

Type SAVA

Cross-over plug valve combination



Type SAVA

Cross-over combinations for safety valves

transflow
design



- safe exchange of safety valves
- pressure release guaranteed during cross-over action
- 100% safety during continuous operation

DN 25E - 600E / PN 10 - 100

NPS 1E - 24E / Class 150 - 600

Design characteristics

- full-flow, round bore
- sealing surfaces permanently protected
- reliable and tight for years
- tight during the exchange of safety valves
- safe backflow of blow-off capacity
- a minimal flow (protection of the vessel) is always given

Type SAVA-R

Example: with backflow of blow-off capacity, flange connections, gearbox



Type SAVA-F

Example: without backflow of blow-off capacity, with plug stem extension (T-wrench), female resp. male threads

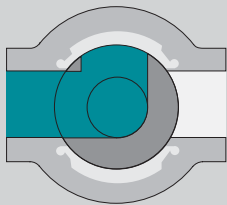


PT diagram, plug types, sealing systems, material selection: see catalogue part **ENGINEERING**

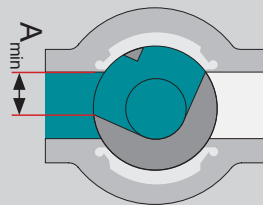
Safe exchange of safety valves during plant operation

Principle of the transflow plug

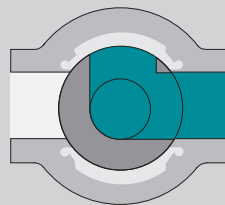
**Position 0°
safety valve I**



Cross-over phase
(least cross section
 A_{min} is guaranteed)



**Position 90°
safety valve II**



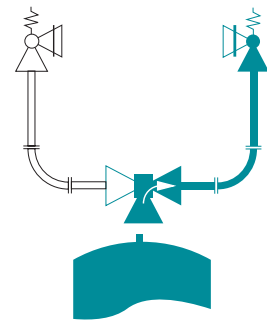
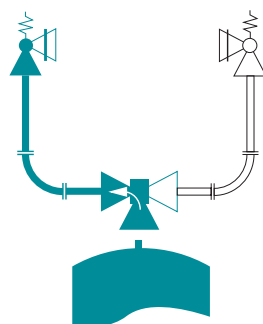
Least cross section A_{min} during the cross-over phase

- full round bore
- minimal turbulence
- good drag coefficient (zeta value)
- minimum opening cross section before safety valve



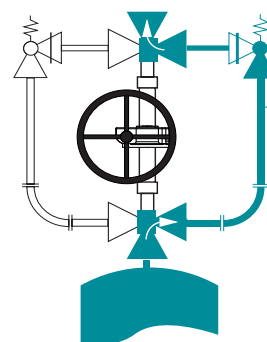
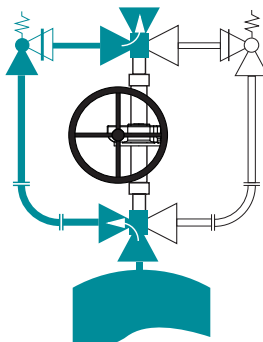
Type SAVA-F

Cross-over single valve without backflow of blow-off capacity, ventilation to atmosphere



Type SAVA-R

Cross-over combination with back-flow of blow-off capacity back to the system



Type SAVA

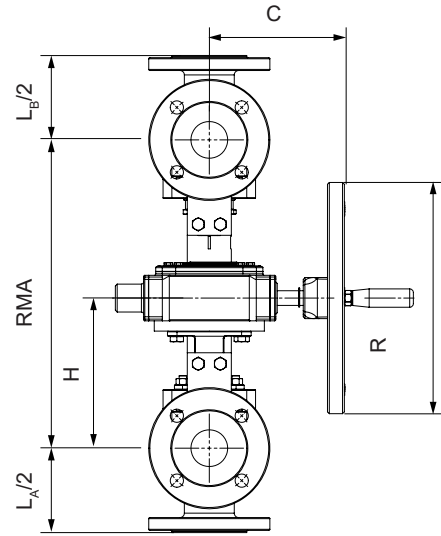
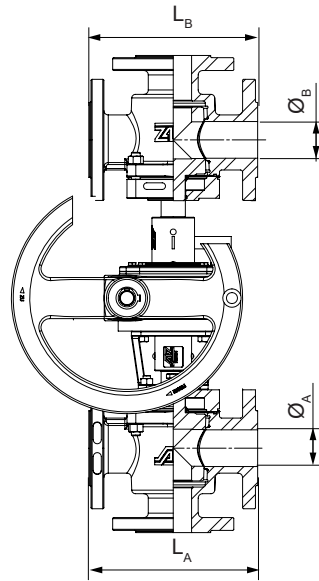
Technical information

F-3-E-W: $\zeta = 1,14$

F-3-E-S: $\zeta = 1,29$

F-3-E-S: $\zeta = 1,29$

(measured ζ -values,
valid for all nominal sizes)



Dimensions acc. to ASME B16.5 / 16.10 - DIN EN 1092-1 / 558 for type ISO-EXTRA / EXTRA	Class 150 ³⁾		PN10 - PN 40 ³⁾		A_{min} [mm ²]	RMA _{min} ¹⁾ [mm]		C [mm]	H [mm]	L_A ³⁾ [mm]	$L_A/2$ [mm]	L_B ⁵⁾ [mm]	$L_B/2$ [mm]	R [mm]
	$\varnothing_A$ [NPS]	$\varnothing_B$ [NPS]	$\varnothing_A$ [DN]	$\varnothing_B$ [DN]		ISO-EXTRA	EXTRA							
1E	1E	1E	25 ⁴⁾	25E ⁴⁾	225	320		132	180	160	80	160	80	160
		1½E		40E		330		165	188			200	100	160
		2E		50E		340		170	205			230	115	315
1½E	1½E	1½E	40E	40E	708	360		165	188	200	100	200	100	160
		2E		50E		360		170	205			230	115	315
		3E		65E		390		170	215			310	155	315
2E	2E	2E	50E	50E	1296	400		170	205	230	115	230	115	315
		2½E		65E		410		170	215			290	145	315
		3E		80E		430		170	235			310	155	400
3E	3E	3E	80E	80E	3754	460		170	235	310	155	310	155	400
		4E		100E		530		299	290			350	175	400
		6E		150E		480		324	342			480	240	500
4E	4E	4E	100E	100E	5184		590	299	290	350	175	350	175	400
		6E		150E			640 (F25)	324	342			480	240	500
		8E		200E			680 (F30)	380	381			600	300	400
6E	6E	6E	150E	150E	14386		720 (F30)	324	342	480	240	480	240	500
		8E		200E			730 (F30)	380	381			600	300	400
		8E		200E			760 (F30)	380	381			600	300	400
8E	8E	8E	200E	200E	25833		830 (F35)	510	434	600	300	730	365	800
		10E		250E			850 (F35)	510	434			730	365	800
		12E		300E ²⁾		42102						850	425	
12E	12E	300E ²⁾	300E ²⁾	300E ²⁾						850	425	850	425	

¹⁾ larger pipe centre line (RMA) on request

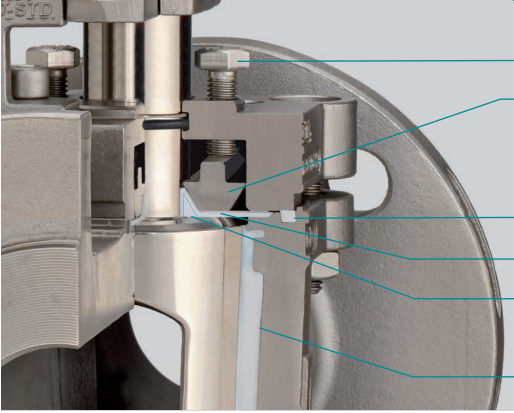
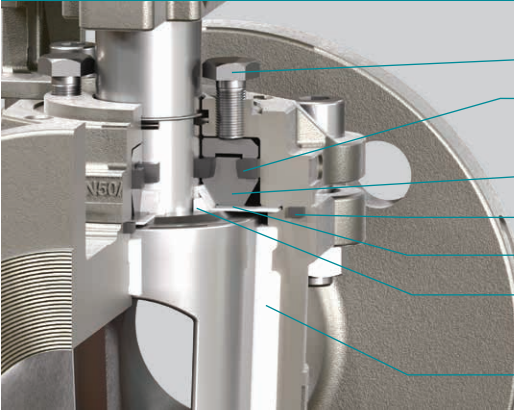
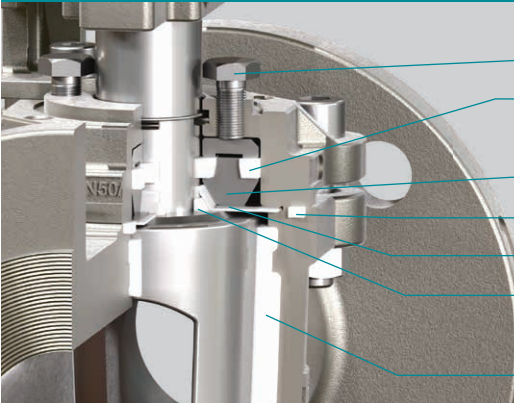
²⁾ All details for PN10 - PN 40 and Class 150, higher sizes or ratings on request

