GATE, GLOBE & CHECK VALVES

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INDUSTRIAL VALVES

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INDUSTRIAL VALVES FOR THE

PETROCHEMICAL, ENERGY & GAS DIVISIONS

PEG

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PETROCHEMICAL DIVISION
WATER DIVISION
GAS DIVISION
ENERGY DIVISION
MARINE DIVISION

We are pleased to present you our company which, since its foundation more than 25 years ago, is dedicated to the production of high quality valves. Since 1988 we have been manufacturing all kind of valves mainly for petrochemical, energy, gas, marine services and water and we are proud to manufacture our valves under our brand ARFLU.

ARFLU 's quality guarantee system as well as all its processes and procedures, both technical ones regarding products and in the organization of the company are certified according to the UNE-EN ISO 9001 standard. In addition ARFLU is certified according to H module of 97/23/CE of the EU. Though this certification is extremely important for our company, it must be said that the best certification and guaranty we can offer is the fact that our customers are placing their confidence in ARFLU products day by day. Living in a world of technology and communications as it is today, in ARFLU we try to keep at the forefront of industry. ARFLU owns the latest and most powerful informatic technology systems in order to have our whole organization perfectly communicated and to be in constant contact with customers worldwide. ARFLU is one of the most qualified companies in its field. We develop tailor made solutions as well as we provide customized advice and training for our clients.

arflu

INNOVATION, QUALITY, DESIGN

GATE VALVES

Gate valves

Gate valves can be used in many applications. They allow the fluid to flow in full open position and restrict in full closed position, with the minimum head losses. It is not recommended for intermediate positions. Gate valves are bidirectional and can be installed horizontal or vertical

MANUFACTURING AND DESIGN STANDARDS

Gate valves are designed and manufactured according to the following international codes and standards:

DESIGN AND MANUFACTURING:

- API 600 bolted bonnet steel gate valves for petroleum and natural gas industries
- API 602 Steel Gate, Globe and Check Valves for Sizes DN 100 and Smaller for the Petroleum and Natural Gas Industries
- API-6D ISO 14313, petroleum and natural gas industries-pipeline transportation systems-pipeline valves
- ASME B16.34 VALVES - flanged, threaded, and welding end
- BS 1414 Steel wedge gate valves (flanged and butt-welding ends) for the petroleum, petrochemical and allied industries.

INSPECTION AND TEST:

- API 600 bolted bonnet steel gate valves for petroleum and natural gas industries
- API-6D ISO 14313, petroleum and natural gas industries-pipeline transportation systems-pipeline valves
- API 598 valve inspection and testing

FLANGE DIMENSION:

- ASME B16.5 pipe flanges and flanged fittings
- ASME B16.47 large diameter steel flanges: nps 26 through nps 60
- MSS SP 44 steel pipeline flanges

WELDED OR THREATED ENDS:

- ASME B16.25 buttwelding ends
- ASME B16.11 forged steel fittings, socket-welding and threaded
- ASME B1.20.1 pipe threads general purpose

FACE TO FACE AND END TO END

- ASME B16.10 face to face and end-to-end dimensions of valves
- API-6D ISO 14313 petroleum and natural gas industries pipeline transportation Systems-pipeline valves

DESIGN FEATURES

| GATE VALVES |

BODY

The valve body is manufactured of cast steel, or forged steel, depending on the customer's requirements. In any case ASME B16.34 pressure-temperature ratings, and API 600, or API 602 minimum wall thickness are strictly fulfilled.

Gate valves are bidirectional and may be installed in both vertical and horizontal position.

Class 150 bodies are designed with elliptical sections. These sections are carefully calculated in order to prevent stress concentrations. Class 300 and bigger bodies have circular sections to make minimum stresses, under severe working conditions.
Sealing rings seating is carefully machined and inspected to prevent leakage between seat ring and body. Seating surface must be 1,6 AARH at least.

Tapered machining on seat sealing is controlled to ensure perfect sealing and interchange ability with spare parts.

Special care is taken to ensure, body end flanges, and bonnet flange to be parallel and perpendicular to prevent operating problems in line and during testing.

Flange facing is spiral smooth finish 125-250 AARH standard machining. Other facings are available under request.

Auxiliary connection bosses are provided according to ASME B16.34 for instrumentation, drain, or measure purposes.

Flange dimensions fulfil with ASME B16.5, ASME B16.47 and MSS SP 44. Other flange types may be produced under request.

BONNET

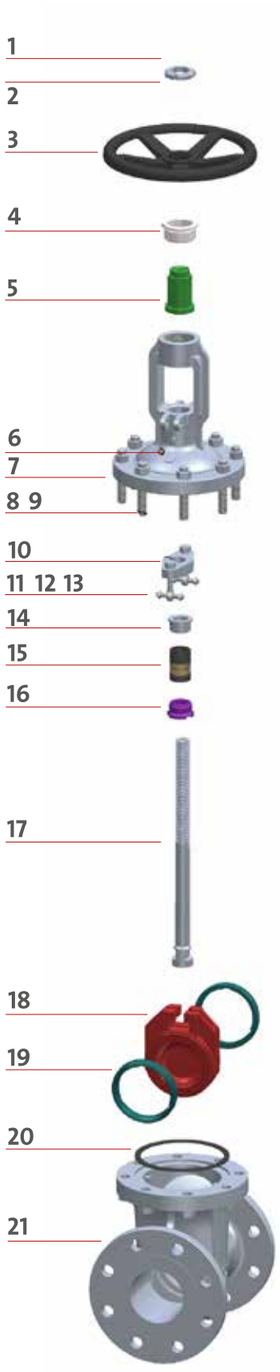
Bonnet design is elliptical for class 150 valves, and circular for bigger ratings. In all cases bonnet flange thickness is designed to work under most severe conditions according to ASME B16.34.

Body bonnet connection is flat face for class 150 valves, and male-female for bigger ratings. On request other connections such as RTJ or pressure seal may be supplied.

Auxiliary connection boxes are provided according to ASME B16.34 for instrumentation, drain, or measure purposes.

Bonnet machining is carefully checked to ensure wedge travel to be perpendicular to the bore line, so that operating problems are avoided. Stem nut seating must be parallel to bonnet connection.

Stuffing box must be extremely smooth machined to provide perfect tightness without applying too much strength on the eye bolts. Life loaded stuffing box may be fitted for special applications using Belleville springs to improve durability and reliability of the packing seal.



YOKE

Depending on the size of the valve between the handwheel and the bonnet a yoke is set.

The connecting flange of the yoke to the bonnet must be carefully machined to ensure wedge travel to be perpendicular to the bore line, so that operating problems are avoided.

A basement is provided on the bonnet to ensure perfect alignment with the stem nut.

SEAT

For carbon steel valves seat ring is manufactured from forged steel. The sealing surface is sprayed welded with the material required by customer. Renewable threaded seat is used for NPS 10" and smaller valves, welded seat design is used for NPS 12" and bigger. For stainless steel valves usually integral seat is used, overlaid, or not. Other constructions are available under request.

Seat surfaces are carefully machined to provide tightness. Special attention must be taken with the seat ring thread to avoid seizing.

Special care is taken to provide hardness difference between seat and wedge according to API 600. For this reason seat rings are heat treated.

GATE

Gate valves NPS 2" and bigger are flexible wedge design, NPS smaller than 2" are solid wedge. Sealing surfaces may be overlaid or not depending on the customer's requirements.

Special manufactures such as SPLIT WEDGE, or SOFT SEATED may be produced for special applications.

Sealing surfaces are carefully machined so that long life, small torque, and no leakage are achieved.

STEM

Stem is made of one piece forged steel.
The diameter of the stem fulfil with API-600. Wedge connection is T type, and has been designed to fulfil with API-591 on a strength test. T head is properly designed to allow the wedge adapt to the stem in any assembling position (vertical or horizontal)

Back seat sealing face is carefully machined to provide tightness on pressurized pipe line with valve fully opened. For this reason the surface finish of the packing seal must be smooth enough.

Machining of ACME threads is smooth enough to obtain a low operating torque.

MATERIALS

		WCB TRIM 1/5/8	CF8/304	CF8M/316	LCB TRIM 8/10	WC6 TRIM 5/8	C5 TRIM 5/8
1	**SET SCREW**	ASME	ASME	ASME	ASME 1020	ASME 1020	ASME 1020
2	**HAND WHEEL NUT**	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
3	**HAND WHEEL**	DUCTILE IRON	DUCTILE IRON	DUCTILE IRON	DUCTILE IRON	DUCTILE IRON	DUCTILE IRON
4	**YOKE SLEEVE NUT**	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
5	**STEM NUT**	ASTM A439 D2	ASTM A439 D2	ASTM A439 D2	ASTM A439 D2	ASTM A439 D2	ASTM A439 D2
6	**NIPPLE**	CARBON STEEL	STAINLESS STEEL	STAINLESS STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
7	**BONNET**	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M	ASTM A352 LCB	ASTM A217 WC6	ASTM A217 C5
8	**BONNET NUT**	ASTM A194 2H	ASTM A194 8	ASTM A194 8M	ASTM A194 4	ASTM A194 7	ASTM A194 7
9	**BONNET BOLT**	ASTM A193 B7	ASTM A193 B8	ASTM A193 B8M	ASTM A193 L7	ASTM A193 B16	ASTM A193 B16
10	**GLAND FLANGE**	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M	ASTM A2352 LCB	ASTM A217 WC6	ASTM A217 C5
11	**EYEBOLT PIN**	ASTM A36	SS 304	SS 316	ASTM A36	ASTM A36	ASTM A36
12	**EYEBOLT NUT**	ASTM A194 2H	ASTM A194 8	ASTM A194 8M	ASTM A194 4	ASTM A194 7	ASTM A194 7
13	**GLAND EYEBOLT**	ASTM A193 B7	ASTM A193 B8	ASTM A193 B8M	ASTM A193 L7	ASTM A193 B16	ASTM A193 B16
14	**GLAND**	ASTM A182 F6A	ASTM A182 F304	ASTM A182 F316	TRIM 8: ASTM A182 F6A / TRIM 10: ASTM A182 F316	ASTM A182 F6A	ASTM A182 F6A
15	**PACKING**	GRAPHITE	GRAPHITE	GRAPHITE	GRAPHITE	GRAPHITE	GRAPHITE
16	**BACKSEAT BUSHING**	ASTM A182 F6A	ASTM A351 CF8	ASTM A351 CF8M	TRIM 8: ASTM A182 F6A / TRIM 10: ASTM A182 F316	ASTM A182 F6A	ASTM A182 F6A
17	**STEM**	ASTM A182 F6A	ASTM A182 F304	ASTM A182 F316	TRIM 8: ASTM A182 F6A / TRIM 10: ASTM A182 F316	ASTM A182 F6A	ASTM A182 F6A
18	**WEDGE**	TRIM 1: ASTM A216 WCB + 13%CR / A105 + 13%CR; TRIM 5: ASTM A216 WCB + STL / A105 + STL; TRIM 8: ASTM A216 WCB + 13%CR / A105 + STL	ASTM A351 CF8	ASTM A351 CF8M	TRIM 8: ASTM A352 LCB + 13%CR / A350 LF2 + STL; TRIM 10: ASTM A352 LCB + AISI 316 / A350 LF2 + AISI 316	TRIM 5: ASTM A217 WC6 + STL / ASTM A182 F11 + STL; TRIM 8: ASTM A217 WC6 + 13%CR / ASTM A182 F11 + 13%CR	TRIM 5: ASTM A217 C5 + STL / ASTM A182 F5 + STL; TRIM 8: ASTM A217 C5 + 13%CR / ASTM A182 F5 + 13%CR
19	**SEAT RING**		ASTM A351 CF8	ASTM A351 CF8M			
20	**GASKET**	304 + GRAPHITE	304 + GRAPHITE	316 + GRAPHITE	TRIM 8: 304 + GRAPHITE / TRIM 10: 316 + GRAPHITE	304 + GRAPHITE	304 + GRAPHITE
21	**BODY**	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M	ASTM A352 LCB	ASTM A217 WC6	ASTM A217 C5

GLAND ASSEMBLY

The gland flange and the gland bushing push the packing rings to make them seal the stuffing box and the stem. Gland bushing is shoulder type to prevent over strength over the packing. Gland flange is designed with enough resistance to work on the most severe conditions. Gland flange and gland bushing are self adjusting to each other to ensure perpendicular pressure on the packing.

BACK SEAT

All of our valves have back seat design according to API-600. Carbon steel valves are fitted with renewable back seat 13% Cr minimum. For stainless steel valves, the back seat is directly machined on the body. Overlaid surface is possible under request.

STEM NUT

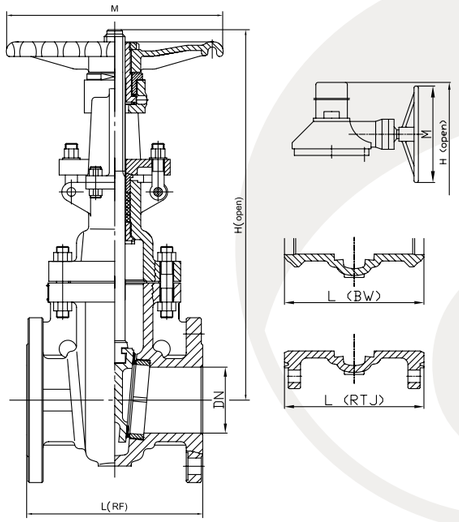
Stem nut is made of different materials such as ASTM A439 D2, Ni-Resist, or Aluminium bronze.

Depending on the size and class of the valves rolling bearings are fitted on both sides of the stem nut, in order to make operation torque minimum.

