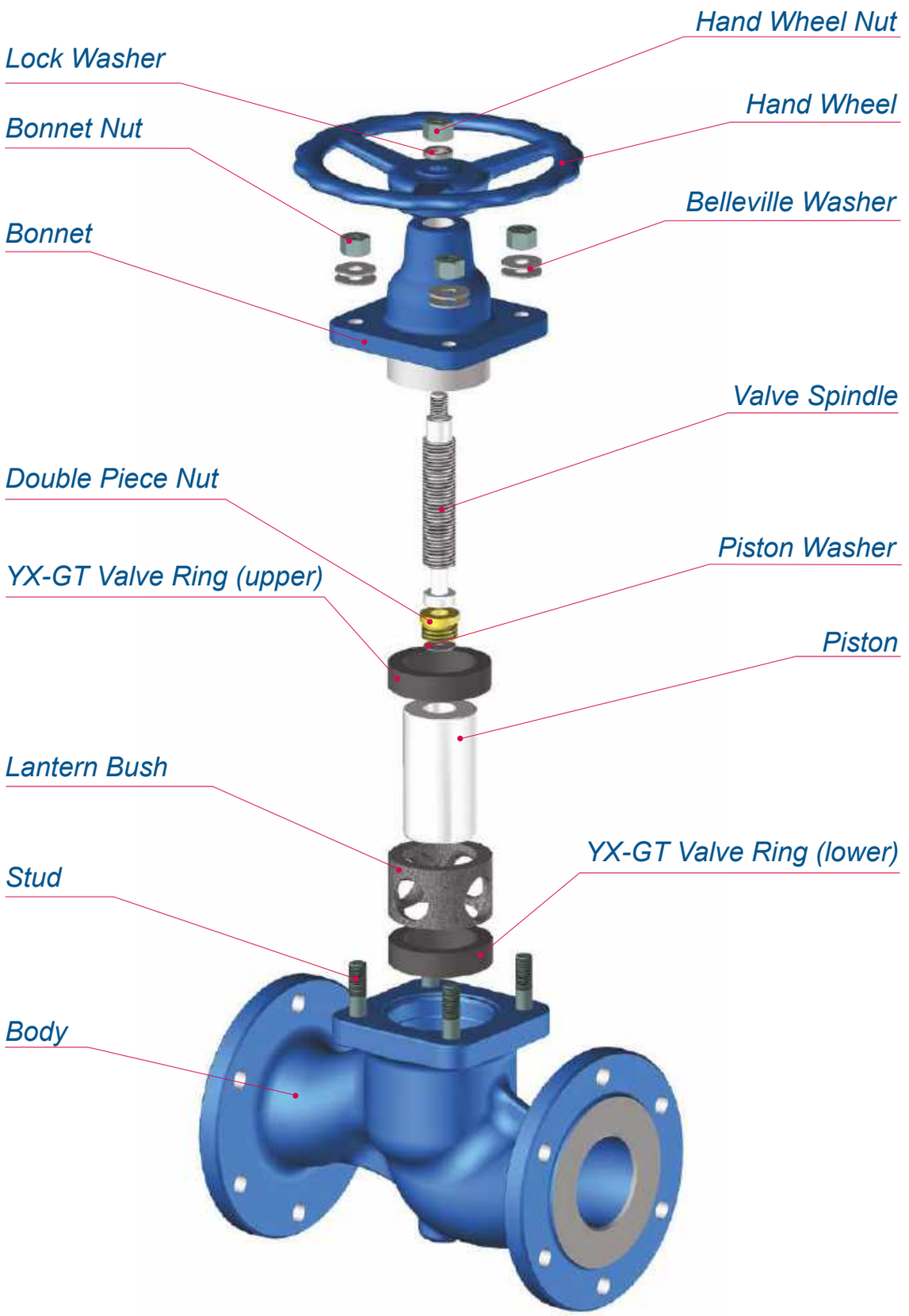

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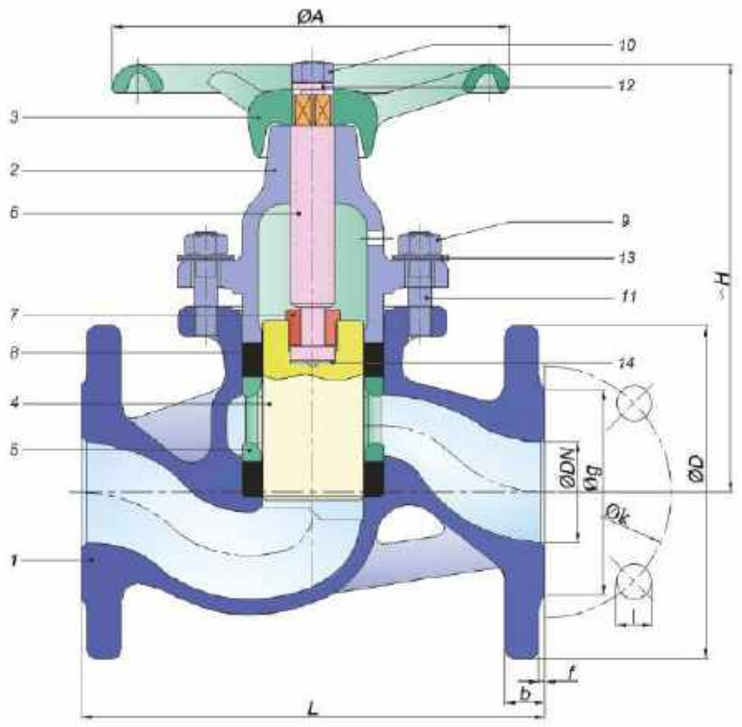

Piston Valves
DN 15 - 50
Type: YVN Flanged

Material Type	Cast Iron	Ductile Iron	Cast Steel	Stainless Steel
Size	DN15-50	DN15-50	DN15-50	DN15-50
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	1.4021	1.4021	1.4021	1.4301	1.4401
5	Lantern Bush	GJL 200 + Phosphate	GJL 200 + Phosphate	GJL 200 + Phosphate	1.4308***	1.4408***
6	Valve Spindle	1.4021/St-42	1.4021/St-42	1.4021/St-42	1.4301	1.4401
7	Double Piece Nut	Ms-58	Ms-58	Ms-58	1.4301	1.4401
8	Valve Ring	Graphite	Graphite	Graphite	Graphite	Graphite
9	Nut	8.8+Gal.	8.8+Gal.	8.8+Gal.	A2-70	A2-70
10	Nut	8.8+Gal.	8.8+Gal.	8.8+Gal.	A2-70	A2-70
11	Stud	8.8+Gal.	8.8+Gal.	8.8+Gal.	A2-70	A2-70