³⁾ Flanges acc. to ASME, Class 300/600 or others on request

⁴⁾ also available with T-wrench

⁵⁾ F/F dimension acc. to DIN 3202 / DIN EN 558-1

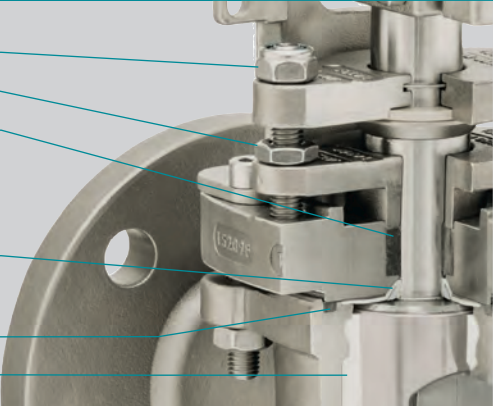
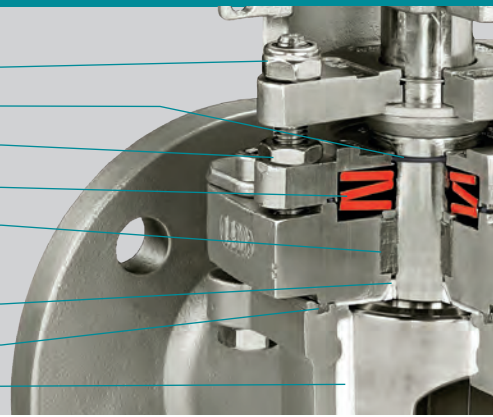
Cover and stem sealing systems suitable for general applications

Type STANDARD	
	● plug adjustment ● thrust collar ● cover sealing (PTFE) ● stainless steel diaphragm ● Secondary sealing: V-diaphragm (PTFE), delta thrust collar (PTFE) ● Primary sealing: sleeve*
Type FS2	Fire-Safe-sealing (API 607)
	● plug & packing adjustment ● Tertiary sealing: Packing to atmosphere (graphite) ● thrust collar ● cover sealing (graphite) ● stainless steel diaphragm ● Secondary sealing: V-diaphragm (PTFE) and delta thrust collar (PTFE) ● Primary sealing: sleeve*
Type CA2	Chemistry sealing
	● plug & packing adjustment ● Tertiary sealing: Packing to atmosphere (PTFE) ● thrust collar ● cover sealing (PTFE) ● stainless steel diaphragm ● Secondary sealing: V-diaphragm, delta thrust collar (PTFE) ● Primary sealing: sleeve*

*) The sleeve material has a decisive influence on the maximum operating temperature
Material selection acc. to PT-diagram

More safety for severe applications

*engineered.
fast.
dynamic.*

Type FSN	Fire-Safe-sealing (API 607)	
		
	- plug adjustment - triple safety stem packing adjustment Tertiary sealing: triple safety stem packing (graphite) Secondary sealing: V-diaphragm (PTFE) and delta thrust collar (PTFE) - cover sealing (graphite) Primary sealing: sleeve*	
Type FSN-EF	Fire-Safe-sealing (API 607)	
Emission Free		
	- plug adjustment - triple safety stem packing adjustment Quaternary sealing: three o-rings at the stem Tertiary sealing: triple safety stem packing Secondary sealing: V-diaphragm (PTFE) and delta thrust collar (PTFE) - cover sealing (graphite) Primary sealing: sleeve*	
Type FSN-SL	Fire-Safe-sealing (API 607)	
live-loaded		
	- plug adjustment - o-rings protect the springs against corrosion - triple safety stem packing adjustment - disk springs (optionally made of Inconel) Tertiary sealing: triple safety stem packing (graphite) Secondary sealing: V-diaphragm (PTFE) and delta thrust collar (PTFE) - cover sealing (graphite) Primary sealing: sleeve*	

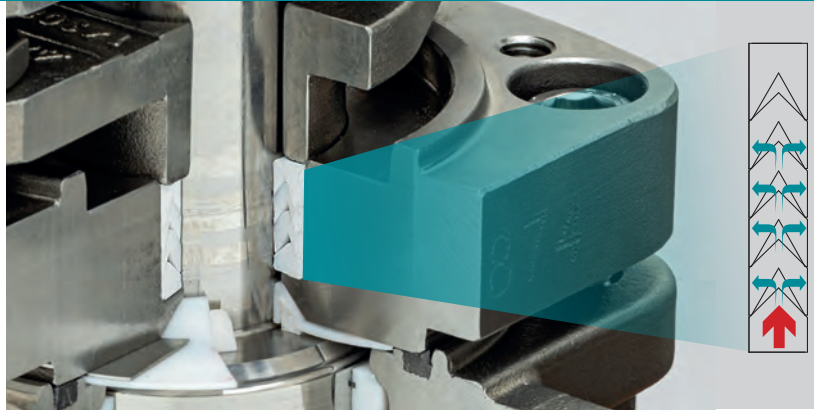
*) The sleeve material has a decisive influence on the maximum operating temperature
Material selection acc. to PT-diagram

Material for **type CASN** and **CASN-SL** chemistry safety sealing: packing and cover sealing in PTFE

Special sealing systems

Chevron packing

- increases the contact pressure (when pressure builds up on the safety stem packing towards plug stem)
- for toxic and fugitive media
- high wear resistance



Type CL Chlorine / gas applications

- approved for chlorine applications and other toxic gases
- ideal for media with changing state of aggregate (e.g. liquid to gas, vice versa)
- vacuum capable



Detection ports for monitoring purpose of lethal gases (phosgene, etc.)

- detection ports for early recognition of potential leakages
- sniffing at sealing surfaces to atmosphere

stem packing

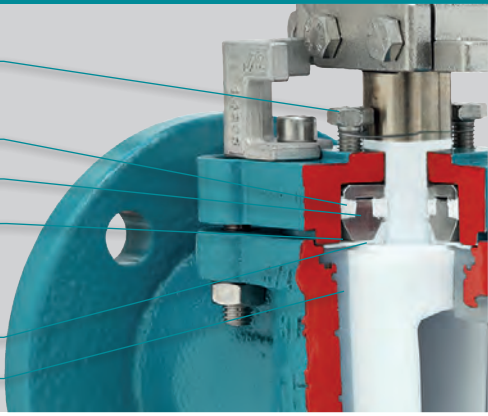
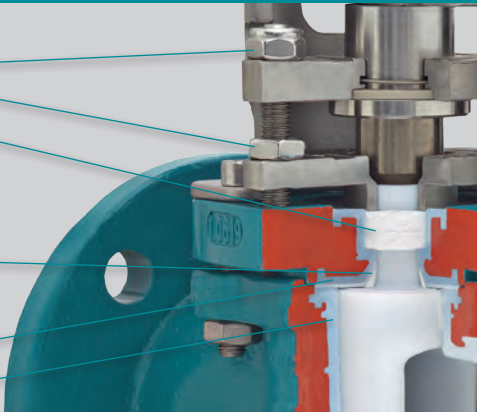
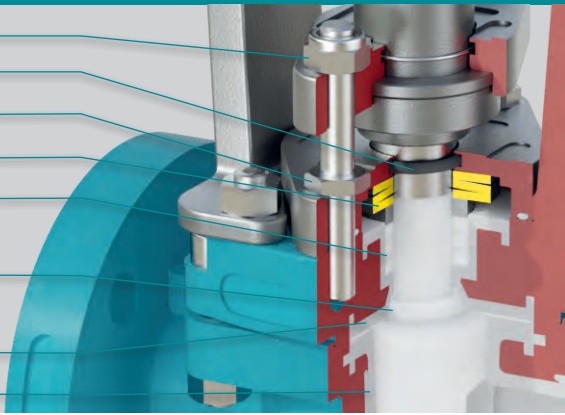
cover sealing

flange sealing



Cover and stem sealing systems for lined plug valves

*engineered.
fast.
dynamic.*

Type CA	Chemistry sealing
plug & packing adjustment Tertiary sealing: Packing to atmosphere (PTFE) thrust collar stainless steel diaphragm Secondary sealing: V-diaphragm & delta thrust collar (PTFE) Primary sealing: lined body	
Type SAFE-LINED	Chemistry sealing
lined cover plug adjustment triple safety stem packing adjustment Tertiary sealing: triple safety stem packing (PTFE) to atmosphere Secondary sealing: V-diaphragm (PTFE), delta thrust collar (PTFE) lined cover Primary sealing: lined body*	
Type SAFE-LINED-SL	Chemistry sealing
live-loaded plug adjustment o-rings protect the springs against corrosion triple safety stem packing adjustment disk springs (optionally made of Inconel) Tertiary sealing: triple safety stem packing (PTFE) to atmosphere Secondary sealing: V-diaphragm (PTFE), delta thrust collar (PTFE) lined cover Primary sealing: lined body*	

*) Lining and plug material have a decisive influence on the maximum operating temperature
Material selection according to PT-diagram.