Gate valve API 600-BS1414

COD. AC-1000

GATE VALVES CLASS **150** (BOLTED BONNET) 2" TO 48"



DESIGN	ASME B16.34 & API-600 or UNE EN ISO 10434
FACE TO FACE	ASME B16.10
FLANGED ENDS	From 2" to 24" Ac c/ASME B16.5, upper than 24" Ac c/ASME B16.47 or MSS SP-44 or upon request
BUTT WELD ENDS	ASME B16.25
BY-PASS & DRAIN	MSS SP-45
TEST	API-598, API 6D & ISO 15848, ASME B16.34
CONSTRUCTION	• O.S & Y. Rising Stem • Flexible Solid Wedge, split wedge, others upon request • Threaded, Welded or integral Seat Ring • Metal Seats or Inserted soft seats • Bolted Bonnet • Extended Bonnet • 10" and above two pieces yoke • Manual and actuator operated (electric, pneumatic, hydraulic...)
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M,CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Jacketed, cryogenic services, H.F. services, Non rising stem, by-pass.... all kind of actuators, all type of painting and coting

*** other requirements upon request.**

***Arflu has Monogram API certification (API 600) if required by the customer**

CLASS 150 DIMENSIONS IN MILIMETERS

ND.	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
L (BW)	216	241	282	305	381	403	419	457	502	572	610	660	711	813
L (RF)	178	190	203	229	254	267	292	330	356	381	406	432	457	508
L (RTJ)	191	203	216	241	267	279	305	343	369	394	419	445	470	521
DN	50	60	80	100	125	150	200	250	300	350	400	450	500	600
H (OPEN)	409	472	532	612	710	806	990	1186	1405	1615	1811	1986	2210	3045
M	200	200	250	250	300	300	350	450	500	460	460	460	610	450
WEIGHT (KG.) (BW)	17	26	29	46	66	77	116	202	294	350	506	575	720	1130
WEIGHT (KG.) (RF)	20	30	36	53	71	85	136	220	323	387	553	660	810	1250

CLASS 150 DIMENSIONS IN MILIMETERS

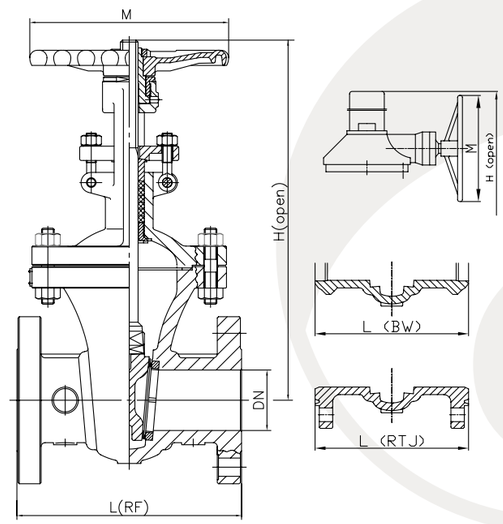
ND.	28"	30"	32"	36"	42"	48"
L (BW)	914	914	965	1016	1092	1371
L (RF)	610	610	711	711	813	1067
L (RTJ)	622	622	673	714		
DN	700	750	800	900	1050	1200
H (OPEN)	3030	3317	3487	3825		3962
M	610	610	610	760	760	1020
WEIGHT (KG.) (BW)	1765	2028	2280	3080		
WEIGHT (KG.) (RF)	1931	2380	2490	3600	5100	6500

*** Other measures upon request.**

Gate valve API 600-BS1414

COD. AC-3000

GATE VALVES CLASS **300** (BOLTED BONNET) 2" TO 48"



DESIGN	ASME B16.34 & API-600 or UNE EN ISO 10434
FACE TO FACE	ASME B16.10
FLANGED ENDS	From 2" to 24" Ac c/ASME B16.5, upper than 24" Ac c/ASME B16.47 or MSS SP-44 or upon request
BUTT WELD ENDS	ASME B16.25
BY-PASS & DRAIN	MSS SP-45
TEST	API-598, API 6D & ISO 15848, ASME B16.34
CONSTRUCTION	• O.S & Y. Rising Stem • Flexible Solid Wedge, split wedge, others upon request • Threaded, Welded or integral Seat Ring • Metal Seats or Inserted soft seats • Bolted Bonnet • Extended Bonnet • 10" and above two pieces yoke • Manual and actuator operated (electric, pneumatic, hydraulic...)
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M,CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Jacketed, cryogenic services, H.F. services, Non rising stem, by-pass.... all kind of actuators, all type of painting and coting

*** other requirements upon request.**

***Arflu has Monogram API certification (API 600) if required by the customer**

CLASS 300 DIMENSIONS IN MILIMETERS

ND.	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
L (BW)	216	241	282	305	381	403	419	457	502	762	838	914	991	1143
L (RF)	"	"	"	"	"	"	"	"	"	"	"	"	"	"
L (RTJ)	232	257	298	321	397	419	435	473	518	778	854	930	1010	1165
DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600
H (OPEN)	400	477	543	650	770	880	1037	1275	1438	1650	1840	2030	2240	2900
M	200	250	250	300	300	350	450	500	560	460	460	610	610	610
WEIGHT (KG.) (BW)	26	34	47	68	77	118	195	271	432	595	848	1025	1460	2294
WEIGHT (KG.) (RF)	30	39	55	83	92	137	240	333	536	669	1010	1205	1720	2800

CLASS 300 DIMENSIONS IN MILIMETERS

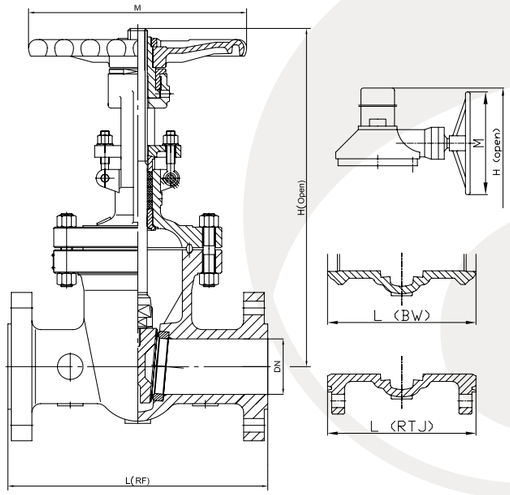
ND.	28"	30"	32"	36"	42"	48"
L (BW)	1346	1397	1524	1727	2032	2286
L (RF)	1346	1397	1524	1727	2032	2286
L (RTJ)	1371	1422	1552	1755		
DN	700	750	800	900	1050	1200
H (OPEN)	2641	2743	2857	3048		
M	860	860	860	860	720	720
WEIGHT (KG.) (BW)	3600	3780	4235	5900		
WEIGHT (KG.) (RF)	4027	4310	4850	6632	9750	13050

*** Other measures upon request.**

Gate valve API 600-BS1414

COD. AC-6000

GATE VALVES CLASS **600** (BOLTED BONNET) 2" TO 48"



DESIGN ASME B16.34 & API-600 or UNE EN ISO 10434

FACE TO FACE ASME B16.10

FLANGED ENDS From 2" to 24" Ac c/ASME B16.5, upper than 24" Ac c/ASME B16.47 or MSS SP-44 or upon request

BUTT WELD ENDS ASME B16.25

BY-PASS & DRAIN MSS SP-45

TEST API-598, API 6D & ISO 15848, ASME B16.34

CONSTRUCTION
- O.S & Y. Rising Stem
- Flexible Solid Wedge, split wedge, others upon request
- Threaded, Welded or integral Seat Ring
- Metal Seats or Inserted soft seats
- Bolted Bonnet
- Extended Bonnet
- 10" and above two pieces yoke
- Manual and actuator operated (electric, pneumatic, hydraulic...)

MATERIALS WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M,CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials

TRIM 13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....

OTHERS Jacketed, cryogenic services, by-pass.... all kind of actuators, all type of painting and coting

*** other requirements upon request.**

***Arflu has Monogram API certification (API 600) if required by the customer**

CLASS 600 DIMENSIONS IN MILIMETERS

ND.	2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
L (BW)	292	330	356	432	559	660	787	838	889	991	1092	1194	1397
L (RF)	"	"	"	"	"	"	"	"	"	"	"	"	"
L (RTJ)	295	333	359	435	562	663	790	841	892	994	1095	1200	1407
DN	50	65	80	100	150	200	250	300	350	400	450	500	600
H (OPEN)	474	553	593	713	970	1122	1330	1519	1730	1835	2290	2510	3022
M	250	250	300	350	500	560	720	610	610	610	610	760	760
WEIGHT	35	50	68	104	208	328	496	637	1120	1448	1828	2201	3360
WEIGHT (KG.) (RF)	41	58	88	131	253	413	623	784	1288	1820	2150	2540	4080

CLASS 600 DIMENSIONS IN MILIMETERS

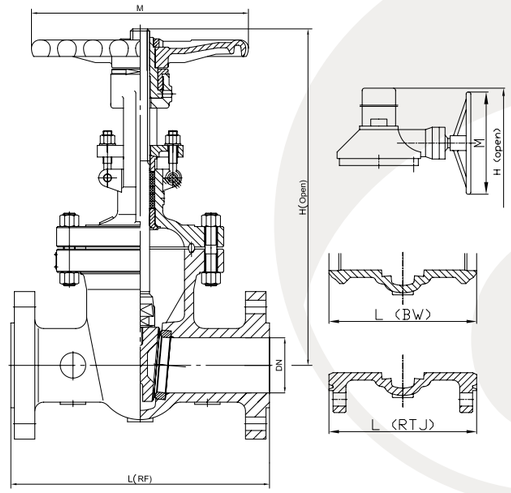
ND.	28"	30"	32"	36"	42"	48"
L (BW)	1549	1651	1778	2083	2260	2667
L (RF)	1549	1651	1778	2083	2260	2667
L (RTJ)	1562	1664	1794	2099		
DN	700	750	800	900	1050	1200
H (OPEN)						
M	610	610	720	720	720	720
WEIGHT		6160		9580		
WEIGHT (KG.) (RF)	5960	6700	8312	10125	16460	22900

*** Other measures upon request.**

Gate valve API 600-BS1414

COD. AC-9000

GATE VALVES CLASS **900** (BOLTED BONNET) 2" TO 20"



DESIGN ASME B16.34 & API-600 or UNE EN ISO 10434

FACE TO FACE ASME B16.10

FLANGED ENDS From 2" to 24" Ac c/ASME B16.5, upper than 24" Ac c/ASME B16.47 or MSS SP-44 or upon request

BUTT WELD ENDS ASME B16.25

BY-PASS & DRAIN MSS SP-45

TEST API-598, API 6D & ISO 15848, ASME B16.34

CONSTRUCTION
- O.S & Y. Rising Stem
- Flexible Solid Wedge, split wedge, others upon request
- Threaded, Welded or integral Seat Ring
- Metal Seats or Inserted soft seats
- Bolted Bonnet
- Extended Bonnet
- 10" and above two pieces yoke
- Manual and actuator operated (electric, pneumatic, hydraulic...)

MATERIALS WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M,CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials

TRIM 13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....

OTHERS Jacketed, cryogenic services, by-pass.... all kind of actuators, all type of painting and coting

*** other requirements upon request.**

***Arflu has Monogram API certification (API 600) if required by the customer**

CLASS 900 DIMENSIONS IN MILIMETERS

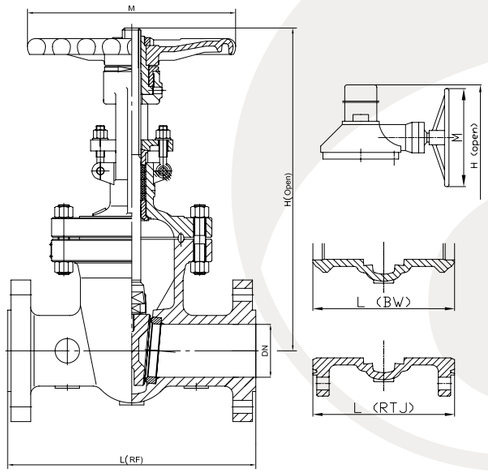
ND.	2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"
L (BW)	368	419	381	457	610	737	838	965	1029	1130	1219	1321
L (RF)	"	"	"	"	"	"	"	"	"	"	"	"
L (RTJ)	371	422	384	460	613	740	841	968	1039	1140	1232	1334
DN	50	65	80	100	150	200	250	300	350	400	450	500
H (OPEN)		590	666	764	827	895	1173	1050	1243	1332	1500	1634
M	350	350	400	450	460	460	460	530	530	600	600	600
WEIGHT	82	93	108	122	359	566	980	1450	2000	2390	2995	3810
WEIGHT (KG.) (RF)	82	93	108	122	359	566	980	1450	2000	2390	2995	3810

*** Other measures upon request.**

Gate valve API 600-BS1414

COD. AC-4000

GATE VALVES CLASS **1500** (BOLTED BONNET) 2'' TO 16"



DESIGN ASME B16.34 & API-600 or UNE EN ISO 10434

FACE TO FACE ASME B16.10

FLANGED ENDS From 2" to 24" Ac c/ASME B16.5, upper than 24" Ac c/ASME B16.47 or MSS SP-44 or upon request

BUTT WELD ENDS ASME B16.25

BY-PASS & DRAIN MSS SP-45

TEST API-598, API 6D & ISO 15848, ASME B16.34

CONSTRUCTION
- O.S & Y. Rising Stem
- Flexible Solid Wedge, split wedge, others upon request
- Threaded, Welded or integral Seat Ring
- Metal Seats or Inserted soft seats
- Bolted Bonnet
- Extended Bonnet
- 10" and above two pieces yoke
- Manual and actuator operated (electric, pneumatic, hydraulic...)

MATERIALS WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M,CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials

TRIM 13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....

OTHERS Jacketed, cryogenic services, by-pass.... all kind of actuators, all type of painting and coting

*** other requirements upon request.**

***Arflu has Monogram API certification (API 600) if required by the customer**

CLASS 1500 DIMENSIONS IN MILIMETERS

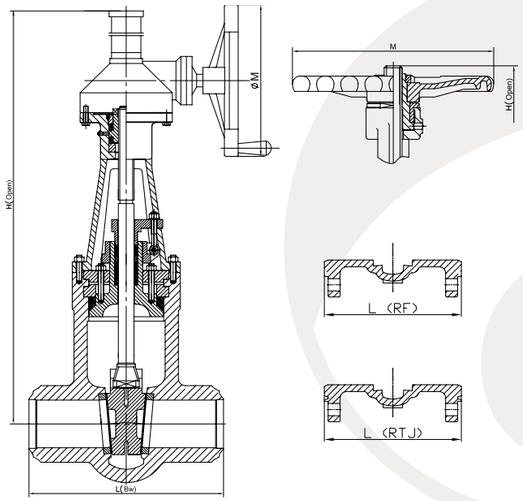
ND.	2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"
L (BW)	368	419	470	546	705	832	991	1130	1257	1384
L (RF)	"	"	"	"	"	"	"	"	"	"
L (RTJ)	371	422	473	549	711	842	1001	1146	1276	1406
DN	50	65	80	100	150	200	250	300	350	400
H (OPEN)	574	700	806	887	1079	1370	1520	1651	1945	2250
M	350	400	450	560	305*	610*	760*	760*	760*	760
WEIGHT	93	144	185	285	584	978	1990	2850	3320	4890
WEIGHT (KG.) (RF)	117	175	240	337	680	1228	2278	3260	4100	5960

*** Other measures upon request.**

Gate valve ASME B16.34

COD. AC-9000-P

GATE VALVES CLASS **900** (PRESSURE SEAL) 2'' TO 16"



DESIGN ASME B16.34

FACE TO FACE ASME B16.10

FLANGED ENDS ASME B16.5

BUTT WELD ENDS ASME B16.25

BY-PASS & DRAIN MSS SP-45

TEST API-598, API 6D & ISO 15848, ASME B16.34

CONSTRUCTION
- O.S & Y. Rising Stem
- Flexible Solid Wedge, split wedge, others upon request
- Threaded, Welded or integral Seat Ring
- Metal Seats or Inserted soft seats
- Pressure Seal
- Extended Bonnet
- Manual and actuator operated (electric, pneumatic, hydraulic...)

