Selecting your valve

Aspects to take into consideration when determining a valve.

Service conditions

- Fluid used:
  - Phase: gas, liquid or powdered
  - Nature: water, air, petrol, solvent…
  - Classification acc. to Regulation n°1272 (hazardous, non-hazardous)
- Operating pressure: allowable maximum and minimum
- Operating temperature: allowable maximum and minimum

Type of valve and its functionality

- Type:
  - Ball valve
  - Butterfly valve
  - Globe valve
  - Needle valve
  - Gate valve
  - Knife gate valve
  - Check valve
  - Control valve
  - Safety valve
  - Pressure regulating valve
  - Strainers
  - etc.
- Function: sectioning, regulation, balancing, safety, passing, releasing...

Features

- Material of the body, the closing member, the seats and gaskets
- Nominal diameter and bore
- Type of connection:
  - Threaded: BSP/NPT/SMS
  - Welding: SW/BW
  - Flanged: various standards
  - Quick couplings (camlock, symmetrical, clamp...)
- Face-to-face dimension acc. to EN 558 or others
- Type of operation:
  - Manual valves: handle, handwheel, lever, gear box
  - Actuated valves: pneumatic, hydraulic, electric

Other factors

- Environmental conditions & installation location of the valves
- Standards: ISO, EN, ANSI, other specific national standards, fire safe, fugitive emissions…
- Required certification: CE-PED, ATEX, inspection documents acc. to EN 10204, hydraulic test
- Service lifetime, cycles and expected wear
- Maintenance procedures and spare parts availability

Summary of inspection documents acc. to EN 10204:2004

EN 10204 Reference	Designation of the document type	Document content	Document validated by
Type 2.1	Declaration of compliance with the order	Statement of compliance with the order.	The manufacturer
Type 2.2	Test report	Statement of compliance with the order, with indication of results of non-specific inspection.	The manufacturer
Type 3.1	Inspection Certificate 3.1	Statement of compliance with the order, with indication of results of specific inspection.	The manufacturer's authorized inspection representative independent of the manufacturing department
Type 3.2	Inspection Certificate 3.2	Statement of compliance with the order, with indication of results of specific inspection.	The manufacturer's authorized inspection representative independent of the manufacturing department and either the purchaser's authorized inspection representative or the inspector designated by the official regulations.

Diameter equivalences table

DN	8	10	15	20	25	32	40	50	65	80	100	125	150	200	250	300
NPS	1/4"	3/8"	1/2"	3/4"	1"	1"1/4	1"1/2	2"	2"1/2	3"	4"	5"	6"	8"	10"	12"
Metric	8/13	8/13	15/21	20/27	26/34	33/42	40/49	50/60	66/76	80/88	102/114	125/139	150/168	200/219	-	-
Plastic pipes	-	-	20	25	32	40	50	63	75	90	110	-	-	-	-	-

Foreword on the new Pressure Equipment Directive (2014/68/EU)

On May 15th, 2014, the new Pressure Equipment Directive (PED) has been adopted by the European Parliament and the Council of the European Union. This recast of the former 97/23/EC Directive is meant to be transferred and enforced in 2 steps:

- **June 1st, 2015**: Start of application of the Art. 13 of the new PED, introducing a new determination of fluid groups acc. to the Classification, Labelling and Packaging (CLP) Regulation (EC 1272/2008). This article replaces the Art. 9 of the 97/23/EC Directive.
- **July 19th, 2016**: Start of full application of the new 2014/68/EU Directive.

Some essentials of the former PED remain unchanged such as the scope, the "Essential Safety Requirements" (Annex I), the "Conformity Assessment Tables" (Annex II), and the CE marking requirements.

However, concerning changes, in addition to the classification of fluids, the new PED defines the obligations and responsibilities of importers (Art.8) and distributors (Art. 9), and it reevaluates four of the conformity assessment modules (Annex III) as follows:

97/23/EC	A1	B1	B	C1
2014/68/EU	A2	B (design type)	B (production type)	C2

It is also quite noticeable that the Art. 3, §3 of the 97/23/EC Directive, defining the exclusions of the PED's Technical Requirements, becomes the Art. 4, §3 under the 2014/68/EU Directive.

Finally, the Article 48, §3 of the new PED establishes that "certificates and decisions issued by conformity assessment bodies under Directive 97/23/EC shall be valid under this Directive," therefore all the certificates issued under the former PED by our manufacturers remain valid until their renewal. We decided to present a summary of the 2014/68/EU Directive. The references to the PED corresponding to each item are related to the certifications valid on the date of issue of this catalogue.

PED - Pressure Equipment Directive (2014/68/EU)

1 - Scope

The PED applies to the design, manufacture and conformity assessment of pressure equipment and assemblies with a maximum allowable pressure (PS) greater than 0,5 bar such as: vessels, pressurised storage containers, heat exchangers, steam generators, boilers, industrial pipes, safety devices, pressure accessories, valves and fittings.

Equipment excluded from the PED (CE marking prohibited) :

- Equipment with PS < 0,5 bar (Art. 1 §1)
- Valves and fittings < DN32 (Art. 4 §3)

DN: Nominal size
PS: Maximum allowable pressure
TS: Maximum/minimum allowable temperature

2 - Classification & fluid groups acc. to Regulation n°1272/2008 (2014/68/EU Directive, Art. 13, §1)

Fluids means gases, liquids and vapours in pure phase as well as mixtures thereof. Fluids may contain a suspension of solids.

Group 1 - Hazardous fluids		Group 2 - Non hazardous fluids	
explosive, extremely flammable, highly flammable, flammable (max. allowable temp. above flashpoint), pyrophoric, very toxic, toxic, oxidizing.		other fluids not referred to in Group 1	
Liquids example: fuel	**Gases** example: natural gas	**Liquids** example: water	**Gases** example: saturated steam

3 - Risk categories (Annex II)

Risk category IV only applies for safety devices.

3/1 - Dangerous gases (Group 1), example: natural gas (Annex II, table 6)

Class PN \ DN	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400
	2,5	A3 § 3														
	6				Category I											
	10															
	16															
150																
	25															
	40															
300																
	63				Category II							Category III				
	100															
600																
1500																
2500																

3/2 - Other gases (Group 2), example: air (Annex II, table 7)

Class PN \ DN	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500
	2,5	A3 § 3																
	6				A3 § 3													
	10															Category II		
	16																	
150																		
	25																	
	40																	
300																		
	63				Category I				Category II					Category III				
	100																	
600																		
1500																		
2500																		

3/3 - Dangerous liquids (Group 1), example : fuel (Annex II, table 8)

Class PN \ DN	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500
	2,5	A3 § 3																
	6					A3 § 3												
	10														Category I			
	16																	
150																		
	25																	
	40																	
300																		
	63									Category II								
	100																	
600																		
1500																		
2500																		
> 500 bar										Category III								

3/4 - Other liquids (Group 2), example: water (Annex II, table 9)

Class PN \ DN	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500
	2,5	A3 § 3																
	6														A3 § 3			
	10																	
	16																	
150																		
	25																	
	40																	
300															Category I			
	63																	
	100																	
600																		
1500																		
2500																		
> 500 bar															Category II			

4 - Conformity assessment procedures (Art. 4 + Annex III)