Casting materials



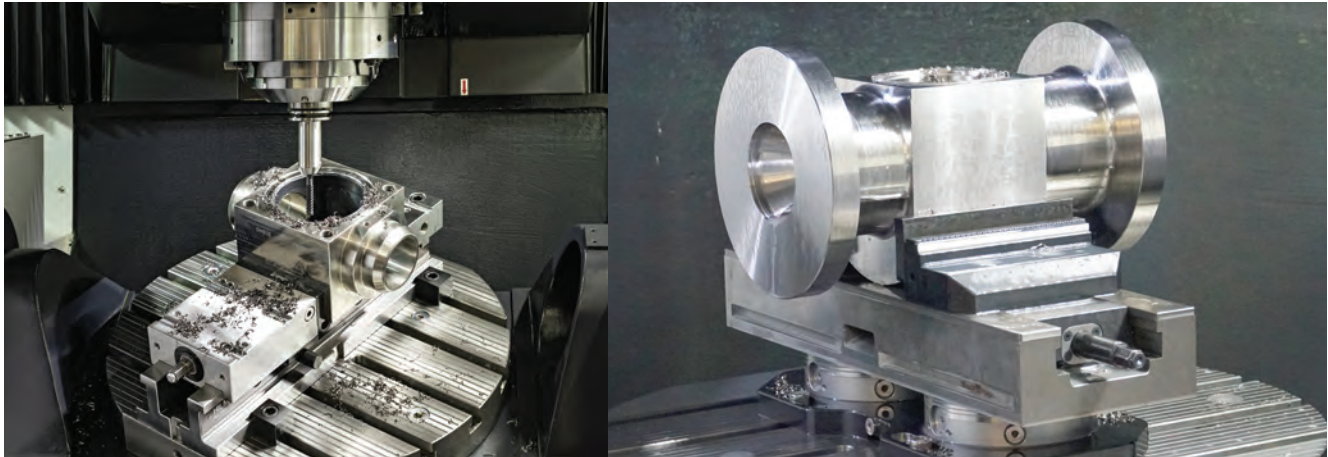
		Casting Material					
Material Group	Common Name	EN / DIN	Short name	Material-No.	ASTM	Grade	UNS
Carbon Steel / Ductile Iron							
Ductile Iron	SG Iron	EN 1563	EN-GJS-400-18-LT	5.3103	A395	-	F32800
Carbon Steel	CS	EN 10213	GP240GH	1.0619	A216	WCB	J03002
Low Temp. Carbon Steel	LTCS	EN 10213	G17Mn5	1.1131	A352	LCB	J03003
Low Temp. Carbon Steel	LTCS	EN 10213	G21Mn5	1.1138	A352	LCC	J02505
Stainless Steel							
Stainless Steel	Duplex 2205	EN 10213	GX2CrNiMoN22-5-3(4A)	1.4470	A995	4A-CD3MN	J92205
Stainless Steel	Duplex 1B	EN 10213	GX3NiCrMoCuN26-6-3-3	1.4517	A995	1B-CD4MCuN	J93372
Austenitic	SS	EN 10213	GX5CrNi19-10	1.4308	A351	CF8	J92600
Austenitic	SS	EN 10213	GX2CrNi19-11	1.4309	A351L	CF3	J92700
Austenitic	SS	EN 10213	GX5CrNiMo19-11-2	1.4408	A351	CF8M	J92900
Austenitic	SS	EN 10213	GX2CrNiMo19-11-2	1.4409	A351	CF3M	J92800
Super Austenitic	Alloy 20	EN 10213	NiC420CuMo	1.4500	A351	CN7M	N08007
Super Austenitic	Alloy 20 mod.	EN 10213	GX2NiCrMoCuN25-20	1.4536	A743	CN7MS	J94650
Super Austenitic	AL6XN	-	-	-	A351	CN3MN	J94651
Superduplex	Superduplex 5A	EN 10213	25Cr-7Ni-Mo-N	1.4469	A995	CE3MN	J93404
Nickel Alloy							
	Monel/Alloy400	DIN 17730	G-NiCu30 Nb	2.4365	A494	M35-1	N24135
	Hastelloy C mod.	-	-	-	A494	CW6M	N30107
	Hastelloy C	-	-	2.4537	A494	CW12MW	N30002
	Hastelloy C-276	-	-	2.4883	-	-	-
	Hastelloy B-3	-	-	-	-	-	-
	Inconel 600	-	-	-	A494	CY40	N06040
	Inconel 625	-	-	-	A494	CW6MC	N26625
	Inconel 825	-	-	-	A494	CU5MCuC	N08826
	Nickel	DIN 17730	G-Ni 95	2.4170	A494	CZ100	N02100
Other Material Groups							
Tantalum	Tantalum	-	-	-	-	-	-
Titanium	Ti 2	DIN 17865	G-Ti 2	3.7031	B367	C-2	R52550
Zirconium	Zirconium 702	-	-	-	B752	702C	-
Zirconium	Zirconium 705	-	-	-	-	705C	-

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The use of these equivalents has to be evaluated on a case-by-case basis.

Other materials on request.

Equivalent forged and bar-stock materials



			Similar Forged Material							Bar Material	
Common Name	Mat.Nr.	Grade	EN / DIN	Short Name	Mat.Nr.	ASTM	Grade	UNS	ASTM	Short	
Carbon Steel / Ductile Iron											
SG Iron	5.3103	-	EN 1563	EN-GJS-400-18-LT	5.3103	A395-99	60-40-18	-	-	-	
CS	1.0619	WCB	EN 10213	GP240GH	1.0619	A105	A105	-	-	-	
LTCS	1.1131	LCB	-	-	-	A350	LF2-Class1	G10300	-	-	
LTCS	1.1138	LCC	-	-	1.0566	A350	LF2-Class1	G10250	-	-	
Stainless Steel											
Duplex 2205	1.4470	4A-CD3MN	EN 10028-7	X2CrNiMoN22-5-3	1.4462	A182	F51	S32205	A479	S31803	
Duplex 1B	1.4517	1B-CD4MCuN	EN 10028-7	X2CrNiMoCuN25-5-3	1.4507	A182	F59	S32520	A479	S32550	
SS	1.4308	CF8	EN 10028-7	X5CrNi18-10	1.4301	A182	F304	S30400	A276	304	
SS	1.4309	CF3	EN 10028-7	X2CrNi19-11	1.4306	A182	F304L	S30403	A276	304L	
SS	1.4408	CF8M	EN 10028-7	X5C4NiMo17-12-2	1.4401	A182	F316	S31600	A276	316	
SS	1.4409	CF3M	EN 10028-7	X2CrNiMo 17-12	1.4404	A182	316L	S31603	A276	316L	
Alloy 20	1.4500	CN7M	-	-	2.4660	B462	N08020	N08020	B473	N08020	
Alloy 20 mod.	1.4536	CN7MS	-	-	-	-	-	-	-	-	
AL6XN	-	CN3MN	EN 10028-7	X1NiCrMoCuN25-20-7	1.4529	A182	F62	N08367	B462	N08367	
Superduplex 5A	1.4469	CE3MN	EN 10028-7	X2CrNiMoN25-7-4	1.4410	A182	F63	S32615	-	-	
Nickel Alloy											
Monel/Alloy400	2.4365	M35-1	DN 17744	NiCu30Fe	2.4360	B165	Alloy 400	N04400	B164	N04400	
Hastelloy C mod.	-	CW6M	-	-	-	A494	-	-	-	-	
Hastelloy C	-	CW12MW	-	NiMo16CrW	-	A494	-	-	-	-	
Hastelloy C-276	-	-	DIN 17744	NiMo16Cr15W	2.4819	B565	N10675	N10276	B574	N10276	
Hastelloy B-3	-	-	DIN 17744	NiMo29Cr	2.4600	B565	N10675	N10675	B335	N10675	
Inconel 600	-	CY40	DIN 17742	NiCr15Fe	2.4816	B565	N06600	N06600	B166	N06600	
Inconel 625	-	CW6MC	DIN 17744	NiCr22Mo9Nb	2.4856	B565	N06625	N06625	B446	N06625	
Inconel 825	-	CU5MCuC	DIN 17744	NiCr21Mo	2.4858	B564	N08825	N08825	B425	N08825	
Nickel	2.4170	CZ100	-	-	-	-	-	-	B160	N02200	
Other Material Groups											
Tantalum	-	-	-	-	-	B365	TaW2,5	R05252	-	-	
Ti 2	3.7031	C-2	DIN 17864	Grade 2	3.7035	B381	F2	R50400	B348	Grade 2	
Zirconium 702	-	702C	-	-	6.0702	B493	R60702	R60702	B550	R60702	
Zirconium 705	-	705C	-	-	-	B493	R60705	R60705	B550	R60705	

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The use of these equivalents has to be evaluated on a case-by-case basis.

Other materials on request.

Lining materials



Lining materials

The high density, extremely resistant lining is at least 3 mm thick. New granulate is used exclusively, no refurbished regenerates or similar materials.