MATERIALS WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials

TRIM 13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....

OTHERS Jacketed, cryogenic services, by-pass.... all kind of actuators, all type of painting and coating

*** other requirements upon request.**

CLASS 900 DIMENSIONS IN MILIMETERS. HIGH PRESSURE - PRESSURE SEAL

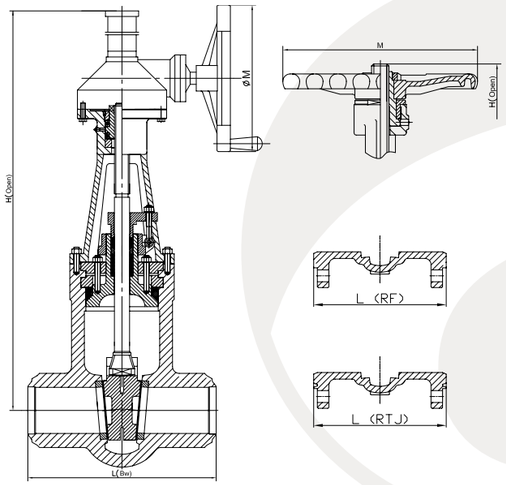
ND.	2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"
L (BW)	216	254	305	356	508	660	787	914	991	1092
L (RF)	368	419	381	457	610	737	838	965	1029	1130
L (RTJ)	371	422	384	460	613	740	841	968	1039	1140
DN	50	65	80	100	150	200	250	300	350	400
H (OPEN)	554	637	680	796	1084	1372	1494	1550	1960	2210
M	300	350	350	400	560	460*	610*	610*	610*	760*
WEIGHT	60	70	77	101	275	395	690	990	1200	1670
WEIGHT (KG.) (RF)	80	90	95	130	310	505	870	1210	1450	2018

*** Other measures upon request.**

Gate valve ASME B16.34

COD. AC-4000-P

GATE VALVES CLASS **1500** (PRESSURE SEAL) 2" TO 16"



DESIGN ASME B16.34

FACE TO FACE ASME B16.10

FLANGED ENDS ASME B16.5

BUTT WELD ENDS ASME B16.25

BY-PASS & DRAIN MSS SP-45

TEST API-598, API 6D & ISO 15848, ASME B16.34

CONSTRUCTION
- O.S & Y. Rising Stem
- Flexible Solid Wedge, split wedge, others upon request
- Threaded, Welded or integral Seat Ring
- Metal Seats or Inserted soft seats
- Pressure Seal
- Extended Bonnet
- Manual and actuator operated (electric, pneumatic, hydraulic...)

MATERIALS WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials

TRIM 13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....

OTHERS Jacketed, cryogenic services, by-pass.... all kind of actuators, all type of painting and coating

*** other requirements upon request.**

CLASS 1500 DIMENSIONS IN MILIMETERS. HIGH PRESSURE - PRESSURE SEAL

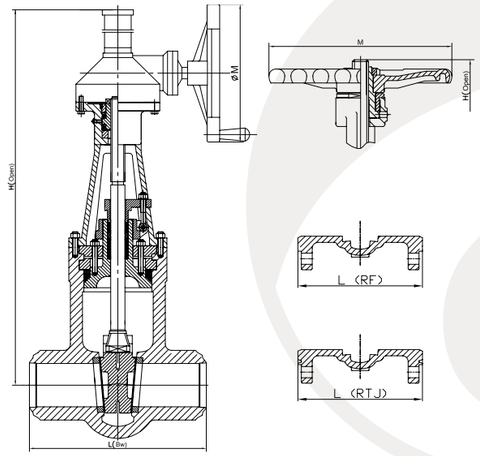
ND.	2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"
L (BW)	216	254	305	406	559	711	864	991	1067	1194
L (RF)	368	419	470	546	705	832	991	1130	1257	1384
L (RTJ)	371	422	473	549	711	842	1001	1146	1276	1406
DN	50	65	80	100	150	200	250	300	350	400
H (OPEN)	554	637	767	875	1094	1372	1655	1834	2150	2260
M	300	450	450	560	305*	460*	610*	610*	760*	760
WEIGHT	46	71	71	130	292	587	974	1615	2010	2815
WEIGHT (KG.) (RF)	60	91	91	182	394	795	1370	2120	2800	3870

*** Other measures upon request.**

Gate valve ASME B16.34

COD. AC-7000-P

GATE VALVES CLASS **2500** (PRESSURE SEAL) 2" TO 16"



DESIGN ASME B16.34

FACE TO FACE ASME B16.10

FLANGED ENDS ASME B16.5

BUTT WELD ENDS ASME B16.25

BY-PASS & DRAIN MSS SP-45

TEST API-598, API 6D & ISO 15848, ASME B16.34

CONSTRUCTION
- O.S & Y. Rising Stem
- Flexible Solid Wedge, split wedge, others upon request
- Threaded, Welded or integral Seat Ring
- Metal Seats or Inserted soft seats
- Pressure Seal
- Extended Bonnet
- Manual and actuator operated (electric, pneumatic, hydraulic...)

MATERIALS WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials

TRIM 13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....

OTHERS Jacketed, cryogenic services, by-pass.... all kind of actuators, all type of painting and coating

*** other requirements upon request.**

CLASS 2500 DIMENSIONS IN MILIMETERS. HIGH PRESSURE - PRESSURE SEAL

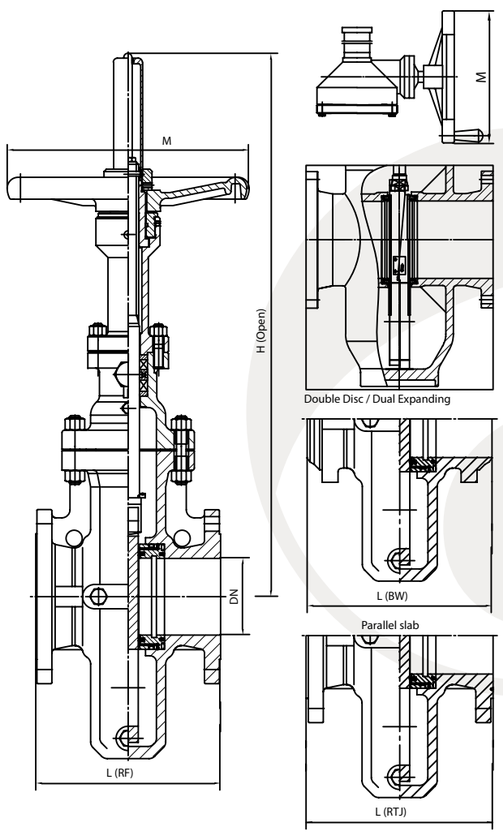
ND.	2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"
L (BW)	279	330	368	457	610	762	914	1041	1118	1245
L (RF)	451	508	578	673	917	1022	1270	1422		
L (RTJ)	454	514	584	683	930	1038	1292	1444		
DN	50	65	80	100	150	200	250	300	350	400
H (OPEN)	610	654	753	850	1254	1374	1685			
M	500	500	600	600	460*	460*	610*			
WEIGHT	88	135	144	158	500	892	1550			
WEIGHT (KG.) (RF)	121	175	195	229	720	1295	2250			

*** Other measures upon request.**

Through Conduit Gate Valve API 6D

COD. ACTC 1000

THROUGH CONDUIT GATE VALVES CLASS **150** (BOLTED BONNET) 2” TO 24”



THROUGH CONDUIT GATE VALVES ARE SUITABLE TO CONDUCT DIFFERENT TYPES OF FLUID ON / OFF OPERATION

DESIGN	ASME B16.34 & API-6D
FACE TO FACE	ASME B16.10 & API-6D
FLANGED ENDS	ASME B16.5
BUTT WELD ENDS	ASME B16.25
BY-PASS & DRAIN	MSS SP-45
TEST	API-598, API 6D & ISO 15848, ASME B16.34
CONSTRUCTION	- O.S & Y. Rising Stem - Parallel slab, double disc/Dual Expanding, others upon request - Metal Seats or Inserted soft seats - Bolted Bonnet - Extended Bonnet - Two pieces yoke - Manual and actuator operated (electric, pneumatic, hydraulic...)
MATERIALS	Ac c/ASME B16.34 DI, WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M,CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS REQUIREMENTS	Upon request
AVERAGE LIFE	30 years approx. (15.000 to 20.000 cycles approx.)
PRESSURE/ TEMPERATURE	ASME B16.34

*** other requirements upon request.**

CLASS 150 DIMENSIONS IN MILIMETERS.

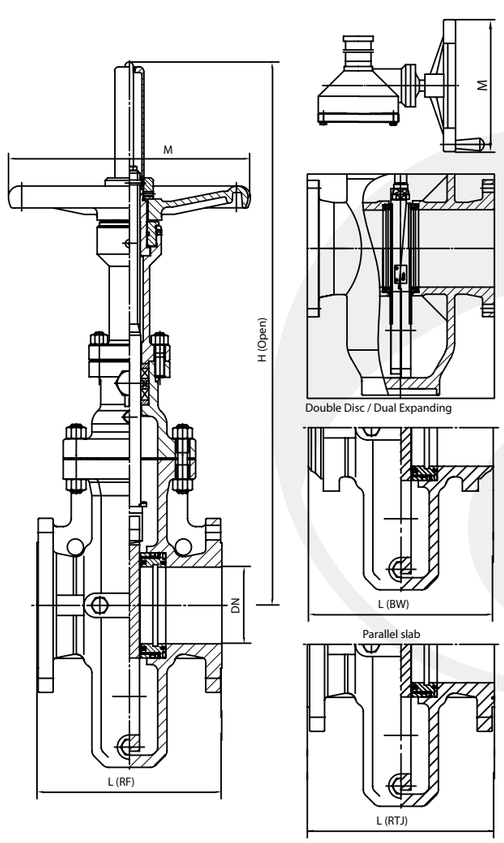
ND.	2”	2 1/2”	3”	4”	5”	6”	8”	10”	12”	14”	16”	18”	20”	24”
L (BW)	216	241	282	305	381	403	419	457	502	572	610	660	711	813
L (RF)	178	190	203	229	254	267	292	330	356	381	406	432	457	508
L (RTJ)	191	203	216	242	267	280	305	343	369	394	419	445	470	521
DN	50	60	80	100	125	150	200	250	300	350	400	450	500	600
H (OPEN)	475	535	600	700	825	910	1095	1510	1610	1890	2030	2415	2565	3045
M	300	300	300	350	350	350	350	300	300	450	450	450	450	450
WEIGHT (KG.) (BM)	48	59	63	73	100	158	264	310	420	650	910	1155	1485	2370
WEIGHT (KG.) (RF)	54	70	73	85	120	180	300	350	475	735	1030	1310	1680	2685

*** Other measures upon request.**

Through Conduit Gate Valve API 6D

COD. ACTC 3000

THROUGH CONDUIT GATE VALVES CLASS **300** (BOLTED BONNET) 2” TO 24”



THROUGH CONDUIT GATE VALVES ARE SUITABLE TO CONDUCT DIFFERENT TYPES OF FLUID ON / OFF OPERATION

DESIGN	ASME B16.34 & API-6D
FACE TO FACE	ASME B16.10 & API-6D
FLANGED ENDS	ASME B16.5
BUTT WELD ENDS	ASME B16.25
BY-PASS & DRAIN	MSS SP-45
TEST	API-598, API 6D & ISO 15848, ASME B16.34
CONSTRUCTION	- O.S & Y. Rising Stem - Parallel slab, double disc/Dual Expanding, others upon request - Metal Seats or Inserted soft seats - Bolted Bonnet - Extended Bonnet - Two pieces yoke - Manual and actuator operated (electric, pneumatic, hydraulic...)
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M,CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS REQUIREMENTS	Upon request
AVERAGE LIFE	30 years approx. (15.000 to 20.000 cycles approx.)
PRESSURE/ TEMPERATURE	ASME B16.34

*** other requirements upon request.**

CLASS 300 DIMENSIONS IN MILIMETERS.