12	Lock Washer	8.8+Gal.	8.8+Gal.	8.8+Gal.	A2-70	A2-70
13	Belleville Washer	50CrV4	50CrV4	50CrV4	A2-70	A2-70
14	Piston Washer	Ms-58	Ms-58	Ms-58	1.4301	1.4301

DN			Dimensions			Assembly size													
										PN16			PN25			PN40		
mm	inch	Type	L	H	A	D	g	Hole Nr.	k	b	f	l	b	f	l	b	f	l
15	1/2"	YVN 15	130	105	100	95	45	4	65	14	2	14	16	2	14	16	2	14
20	3/4"	YVN 20	150	120	120	105	58	4	75	16	2	14	18	2	14	18	2	14
25	1"	YVN 25	160	138	140	115	68	4	85	16	2	14	18	3	14	18	2	14
32	1 1/4"	YVN 32	180	154	160	140	78	4	100	18	2	19	18	3	19	18	2	18
40	1 1/2"	YVN 40	200	186	180	150	88	4	110	18	3	19	18	3	19	18	2	18
50	2"	YVN 50	230	211	200	165	102	4	125	20	3	19	20	3	19	20	2	18

** For temperatures below -10°C, stud and nut material should be stainless steel*
****1.4401 for DN15 and DN20*
***** Ck22 for DN15 and DN20*