Fluoropolymer lining materials

- Body: PFA, PFA conductive and FEP
- Plug: PTFE, PFA, PFA conductive and FEP

body lining	Combination of linings plug lining	T _{max}
PFA	PTFE ¹⁾ or special materials	210°C / 410°F
PFA	PFA	200°C / 392°F
PFA	FEP	150°C / 302°F
PFA conductive	PFA conductive	125°C / 257°F
FEP	FEP	150°C / 302°F
FEP	PFA	150°C / 302°F

- 1) Plugs with PTFE lining only for two-way valves up to DN 100.
Plugs for multi-way valves not with PTFE lining available.

IMPORTANT NOTE

For demanding conditions, such as process temperatures exceeding 150°C / 302°F: Valve size, media phase, plug position & temperature (constant or fluctuating) may have an impact on the lifetime. Consult factory for proper selection of lining material, cover sealing type and special features.

Sleeve materials



Category	Sleeve Material	Characteristics	Typical applications	T _{MAX}
PTFE	PTFE, virgin	low friction, very good sealing characteristic	standard sleeve material for most applications	230°C / 446°F
RPTFE	PTFE-Glass	reinforced PTFE	additional stability for multiway valves with horizontal ports	230°C / 446°F
	PTFE-Graphite	reinforced PTFE	high temperature applications	250°C / 482°F
modified PTFE	TFM 1600* NXT 75* M 111*	chemically modified PTFE, reduced permeation, low friction	chemical applications where reduced permeability compared to PTFE is required	250°C / 482°F
Special Sleeves	PTFE-P* NFCE* NCS*	high performance sleeve materials	severe service highest temperatures, high pressure, abrasive applications	320°C / 608°F
PFA	PFA	reduced permeation	chemical applications where reduced permeability compared to PTFE is required	200°C / 392°F
UHMW-PE	UHMW-PE	Ultra High Molecular Weight Polyethylene	radiation resistant, abrasive application	80°C / 176°F

*) sleeve material selection depending on availability at AZ manufacturing site

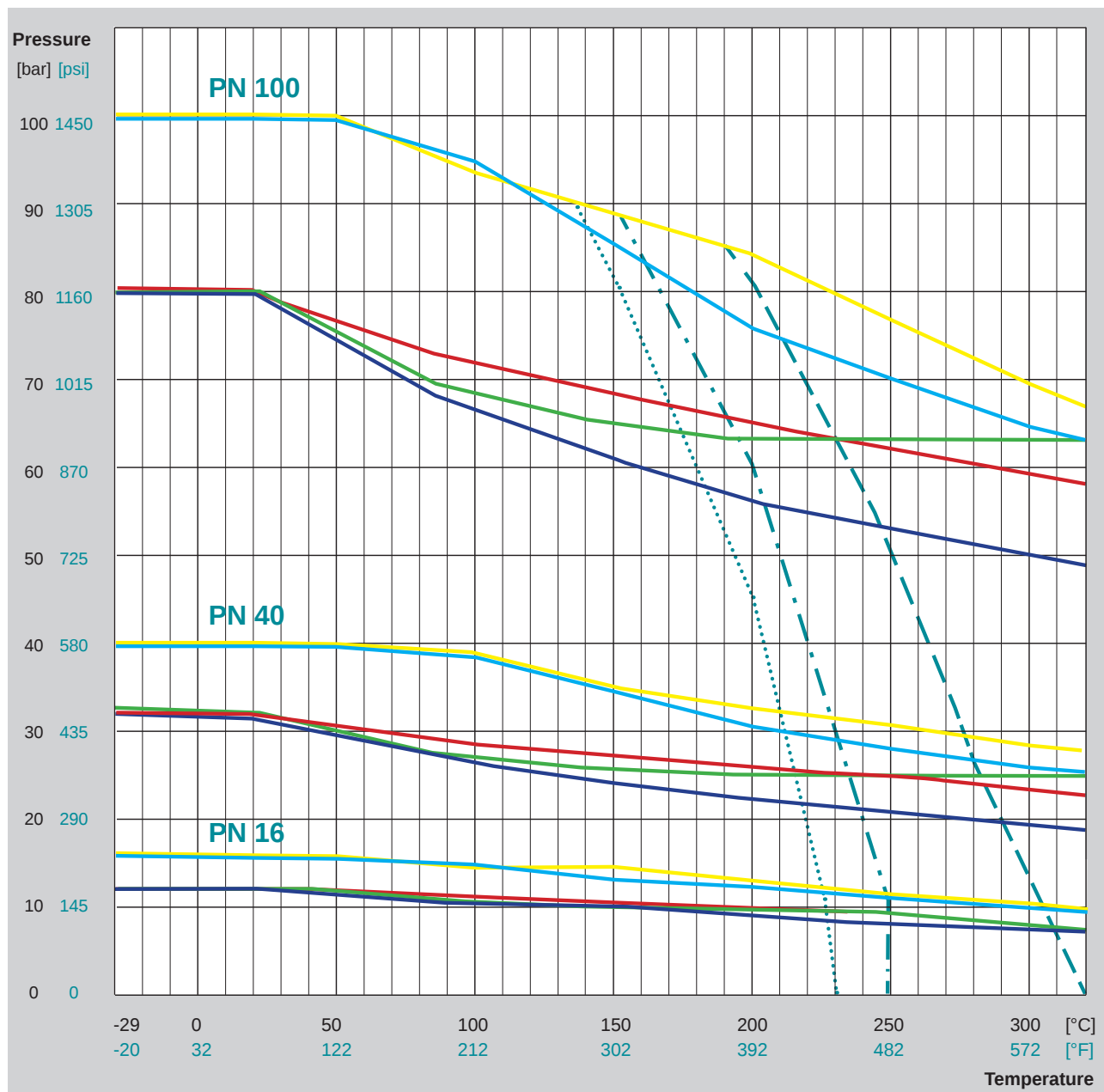
IMPORTANT NOTE

for demanding conditions, such as process temperatures exceeding 200°C / 392°F:

Valve size, media phase, plug position & temperature (constant or fluctuating) may have an impact on the lifetime. Consult factory for proper selection of sleeve material, cover sealing type and special features. For other sleeve materials not listed above: please contact your AZ sales representative.

PT Diagram, PN 16 - PN 100

PTFE sleeved plug valves



Body material

- EN 10213 - 1.0619 / Carbon Steel
 - EN 10213 - 1.4408 / Stainless Steel
 - EN 17744 - 2.4819 / Hastelloy
 - EN 17730 - 2.4365 / Monel 400
 - UNS N08007 - 1.4500 / Alloy 20
- other body materials on request

Sleeve material

- PTFE (virgin) / PTFE (glass) T_{max} 230°C / 446°F
 - TFM / NXT / M111 / PTFE graphite T_{max} 250°C / 482°F
 - PTFE-P / NFCE / NCS T_{max} 320°C / 608°F
- other sleeve materials on request

The data given are max. values according to EN 12516-1 and EN 1092-1.

IMPORTANT NOTE

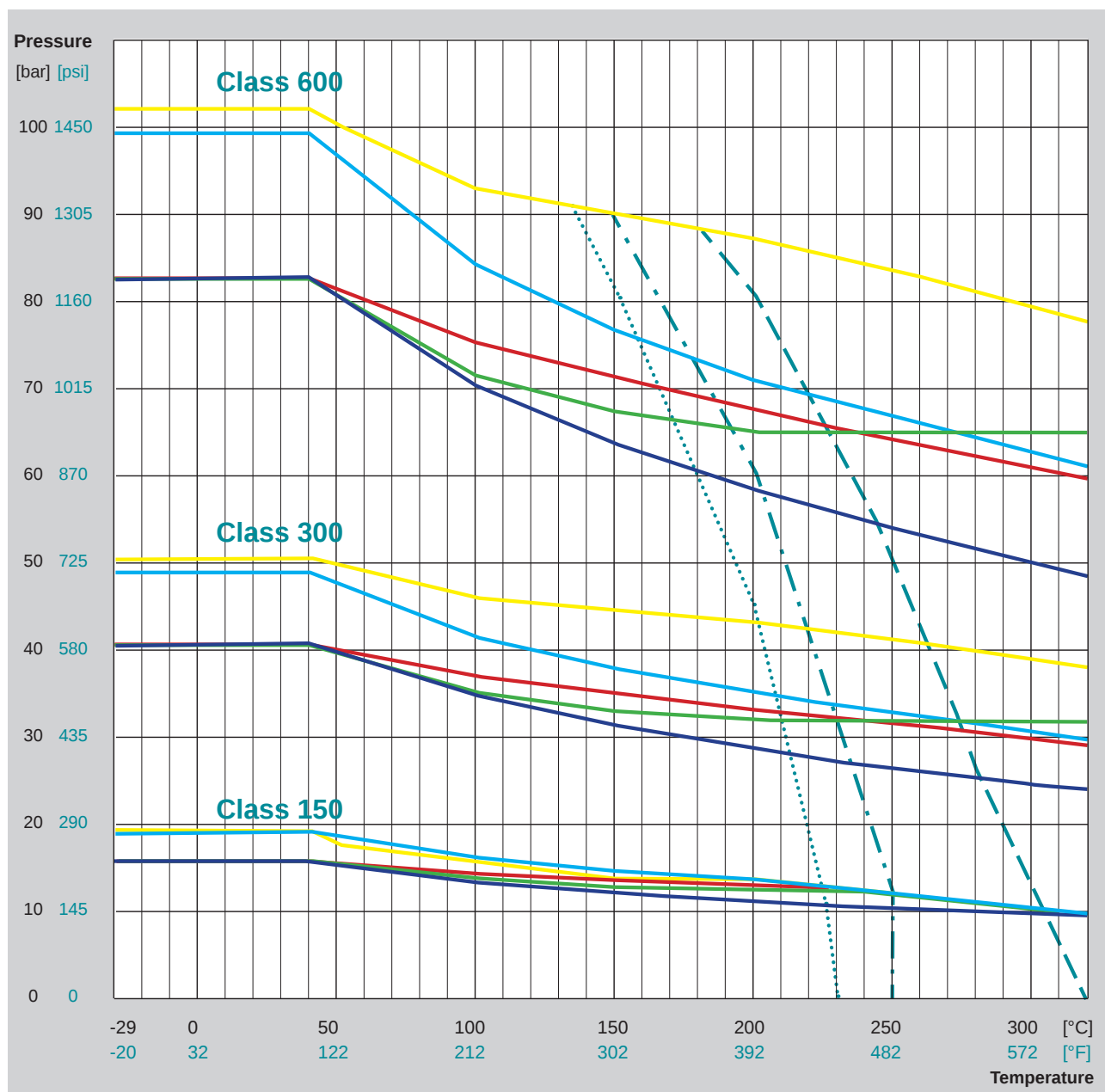
for demanding conditions, such as process temperatures exceeding 200°C / 392°F: Valve size, media phase, plug position & temperature (constant or fluctuating) may have an impact on the lifetime. Consult factory for proper selection of sleeve material, cover sealing type and special features.