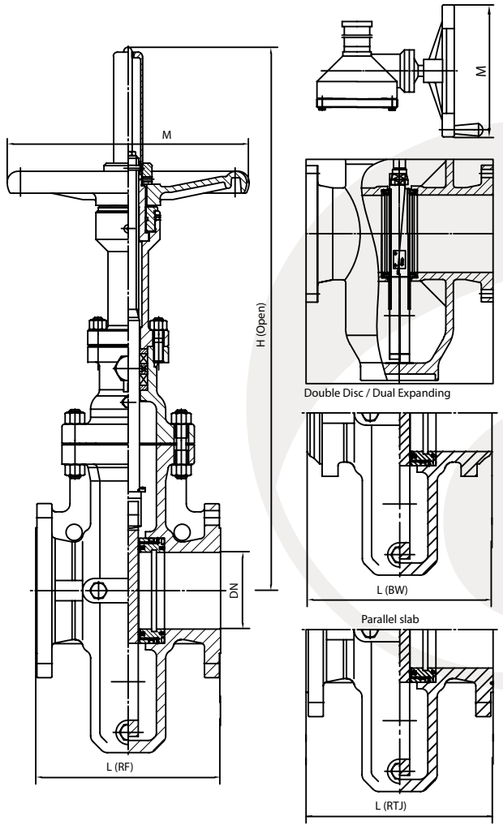
ND.	2”	2 1/2”	3”	4”	5”	6”	8”	10”	12”	14”	16”	18”	20”	24”
L (BW)	216	241	282	305	381	403	419	457	502	762	838	914	991	1143
L (RF)	”	”	”	”	”	”	”	”	”	”	”	”	”	”
L (RTJ)	232	257	298	321	397	419	435	473	518	778	854	930	1010	1165
DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600
H (OPEN)	475	535	600	700	810	910	1235	1510	1610	1890	2030	2415	2565	3045
M	250	300	300	350	350	350	300	300	300	450	450	450	450	450
WEIGHT (KG.) (BM)	51	62	66	78	130	159	290	435	605	920	1300	1670	2160	3470
WEIGHT (KG.) (RF)	54	70	73	90	150	180	320	490	680	1035	1450	1860	2380	3810

*** Other measures upon request.**

Through Conduit Gate Valve API 6D

COD. ACTC 6000

THROUGH CONDUIT GATE VALVES CLASS **600** (BOLTED BONNET) 2" TO 24"



THROUGH CONDUIT GATE VALVES ARE SUITABLE TO CONDUCT DIFFERENT TYPES OF FLUID ON / OFF OPERATION

DESIGN	ASME B16.34 & API-6D
FACE TO FACE	ASME B16.10 & API-6D
FLANGED ENDS	ASME B16.5
BUTT WELD ENDS	ASME B16.25
BY-PASS & DRAIN	MSS SP-45
TEST	API-598, API 6D & ISO 15848, ASME B16.34
CONSTRUCTION	- O.S & Y. Rising Stem - Parallel slab, double disc/Dual Expanding, others upon request - Metal Seats or Inserted soft seats - Bolted Bonnet - Extended Bonnet - Two pieces yoke - Manual and actuator operated (electric, pneumatic, hydraulic...)
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M,CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS REQUIREMENTS	Upon request
AVERAGE LIFE	30 years approx. (15.000 to 20.000 cycles approx.)
PRESSURE/ TEMPERATURE	ASME B16.34

*** other requirements upon request.**

CLASS 600 DIMENSIONS IN MILIMETERS.

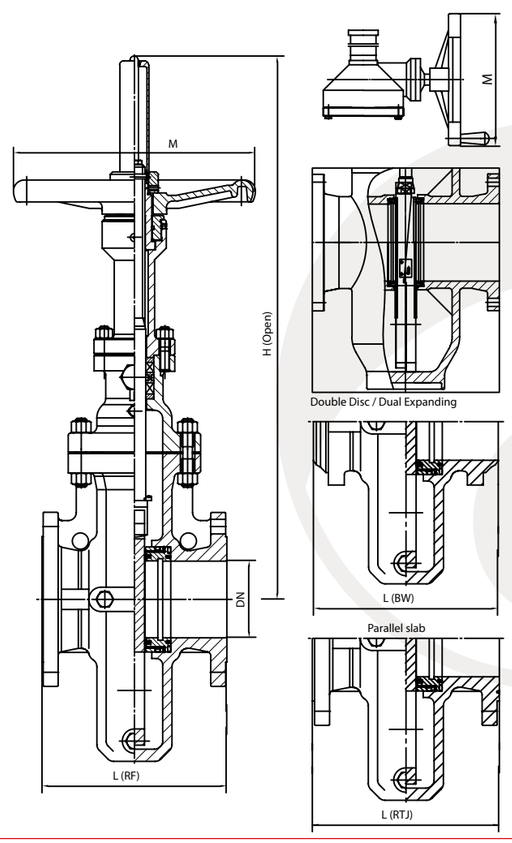
ND.	2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
L (BW)	292	330	356	432	559	660	787	838	889	991	1092	1194	1397
L (RF)	"	"	"	"	"	"	"	"	"	"	"	"	"
L (RTJ)	295	333	359	435	562	663	790	841	892	994	1095	1200	1407
DN	50	65	80	100	150	200	250	300	350	400	450	500	600
H (OPEN)	499	562	630	735	1096	1290	1580	1705	1977	2125	2525	2685	2922
M	300	350	350	400	300	300	450	450	450	450	450	450	500
WEIGHT (KG.) (BM)	59	78	106	134	235	405	570	995	1345	1400	2000	2425	3870
WEIGHT (KG.) (RF)	68	90	122	167	280	505	750	1190	1660	1850	2490	3045	4810

*** Other measures upon request.**

Through Conduit Gate Valve API 6D

COD. ACTC 9000

THROUGH CONDUIT GATE VALVES CLASS **900** (BOLTED BONNET) 2" TO 16"



THROUGH CONDUIT GATE VALVES ARE SUITABLE TO CONDUCT DIFFERENT TYPES OF FLUID ON / OFF OPERATION

DESIGN	ASME B16.34 & API-6D
FACE TO FACE	ASME B16.10 & API-6D
FLANGED ENDS	ASME B16.5
BUTT WELD ENDS	ASME B16.25
BY-PASS & DRAIN	MSS SP-45
TEST	API-598, API 6D & ISO 15848, ASME B16.34
CONSTRUCTION	- O.S & Y. Rising Stem - Parallel slab, double disc/Dual Expanding, others upon request - Metal Seats or Inserted soft seats - Bolted Bonnet - Extended Bonnet - Two pieces yoke - Manual and actuator operated (electric, pneumatic, hydraulic...)
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M,CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS REQUIREMENTS	Upon request
AVERAGE LIFE	30 years approx. (15.000 to 20.000 cycles approx.)
PRESSURE/ TEMPERATURE	ASME B16.34

*** other requirements upon request.**

CLASS 900 DIMENSIONS IN MILIMETERS.

ND.	2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"
L (BW)	368	419	381	457	610	737	838	965	1029	1130
L (RF)	"	"	"	"	"	"	"	"	"	"
L (RTJ)	371	422	384	460	613	740	841	968	1039	1140
DN	50	65	80	100	150	200	250	300	350	400
H (OPEN)	550	618	833	950	1212	1423	1813	1928	2230	2450
M	350	400	300	300	450	450	450	450	450	500
WEIGHT (KG.) (BM)	78	100	150	210	451	705	1010	1675	2405	2675
WEIGHT (KG.) (RF)	99	115	169	255	475	740	1065	1760	2525	2810

*** Other measures upon request.**

GLOBE VALVES

Globe valves

Because of their configuration, globe valves are perfect to regulate or limit the flow. Depending on the system needs, design or position, they could generate different head losses in the line.

MANUFACTURING AND DESIGN STANDARDS

Globe valves are designed and manufactured according to the following international codes and standards:

DESIGN AND MANUFACTURING:

- BS 1873 steel globe and globe stop and check valves (flanged and butt- welding ends) for the petroleum, petrochemical and allied industries
- ISO 15761 Steel gate, globe and check valves for sizes DN100 and smaller, for the petroleum and natural gas industries
- ASME B16.34 valves - flanged, threaded, and welding end
- API 602 Steel Gate, Globe and Check Valves for Sizes DN 100 and Smaller for the Petroleum and Natural Gas Industries

INSPECTION AND TEST:

- API 598 valve inspection and testing
- BS-1873 steel globe and globe stop and check valves (flanged and butt-welding ends)

FLANGE DIMENSION:

- ASME B16.5 pipe flanges and flanged fittings

WELDED OR THREADED ENDS:

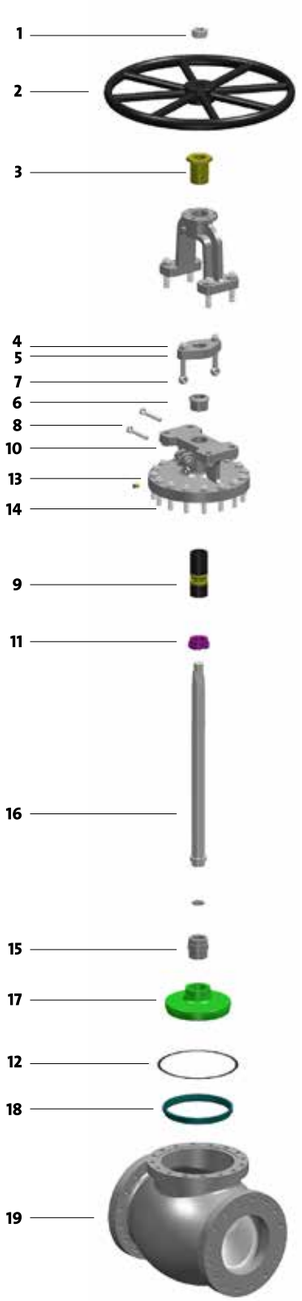
- ASME B16.25 buttwelding ends
- ASME B16.11 forged steel fittings, socket-welding and threaded
- ASME B1.20.1 pipe threads general purpose

FACE TO FACE AND END TO END

- ASME B16.10 face to face and end-to-end dimensions of valves

DESIGN FEATURES

GLOBE VALVES



BONNET

Bonnet design is circular for all ratings. In all cases bonnet flange thickness is designed to work under most severe conditions according to ASME B16.34.

Body bonnet connection is usually male-female designed up to 900 class valves. For class 1500 and 2500 pressure seal design is preferable. On request other connections such as RTJ seal may be supplied. Auxiliary connection bosses are provided according to ASME B16.34 for instrumentation, drain, or measure purposes.

Bonnet machining is carefully checked to ensure disc travel to be perpendicular to the bore line, so that operating problems are avoided. Stem nut seating must be parallel to bonnet connection.

Stuffing box must be extremely smooth machined to provide perfect tightness without applying too much strength on the eye bolts. Life loaded stuffing box may be fitted for special applications using Belleville springs to improve durability and reliability of the packing seal.

BODY

The valve body is manufactured of cast steel, or forged steel, depending on the customer's requirements. In any case ASME B16.34 pressure-temperature ratings, and BS 1873, or ISO 15761 minimum wall thickness are strictly fulfilled.

Globe valves are unidirectional and may be installed in both vertical and horizontal position.

All ratings valves have circular sections to make minimum stresses, under severe working conditions,. These sections are carefully calculated in order to prevent stress concentrations.

Sealing ring seating is carefully machined and inspected to prevent leakage between seat ring and body. Seating surface must be 1,6 AARH at least.

Machining on seat sealing is controlled to ensure perfect sealing and interchange ability with spare parts.

Special care is taken to ensure body end flanges and bonnet flange to be parallel and perpendicular to prevent operating problems in line and during testing.

Flange facing is spiral smooth finish 125-250 AARH standard machining. Other facings are available under request.

Auxiliary connection bosses are provided according to ASME B16.34 for instrumentation, drain, or measure purposes.

Flange dimensions fulfil with ASME B16.5. Other flange types may be produced under request.

DISC

The disc seats on the seat ring to tight the valve. Disc is designed to revolve free over the stem to avoid rubbing against the seat ring while closing and prevent galling at the closure.

Plug sealing surface is at least 13% Cr, integral or overlaid.

Usually plug works opposite to the pressure line. For big size valves, or big ratings, to achieve a smaller torque on line, the design is changed to make plug work parallel to the pressure line. In this cases opening is in two steps. In the first one the pressure equalizes on both sizes of the plug, and in the second one the valve opens. For pipelines with a lot of turbulence, or for valves in vertical position, the plug is guided in the seat ring.

Special manufactures such as parabolycal or percentual plug, or SOFT SEATED may be produced for special applications.

Sealing surfaces are carefully machined so that long life, small torque, and no leakage are achieved.

SEAT

For carbon steel valves seat ring is manufactured from forged steel. The sealing surface is sprayed welded with the material required by customer. Renewable threaded seat is used for NPS 10" and smaller valves, welded seat design is used for NPS 12" and bigger. For stainless steel valves usually integral seat is used, overlaid, or not. Other constructions are available under request.

Seat surfaces are carefully machined to provide tightness. Special attention must be taken with the seat ring thread to avoid seizing.

Special care is taken to provide hardness difference between seat and wedge according to BS 1873. For this reason seat rings are heat treated.

STEM

Stem is made of one piece forged steel. The diameter of the stem fulfil with BS-1873.

Stem connection is T type. T head is properly designed to allow the plug adapt to the stem in any assembling position (vertical or horizontal). In some cases a washer is assembled to help the plug adapt to the stem.

Stem connection is designed to prevent the stem being disengaged from the plug using a stem nut and one split washer.

Back seat sealing face is carefully machined to provide tightness on pressurized pipe line with valve fully opened. For this reason the surface finish of the packing seal must be smooth enough.

Machining of ACME threads is smooth enough to obtain a low operating torque.

GLAND ASSEMBLY

The gland flange and the gland bushing push the packing rings to make them seal the stuffing box and the stem. Gland bushing is shoulder type to prevent over strength over the packing. Gland flange is designed with enough resistance to work on the most severe conditions.
Gland flange and gland bushing are self adjusting to each other to ensure perpendicular pressure on the packing.

STEM NUT

Stem nut is made of different materials such as ASTM A439 D2, Ni-Resist, or Aluminium bronze. Depending on the size and class of the valves rolling bearings are fitted on both sides of the stem nut, in order to make torque operation minimum.

BACK SEAT

All of our valves have back seat design according to BS 1873. Carbon steel valves are fitted with renewable back seat 13% Cr minimum. For stainless steel valves, the back seat is directly machined on the body. Overlaid surface is possible under request.

SPECIAL VALVES

Special design valves may be supplied under request;

Jacketed valves, extended bonnet valves, cryogenic valves, bellow seal valves, flat gate valves, and so on..