	Without Quality Assurance		With Quality Assurance	
	type	**unit**	**type**	**unit**
Category I	**Module A** Internal production control (self-certification)		-	
Category II	**Module A2** Internal manufacturing control & Random checks + monitoring of final assessment by NB		**Module D1** Production process QA by NB	**Module E1** Final product inspection QA by NB
Category III	**Module B (design type) + C2** EU design-examination + conformity to type by NB & Random checks	**Module B (design type) + F** EU design-examination + product verification by NB	**Module B (production type) + E** EU type-examination + product QA by NB	**Module H** Full QA = Quality system assessment & surveillance by NB
			Module B (design type) + D EU design-examination + production process QA by NB	
Category IV	**Module B (production type) + F** EU type-examination + product verification by NB	**Module G** EU unit verification by NB	**Module B (production type) + D** EU type-examination + production process QA by NB	**Module H1** Full QA + design-examination + special surveillance of final assessment by NB

QA: Quality assurance / NB: Notified bodies

5 - Notified bodies

List of notified bodies operating with our manufacturers under 97/23/EC & 2014/68/EU Directives:

0035	0036	0045	0056	0062	0408	0409	0496	0497	0948	1115
TÜV Rheinland Industrie Service	**TÜV Süd Industrie Service**	**TÜV Nord Systems**	**ECA Grupo Bureau Veritas**	**Bureau Veritas**	**TÜV Austria Services**	**Inspecta Sweden**	**DNV GL Business Assurance Italia**	**CSI**	**TÜV Italia**	**Consorzio Pascal**
Germany Köln	Germany München	Germany Hamburg	Spain Barcelona	France Neuilly	Austria Wien	Sweden Stockholm	Italy Vimercate	Italy Bollate	Italy Sesto San Giovanni	Italy Milano

ATEX Directive (2014/34/EU)

Directive on equipment and protective systems intended for use in potentially explosive atmospheres.

1 - Area classification

Gases	Dusts	Definition of zone
0	20	areas where an explosive atmosphere is expected to exist continuously or for long periods of time or more than 1000h/year.
1	21	areas where an explosive atmosphere is expected to exist for short periods of time and less than 1000h/year.
2	22	areas where an explosive atmosphere is not expected and if released, it will only exist for a very short period of time and less than 10h/year.

2 - ATEX marking - Example & explanation

	II	2	G	Eex	ia	IIC	T6

"T6" Max. surface temperature class (gas group):
T1 450°C
T2 300°C
T3 200°C
T4 135°C
T5 100°C
T6 85°C

"IIC" Explosion group (gas group):
I Methane (Mining)
IIA less easily ignited such as Propane
IIB easily ignited such as Ethylene
IIC most easily ignited such as Hydrogen & Acetylene

"ia" Type of protection:
d Flameproof pressure-resistant encapsulation
e Increased safety
ia/ib Intrinsic safety ("ia" for zone 0 / "ib" sufficient for zone 1)
ma/mb Encapsulated ("ma" for zone 0 / "mb" sufficient for zone 1)

"Eex" Explosion protection

"G" Environment:
G Gas group
D Dust group

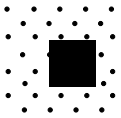
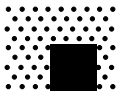
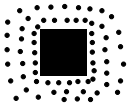
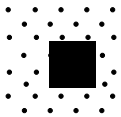
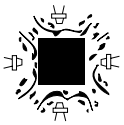
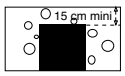
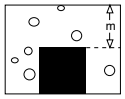
"2" Equipment Category:
1 Category 1 - Equipment that is intended for use in zone 0 or 20
2 Category 2 - Equipment that is intended for use in zone 1 or 21
3 Category 3 - Equipment that is intended for use in zone 2 or 22
M1 Mining
M2 Mining

"II" Equipment Group:
I Mining - Category M1 and M2.
II All other places - Category 1, Category 2 & Category 3.

Marking for explosion protection

Ingress Protection rating (IP code)

Degree of protection provided by the product enclosure; marked on the product in the form of an "IP" code.

First digit: solid particle protection		Second digit: liquid ingress protection			
4	 Element Ø ≥ 1 mm	0	 Not protected	3	 Protected against spraying water & rain up to 60° from vertical
5	 Dust protected	1	 Protected against vertical dripping water	4	 Protected against splashing water from all directions
6	 Dust tight	2	 Protected against dripping water up to 15° from vertical	5	 Protected against water jets
				6	 Protected against heavy seas & high pressure water jets
				7	 < 1 m Protection against the effects of immersion inferior of 1 m
				8	 < 1 m Protection against submersion superior of 1 m

Example: IP **54** would indicate a dust protected (first digit 5) piece of equipment which is protected against splashing water (second digit **4**).

SIL - Safety Integrity Level certification (IEC EN 61508)

The International Electrotechnical Commission defines the different SIL levels for electric and electronic devices as follows:

For low demand operation:

PFD (Probability of Failure on Demand) and RRF (Risk Reduction Factor)

SIL	PFD		RRF
1	0.1-0.01	10^{-1} - 10^{-2}	10-100
2	0.01-0.001	10^{-2} - 10^{-3}	100-1000
3	0.001-0.0001	10^{-3} - 10^{-4}	1000-10,000
4	0.0001-0.00001	10^{-4} - 10^{-5}	10,000-100,000

For continuous operation:

PFH (Probability of Failure per Hour) and RRF (Risk Reduction Factor)

SIL	PFH		RRF
1	0.00001-0.000001	10^{-5} - 10^{-6}	100,000-1,000,000
2	0.000001-0.0000001	10^{-6} - 10^{-7}	1,000,000-10,000,000
3	0.0000001-0.00000001	10^{-7} - 10^{-8}	10,000,000-100,000,000
4	0.00000001-0.000000001	10^{-8} - 10^{-9}	100,000,000-1,000,000,000

Pressure ratings

Standard	Temp.	Pressure									
Max. allowable pressure		20 bar	50 bar	63 bar	69 bar	100 bar	138 bar	150 bar	207 bar	250 bar	420 bar
ISO	20°C	PN20	PN50	PN63	-	PN100	-	PN150	-	PN250	PN420
ANSI B 16.34	454°C	150 lbs (300°C)	300 lbs	-	400 lbs	600 lbs	-	900 lbs	-	1500 lbs	2500 lbs
API 602 (forged)	454°C	-	-	-	-	-	800 lbs	-	-	1500 lbs	-
API 6A / CWP (Cold Water Pressure)	16°C	-	-	-	API 1000	API 1500	API 2000	-	API 3000	-	API 6000
WOG (Water Oil Gas)	16°C	-	-	-	1000 psi	1500 psi	2000 psi	-	3000 psi	-	6000 psi

Steam table

Relative pressure / Temperature correlation table for saturated steam (rounded to 1 decimal).

bar	°C	bar	°C	bar	°C	bar	°C	bar	°C	bar	°C	bar	°C	bar	°C
0,5	111,6	6	165,0	11,5	189,9	19	212,4	30	235,7	45	258,8	100	311,7	155	345,3
1	120,4	6,5	167,8	12	191,6	20	214,9	31	237,5	50	265,2	105	315,3	160	347,9
1,5	127,6	7	170,5	12,5	193,4	21	217,3	32	239,2	55	271,1	110	318,8	165	350,4
2	133,7	7,5	173,0	13	195,1	22	219,6	33	240,9	60	276,7	115	322,1	170	352,8
2,5	139,0	8	175,4	13,5	196,7	23	221,9	34	242,6	65	281,9	120	325,3	175	355,1
3	143,7	8,5	177,7	14	198,3	24	224,0	35	244,2	70	286,8	125	328,4	180	357,5
3,5	148,0	9	179,9	14,5	199,9	25	226,1	36	245,8	75	291,5	130	331,5	185	359,7
4	151,9	9,5	182,0	15	201,4	26	228,1	37	247,4	80	295,9	135	334,4	190	361,9
4,5	155,6	10	184,1	16	204,4	27	230,1	38	248,9	85	300,1	140	337,2	195	364,1
5	158,9	10,5	186,1	17	207,2	28	232,0	39	250,4	90	304,2	145	340,0	200	366,2
5,5	162,1	11	188,0	18	209,8	29	233,9	40	251,8	95	308,0	150	342,7	210	370,2