For temperatures < -29°C / -20°F, (T_{limit} = -60°C / -76°F) operating temperature, low-temperature carbon steel or austenitic stainless steels are required.

Subject to technical change without notice.

PT Diagram, Class 150 - Class 600

PTFE sleeved plug valves



Body material

- ASTM A216 - WCB
- ASTM A351 - CF8M
- ASTM A494 - CW12MW / Hastelloy
- ASTM A494 - M35.1 / Monel 400
- ASTM A351 - CN7M Alloy 20
- other body materials on request

Sleeve material

- PTFE (virgin) / PTFE (glass) $T_{max} 230^{\circ}\text{C} / 446^{\circ}\text{F}$
- TFM / NXT / M111 / PTFE graphite $T_{max} 250^{\circ}\text{C} / 482^{\circ}\text{F}$
- PTFE-P / NFCE / NCS $T_{max} 320^{\circ}\text{C} / 608^{\circ}\text{F}$
- other sleeve materials on request

The data given are max. values according to ASME B16.34.

IMPORTANT NOTE

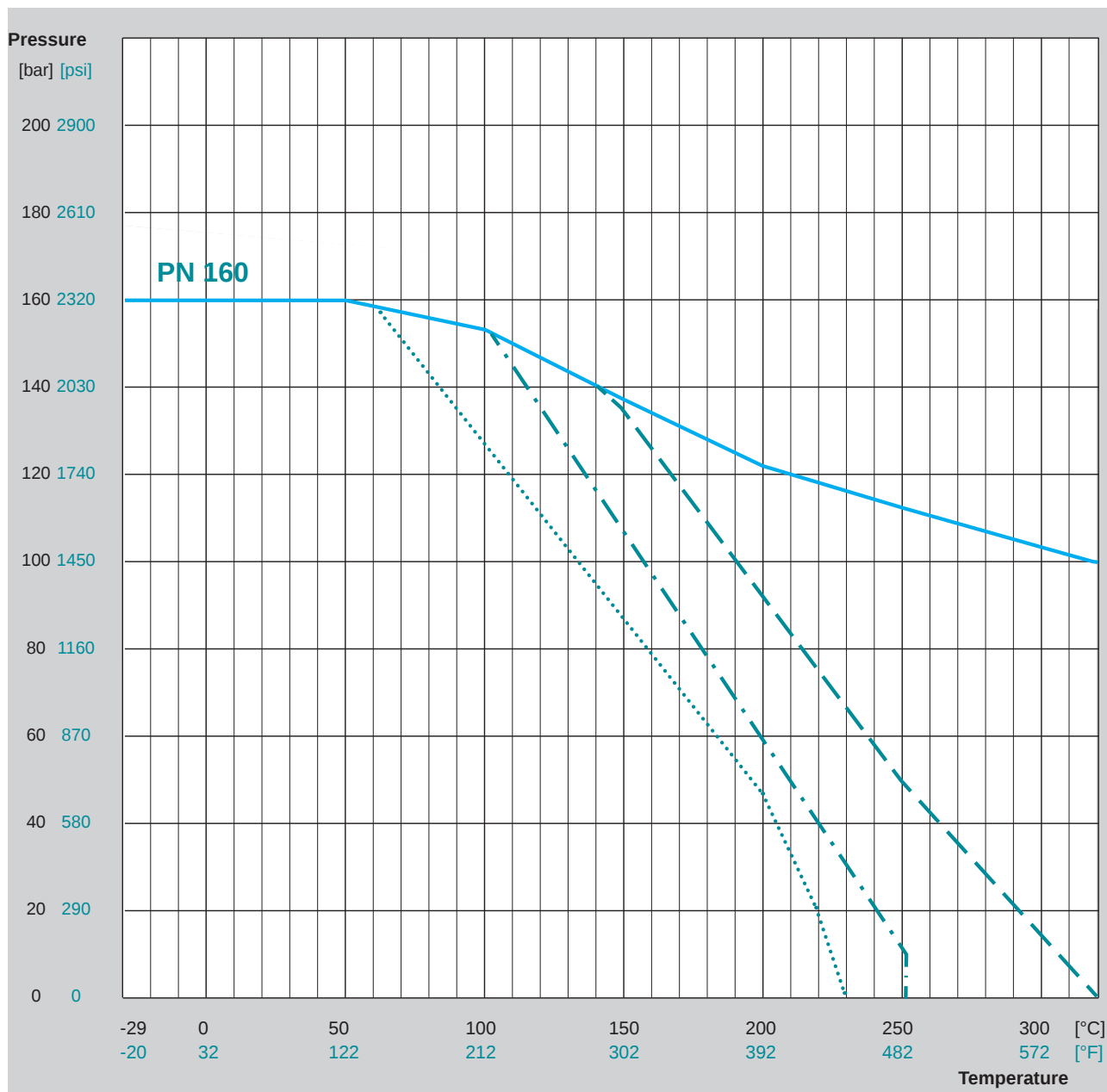
for demanding conditions, such as process temperatures exceeding $200^{\circ}\text{C} / 392^{\circ}\text{F}$: Valve size, media phase, plug position & temperature (constant or fluctuating) may have an impact on the lifetime. Consult factory for proper selection of sleeve material, cover sealing type and special features.

For temperatures $< -29^{\circ}\text{C} / -20^{\circ}\text{F}$, ($T_{limit} = -60^{\circ}\text{C} / -76^{\circ}\text{F}$) operating temperature, low-temperature carbon steel or austenitic stainless steels are required.

Subject to technical change without notice.

PT Diagram High Pressure, PN 160

PTFE sleeved plug valves with trunnion mounted design



Body material (in line with EN 12516-1 and EN 1092-1)

— EN 10213 - 1.4408 / Stainless Steel
other body materials on request

Sleeve material

..... PTFE (virgin) / PTFE (glass) T_{max} 230°C / 446°F
 - . - . TFM / NXT / M111 / PTFE graphite T_{max} 250°C / 482°F
 - - - PTFE-P / NFCE / NCS T_{max} 320°C / 608°F
 other sleeve materials on request

The data given are max. values according to EN 12516-1 and EN 1092-1.