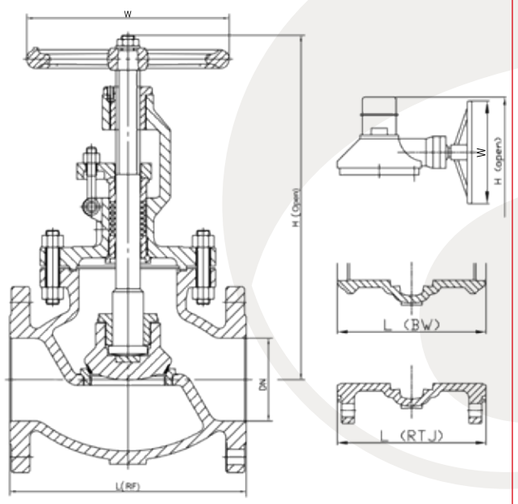
MATERIALS

		WCB TRIM 1/5/8	CF8/304	CF8M/316	LCB TRIM 8/10	WC6 TRIM 5/8	C5 TRIM 5/8
1	**HAND WHEEL NUT**	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel
2	**HAND WHEEL**	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron
3	**STEM NUT**	ASTM A439 D2	ASTM A439 D2	ASTM A439 D2	ASTM A439 D2	ASTM A439 D2	ASTM A439 D2
4	**EYEBOLT NUT**	ASTM A194 2H	ASTM A194 8	ASTM A194 8M	ASTM A194 4	ASTM A194 7	ASTM A194 7
5	**GLAND FLANGE**	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M	ASTM A352 LCB	ASTM A217 WC6	ASTM A217 C5
6	**GLAND**	ASTM A182 F6A	ASTM A182 F304	ASTM A182 F316	TRIM 8: ASTM A182 F6A / TRIM 10: ASTM A182 F316	ASTM A182 F6A	ASTM A182 F6A
7	**GLAND EYEBOLT**	ASTM A193 B7	ASTM A193 B8	ASTM A193 B8M	ASTM A193 L7	ASTM A193 B16	ASTM A193 B16
8	**EYEBOLT PIN**	ASTM A36	SS 304	SS 316	ASTM A36	ASTM A36	ASTM A36
9	**PACKING**	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite
10	**BONNET**	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M	ASTM A352 LCB	ASTM A217 WC6	ASTM A217 C5
11	**BACKSEAT BUSHING**	ASTM A182 F6A	ASTM A351 CF8	ASTM A351 CF8M	TRIM 8: ASTM A182 F6A / TRIM 10: ASTM A182 F316	ASTM A182 F6A	ASTM A182 F6A
12	**GASKET**	SS 304 + Graphite	304 + Graphite	316 + Graphite	TRIM 8: 304 + GRAPHITE / TRIM 10: 316 + GRAPHITE	304 + Graphite	304 + Graphite
13	**BONNET BOLT**	ASTM A193 B7	ASTM A193 B8	ASTM A193 B8M	ASTM A193 L7	ASTM A193 B16	ASTM A193 B16
14	**BONNET NUT**	ASTM A194 2H	ASTM A194 8	ASTM A194 8M	ASTM A194 4	ASTM A194 7	ASTM A194 7
15	**DISC NUT**	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M	ASTM A352 LCB	ASTM A217 WC6	ASTM A217 C5
16	**STEM**	ASTM A182 F6A	ASTM A182 F304	ASTM A182 F316	TRIM 8: ASTM A182 F6A / TRIM 10: ASTM A182 F316	ASTM A182 F6A	ASTM A182 F6A
17	**DISC**	ASTM A216 WCB + 13%CR / ASTM A216 WCB + STL / ASTM A216 WCB + 13%CR; A105 + 13%CR / A105 + STL / A105 + STL	ASTM A351 CF8	ASTM A351 CF8M	TRIM 8: ASTM A352 LCB + 13% CR / TRIM 10: ASTM A352 LCB + AISI 316; TRIM 8: A350 LF2 + STL / TRIM 10: ASTM A352 LCB + AISI 316	TRIM 5: ASTM A182 F11 + STL / TRIM 8: ASTM A182 F11 + 13%CR / TRIM 5: ASTM A217 C5 + STL / TRIM 8: ASTM A182 F5 + 13%CR; TRIM 5: ASTM A182 F11 + STL / TRIM 8: A182 F11 + STL / TRIM 5: ASTM A217 C5 + STL / TRIM 8: ASTM A182 F5 + STL	
18	**SEAT RING**	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M	ASTM A352 LCB	ASTM A217 WC6	ASTM A217 C5
19	**BODY**						

Globe valve BS 1873

COD. AG 1000

GLOBE VALVES CLASS **150** (BOLTED BONNET) 2" TO 24"



DESIGN	ASME B16.34 & BS-1873
FACE TO FACE	ASME B16.10
FLANGED ENDS	ASME B16.5
BUTT WELD ENDS	ASME B16.25
BY-PASS & DRAIN	MSS SP-45
TEST	API-598, ASME B16.34 & ISO 15848
CONSTRUCTION	• O.S & Y. Rising Stem • Plug type disc, others upon request • Threaded, Welded or integral Seat Ring • Metal Seats or Inserted soft seats • Bolted Bonnet • Extended Bonnet • Manual and actuator operated (gear, electric, pneumatic, hydraulic...)
MATERIALS	Ac c/ASME B16.34 DI, WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Jacketed, cryogenic services, H.F. services, Non rising stem, by-pass.... all kind of actuators, all type of painting and coating

*** other requirements upon request.**

CLASS 150 DIMENSIONS IN MILIMETERS

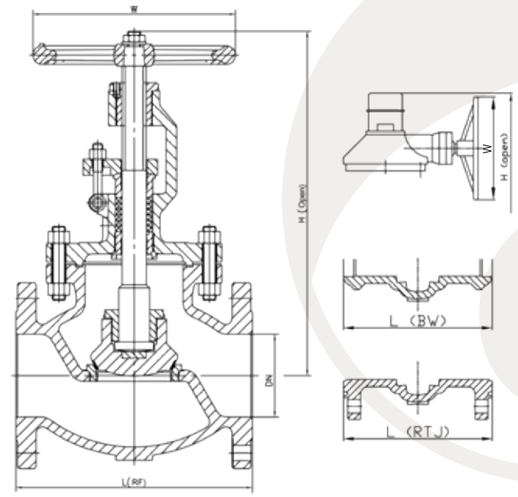
ND.	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
L (BW)	203	216	241	292	356	406	495	622	698	787	914	978	978	1295
L (RF)	"	"	"	"	"	"	"	"	"	787	914	978	978	1295
L (RTJ)	216	229	254	305	369	419	508	635	711	800	927	991	991	1308
D	50	65	80	100	125	150	200	250	300	350	400	450	500	600
H (OPEN)	373	390	421	515	538	567	626	712	990	1115	1250	1375	1545	1975
W	200	250	250	300	300	350	400	450	610	610	720	720	720	850
WEIGHT (KG.) (BW)	19	25	34	49	65	82	131	249	430	573	833	1065	1560	2080
WEIGHT (KG.) (RF)	22	29	42	64	77	105	154	288	507	610	880	1150	1650	2200

*** Other measures upon request.**

Globe valve BS 1873

COD. AG 3000

GLOBE VALVES CLASS **300** (BOLTED BONNET) 2" TO 24"



DESIGN	ASME B16.34 & BS-1873
FACE TO FACE	ASME B16.10
FLANGED ENDS	ASME B16.5
BUTT WELD ENDS	ASME B16.25
BY-PASS & DRAIN	MSS SP-45
TEST	API-598, ASME B16.34 & ISO 15848
CONSTRUCTION	• O.S & Y. Rising Stem • Plug type disc, others upon request • Threaded, Welded or integral Seat Ring • Metal Seats or Inserted soft seats • Bolted Bonnet • Extended Bonnet • Manual and actuator operated (gear, electric, pneumatic, hydraulic...)
MATERIALS	Ac c/ASME B16.34 DI, WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A,AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Jacketed, cryogenic services, H.F. services, Non rising stem, by-pass.... all kind of actuators, all type of painting and coating

*** other requirements upon request.**

CLASS 300 DIMENSIONS IN MILIMETERS

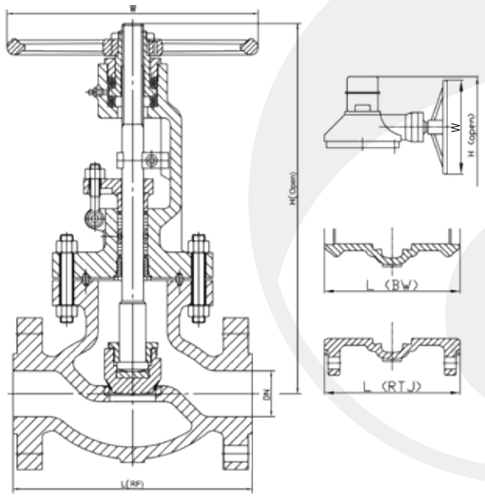
ND.	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
L (BW)	267	292	318	356	400	444	559	622	711	838	864	978	1016	1346
L (RF)	"	"	"	"	"	"	"	"	"	"	"	"	"	"
L (RTJ)	283	308	334	372	416	460	575	638	727	854	880	994	1035	1368
D	50	65	80	100	125	150	200	250	300	350	400	450	500	600
H (OPEN)	398	436	462	560	620	694	982	1130	1049					
W	200	250	250	350	400	450	560	864	460*	610	610	610	720	720
WEIGHT (KG.) (BW)	26	28	44	68	110	138	228	329	618					
WEIGHT (KG.) (RF)	31	43	57	86	130	168	280	385	724	876	1200	1600	2100	3150

*** Other measures upon request.**

Globe valve BS 1873

COD. AG 6000

GLOBE VALVES CLASS **600** (BOLTED BONNET) 2" TO 16"



DESIGN	ASME B16.34 & BS-1873
FACE TO FACE	ASME B16.10
FLANGED ENDS	ASME B16.5
BUTT WELD ENDS	ASME B16.25
BY-PASS & DRAIN	MSS SP-45
TEST	API-598, ASME B16.34 & ISO 15848
CONSTRUCTION	• O.S & Y. Rising Stem • Plug type disc, others upon request • Threaded, Welded or integral Seat Ring • Metal Seats or Inserted soft seats • Bolted Bonnet • Extended Bonnet • Manual and actuator operated (gear, electric, pneumatic, hydraulic...)
MATERIALS	Ac c/ASME B16.34 DI, WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Jacketed, cryogenic services, by-pass.... all kind of actuators, all type of painting and coating

*** other requirements upon request.**

CLASS 600 DIMENSIONS IN MILIMETERS

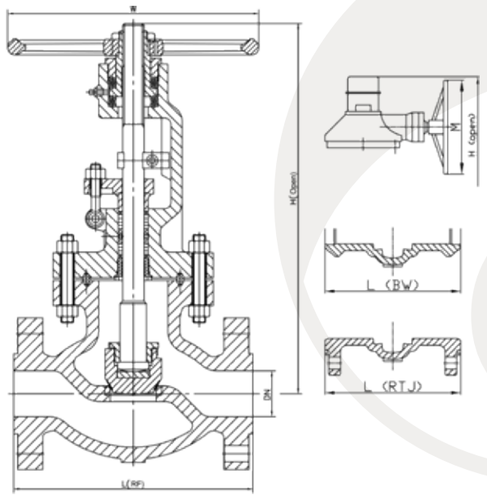
ND.	2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"
L (BW)	292	330	356	432	559	660	787	838	889	991
L (RF)	"	"	"	"	"	"	"	"	"	"
L (RTJ)	295	333	359	435	562	663	790	841	892	994
D	50	65	80	100	150	200	250	300	350	600
H (OPEN)	425	502	521	548	780	852	936	1132	1280	1400
W	250	300	350	400	460	550	550	550	550	610
WEIGHT (KG.) (BW)	33	48	61	95	324	507	729	1085	1295	1525
WEIGHT (KG.) (RF)	34	56	68	120	349	532	754	1100	1320	1550

*** Other measures upon request.**

Globe valve BS 1873

COD. AG 9000

GLOBE VALVES CLASS **900** (BOLTED BONNET) 2" TO 12"



DESIGN	ASME B16.34 & BS-1873
FACE TO FACE	ASME B16.10
FLANGED ENDS	ASME B16.5
BUTT WELD ENDS	ASME B16.25
BY-PASS & DRAIN	MSS SP-45
TEST	API-598, ASME B16.34 & ISO 15848
CONSTRUCTION	• O.S & Y. Rising Stem • Plug type disc, others upon request • Threaded, Welded or integral Seat Ring • Metal Seats or Inserted soft seats • Bolted Bonnet • Extended Bonnet • Manual and actuator operated (gear, electric, pneumatic, hydraulic...)
MATERIALS	Ac c/ASME B16.34 DI, WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A,AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Jacketed, cryogenic services, by-pass.... all kind of actuators, all type of painting and coating

*** other requirements upon request.**

CLASS 900 DIMENSIONS IN MILIMETERS

ND.	2"	2 1/2"	3"	4"	6"	8"	10"	12"
L (BW)	368	419	381	457	610	737	838	965
L (RF)	368	419	381	457	610	737	838	965
L (RTJ)	371	422	384	460	613	740	841	968
D	50	65	80	100	150	200	250	300
H (OPEN)	428	465	502	630	899	985	1050	1141
W	350	400	400	460	460	460	610	610
WEIGHT (KG.) (BW)	75	94	105	260	340	665	1200	1360
WEIGHT (KG.) (RF)	100	118	130	293	464	745	1300	1450

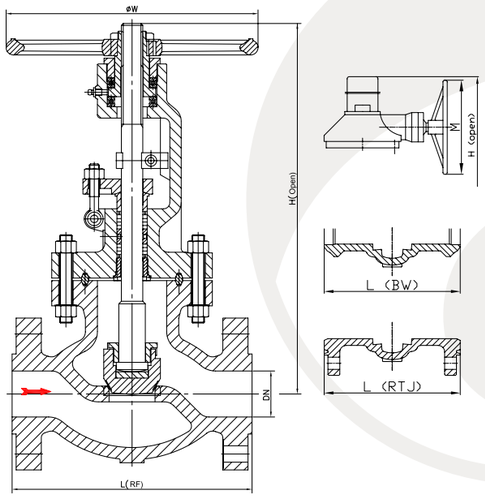
*** Other measures upon request.**

technical datas

Globe valve BS 1873

COD. AG 4000

GLOBE VALVES **1500** LBS (BOLTED BONNET) 2" TO 8"



DESIGN ASME B16.34 & BS-1873

FACE TO FACE ASME B16.10

FLANGED ENDS ASME B16.5

BUTT WELD ENDS ASME B16.25

BY-PASS & DRAIN MSS SP-45

TEST API-598, ASME B16.34 & ISO 15848

CONSTRUCTION
- O.S & Y. Rising Stem
- Plug type disc, others upon request
- Threaded, Welded or integral Seat Ring
- Metal Seats or Inserted soft seats
- Bolted Bonnet
- Extended Bonnet
- Manual and actuator operated (gear, electric, pneumatic, hydraulic...)

MATERIALS Ac c/ASME B16.34
DI, WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF_3, CF_3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK_3MCUN, Duplex, Superduplex, exotic materials

TRIM 13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK_3MCUN, Duplex, Superduplex, exotic materials....