Main chemical compatibility chart for pressure gauges

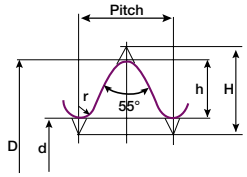
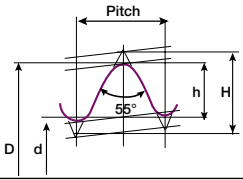
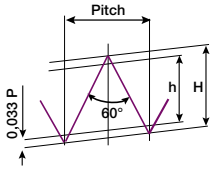
Concerns the wetted parts of our pressure gauges (pages 193 to 196).

Fluid	Wetted part	Fluid	Wetted part	Fluid	Wetted part
Acetic Acid	B	Ethyl Acetate	A	Nitrogen	A
Acetone	B	Ethyl Cellulose	B	Oxygen	A
Acetylene	B	Ethylene	A	Ozone	A
Air	A	Ethylene Dibromide	B	Paraffin	A
Alcohol	A	Ethylene Glycol	A	Phosphoric Acid	B
Alums	B	Ferric Nitrate	B	Pickling Solutions	B
Aluminium Sulfate	B	Ferric Sulfate	B	Picric Acid	B
Ammonia	B	Formaldehyde	B	Potassium Cyanide	B
Ammonium Carbonate	B	Freon	A	Potassium Permanganate	B
Beer	A	Fuel Oil	B	Prestone	A
Benzine	A	Gallic Acid	B	Refined Oil	B
Benzol	A	Gasoline	A	Salicylic Acid	A
Benzyl Alcohol	B	Gasoline (refined)	B	Silver Nitrate	B
Bleach Liquors	B	Glycerine	A	Sodium Nitrate	B
Brine	B	Helium	B	Sodium Peroxide	B
Butane	B	Hydrocyanic Acid	B	Sodium Phosphate	B
Butanol	A	Hydrogen	B	Sodium Sulfate	B
Butyric Acid	B	Hydrogen Peroxide	B	Sodium Sulfite	B
Calcium Bisulfite	B	Kerosene	A	Sulfur Dioxide (dry)	B
Calcium Hydroxide	B	Lacquers	A	Sulfuric (75%)	B
Carbon Dioxide (dry)	B	Lactic Acid	B	Sulfurous Acid	B
Carbon Bisulfide	B	Lysol	B	Toluene	A
Casein	B	Magnesium Sulfate	B	Vegetable Oils	B
Chloroform	B	Mercury	B	Vinegar	B
Chromic Acid	B	Methane	A	Water	A
Citric Acid	B	Mineral Oils	A	Water (corbonated)	B
Coal Gas	A	Naphtha	A	Water (demineralized)	A
Copper Sulfate	B	Natural Gas	A	Whisky	B
Cottonseed Oil	B	Nickel Acetate	B	Wines	B
Dextrine	A	Nitric Acid (pure)	B	Zinc Sulfate	B

A = Brass **B = F316 Stainless Steel**

IMPORTANT NOTICE: Data provided for informational purpose only. We recommend our customers to specify the materials they consider adapted to their actual service conditions.

Threaded connection standards

BSPP parallel thread ISO 228 & ISO 7 Rp for female thread	BSPT conical thread ISO 7 for male thread only	NPT conical thread ANSI B1.20 for both male & female thread
		
H = 0,9604 x pitch	H = 0,9604 x pitch	H = 0,866 x pitch
h = 0,6043 x pitch	h = 0,6043 x pitch	h = 0,800 x pitch
r = 0,1373 x pitch	r = 0,1373 x pitch	
	conicity: 6,25 %	conicity: 6,25 %

Ø		1/4"	3/8"	1/2"	3/4"	1"	1"1/4	1"1/2	2"	2"1/2	3"	4"
BSP thread	threads per inch	19	19	14	14	11	11	11	11	11	11	11
	pitch (mm)	1.337	1.337	1.814	1.814	2.309	2.309	2.309	2.309	2.309	2.309	2.309
NPT thread	threads per inch	18	18	14	14	11.5	11.5	11.5	11.5	8	8	8
	pitch (mm)	1.411	1.411	1.814	1.814	2.209	2.209	2.209	2.209	3.175	3.175	3.175

Diameter equivalences table

DN	8	10	15	20	25	32	40	50	65	80	100	125	150	200	250	300
NPS	1/4"	3/8"	1/2"	3/4"	1"	1"1/4	1"1/2	2"	2"1/2	3"	4"	5"	6"	8"	10"	12"
Metric	8/13	8/13	15/21	20/27	26/34	33/42	40/49	50/60	66/76	80/88	102/114	125/139	150/168	200/219	-	-
Plastic pipes	-	-	20	25	32	40	50	63	75	90	110	-	-	-	-	-

Flanges dimensions

EN 1092-1 - Steel flanges

Dimensions in mm	ISO PN10					ISO PN16					ISO PN25					ISO PN40				
DN	Union sizes			Screws		Union sizes			Screws		Union sizes			Screws		Union sizes			Screws	
	D	K	L	Number	Ø	D	K	L	Number	Ø	D	K	L	Number	Ø	D	K	L	Number	Ø
10	90	60	14	4	M 12	90	60	14	4	M 12	90	60	14	4	M 12	90	60	14	4	M 12
15	95	65	14	4	M 12	95	65	14	4	M 12	95	65	14	4	M 12	95	65	14	4	M 12
20	105	75	14	4	M 12	105	75	14	4	M 12	105	75	14	4	M 12	105	75	14	4	M 12
25	115	85	14	4	M 12	115	85	14	4	M 12	115	85	14	4	M 12	115	85	14	4	M 12
32	140	100	18	4	M 16	140	100	18	4	M 16	140	100	18	4	M 16	140	100	18	4	M 16
40	150	110	18	4	M 16	150	110	18	4	M 16	150	110	18	4	M 16	150	110	18	4	M 16
50	165	125	18	4	M 16	165	125	18	4	M 16	165	125	18	4	M 16	165	125	18	4	M 16
65	185	145	18	8*	M 16	185	145	18	8*	M 16	185	145	18	8	M 16	185	145	18	8	M 16
80	200	160	18	8	M 16	200	160	18	8	M 16	200	160	18	8	M 16	200	160	18	8	M 16
100	220	180	18	8	M 16	220	180	18	8	M 16	235	190	22	8	M 20	235	190	22	8	M 20
125	250	210	18	8	M 16	250	210	18	8	M 16	270	220	26	8	M 24	270	220	26	8	M 24
150	285	240	22	8	M 20	285	240	22	8	M 20	300	250	26	8	M 24	300	250	26	8	M 24
200	340	295	22	8	M 20	340	295	22	12	M 20	360	310	26	12	M 24	375	320	30	12	M 27
250	395	350	22	12	M 20	405	355	26	12	M 24	425	370	30	12	M 27	450	385	33	12	M 30
300	445	400	22	12	M 20	460	410	26	12	M 24	485	430	30	16	M 27	515	450	33	16	M 30
350	505	460	22	16	M 20	520	470	26	16	M 24	555	490	33	16	M 30	580	510	36	16	M 33
400	565	515	26	16	M 24	580	525	30	16	M 27	620	550	36	16	M 33	660	585	39	16	M 36

* Under specific agreement between parts; 4 hole flanges may be provided.