IMPORTANT NOTE

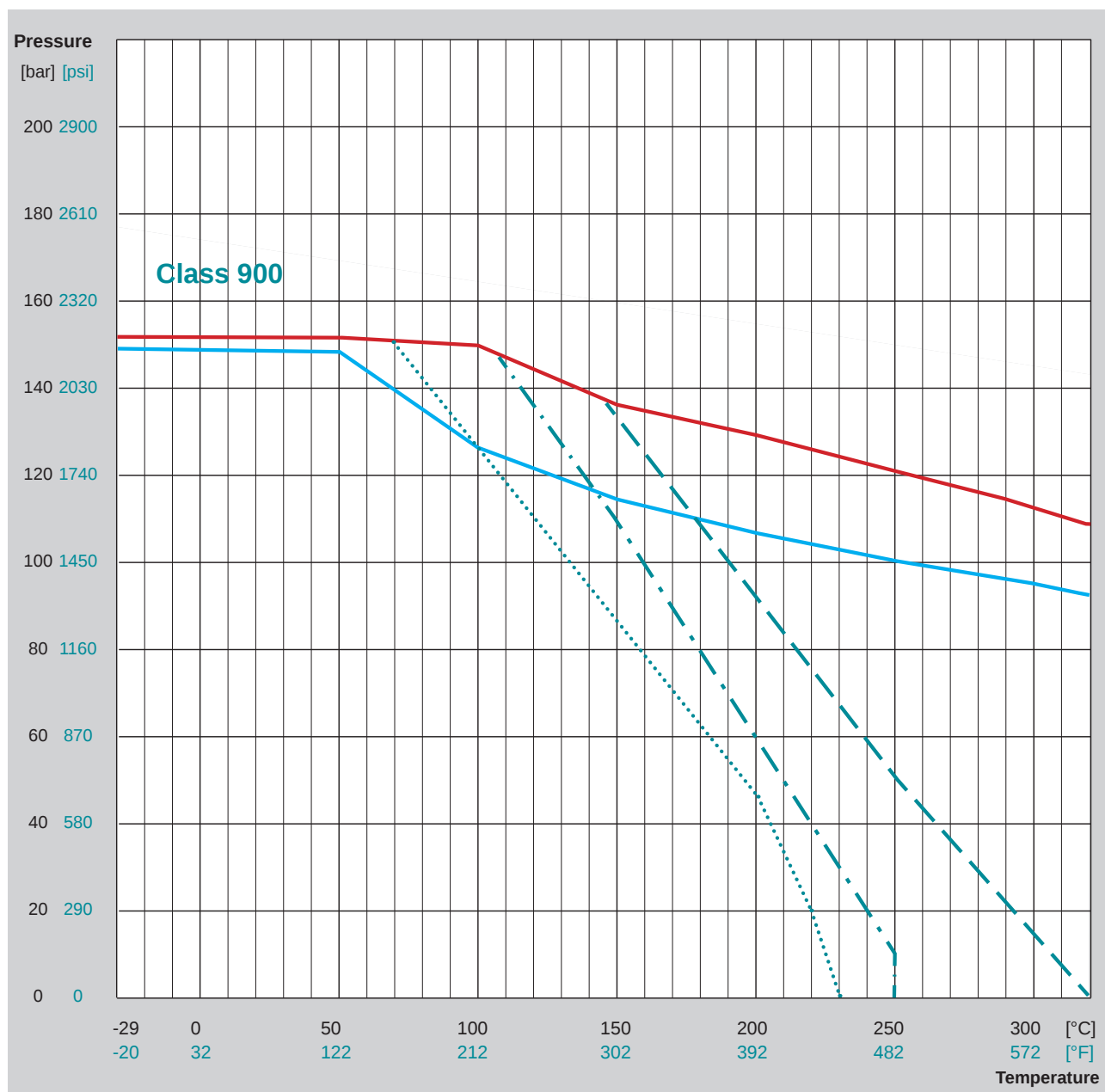
for demanding conditions, such as process temperatures exceeding 200°C / 392°F: Valve size, media phase, plug position & temperature (constant or fluctuating) may have an impact on the lifetime. Consult factory for proper selection of sleeve material, cover sealing type and special features.

For temperatures < -29°C / -20°F, (T_{limit} = -60°C / -76°F) operating temperature, low-temperature carbon steel or austenitic stainless steels are required.

Subject to technical change without notice.

PT Diagram High Pressure, Class 900

PTFE sleeved plug valves with trunnion mounted design



Body material (in line with ASME B16.34)

- ASTM A351 - CF8M / Stainless Steel
- ASTM A995 - CD3MN / Superduplex
- other body materials on request

Sleeve material

- PTFE (virgin) / PTFE (glass) $T_{max} 230^{\circ}\text{C} / 446^{\circ}\text{F}$
- - - TFM / NXT / M111 / PTFE graphite $T_{max} 250^{\circ}\text{C} / 482^{\circ}\text{F}$
- PTFE-P / NFCE / NCS $T_{max} 320^{\circ}\text{C} / 608^{\circ}\text{F}$
- other sleeve materials on request

The data given are max. values according to ASME B16.34.

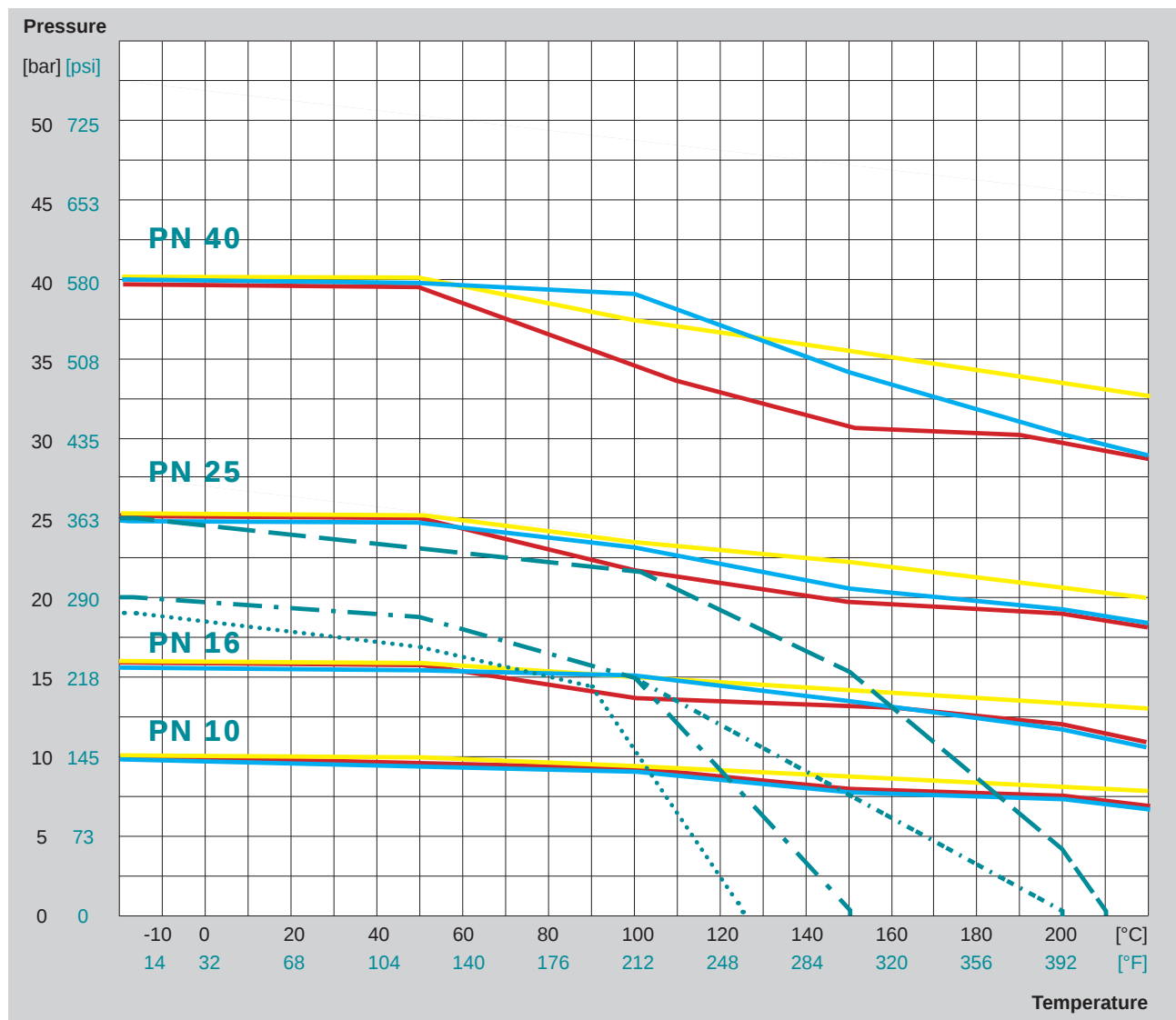
IMPORTANT NOTE

for demanding conditions, such as process temperatures exceeding $200^{\circ}\text{C} / 392^{\circ}\text{F}$: Valve size, media phase, plug position & temperature (constant or fluctuating) may have an impact on the lifetime. Consult factory for proper selection of sleeve material, cover sealing type and special features.

Subject to technical change without notice.

For temperatures $< -29^{\circ}\text{C} / -20^{\circ}\text{F}$, ($T_{limit} = -60^{\circ}\text{C} / -76^{\circ}\text{F}$) operating temperature, low-temperature carbon steel or austenitic stainless steels are required.

PT Diagram, PN 10 - PN 40 lined valves



Body material

- EN 10213 - 1.0619 / Carbon Steel
 - EN 10213 - 1.4408 / Stainless Steel
 - EN 1563 - EN-GJS-400-18-LT / Ductile Iron
- other body materials on request

The data given are max. values according to EN 12516-4.