OTHERS Jacketed, cryogenic services, by-pass.... all kind of actuators, all type of painting and coating

*** other requirements upon request.**

CLASS 1500 DIMENSIONS IN MILIMETERS

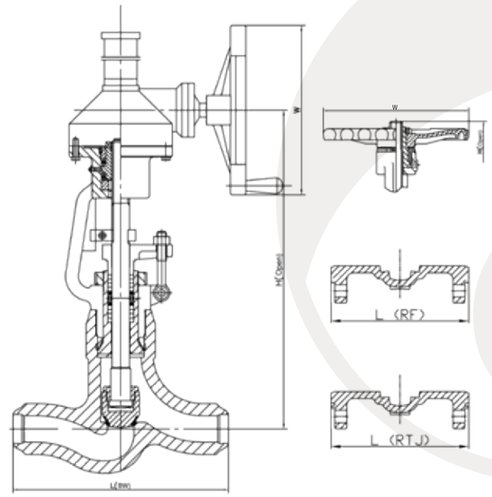
ND.	2"	2 1/2"	3"	4"	6"	8"
L (BW)	368	419	470	546	705	832
L (RF)	"	"	"	"	"	"
L (RTJ)	371	422	473	549	711	842
D	50	65	80	100	150	200
H (OPEN)	592	660	692	907	1015	1145
M	350	400	450	460*	610*	610*
WEIGHT (KG.) (BW)	84	115	183	277	715	615
WEIGHT (KG.) (RF)	112	141	228	336	822	720

*** Other measures upon request.**

Globe valve ASME B16.34

COD. AG 9000-P

GLOBE VALVES CLASS **900** (PRESSURE SEAL) 2" TO 8"



DESIGN ASME B16.34

FACE TO FACE ASME B16.10

FLANGED ENDS ASME B16.5

BUTT WELD ENDS ASME B16.25

BY-PASS & DRAIN MSS SP-45

TEST API-598, ASME B16.34 & ISO 15848

CONSTRUCTION
- O.S & Y. Rising Stem
- Plug type disc, others upon request
- Threaded, Welded or integral Seat Ring
- Metal Seats or Inserted soft seats
- Pressure Seal
- Extended Bonnet
- Manual and operated (gear, electric, pneumatic, hydraulic...)

MATERIALS WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF_3, CF_3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK_3MCUN, Duplex, Superduplex, exotic materials

TRIM 13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK_3MCUN, Duplex, Superduplex, exotic materials....

OTHERS Jacketed, cryogenic services, by-pass.... all kind of actuators, all type of painting and coating

*** other requirements upon request.**

CLASS 900 DIMENSIONS IN MILIMETERS. PRESSURE SEAL

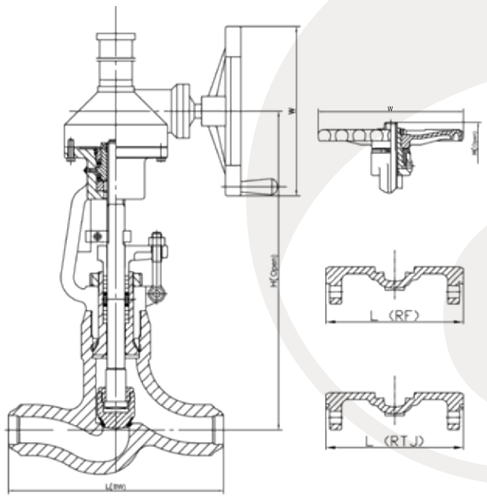
ND.	2"	2 1/2"	3"	4"	6"	8"
L (BW)	216	254	305	356	508	660
L (RF)	368	419	381	457	610	737
L (RTJ)	371	422	384	460	613	740
D	50	65	80	100	150	200
H (OPEN)	550	605	678	798	930	1260
W	350	350	400	450	458	610*
WEIGHT (KG.) (BW)	66	91	87	128	355	868
WEIGHT (KG.) (RF)	78	108	102	142	400	960

*** Other measures upon request.**

Globe valve ASME B16.34

COD. AG 4000-P

GLOBE VALVES CLASS **1500** (PRESSURE SEAL) 2" TO 8"



DESIGN	ASME B16.34
FACE TO FACE	ASME B16.10
FLANGED ENDS	ASME B16.5
BUTT WELD ENDS	ASME B16.25
BY-PASS & DRAIN	MSS SP-45
TEST	API-598, ASME B16.34 & ISO 15848
CONSTRUCTION	• O.S & Y. Rising Stem • Plug type disc, others upon request • Threaded, Welded or integral Seat Ring • Metal Seats or Inserted soft seats • Pressure Seal • Extended Bonnet • Manual and operated (gear, electric, pneumatic, hydraulic...)
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Jacketed, cryogenic services, by-pass.... all kind of actuators, all type of painting and coating

*** other requirements upon request.**

CLASS 1500 DIMENSIONS IN MILIMETERS. PRESSURE SEAL

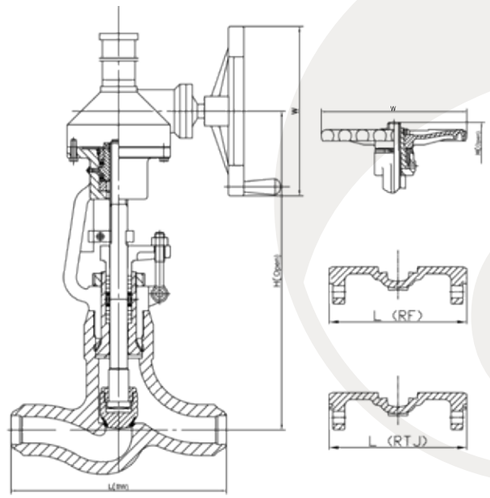
ND.	2"	2 1/2"	3"	4"	6"	8"
L (BW)	216	254	305	406	559	711
L (RF)	368	419	470	546	705	832
L (RTJ)	371	422	473	549	711	842
D	50	65	80	100	150	200
H (OPEN)	550	605	866	956	1260	1263
W	400	450	560	310*	610*	760*
WEIGHT (KG.) (BW)	77	101	122	209	595	1440
WEIGHT (KG.) (RF)	85	110	135	230	660	1590

*** Other measures upon request.**

Globe valve ASME B16.34

COD. AG 7000-P

GLOBE VALVES CLASS **2500** (PRESSURE SEAL) 2" TO 8"



DESIGN	ASME B16.34
FACE TO FACE	ASME B16.10
FLANGED ENDS	ASME B16.5
BUTT WELD ENDS	ASME B16.25
BY-PASS & DRAIN	MSS SP-45
TEST	API-598, ASME B16.34 & ISO 15848
CONSTRUCTION	• O.S & Y. Rising Stem • Plug type disc, others upon request • Threaded, Welded or integral Seat Ring • Metal Seats or Inserted soft seats • Pressure Seal • Extended Bonnet • Manual and operated (gear, electric, pneumatic, hydraulic...)
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Jacketed, cryogenic services, by-pass.... all kind of actuators, all type of painting and coating

*** other requirements upon request.**

CLASS 2500 DIMENSIONS IN MILIMETERS. PRESSURE SEAL

ND.	2"	2 1/2"	3"	4"	6"	8"
L (BW)	279	330	368	457	610	762
L (RF)	451	508	578	673	914	1022
L (RTJ)	454	514	584	683	927	1038
D	50	65	80	100	150	200
H (OPEN)	560	720	755	1230	1791	2086
W	400	450	560	310*	610*	760*
WEIGHT (KG.) (BW)	100	118	180	438	1148	2594
WEIGHT (KG.) (RF)	140	168	247	620	1500	3200

*** Other measures upon request.**

CHECK VALVES

Check valves

Check valves are automatic operation valves, they have safety applications to avoid flow returns. When the pump is not working, they maintain the pipe line full. These valves are unidirectional, and can be installed in horizontal and vertical in the line.

MANUFACTURING AND DESIGN STANDARDS

Check valves are designed and manufactured according to the following international codes and standards:

DESIGN AND MANUFACTURING:

- BS 1868 steel check valves (flanged and butt-welding ends) for the petroleum, petrochemical and allied industries
- ISO 15761 Steel gate, globe and check valves for sizes DN100 and smaller, for the petroleum and natural gas industries
- API-6D ISO 14313, petroleum and natural gas industries-pipeline transportation systems-pipeline valves
- ASME B16.34 valves - flanged, threaded, and welding end
- API-594 Check Valves: Wafer, Wafer-Lug, and Double Flanged Type

INSPECTION AND TEST:

- API 598 valve inspection and testing
- API-6D ISO 14313, petroleum and natural gas industries-pipeline transportation systems-pipeline valves.

FLANGE DIMENSION:

- ASME B16.5 pipe flanges and flanged fittings
- ASME B16.47 large diameter steel flanges: NPS 26 through NPS 60
- MSS SP 44 steel pipeline flanges

WELDED OR THREADED ENDS:

- ASME B16.25 buttwelding ends
- ASME B16.11 forged steel fittings, socket-welding and threaded
- ASME B1.20.1 pipe threads general purpose

FACE TO FACE AND END TO END

- ASME B16.10 face to face and end-to-end dimensions of valves
- API-6D ISO 14313, petroleum and natural gas industries pipeline transportation Systems-pipeline valves
- API 594 – Check Valves: Wafer, Wafer-Lug, and Double Flanged Type

DESIGN FEATURES

| FOR SWING CHECK VALVES AND LIFT DISC |

SEAT

For carbon steel valves seat ring is manufactured from forged steel. The sealing surface is sprayed welded with the material required by customer. Renewable threaded seat is used for NPS 10" and smaller valves, welded seat design is used for NPS 12" and bigger. For stainless steel valves usually integral seat is used, overlaid, or not. Other constructions are available under request.

Seat surfaces are carefully machined to provide tightness. Special attention must be taken with the seat ring thread to avoid seizing.

Special care is taken to provide hardness difference between seat and wedge according to BS 1868. For this reason seat rings are heat treated.

BODY

The valve body is manufactured of cast steel, or forged steel, depending on the customer's requirements. In any case ASME B16.34 pressure-temperature ratings, and BS 1868 or ISO 15761 minimum wall thickness are strictly fulfilled.

Check valves are unidirectional and may be installed in both vertical and horizontal position.

All ratings valves have circular sections to make minimum stresses, under severe working conditions. These sections are carefully calculated in order to prevent stress concentrations.

Seat ring sealing is carefully machined and inspected to prevent leakage between seat ring and body. Seating surface must be 1,6 AARH at least.

Machining on seat sealing is controlled to ensure perfect sealing and interchange ability with spare parts.

Special care is taken to ensure body end flanges and bonnet flange to be parallel and perpendicular to prevent operating problems in line and during testing.

Flange facing is spiral smooth finish 125-250 AARH standard machining. Other facings are available under request.

Auxiliary connection bosses are provided according to ASME B16.34 for instrumentation, drain, or measure purposes.

Flange dimensions fulfil with ASME B16.5. Other flange types may be produced under request.

BONNET

Bonnet design is circular for all ratings. In all cases bonnet flange thickness is designed to work under most severe conditions according to ASME B16.34.

Body bonnet connection is usually male-female designed up to 900 class valves. For class 1500 and 2500 pressure seal design is preferable. On request other connections such as RTJ seal may be supplied.

Auxiliary connection bosses are provided according to ASME B16.34 for instrumentation, drain, or measure purposes.

DISC

The disc seats on the seat ring to tight the valve. Disc is designed to revolve free over the arm to avoid leakage

Disc sealing surface is at least 13% Cr, integral or overlaid.

Special manufactures such damped or counter weight valves may be developed.

Sealing surfaces are carefully machined so that long life, small torque, and no leakage are achieved.

SPECIAL VALVES

Special design valves may be supplied under request such as dual plate check valves, and wafer type lift check valves.

COMPARISON

|SWING CHECK VALVES- DUAL PLATE CHECK VALVES |

PRESSURE OF WATER HAMMER

Water hammer pressure of dual plate wafer type swing check valve is 1/2 to 1/5 times of swing check valve.

INSTALLATION

Both valves are suitable for vertical and horizontal assembling, however swing check valve is heavier than dual plate valve, so supports are often needed.

SIZE AND WEIGHT

Face to face dimensions for dual plate wafer type valve is 1/4 to 1/6 times of swing check valve

OPENING PRESSURE

The opening pressure is lower in dual plate valves. The inlet pressure has only to exceed the pressure of the two springs. For swing check valves the disc is very heavy, specially for big valves, which makes high inlet pressure necessary to fully open the valve.

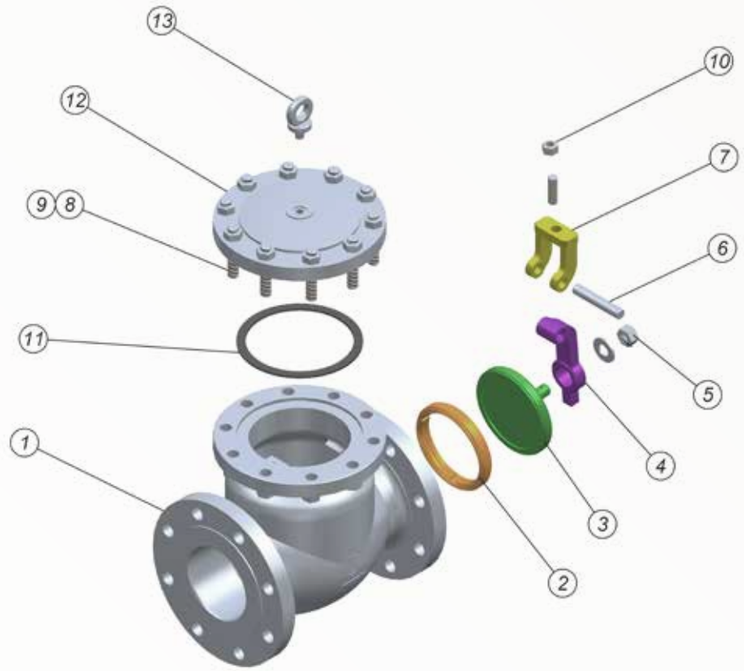
FLOW RESISTANCE

Pressure loss for dual plate valves is lower than swing check valves. Disc in swing check valves can not be fully opened with low working pressure, which makes valve required diameter being bigger.

RELIABILITY

Generally the dual plate valve itself is smaller and the closing impact force is lower than swing check valve. For swing check valves as big impact force is involved in closing, the seal surfaces can easily get damaged, and also hammer water pressure is bigger.
These two facts make dual plate valve more reliable that swing check valve.