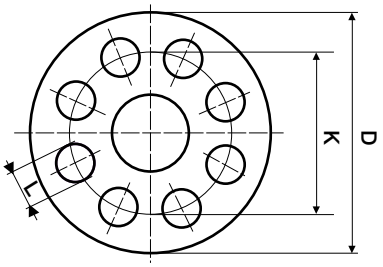
EN 1092-2 - Cast iron flanges

Dimensions in mm	ISO PN10					ISO PN16					ISO PN25					ISO PN40				
DN	Union sizes			Screws		Union sizes			Screws		Union sizes			Screws		Union sizes			Screws	
	D	K	L	Number	Ø	D	K	L	Number	Ø	D	K	L	Number	Ø	D	K	L	Number	Ø
10	90	60	14	4	M 12	90	60	14	4	M 12	90	60	14	4	M 12	90	60	14	4	M 12
15	95	65	14	4	M 12	95	65	14	4	M 12	95	65	14	4	M 12	95	65	14	4	M 12
20	105	75	14	4	M 12	105	75	14	4	M 12	105	75	14	4	M 12	105	75	14	4	M 12
25	115	85	14	4	M 12	115	85	14	4	M 12	115	85	14	4	M 12	115	85	14	4	M 12
32	140	100	19	4	M 16	140	100	19	4	M 16	140	100	19	4	M 16	140	100	19	4	M 16
40	150	110	19	4	M 16	150	110	19	4	M 16	150	110	19	4	M 16	150	110	19	4	M 16
50	165	125	19	4	M 16	165	125	19	4	M 16	165	125	19	4	M 16	165	125	19	4	M 16
65	185	145	19	4*	M 16	185	145	19	4*	M 16	185	145	19	8	M 16	185	145	19	8	M 16
80	200	160	19	8	M 16	200	160	19	8	M 16	200	160	19	8	M 16	200	160	19	8	M 16
100	220	180	19	8	M 16	220	180	19	8	M 16	235	190	23	8	M 20	235	190	23	8	M 20
125	250	210	19	8	M 16	250	210	19	8	M 16	270	220	28	8	M 24	270	220	28	8	M 24
150	285	240	23	8	M 20	285	240	23	8	M 20	300	250	28	8	M 24	300	250	28	8	M 24
200	340	295	23	8	M 20	340	295	23	12	M 20	360	310	28	12	M 24	375	320	31	12	M 27
250	395	350	23	12	M 20	405	355	28	12	M 24	425	370	31	12	M 27	450	385	34	12	M 30
300	445	400	23	12	M 20	460	410	28	12	M 24	485	430	31	16	M 27	515	450	34	16	M 30
350	505	460	23	16	M 20	520	470	28	16	M 24	555	490	34	16	M 30	580	510	37	16	M 33
400	565	515	28	16	M 24	580	525	31	16	M 27	620	550	37	16	M 33	660	585	41	16	M 36
450	615	565	28	20	M 24	640	585	31	20	M 27	670	600	37	20	M 33	685	610	41	20	M 36
500	670	620	28	20	M 24	715	650	34	20	M 30	730	660	37	20	M 33	755	670	43	20	M 39
600	780	725	31	20	M 27	840	770	37	20	M 33	845	770	41	20	M 36	890	795	49	20	M 45
700	895	840	31	24	M 27	910	840	37	24	M 33	960	875	44	24	M 39					
800	1015	950	34	24	M 30	1025	950	41	24	M 36	1085	990	50	24	M 45					
900	1115	1050	34	28	M 30	1125	1050	41	28	M 36	1185	1090	50	28	M 45					
1000	1230	1160	37	28	M 33	1255	1170	44	28	M 39	1320	1210	5	28	M 52					

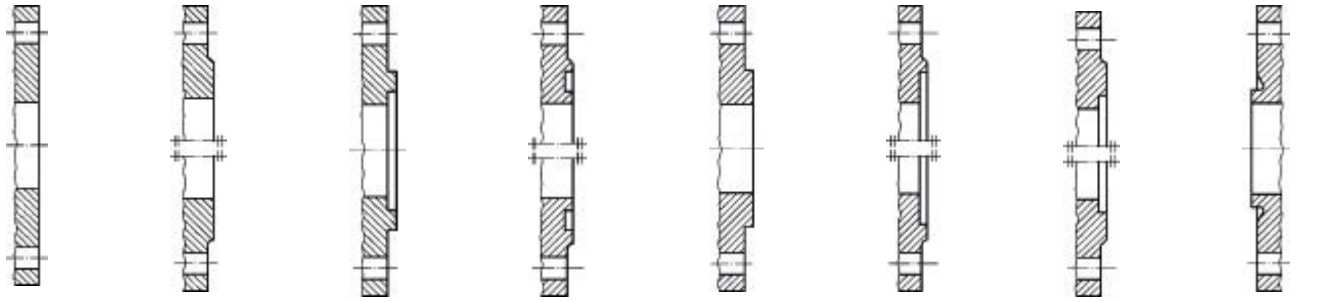
* Under specific agreement between parts; 8 hole flanges may be provided.

EN 1759-1 / ANSI B16.5 - Steel flanges

Dimensions in mm		ISO PN20 - ANSI 150					ISO PN50 - ANSI 300				
NPS	DN	Union sizes			Screws		Union sizes			Screws	
		D	K	L	Number	Ø	D	K	L	Number	Ø
1/2"	15	88,9	60,5	15,8	4	M 14	95,3	66,5	15,8	4	M 14
3/4"	20	98,6	69,9	15,8	4	M 14	117,4	88,6	19	4	M 16
1"	25	108	79,4	15,8	4	M 14	124	88,9	19	4	M 16
1"1/4	32	117	88,9	15,8	4	M 14	133	98,4	19	4	M 16
1"1/2	40	127	98,4	15,8	4	M 14	156	114,3	22,2	4	M 20
2"	50	152	120,4	19	4	M 16	165	127	22,2	8	M 20
2"1/2	65	178	139,7	19	4	M 16	190	149,2	22,2	8	M 20
3"	80	190	152,4	19	4	M 16	210	168,3	22,2	8	M 20
4"	100	229	190,5	19	8	M 16	254	200	22,2	8	M 20
5"	125	254	215,9	22,2	8	M 20	279	235	22,2	8	M 20
6"	150	279	241,3	22,2	8	M 20	318	269,9	22,2	12	M 20
8"	200	343	298,4	22,2	8	M 20	381	330,2	25,4	12	M 24
10"	250	406	362	25,4	12	M 24	444	387,4	28,5	16	M 27
12"	300	483	431,8	25,4	12	M 24	521	450,8	31,8	16	M 30
14"	350	533	476,2	28,5	12	M 27	584	514,4	31,8	20	M 30
16"	400	597	539,8	28,5	16	M 27	648	571,5	35	20	M 33