Lining combination

	Body	Plug / Ball	T _{MAX}
— —	PFA	PTFE or special*	210°C / 410°F
— . . .	PFA	PFA	200°C / 392°F
— — — —	all combinations with PFA and FEP		150°C / 302°F
—	PFA conductive	PFA conductive**	125°C / 257°F

*) Special materials (metallic) for plugs without lining on request

**) Material combination PFA / FEP possible

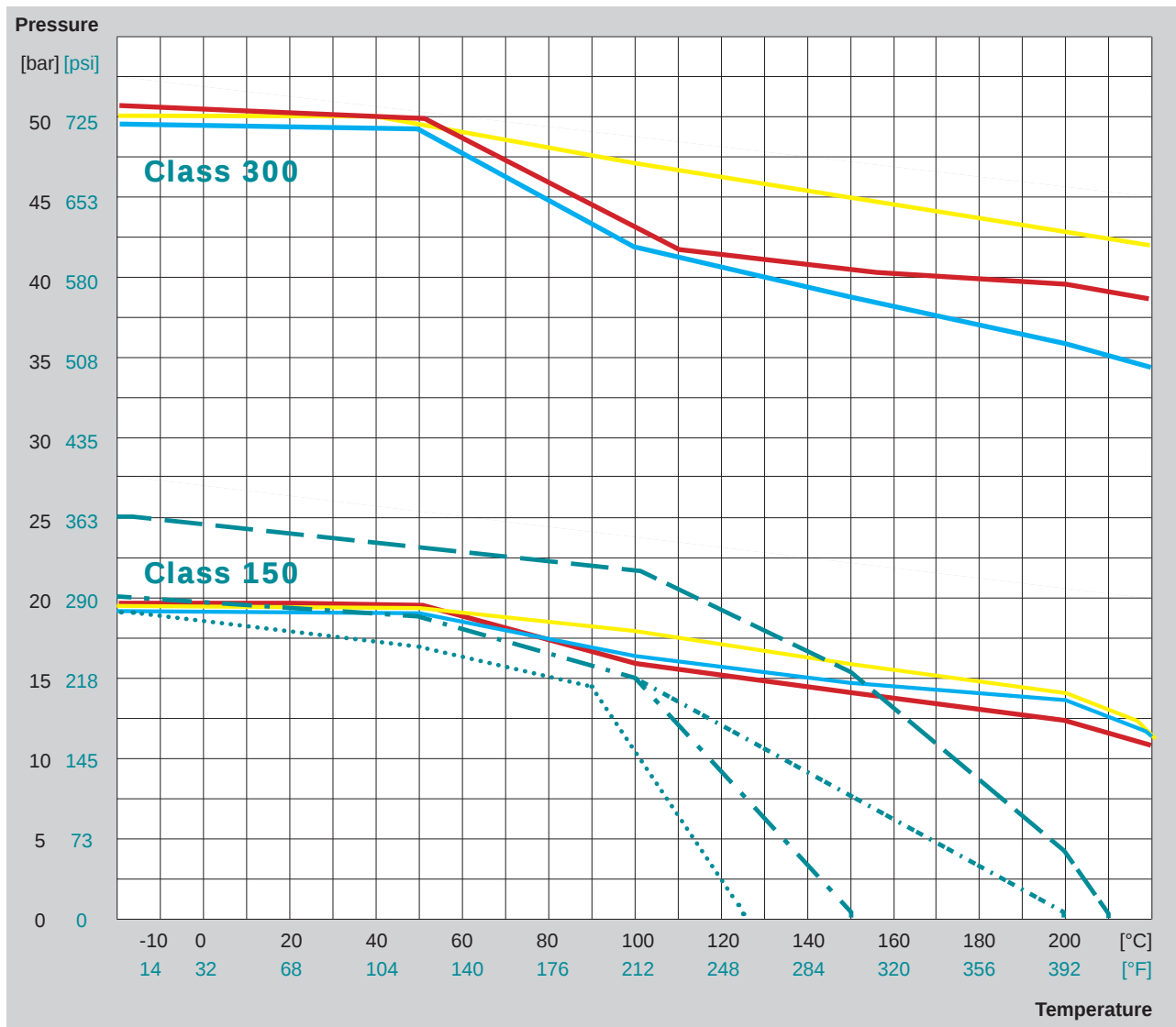
IMPORTANT NOTE

for demanding conditions, such as process temperatures exceeding 150°C / 302°F: Valve size, media phase, plug position & temperature (constant or fluctuating) may have an impact on the lifetime. Consult factory for proper selection of lining material, cover sealing type and special features.

Maximum breakaway torque depending on material combinations according to the technical data sheets of the plug valve.

Subject to technical change without notice.

PT Diagramm, Class 150 - Class 300 lined valves



Body material

- ASTM A216 - WCB
- ASTM A351 - CF8M / Stainless Steel
- ASTM A395 / Ductile Iron
- other body materials on request

Lining combination

	Body	Plug / Ball	T _{MAX}
—	PFA	PTFE or special*	210°C / 410°F
---	PFA	PFA	200°C / 392°F
---	all combinations with PFA and FEP		150°C / 302°F
.....	PFA conductive	PFA conductive**	125°C / 257°F

*) Special materials (metallic) for plugs without lining on request

**) Material combination PFA / FEP possible

The data given are max. values according to EN 12516-4.

IMPORTANT NOTE

for demanding conditions, such as process temperatures exceeding 150°C / 302°F: Valve size, media phase, plug position & temperature (constant or fluctuating) may have an impact on the lifetime. Consult factory for proper selection of lining material, cover sealing type and special features.

Maximum breakaway torque depending on material combinations according to the technical data sheets of the plug valve.

Subject to technical change without notice.

Plug types: two-way and multi-port for standard reduced and full bore design



- position indicator for all multi-way valves welded on lever or stem extension
- Lined plug valves: multi-way plugs only with PFA / FEP plug lining or made of special materials. Two-way plugs with PTFE lining up to DN 100 / NPS 4 available

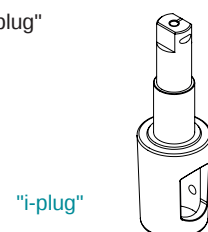
Recommendation for three-way valves type F-3-S with vertical outlet (longer life-time compared to type F-3-W with horizontal outlet)

Options

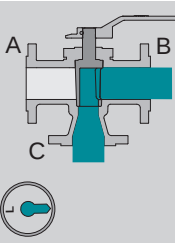
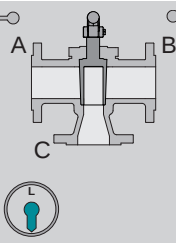
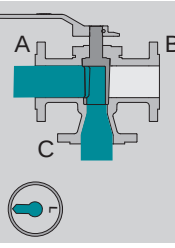
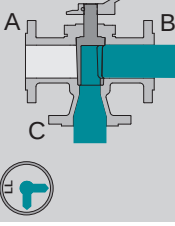
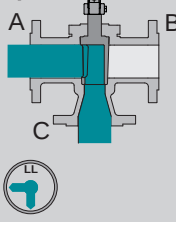
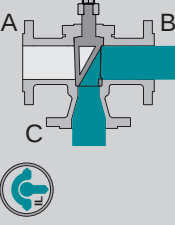
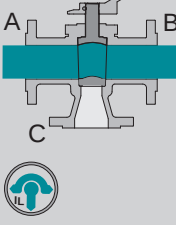
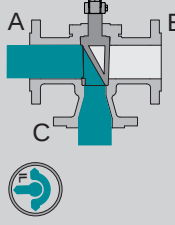
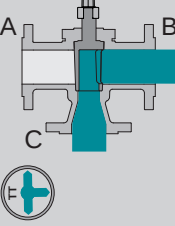
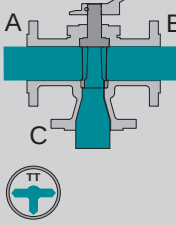
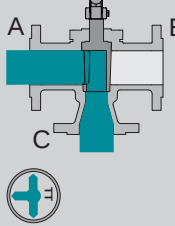
Plugs made of special materials or special designs, e.g. with flushing devices, vent holes in plug bottom or plug upstream / downstream side

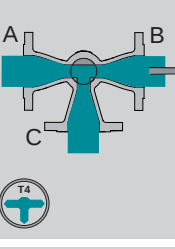
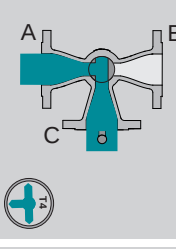
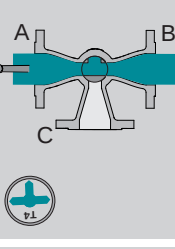
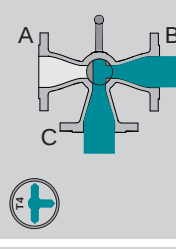
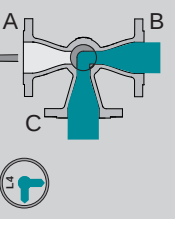
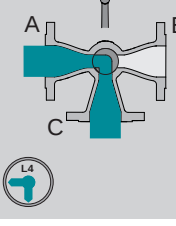
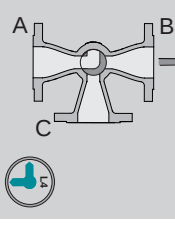
2-way	Plug type	Pos. I = 0°	Pos. II = 90°	Pos. III = 180°	Pos. IV = 270°
	D 				
Type F-2-ISO-STANDARD	T4 * 				