Check valve



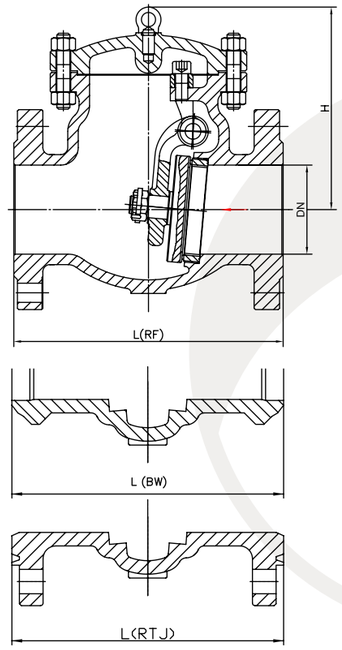
MATERIALS

		WCB TRIM 1/5/8	CF8/304	CF8M/316	LCB TRIM 8/10	A217 WC6	A217 C5
1	**BODY**	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M	ASTM A352 LCB	ASTM A217 WC6	ASTM A217 C5
2	**SEAT RING**	TRIM 1: A105 + 13%CR; TRIM 5: A105 + STL; TRIM 8: A105 + STL	ASTM A351 CF8	ASTM A351 CF8M	TRIM 8: A350 LF2 + STL; TRIM 10: A350 LF2 + AISI 316	ASTM A182 F11+STL	ASTM A182 F5 + STL
3	**DISC**	TRIM 1: ASTM A216 WCB + 13%CR; TRIM 5: ASTM A216 WCB + STL; TRIM 8: ASTM A216 WCB + 13%CR	ASTM A351 CF8	ASTM A351 CF8M	TRIM 8: ASTM A352 LCB + 13%CR; TRIM 10: A352 WCB + AISI 316	ASTM A217 WC6+STL	ASTM A217 C5 + STL
4	**ARM**	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M	ASTM A352 LCB	ASTM A217 WC6	ASTM A217 C5
5	**NUT**	ASTM A194 2H	ASTM A194 8	ASTM A194 8M	ASTM A194 4	ASTM A194 7	ASTM A194 7
6	**ARM PIN**	ASTM A182 F6A	ASTM A182 F304	ASTM A182 F316	TRIM 8: A182 F6A; TRIM 10: A182 F316	ASTM A182 F11	ASTM A182 F5
7	**YOKE**	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M	ASTM A352 LCB	ASTM A217 WC6	ASTM A217 C5
8	**BONNET NUT**	ASTM A194 2H	ASTM A194 8	ASTM A194 8M	ASTM A194 4	ASTM A194 7	ASTM A194 7
9	**BONNET BOLT**	ASTM A193 B7	ASTM A193 B8	ASTM A193 B8M	ASTM A193 L7	ASTM A193 B16	ASTM A193 B16
10	**BOLT**	ASTM A193 B7	ASTM A193 B8	ASTM A193 B8M	ASTM A193 L7	ASTM A193 B16	ASTM A193 B16
11	**GASKET**	SS 304 SHEET + GRAPHITE	SS 304 + GRAPHITE	SS 316 + GRAPHITE	TRIM 8: SOFT IRON / SS 304 + GRAPHITE; TRIM 10: SOFT IRON / SS 316 + GRAPHITE	SS 304 + GRAPHITE	SS 304 + GRAFITO
12	**BONNET**	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M	ASTM A352 LCB	ASTM A217 WC6	ASTM A217 C5
13	**EYE BOLT**	ASTM A181	ASTM A181	ASTM A181	ASTM A181	ASTM A181	ASTM A181

Check valve API 6D-BS1868

COD. AR 1000

SWING CHECK VALVES CLASS **150** (BOLTED BONNET) 2" TO 36"



DESIGN ASME B16.34 & API6D or BS-1868

FACE TO FACE ASME B16.10 & API6D

FLANGED ENDS From 2" to 24" Ac c/ASME B16.5, upper than 24" Ac c/ASME B16.47 or MSS SP-44 or upon request

BUTT WELD ENDS ASME B16.25

BY-PASS & DRAIN MSS SP-45

TEST API-598, API 6D, ASME B16.34 & ISO 15848

CONSTRUCTION
- Swing Type Disc
- Threaded, Welded or integral Seat Ring
- Bolted Cover

MATERIALS WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M,CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials

TRIM 13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....

OTHERS Cryogenic services, H.F. services all type of painting and coating.

*** other requirements upon request.**

CLASS 150 DIMENSIONS IN MILIMETERS

ND.	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
L (BW)	203	216	241	292	356	406	495	622	698	787	914	978	978	1295
L (RF)	203	216	241	292	356	406	495	622	698	787	914	978	978	1295
L (RTJ)	216	229	254	305	369	419	508	635	711	800	927	991	991	1308
DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600
M	150	168	180	210	230	275	340	355	410	475	552	600	660	740
WEIGHT (KG.) (BW)	13	17	24	36	57	62	96	158	238	324	483	548	782	1150
WEIGHT (KG.) (RF)	17	21	29	42	69	74	108	177	282	372	570	665	900	1359

CLASS 150 DIMENSIONS IN MILIMETERS

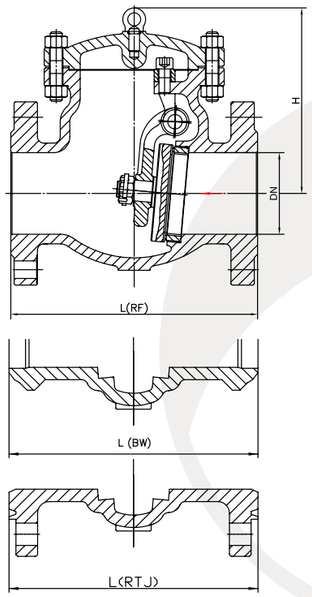
ND.	28"	30"	36"
L (BW)	1448	1524	1956
L (RF)	1448	1524	1956
L (RTJ)	1461	1537	1969
DN	700	750	900
M	770	980	1035
WEIGHT (KG.) (BW)	1780	2120	3344
WEIGHT (KG.) (RF)	1931	2380	3600

*** Other measures upon request.**

Check valve API 6D-BS1868

COD. AR 3000

SWING CHECK VALVES CLASS **300** (BOLTED BONNET) 2” TO 36”



DESIGN ASME B16.34 & API6D or BS-1868

FACE TO FACE ASME B16.10 & API6D

FLANGED ENDS From 2" to 24" Ac c/ASME B16.5, upper than 24" Ac c/ASME B16.47 or MSS SP-44 or upon request

BUTT WELD ENDS ASME B16.25

BY-PASS & DRAIN MSS SP-45

TEST API-598, API 6D, ASME B16.34 & ISO 15848

CONSTRUCTION
- Swing Type Disc
- Threaded, Welded or integral Seat Ring
- Bolted Cover

MATERIALS WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M,CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials

TRIM 13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....

OTHERS Cryogenic services, H.F. services all type of painting and coating.

*** other requirements upon request.**

CLASS 300 DIMENSIONS IN MILIMETERS

ND.	2”	2 1/2”	3”	4”	5”	6”	8”	10”	12”	14”	16”	18”	20”	24”
L (BW)	267	292	318	356	400	444	533	622	711	838	864	978	1016	1346
L (RF)	267	292	318	356	400	444	533	622	711	838	864	978	1016	1346
L (RTJ)	283	308	334	372	416	460	549	638	727	854	880	994	1035	1368
DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600
H	180	185	210	270	345	360	370	385	440	520	654	690	714	740
WEIGHT (KG.) (BW)	16	24	35	44	61	105	167	272	375	560	710	828	1070	1568
WEIGHT (KG.) (RF)	21	32	43	61	84	131	213	384	448	680	840	1025	1320	1960

CLASS 300 DIMENSIONS IN MILIMETERS

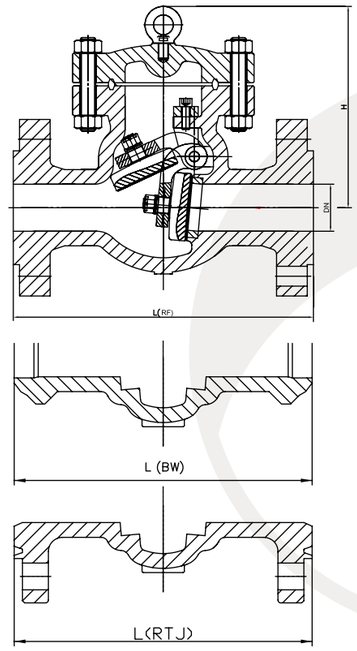
ND.	28"	30"	36”
L (BW)	1499	1594	2083
L (RF)	1499	1594	2083
L (RTJ)	1524	1619	2111
DN	700	750	900
H	880	1066	1300
WEIGHT (KG.) (BW)	2350	2830	4065
WEIGHT (KG.) (RF)	2880	3270	4610

*** Other measures upon request.**

Check valve API 6D-BS1868

COD. AR 6000

SWING CHECK VALVES CLASS **600** (BOLTED BONNET) 2” TO 36”



DESIGN ASME B16.34 & API6D or BS-1868

FACE TO FACE ASME B16.10 & API6D

FLANGED ENDS From 2" to 24" Ac c/ASME B16.5, upper than 24" Ac c/ASME B16.47 or MSS SP-44 or upon request

BUTT WELD ENDS ASME B16.25

BY-PASS & DRAIN MSS SP-45

TEST API-598, API 6D, ASME B16.34 & ISO 15848

CONSTRUCTION
- Swing Type Disc
- Threaded, Welded or integral Seat Ring
- Bolted Cover

MATERIALS WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M,CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials

TRIM 13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....

OTHERS Cryogenic services all type of painting and coating.

*** other requirements upon request.**

CLASS 600 DIMENSIONS IN MILIMETERS

ND.	2”	2 1/2”	3”	4”	5”	6”	8”	10”	12”	14”	16”	18”	20”	24”
L (BW)	292	330	356	432	508	559	660	787	838	889	991	1092	1194	1397
L (RF)	292	330	356	432	508	559	660	787	838	889	991	1092	1194	1397
L (RTJ)	295	333	359	435	511	562	663	890	841	892	994	1095	1200	1407
DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600
H	197	207	231	281	320	362	437	490	528	572	660	720	746	960
WEIGHT (KG.) (BW)	28	40	57	83	120	191	361	543	770	773	1015	1350	1750	2520
WEIGHT (KG.) (RF)	36	49	68	111	170	230	416	673	875	944	1220	1620	2120	3100

CLASS 600 DIMENSIONS IN MILIMETERS

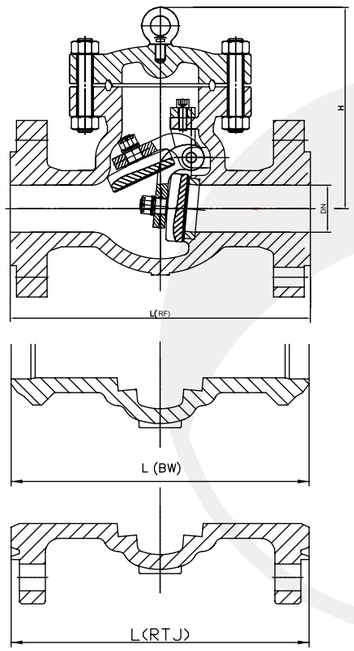
ND.	28"	30"	36”
L (BW)	1600	1651	2083
L (RF)	1600	1651	2083
L (RTJ)	1613	1664	2099
DN	700	750	900
H	1000	1095	1190
WEIGHT (KG.) (BW)	3740	4510	6005
WEIGHT (KG.) (RF)	4270	4950	6550

*** Other measures upon request.**

Check valve API 6D-BS1868

COD. AR 9000

SWING CHECK VALVES CLASS **900** (BOLTED BONNET) 2” TO 20”



DESIGN ASME B16.34 & API6D or BS-1868

FACE TO FACE ASME B16.10 & API6D

FLANGED ENDS From 2" to 24" Ac c/ASME B16.5, upper than 24" Ac c/ASME B16.47 or MSS SP-44 or upon request

BUTT WELD ENDS ASME B16.25

BY-PASS & DRAIN MSS SP-45

TEST API-598, API 6D, ASME B16.34 & ISO 15848

CONSTRUCTION
- Swing Type Disc
- Threaded, Welded or integral Seat Ring
- Bolted Cover

MATERIALS WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M,CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials

TRIM 13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....

OTHERS Cryogenic services
all type of painting and coating.

*** other requirements upon request.**

CLASS 900 DIMENSIONS IN MILIMETERS

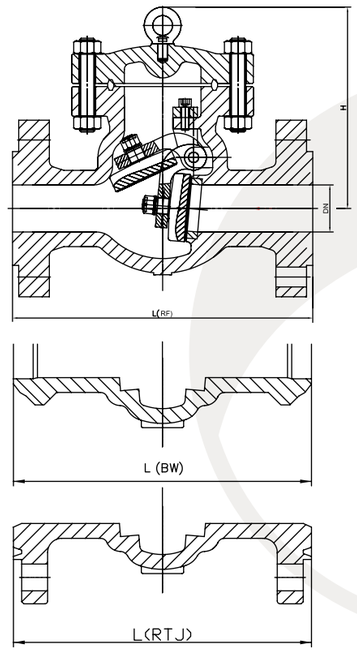
ND.	2”	2 1/2”	3”	4”	5”	6”	8”	10”	12”	14”	16”	18”	20”
L (BW)	368	419	381	457	559	610	737	838	965	1029	1130	1219	1321
L (RF)	368	419	381	457	559	610	737	838	965	1029	1130	1219	1321
L (RTJ)	371	422	384	460	562	613	740	841	968	1039	1140	1232	1334
DN	50	65	80	100	125	150	200	250	300	350	400	450	500
H	240	260	260	320	340	382	530	560	590	630	700	750	850
WEIGHT (KG.) (BW)	52	74	70	112	165	218	448	733	975	1240	1760	2310	3500
WEIGHT (KG.) (RF)	69	93	91	145	190	259	565	900	1200	1500	2130	2700	4100

*** Other measures upon request.**

Check valve API 6D-BS1868

COD. AR 4000

SWING CHECK VALVES CLASS **1500** (BOLTED BONNET) 2” TO 12”



DESIGN ASME B16.34 & API6D or BS-1868

FACE TO FACE ASME B16.10 & API6D

FLANGED ENDS From 2" to 24" Ac c/ASME B16.5, upper than 24" Ac c/ASME B16.47 or MSS SP-44 or upon request

BUTT WELD ENDS ASME B16.25

BY-PASS & DRAIN MSS SP-45

TEST API-598, API 6D, ASME B16.34 & ISO 15848

CONSTRUCTION
- Swing Type Disc
- Threaded, Welded or integral Seat Ring
- Bolted Cover

MATERIALS WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M,CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials

TRIM 13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....

OTHERS Cryogenic services
all type of painting and coating.