Flange facing types according to EN 1092-1



Type A
Flat face

Type B
Raised face

Type C
Tongue

Type D
Groove

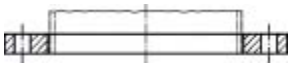
Type E
Spigot

Type F
Recess

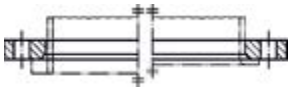
Type G
O-ring spigot

Type H
O-ring groove

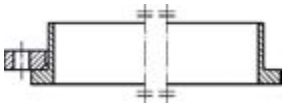
Flange types according to EN 1092-1



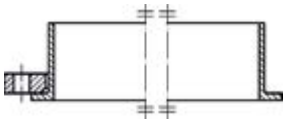
Type 01
Plate flange for welding



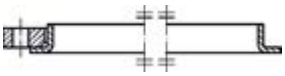
Type 02
Loose plate flange with weld-on collar (see type 32)
or lapped pipe end (see type 33)



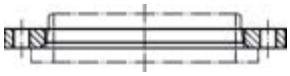
Type 02
Loose plate flange with weld ring neck (see type 35)



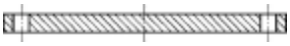
Type 02
Loose plate flange with pressed collar with long neck (see type 36)



Type 02
Loose plate flange with pressed collar (see type 37)



Type 04
Loose plate flange with weld-neck collar (see type 34)

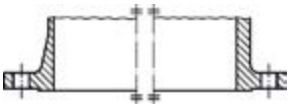


Type 05
Blind flange

Type 11
Weld-neck flange

Type 12
Hubbed slip-on flange for weldeing

Type 13
Hubbed threaded flange



Type 21
Integral flange

Collars types according to EN 1092-1

Type 32
Weld-on collar plate

Type 33
Lapped pipe end

Type 34
Weld-neck collar

Type 35
Weld ring neck

Type 36
Pressed collar with long neck

Type 37
Pressed collar

Face to face dimensions (EN 558)

Main basic series

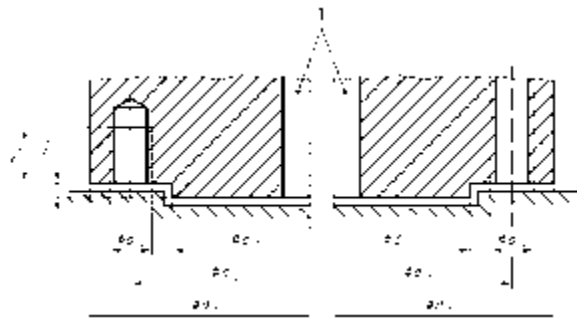
(dimensions in mm)

DN	10	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
Series 1	130	130	150	160	180	200	230	290	310	350	400	480	600	730	850	980	1100	1200	1250	1450
Series 2	210	210	230	230	260	260	300	340	380	430	500	550	650	775	900	1025	1150	1275	1400	1600
Series 3	102	108	117	127	140	165	178	190	203	229	254	267	292	330	356	381	406	432	457	508
Series 4	-	140	152	165	178	190	216	241	283	305	381	403	419	457	502	762	838	914	991	1143
Series 5	-	165	190	216	229	241	292	330	356	432	508	559	660	787	838	889	991	1092	1194	1397
Series 7	108	108	117	127	146	159	190	216	254	305	356	406	521	635	749	-	-	-	-	-
Series 10	-	108	117	127	140	165	203	216	241	292	330	356	495	622	698	787	914	978	978	1295
Series 12	130	130	130	140	165	165	203	222	241	305	356	394	457	533	610	686	762	864	914	1067
Series 13	-	-	-	-	-	106	108	112	114	127	140	140	152	165	178	190	216	222	229	267
Series 14	115	115	120	125	130	140	150	170	180	190	200	210	230	250	270	290	310	330	350	267
Series 15	-	-	-	120	140	240	250	270	280	300	325	350	400	450	500	550	600	650	700	800
Series 16	-	-	-	-	-	33	43	46	64	64	70	76	89	114	114	127	140	152	152	178
Series 18	80	80	90	100	110	120	135	165	185	229	-	-	-	-	-	-	-	-	-	-
Series 19	-	140	152	165	178	190	216	241	283	305	381	403	419	457	502	572	610	660	711	787
Series 20	-	-	-	-	-	33	43	46	46	52	56	56	60	68	78	78	102	114	127	154
Series 21	-	152	178	216	229	241	267	292	318	356	400	444	533	622	711	838	864	978	1016	1346
Series 25	-	-	-	-	-	-	-	-	49	56	64	70	71	76	83	92	102	114	127	154
Series 26	-	-	-	-	-	240	250	290	310	350	400	450	550	650	750	850	950	1050	1150	1350
Series 27	115	115	120	125	130	140	150	170	180	190	325	350	400	450	500	550	762	-	914	-
Series 28	130	130	150	160	180	200	230	290	310	350	400	450	550	650	750	850	950	-	1150	-
Series 29	108	108	117,5	127	127	136	142	154	160	172	186	200	228	255	285	315	340	360	380	425
Series 33	-	-	-	-	-	152	178	216	254	305	381	457	584	711	813	889	991	1092	1194	1397
Series 47	-	-	75	80	90	100	110	130	150	160	200	210	-	-	-	-	-	-	-	-
Series 48	-	-	-	-	-	180	200	240	260	300	350	400	500	600	700	800	900	1000	1100	1300
Series 49	-	16	19	22	28	31.5	40	46	50	60	90	106	140	-	-	-	-	-	-	-
Series 52	25	31,5	35,5	40	45	56	63	71	80	110	125	160	200	250	280	-	-	-	-	-
Series 54	-	-	229	254	279	305	368	419	381	457	551	610	737	838	965	1029	1130	1219	1321	1549
Series 55	-	216	229	254	279	305	368	419	470	546	673	705	832	991	1130	1257	1384	1537	1664	1943
Series 56	-	264	273	308	349	384	451	508	578	673	794	914	1022	1270	1422	-	-	-	-	-
Series 69	-	-	-	140	165	178	216	254	305	356	432	508	660	787	914	991	1092	-	-	-
Series 70	-	-	-	140	165	178	216	254	305	406	483	559	711	864	991	1067	1194	1346	1473	-
Series 71	-	-	-	186	232	232	279	330	368	457	533	610	762	914	1041	1118	1245	1397		-
Series 77	-	318	318	318	-	381	400	441	660	737	-	864	1022	1372	1575	1803	-	-	-	-
Series 91	-	-	-	-	-	310	350	425	470	550	650	750	950	1150	1350	1550	1750	1950	2150	-
Series 92	230	230	260	260	300	300	350	400	450	520	600	700	800	900	1050	-	-	-	-	-
Series 99	-	-	-	-	-	270	300	360	390	450	525	600	750	900	1050	1200	1350	1500	1650	-
Series 105	-	292	292	292	-	333	375	410	441	511	-	714	914	991	1130	1257	1422	1727	-	-
Series 106	-	292	292	292	-	333	375	410	460	530	-	768	972	1067	1219	1257	1422	1727	-	-
Series 107	-	50	50	60	65	80	95	110	145	170	-	-	-	-	-	-	-	-	-	-
Series 108	-	-	-	-	-	-	-	-	48	54	-	57	64	71	81	92	102	114	127	154
Series 109	-	-	-	-	-	-	-	-	48	54	-	59	73	83	92	117	133	149	159	181
Series 110	-	-	-	-	-	-	-	-	54	64	-	78	102	117	140	155	178	200	216	232