*) For highly expanding media AZ recommends the "i-plug" (relief hole and open plug bottom)



Plug types: 3-way valve for STANDARD and EXTRA design

Plug type	Pos. I = 0°	Pos. II = 90°	Pos. III = 180°	Pos. IV = 270°	3-way (vertical)
L 					 Type F-3-S-ISO-STANDARD  Type F-3-S-ISO-STANDARD-A
LL 					
IL* 					
TT 					

Plug type	Pos. I = 0°	Pos. II = 90°	Pos. III = 180°	Pos. IV = 270°	3-way (horizontal)
T4 					 Type F-3-W-ISO-STANDARD  Type F-3-W-ISO-STANDARD-A
L4 					

*) for EXTRA valves with IL-plug, F-3-W-EXTRA with T4-plug is recommended (higher flowrate)
Lined valves: the IL-plug is only available in special materials

Plug types 3-way (120°) valves and 4-way valves for STANDARD and EXTRA design

3-way (120°) type 3-W-120:

- min. cross section guaranteed (switching phase)
- piggable execution on request
- minimum flow guaranteed

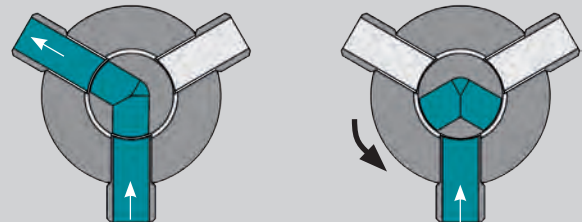
transflow design



3-way (120°) type 3-WP-120

- with positive overlap
- flow interruption / isolation

positive overlap

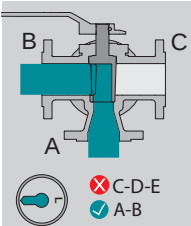
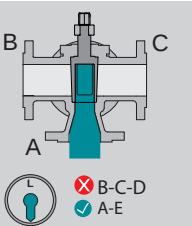
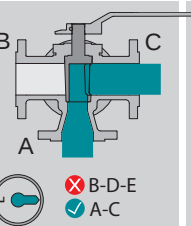
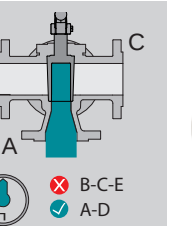
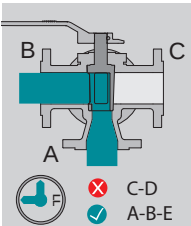
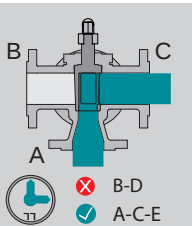
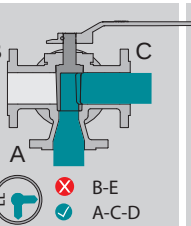
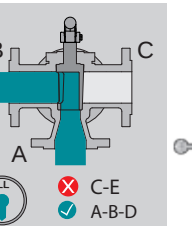
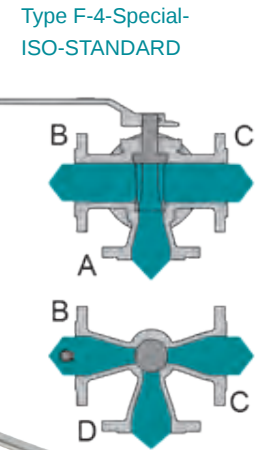
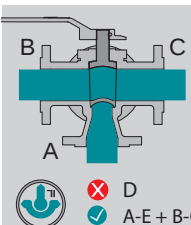
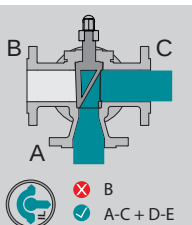
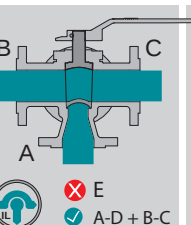
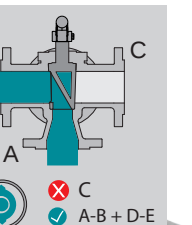
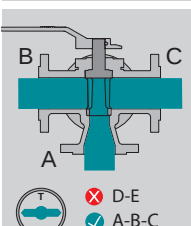
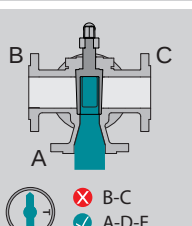
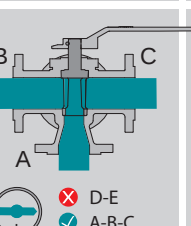
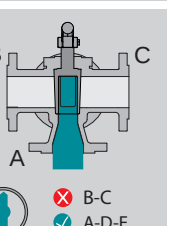
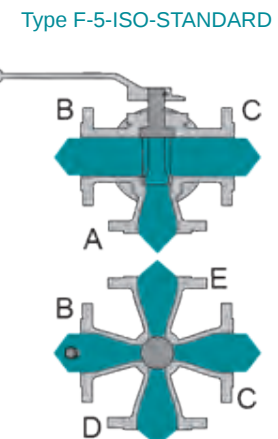
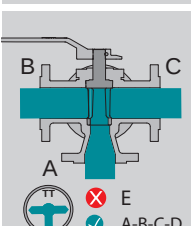
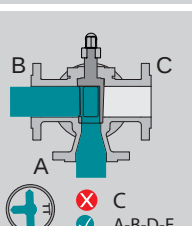
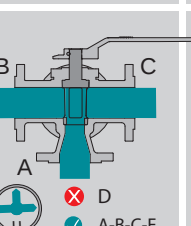
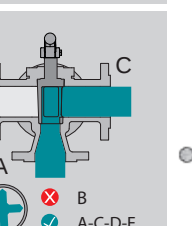


3-way (120°)	Plug type	Pos. I = 0°	Pos. II = 120°	Pos. III = 240°	
	L120 				

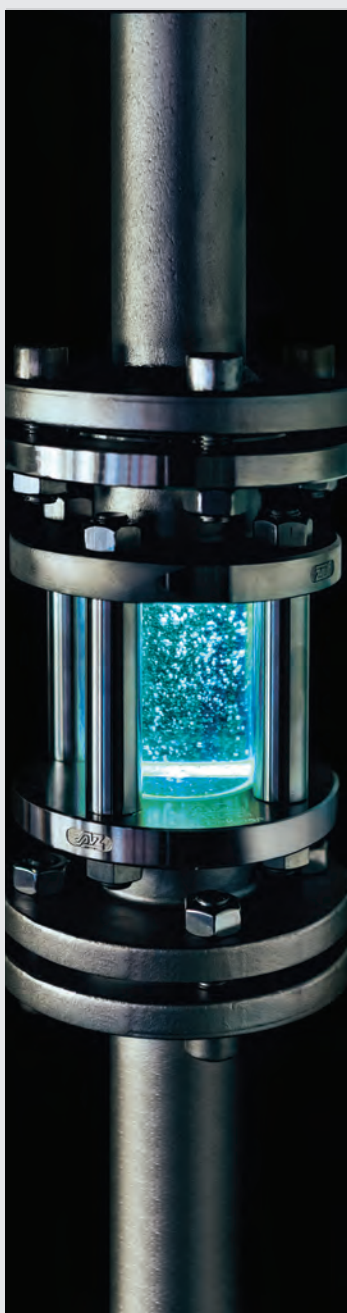
4-way	Plug type	Pos. I = 0°	Pos. II = 90°	Pos. III = 180°	Pos. IV = 270°
 Type F-4-ISO-STANDARD 	L4 				
	T4 				
	LL4 				

✓ open
✗ closed

Plug types 4-way (special) and 5-way valves for STANDARD and EXTRA design

Plug type	Pos. I = 0°	Pos. II = 90°	Pos. III = 180°	Pos. IV = 270°	4-way (special) / 5-way
	 ✓ A-B ✗ C-D-E	 ✓ A-E ✗ B-C-D	 ✓ A-C ✗ B-D-E	 ✓ A-D ✗ B-C-E	
	 ✓ A-B-E ✗ C-D	 ✓ A-C-E ✗ B-D	 ✓ A-C-D ✗ B-E	 ✓ A-B-D ✗ C-E	
	 ✓ A-E + B-C ✗ D	 ✓ A-C + D-E ✗ B	 ✓ A-D + B-C ✗ E	 ✓ A-B + D-E ✗ C	
	 ✓ A-B-C ✗ D-E	 ✓ A-D-E ✗ B-C	 ✓ A-B-C ✗ D-E	 ✓ A-D-E ✗ B-C	
	 ✓ A-B-C-D ✗ E	 ✓ A-B-D-E ✗ C	 ✓ A-B-C-E ✗ D	 ✓ A-C-D-E ✗ B	

 open
 closed



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- Mexico (Mexico-City)
- Peru (Lima)

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- South Korea
- Thailand (Rayong)
- Vietnam (Hanoi)

Africa

- South Africa (Johannesburg)



Detailed addresses
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