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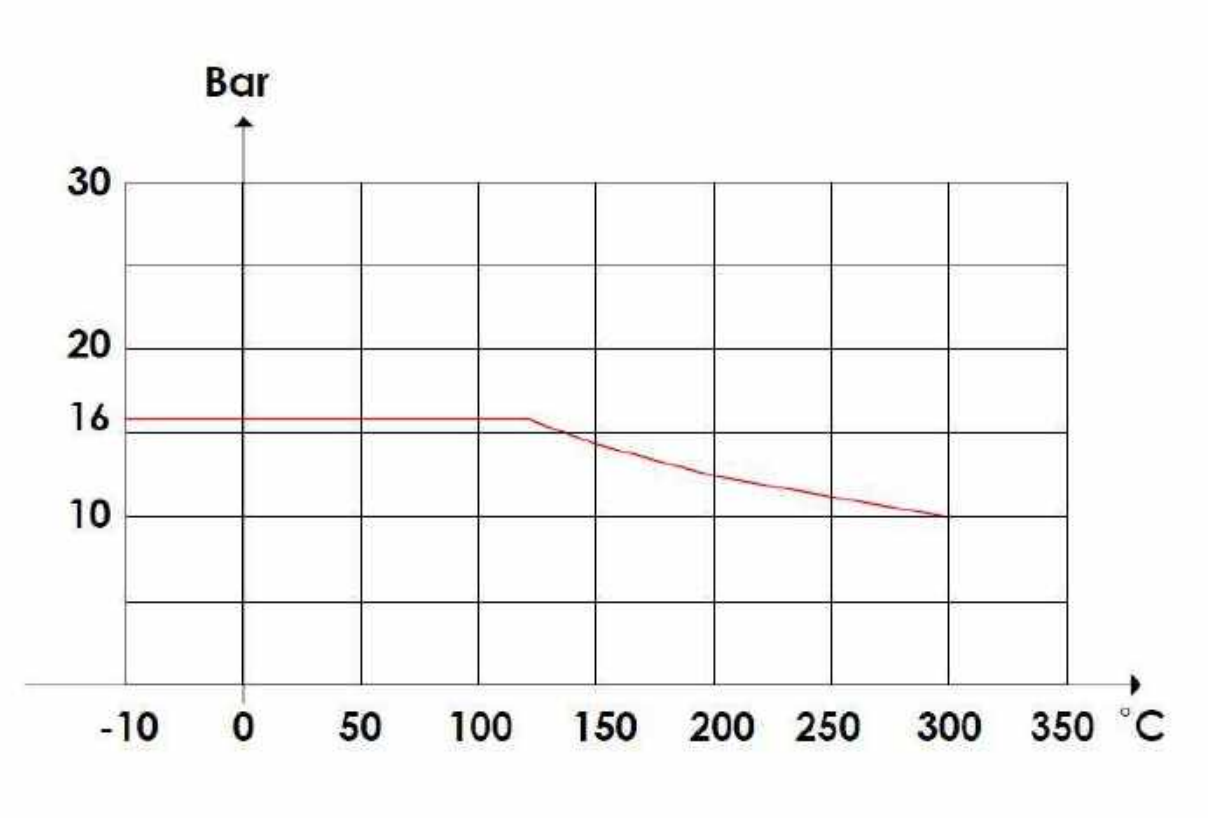
PISTON VALVE