Origin of basic series

1	DIN 3202-1, series F1	**19**	ANSI B16.10, table 2, column 1	**55**	ANSI B16.10, table 6, column 5
2	DIN 3202-1, series F2	**20**	ANSI B16.10, table 9, column 3 & 4	**56**	ANSI B16.10, table 7, column 1 & 2
3	ANSI B16.10, table 1, column 8 & 9	**21**	ANSI B16.10, table 10, column 16 & 18	**69**	ANSI B16.10, table 5, column 2 & 6
4	ANSI B16.10, table 2, column 11	**25**	BS 2080, table 1, series 64	**70**	ANSI B16.10, table 6, column 2 & 6
5	ANSI B16.10, table 4, column 5	**26**	ANSI B16.10, table 9, column 4	**71**	ANSI B16.10, table 7, column 2 & 5
7	BS 2080, table 1, series 7	**27**	DIN 3357-2 ff	**77**	ANSI/ISA S75.16-1994 table 1
10	ANSI B16.10, table 1, column 16	**28**	DIN 3357-2 ff	**91**	DIN 3202-1, series F9
12	ANSI B16.10, table 1, column 3	**29**	NFE 29 - 377	**92**	DIN 3202-1, series F3
	BS 2080, table 1, series 12	**33**	ANSI B16.10, table 4, column 6	**99**	DIN 3202-1, series F8
13	BS 2080, table 1, series 13	**47**	DIN 3202-1, series F19	**105**	ANSI/ISA S75.16 table 1
14	DIN 3202-1, series F4	**48**	DIN 3202-1, series F6	**106**	ANSI/ISA S75.16 table 1
15	DIN 3202-1, series F5	**49**	DIN 3202-3, series F4	**108**	API 609, table 2 - Class 150
16	BS 2080, table 1, series 16	**52**	DIN 3202-3, series F5	**109**	API 609, table 2 - Class 300
18	BS 2080, table 1, series 18	**54**	ANSI B16.10, table 5, column 5	**110**	API 609, table 2 - Class 600

Pad dimensions for actuation according to ISO 5211



Legend

1 Part-turn actuator

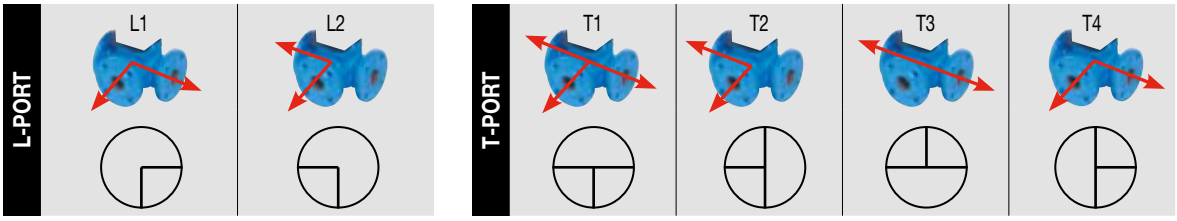
Dimensions in millimetres

Flange type	Dimensions							Number of screws, studs or bolts
	d_1 min.	d_2 [a]	d_3	d_4	h_1 max.	h_2 min.	h_3 min.	n
F03	Ø46	Ø25	Ø36	M5	3	8	5	4
F04	Ø54	Ø30	Ø42	M5	3	8	5	4
F05	Ø65	Ø35	Ø50	M6	3	9	6	4
F07	Ø90	Ø55	Ø70	M8	3	12	8	4
F10	Ø125	Ø70	Ø102	M10	3	15	10	4
F12	Ø150	Ø85	Ø125	M12	3	18	12	4
F14	Ø175	Ø100	Ø140	M16	4	24	16	4
F16	Ø210	Ø130	Ø165	M20	5	30	20	4
F25	Ø300	Ø200	Ø254	M16	5	24	16	8
F30	Ø350	Ø230	Ø298	M20	5	30	20	8
F35	Ø415	Ø260	Ø356	M30	5	45	30	8
F40	Ø475	Ø300	Ø406	M36	8	54	36	8
F48	Ø560	Ø370	Ø483	M36	8	54	36	12
F60	Ø686	Ø470	Ø603	M36	8	54	36	20
F80	Ø900	Ø670	Ø813	M42	10	63	42	20
F100	Ø1 200	Ø870	Ø1 042	M42	10	63	42	32

[a] d_2 shall be manufactured within the diameter tolerance f8.

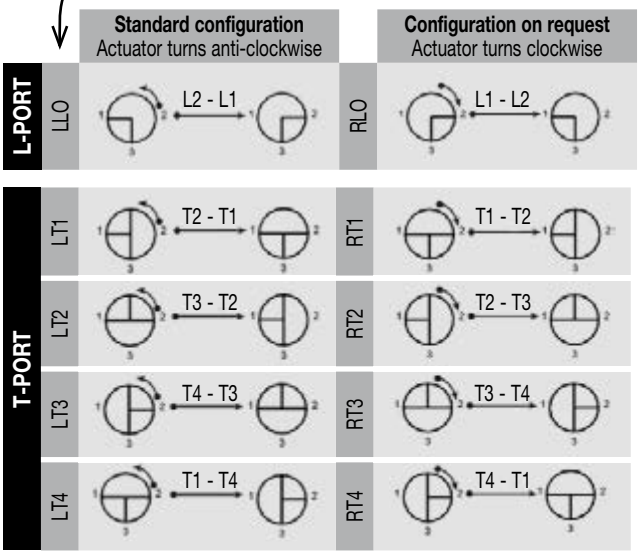
3 way actuated ball valves

■ Configuration and rotation of the ball



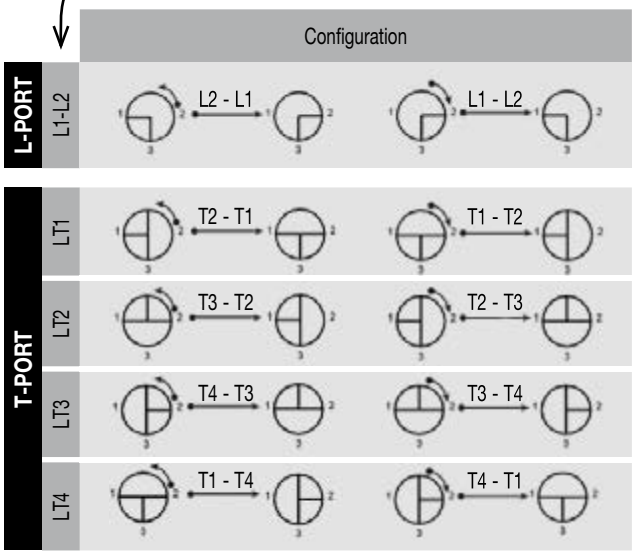
■ With spring return actuator

Mention the positionning code



■ With double acting actuator

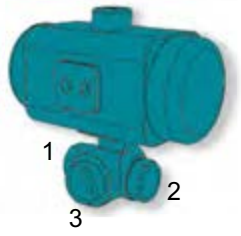
Mention 2 consecutive positions



⚠ ***For spring return actuators, the first position is the fail safe position in case of air failure.***

Mounting position of the actuator

Standard position
Actuator in line



On request
Actuator perpendicular

Materials (EN 1503)

■ Carbon steel

Forged carbon steel (EN 10222-2)

NF A 36-605	EN 10222	DIN 2528	WN°	ASTM	Min. temp.	Max. temp.
A48 AP	P 245 N	C22.8	1.0460	A 105 A 350 LF2	-20°C -46°C	+425°C +425°C

Cast steel (EN 10213-2)

NF	EN 10213-2	DIN	WN°	ASTM	Min. temp.	Max. temp.
A48 CM	GP 240 GH	GSC-25	1.0619 1.1156	A 216 WCB A 352 LCB	-29°C -45°C	+425°C +345°C

■ Stainless steel

Forged stainless steel (EN 10222-5)

NF A 36-607	DIN 17-440	WN°	ASTM	Min. temp.	Max. temp.
AF Z6 CN18-09	X5 CrNi 18-10	1.4301	A 182 F 304	-196°C	+815°C
AF Z2 CN18-10	X2 CrNi 19-11	1.4306	A 182 F 304 L	-196°C	+425°C
AF Z6 CND17-11	X5 CrNiMo 17-12-2	1.4401	A 182 F 316	-196°C	+815°C
AF Z2 CND17-12	X2 CrNiMo 17-12-2	1.4404	A 182 F 316 L	-196°C	+455°C

Cast stainless steel (EN 10213-4)

NF A	DIN 17-445	WN°	ASTM	Min. temp.	Max. temp.
Z6 CN 18.10 N	GX6 CrNi 18-9	1.4308	A 351 CF8	-196°C	+815°C
	GX2 CrNi 19-11	1.4309	A 351 CF3	-196°C	+425°C
Z6 CND18.12N	GX6 CrNiMo 19-11-2	1.4408	A 351 CF8M	-196°C	+815°C
	GX2 CrNiMo 19-11-2	1.4409	A 351 CF3M	-196°C	+455°C

■ Cast iron & ductile iron (EN 1503-3)

Cast iron

NF A 32-101	EN 1561	DIN 1691	WN°	ASTM	Min. temp.	Max. temp.
FGL 200	EN-GJL 250	GG 25	0.6020	A 48 class 308	-10°C	+200°C
FGL 250	EN-GJL 200	GG 20	0.6023	A 48 class 358	-10°C	+200°C

Ductile iron

NF A 32-201	EN 1563	DIN 1693	WN°	ASTM	Min. temp.	Max. temp.
FGS 500-7	EN-GJS-500-7	GGG 50	0.7050	A 536 Gr 80-55-06	-15°C	+350°C
FGS 400-15	EN-GJS-400-15	GGG 40	0.7040	A 536 Gr 65-45-12	-15°C	+350°C
FGS 400-18	EN-GJS-400-18	GGG 40.3	0.7043	A 536 Gr 60-40-18	-20°C	+350°C

■ Brass (EN 1503-4 / EN 12165)

	EN 12420	DIN	WN°	ASTM	Min. temp.	Max. temp.
	CW 617N	Cu Zn40Pb2	2.0402	B 124 C37700	-10°C	+200°C
	CW 614N	Cu Zn39Pb3	2.0372	B 124 C38500	-10°C	+200°C
	CW 510L	Cu Zn42		B 124 C28500	-10°C	+200°C

■ Bronze (EN 1503-4)

	EN 1982	DIN	WN°	ASTM	Min. temp.	Max. temp.
	CC 491K	CuSn5Zn5Pb5-C	2.1096	B 62 C83600	-10°C	+260°C
	CB 491K	CuSn5Zn5Pb5-B	2.1097	B 30 C83600	-10°C	+260°C

Usual working conditions for elastomeres on our butterfly valves

Elastomere	Min. / Max. temperature	Use	Not recommended
EPDM	-10°C/+110°C	Cold and hot water, sea water, alkaline products, sodium hydroxide.	Hydrocarbons, steam, gases, acids, oil, freon.
NBR	-10°C/+90°C	Non aromatic hydrocarbons, natural gas, greases, oil, compressed air, glycol, water.	Atmospheric environment, petrol, solvents.
FKM	-5°C/+180°C	Acids, greases, hydrocarbons, petrol, fuel, oil, gases.	Steam and hot water (max. 130°C), freon, alkaline products.
Natural rubber	-10°C/+60°C	Spirit, acetone, food, abrasive powders.	Acids and hydrocarbons.
Silicone	-30°C/+150°C	High temperature, air or inert gases.	Steam and hot water (max. 100°C), solvents.
Food silicone	-30°C/+150°C	Food.	Other applications.

General information provided for informational purpose only. Please check on data sheets for appropriate restrictions.

TRIM number chart acc. to API 600 (gate valves), API 623 (globe valves) & API 602 (compact gate valves)

Nominal seating surface materials

Trim Number	Part (if differ)	Nominal Trim	Seat Surface Hardness (HB*)	Seat Surface Material Type	Typical Specifications Grade		Stem / Bushing	Stem Hardness (HB*)
					Cast	Forged		
1		F6	250 min.	13Cr	A217 CA15	A182 F6a	13Cr	200 min. - 275 max.
2		304	Mfr. Std	18Cr-8Ni	A351 CF8	A182 F304	18Cr-8Ni	
3		F310	Mfr. Std	25Cr-20Ni	n/a	A182 F310	25Cr-20Ni	
4		Hard F6	750 min.	Hard 13Cr	n/a		13Cr	200 min. - 275 max.
5		Hardfaced	350 min.	Co-Cr A**	n/a	n/a	13Cr	200 min. - 275 max.
5A		Hardfaced	350 min.	Ni-Cr	n/a	n/a	13Cr	200 min. - 275 max.
6	shutter	F6 &	250 min.	13Cr	A217 CA15	A182 F6a	13Cr	200 min. - 275 max.
	body seat	Cu-Ni	175 min.	Cu-Ni	n/a			
7	shutter	F6 &	250 min.	13Cr	A217 CA15	A182 F6a	13Cr	200 min. - 275 max.
	body seat	Hard F6	750 min.	Hard 13Cr	n/a			
8	shutter	F6 &	250 min.	13Cr	A217 CA15	A182 F6a	13Cr	200 min. - 275 max.
	body seat	Hardfaced	350 min.	Co-Cr A**	n/a	n/a		
8A	shutter	F6 &	250 min.	13Cr	A217 CA15	A182 F6a	13Cr	200 min. - 275 max.
	body seat	Hardfaced	350 min.	Ni-Cr	n/a	n/a		
9		Monel	Mfr. Std	Ni-Cu Alloy	n/a	Mfr. Std	Ni-Cu Alloy	
10		316	Mfr. Std	18Cr-8Ni-Mo	A351 CF8M	A182 F316	18Cr-8Ni-Mo	
11	shutter	Monel &	Mfr. Std	Ni-Cu Alloy	n/a	Mfr. Std	Ni-Cu Alloy	
	body seat	Hardfaced	350 min.	Co-Cr A**	n/a	n/a		
11A	shutter	Monel &	Mfr. Std	Ni-Cu Alloy	n/a	Mfr. Std	Ni-Cu Alloy	
	body seat	Hardfaced	350 min.	Ni-Cr	n/a	n/a		
12	shutter	316 &	Mfr. Std	18Cr-8Ni-Mo	A351 CF8M	A182 F316	18Cr-8Ni-Mo	
	body seat	Hardfaced	350 min.	Co-Cr A**	n/a	n/a		
12A	shutter	316 &	Mfr. Std	18Cr-8Ni-Mo	A351 CF8M	A182 F316	18Cr-8Ni-Mo	
	body seat	Hardfaced	350 min.	Ni-Cr	n/a	n/a		
13	shutter	Alloy 20	Mfr. Std	19Cr-29-Ni	A351 CN7M	B473	19Cr-29Ni	
14	shutter	Alloy 20 &	Mfr. Std	19Cr-29-Ni	A351 CN7M	B473	19Cr-29Ni	
	body seat	Hardfaced	350 min.	Co-Cr A**	n/a	n/a		
14A	shutter	Alloy 20 &	Mfr. Std	19Cr-29-Ni	A351 CN7M	B473	19Cr-29Ni	
	body seat	Hardfaced	350 min.	Ni-Cr	n/a	n/a		
15		304 Full Hardfaced	350 min.	Co-Cr A**	n/a	n/a	18Cr-8Ni	
16		316 Full Hardfaced	350 min.	Co-Cr A**	n/a	n/a	18Cr-8Ni-Mo	

* HB is the symbol for the Brinell hardness as per ASTM E10.
** Co-Cr A. This alloy classification includes such trademarked materials as Stellite 6™, Stoody 6™ and Wallex 6™.
Note: Cr = Chromium; Ni = Nickel; Co = Cobalt; Cu = Copper; Mo = Molybdenum; n/a = not applicable; Mfr. Std = manufacturer's standard.