Temperature Pressure Diagram



Pressure Class : PN16

Material : GJL 250

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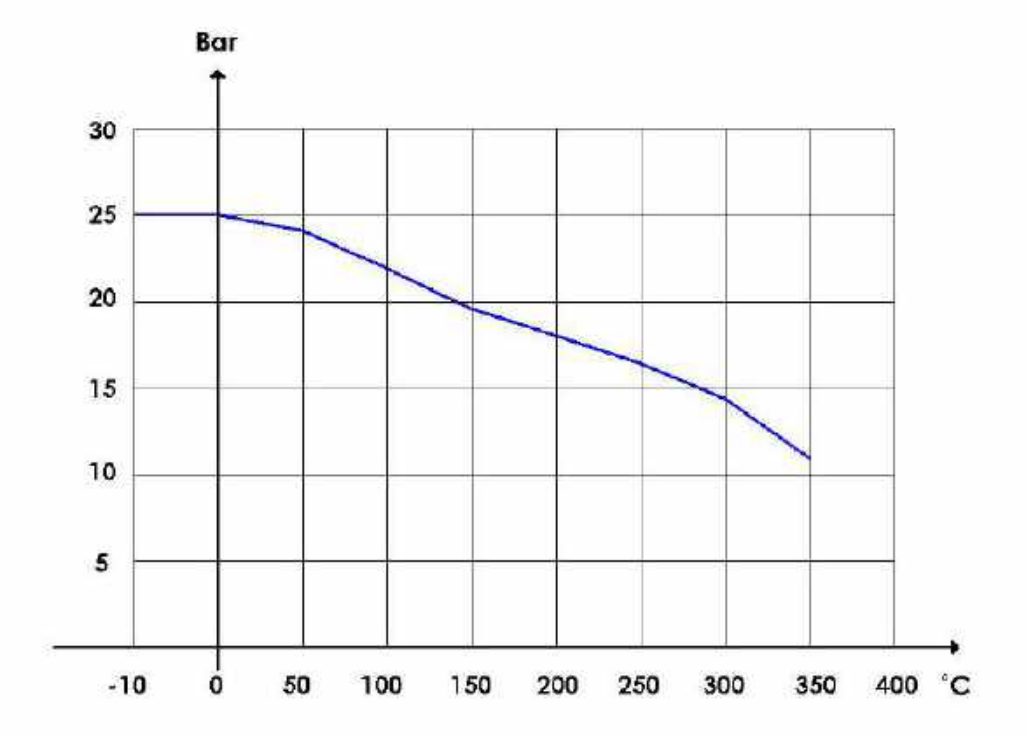
Temperature Pressure Diagram



Pressure Class : PN25

Material : 0.7040

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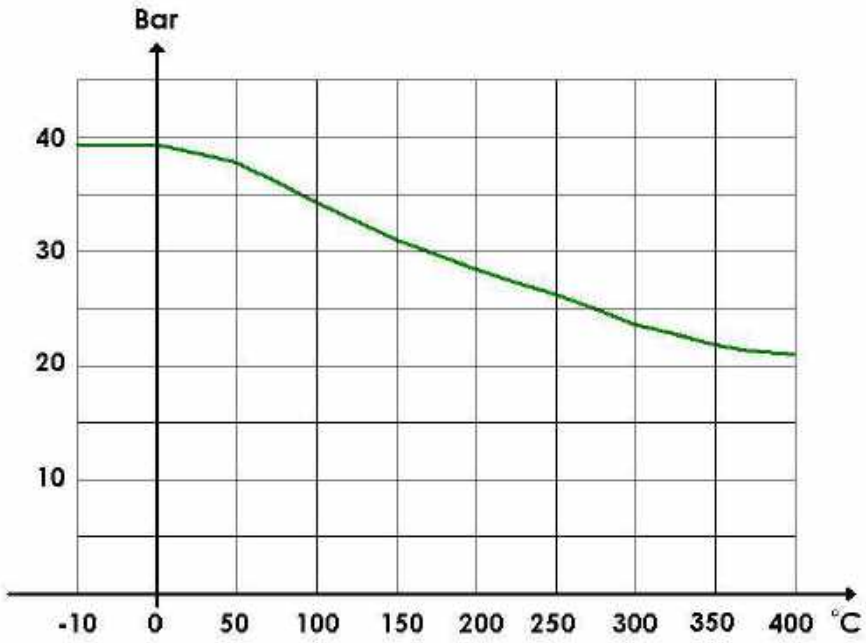
Temperature Pressure Diagram