Typical service

Trim Number	Typical service
1	For general very low erosive or non-corrosive service between -100°C and 320°C. Steam & gas up to 370°C. Oil & oil vapor up to 480°C.
2	For moderate pressure in corrosive, low erosive service between -265°C and 450°C.
3	For moderate pressure in corrosive or non corrosive service between -265°C and 450°C.
4	As Trim 1 but for medium pressure and more corrosive service.
5	For high pressure slightly erosive & corrosive service between -265°C and 650°C. Excellent for high pressure water & steam service.
5A	As Trim 5 where Co is not allowed.
6	As Trim 1 but for more corrosive service.
7	As Trim 1 but for higher pressure and more corrosive or erosive service.
8	Universal Trim for general service requiring long service life. As Trim 5 for moderate pressure & more corrosive service. Steam, gas & general service up to 540°C.
8A	As Trim 8 where Co is not allowed.
9	For corrosive service up to 450°C such as acids, alkalies, salt solutions, etc. For very corrosive fluids. For erosive & corrosive service between -240°C and 480°C. Resistant to sea water, acids, alkalies. Excellent corrosion resistance in chlorine & alkylation service.
10	For superior resistance to corrosion for fluids corrosive to F6. As Trim 2 but for more corrosive service. Excellent resistance to corrosive fluids at high temperatures. Excellent toughness for low temperature service. Usual Trim for F316 valves at low temperature service.
11	As Trim 9 but for medium pressure & more corrosive service.
11A	As Trim 11 where Co is not allowed.
12	As Trim 10 but for medium pressure & more corrosive service.
12A	As Trim 12 where Co is not allowed.
13	For very corrosive service at moderate pressure between -45°C and 320°C.
14	As Trim 13 but for medium pressure & more corrosive service.
14A	As Trim 14 where Co is not allowed.
15	As Trim 2 but for more erosive service & higher pressure.
16	As Trim 10 but for more erosive service & higher pressure.

IMPORTANT NOTICE: Data provided for informational purpose only. Please, always consult latest API specifications to check Trim data.
We recommend our customers to analyse the service requirements and specify the materials they consider adapted to their actual service conditions.

Lexicon

Main standardisation organisations

AFNOR	Association Française de Normalisation
ANSI	American National Standard Institute
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing Materials
DIN	Deutsches Institut für Normung
ISO	International Organisation for Standardisation
JIS	Japanese Industrial Standards
NACE	National Association of Corrosion Engineers

Usual abbreviations

DN	Nominal size
NPS	Nominal pipe size
PS	Maximum allowable pressure
TS	Minimum/maximum allowable temperature
BSP	British Standard Pipe thread (BSPP: Parallel, acc. to ISO 228 / BSPT: Tapered, acc. to ISO 7)
NPT	National Pipe Tapered, acc. to ANSI B1.20
BW	Butt Weld, acc. to ASME B16.9
SW	Socket Weld, acc. to ASME B16.11
RF	Raised flange, acc. to ISO 1092-1 & ANSI B16.5
M	Male
F	Female
PDW	Potable Drinking Water

IP	Ingress Protection (see page 8)
ATEX	Explosive Atmosphere (see page 7)

V AC	Volts Alternating Current
V DC	Volts Direct Current
Nm	Newton metre
PSI	Pounds per Square Inch
ΔP	Differential pressure

Common material abbreviations

ABS	Acrylonitrile Butadiene Styrene
CR	Polychloroprene (such as Neoprene®)
CSM	Chlorosulphonated Polyethylene (such as Hypalon®)
ECO	Epichlorhydrin Rubber
EPDM	Ethylene Propylene Diene Monomer
FKM	Fluorinated Propylene Monomer (such as Viton®)
HDPE	High Density Polyethylene
NBR	Nitrile Butadiene Rubber
NR	Natural Rubber
PA	Polyamide
PE	Polyethylene
PEEK	Polyether Ether Ketone
PES	Polysulfone
PEX	Cross-linked Polyethylene
POM	Polyoxymethylene
PP	Polypropylene
PPG	Polypropylene Glycol
PTFE	Polytetrafluoroethylene
PU	Polyurethane
PVC	Polyvinyl Chloride
PVDF	Polyvinylidene Fluoride
RTFE	Reinforced Polytetrafluoroethylene (with 15% glass fiber)
SAN	Styrene Acrylonitrile
SBR	Styrene Butadiene Rubber

Main pictograms used in this publication

Connections

BSP threaded, see usual abbreviations above.

NPT threaded, see usual abbreviations above.

SMS threaded.

Socket weld, see usual abbreviations above.

Butt weld, see usual abbreviations above.

General certifications

Products certified in conformity with the 2014/68/EU Directive. Apply only for valve above 1".
May refer to other EU Directives when apply.

Products certified in conformity with the 2014/68/EU Directive by a notified body (XXXX: ID of the NB).
Apply only for valve above 1".

Product delivered by an ISO 9001 certified company.

Products certified in conformity with the API-6D Standard (XXXX: certificate number).

Product delivered by an API Spec Q1 registered company.

Product certified in conformity with the 2014/34/EU Directive.

Fire safe certified products (different standards may apply).

Fugitive emission tests certification in conformity with the ISO 15848 or API 622.

Product certified in conformity with German TA Luft regulation (Technische Anleitung zur Reinhaltung der Luft).

Materials for use in H2S containing environments

Specific certifications on products

3.1 certification available. 10€/DN when ordered along with the products. ⚠ 30€/DN when ordered afterwards.

ATEX zone (1, 21, 2 & 22) compatible product that has no own potential source of ignition. Manual valves are excluded from the scope of the 2014/34/EU Directive.

ATEX marking & certification available.
10€/pc, to be ordered along with the products.

Safety Integrity Level certification under IEC EN 61508 (grades from 1 to 4, see page 10).

Ingress protection rating (XX: grade, see page 10)

Specific approvals on products

NF ROB-GAZ, French approval for gas.

French approval for drinkable water.

UK approval for drinkable water.

German approval for drinkable water.

Polish approval for drinkable water.

U.S. Food & Drugs Administration. Complies with the FDA positive list of Food Contact Substances.

US National Sanitary Foundation Approval

Marine approval on products

Bureau Veritas Marine recognition MODE II

Bureau Veritas Type Approval

Lloyd's Register Type Approval

DNV-GL Type Approval

American Bureau of Shipping Type Approval

Technical data & prices are subject to change without prior notice.