Pressure Class : PN40

Material : 1.0619

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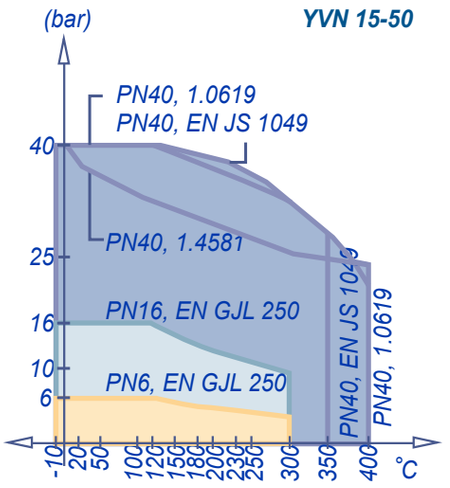
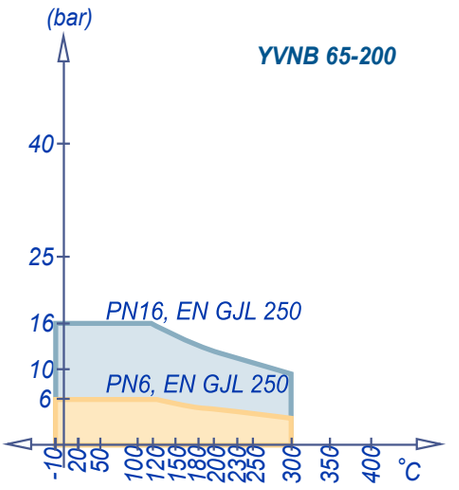
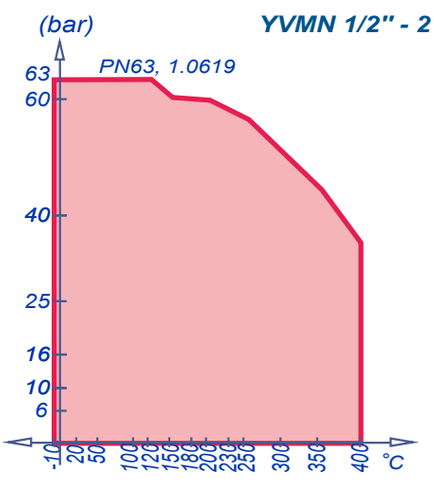
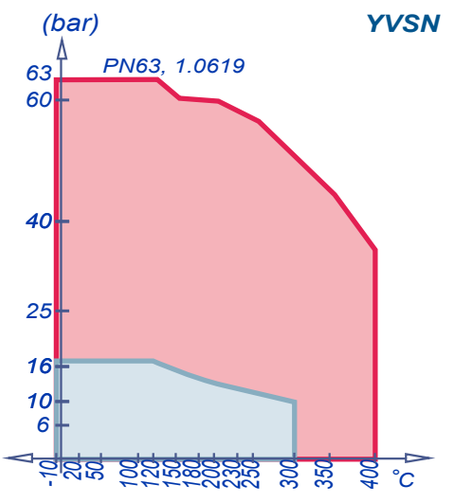
Pressure / Temperature Diagrams



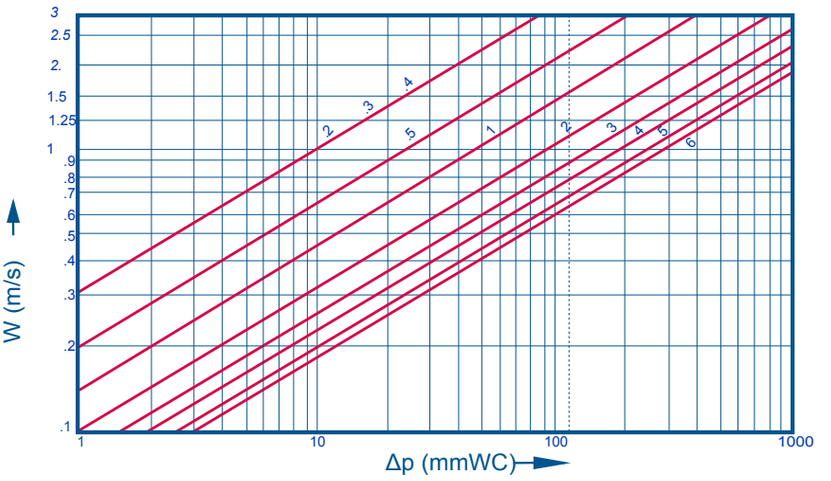






Pressure drop calculation in piston valves

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