*** other requirements upon request.**

CLASS 1500 DIMENSIONS IN MILIMETERS

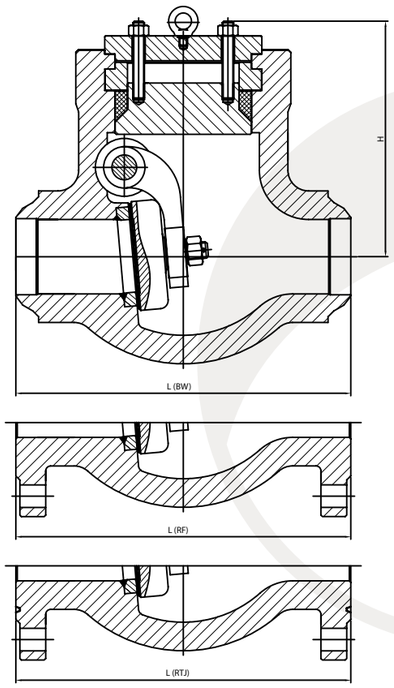
ND.	2”	2 1/2”	3”	4”	6”	8”	10”	12”
L (BW)	368	419	470	546	705	832	991	1130
L (RF)	368	419	470	546	705	832	991	1130
L (RTJ)	371	422	473	549	711	842	1001	1146
DN	50	65	80	100	150	200	250	300
H	310	310	330	355	400	530	560	650
WEIGHT (KG.) (BW)	49	74	111	185	375	803	1250	1625
WEIGHT (KG.) (RF)	69	93	140	232	490	990	1490	1970

*** Other measures upon request.**

Check valve ASME B16.34

COD. AR 9000-P

SWING CHECK VALVES CLASS **900** (PRESSURE SEAL) 2” TO 16”



DESIGN	ASME B16.34
FACE TO FACE	ASME B16.10
FLANGED ENDS	ASME B16.5
BUTT WELD ENDS	ASME B16.25
BY-PASS & DRAIN	MSS SP-45
TEST	API-598, API 6D, ASME B16.34 & ISO 15848
CONSTRUCTION	• Swing Type Disc • Threaded, Welded or integral Seat Ring • Pressure Seal Cover
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Cryogenic services all type of painting and coating.

*** other requirements upon request.**

CLASS 900 DIMENSIONS IN MILIMETERS. HIGH PRESSURE - PRESSURE SEAL

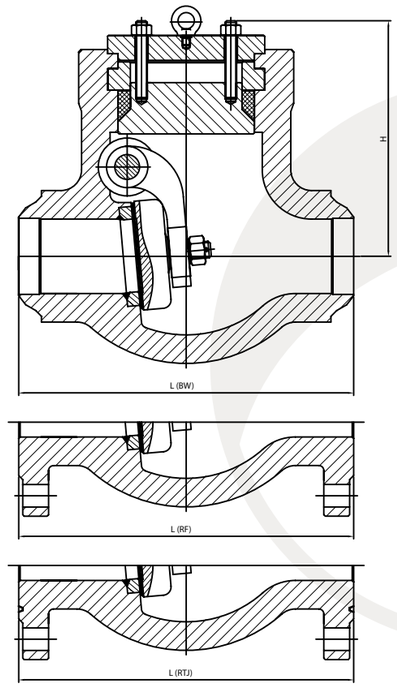
ND.	2”	2 1/2”	3”	4”	6”	8”	10”	12”	14”	16”
L (BW)	216	254	305	356	508	660	787	914	991	1092
L (RF)	368	419	381	457	610	737	838	965	1029	1130
L (RTJ)	371	422	384	460	613	740	841	968	1039	1140
DN	50	65	80	100	150	200	250	300	250	300
H	188	210	210	216	368	511	614	705	736	756
WEIGHT (KG.) (BW)	35	46	44	78	179	385	705	1130	1355	1465
WEIGHT (KG.) (RF)	50	65	62	124	256	513	940	1450	1725	1834

*** Other measures upon request.**

Check valve ASME B16.34

COD. AR 4000-P

SWING CHECK VALVES CLASS **1500** (PRESSURE SEAL) 2” TO 16”



DESIGN	ASME B16.34
FACE TO FACE	ASME B16.10
FLANGED ENDS	ASME B16.5
BUTT WELD ENDS	ASME B16.25
BY-PASS & DRAIN	MSS SP-45
TEST	API-598, API 6D, ASME B16.34 & ISO 15848
CONSTRUCTION	• Swing Type Disc • Threaded, Welded or integral Seat Ring • Pressure Seal Cover
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Cryogenic services all type of painting and coating.

*** other requirements upon request.**

CLASS 1500 DIMENSIONS IN MILIMETERS. HIGH PRESSURE - PRESSURE SEAL

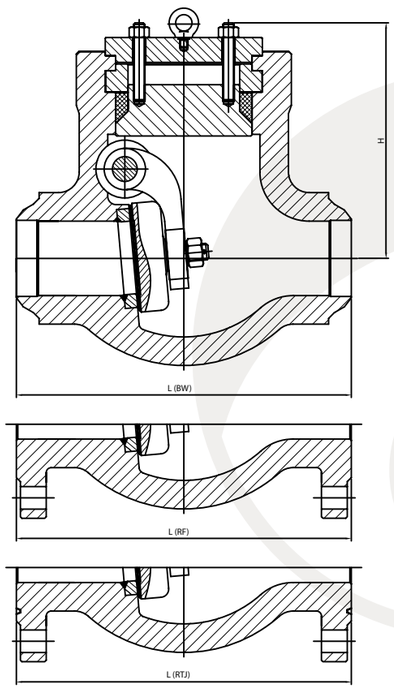
ND.	2”	2 1/2”	3”	4”	6”	8”	10”	12”	14”	16”
L (BW)	216	254	305	406	559	711	864	991	1067	1194
L (RF)	368	419	470	546	705	832	991	1130	1257	1384
L (RTJ)	371	422	473	549	711	842	1001	1146	1276	1406
DN	50	65	80	100	150	200	250	300	250	300
H	265	265	270	370	475	570	630	770	795	824
WEIGHT (KG.) (BW)	42	53	51	86	230	460	715	1150	1390	1544
WEIGHT (KG.) (RF)	60	75	73	130	334	590	1025	1530	1854	2060

*** Other measures upon request.**

Check valve ASME B16.34

COD. AR 7000-P

SWING CHECK VALVES CLASS **2500** (PRESSURE SEAL) 2” TO 12”



DESIGN	ASME B16.34
FACE TO FACE	ASME B16.10
FLANGED ENDS	ASME B16.5
BUTT WELD ENDS	ASME B16.25
BY-PASS & DRAIN	MSS SP-45
TEST	API-598, API 6D, ASME B16.34 & ISO 15848
CONSTRUCTION	• Swing Type Disc • Threaded, Welded or integral Seat Ring • Pressure Seal Cover
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Cryogenic services all type of painting and coating.

*** other requirements upon request.**

CLASS 2500 DIMENSIONS IN MILIMETERS. HIGH PRESSURE - PRESSURE SEAL

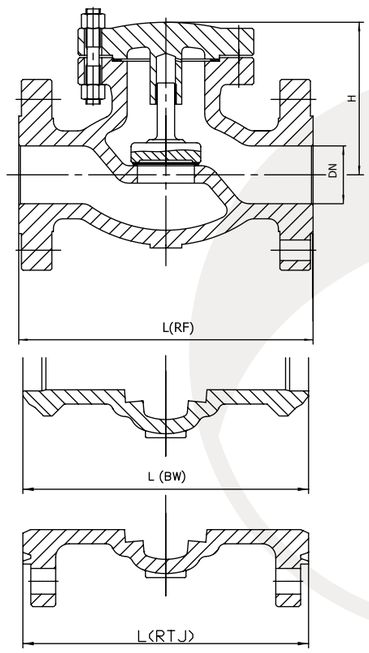
ND.	2”	2 1/2”	3”	4”	6”	8”	10”	12”
L (BW)	279	330	368	457	610	762	914	1041
L (RF)	451	508	578	673	914	1022	1270	1422
L (RTJ)	454	514	584	683	927	1038	1292	1445
DN	50	65	80	100	150	200	250	300
H	280	305	310	370	485	544	710	800
WEIGHT (KG.) (BW)	88	90	95	160	385	640	1200	1725
WEIGHT (KG.) (RF)	88	115	135	215	550	900	1600	2300

*** Other measures upon request.**

Check valve API 6D

COD. AL 1000

LIFT CHECK VALVES CLASS **150** (BOLTED BONNET) 2" TO 12"



DESIGN	BS-1868, ASME B16.34 & API-6D
FACE TO FACE	ASME B16.10 & API6D
FLANGED ENDS	ASME B16.5
BUTT WELD ENDS	ASME B16.25
BY-PASS & DRAIN	MSS SP-45
TEST	API-598, API 6D, ASME B16.34 & ISO 15848
CONSTRUCTION	• Lift Type Disc • Threaded, Welded or integral Seat Ring • Bolted Cover
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Cryogenic services, H.F. services all type of painting and coating.

*** other requirements upon request.**

CLASS 150 DIMENSIONS IN MILIMETERS

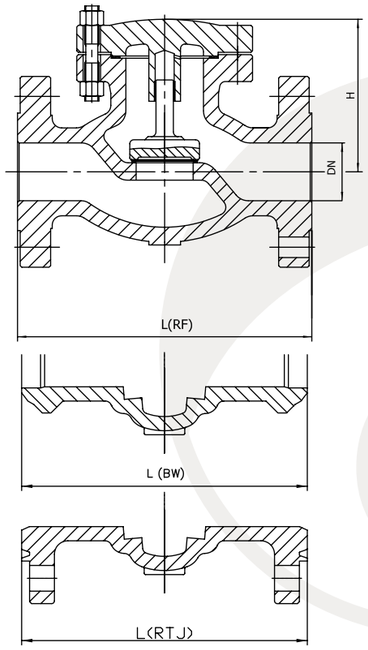
ND.	2”	2 1/2”	3”	4”	5"	6”	8”	10”	12”
L (BW)	203	216	241	292	356	406	495	622	698
L (RF)	203	216	241	292	356	406	495	622	698
L (RTJ)	216	229	254	305	369	419	508	635	711
DN	50	65	80	100	125	150	200	250	300
H	179	194	214	238	260	291	343	389	438
WEIGHT (KG.) (BW)	13	19	24	40	57	66	110	180	268
WEIGHT (KG.) (RF)	17	25	29	48	69	85	138	210	350

*** Other measures upon request.**

Check valve API 6D

COD. AL 3000

LIFT CHECK VALVES CLASS **300** (BOLTED BONNET) 2" TO 12"



DESIGN	BS-1868, ASME B16.34 & API-6D
FACE TO FACE	ASME B16.10 & API6D
FLANGED ENDS	ASME B16.5
BUTT WELD ENDS	ASME B16.25
BY-PASS & DRAIN	MSS SP-45
TEST	API-598, API 6D, ASME B16.34 & ISO 15848
CONSTRUCTION	• Lift Type Disc • Threaded, Welded or integral Seat Ring • Bolted Cover
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Cryogenic services, H.F. services all type of painting and coating.

*** other requirements upon request.**

CLASS 300 DIMENSIONS IN MILIMETERS

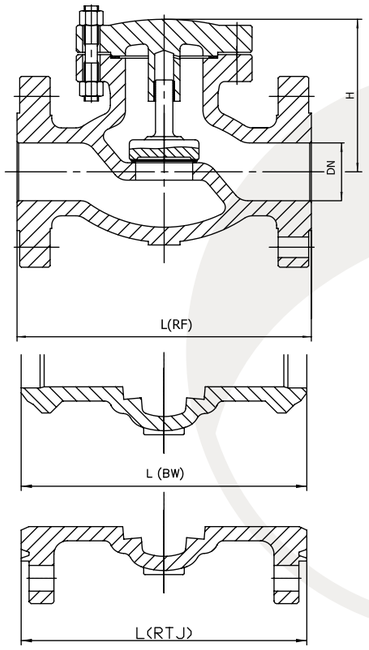
ND.	2”	2 1/2”	3”	4”	5"	6”	8”	10”	12”
L (BW)	267	292	318	356	400	444	559	622	711
L (RF)	267	292	318	356	400	444	559	622	711
L (RTJ)	283	308	334	372	416	460	575	638	727
DN	50	65	80	100	125	150	200	250	300
H	198	219	244	275	298	327	381	432	495
WEIGHT (KG.) (BW)	19	24	35	46	66	106	170	200	375
WEIGHT (KG.) (RF)	28	33	42	67	98	135	203	296	448

*** Other measures upon request.**

Check valve API 6D

COD. AL 6000

LIFT CHECK VALVES CLASS **600** (BOLTED BONNET) 2" TO 12"



DESIGN	BS-1868, ASME B16.34 & API-6D
FACE TO FACE	ASME B16.10 & API6D
FLANGED ENDS	ASME B16.5
BUTT WELD ENDS	ASME B16.25
BY-PASS & DRAIN	MSS SP-45
TEST	API-598, API 6D, ASME B16.34 & ISO 15848
CONSTRUCTION	• Lift Type Disc • Threaded, Welded or integral Seat Ring • Bolted Cover
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Cryogenic services all type of painting and coating.

*** other requirements upon request.**

CLASS 600 DIMENSIONS IN MILIMETERS

ND.	2”	2 1/2”	3”	4”	5"	6”	8”	10”	12”
L (BW)	292	330	356	432	508	559	584	711	813
L (RF)	292	330	356	432	508	559	660	787	838
L (RTJ)	295	333	359	435	511	562	663	890	841
DN	50	65	80	100	125	150	200	250	300
H	32	45	58	102	147	195	308	455	630
WEIGHT (KG.) (BW)	27	38	47	79	104	148	211	305	470
WEIGHT (KG.) (RF)	32	45	58	102	147	195	308	455	630

*** Other measures upon request.**

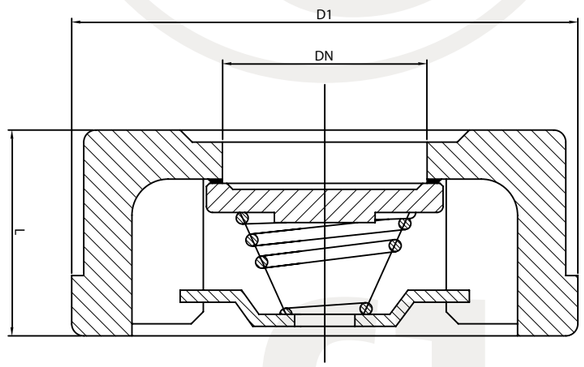
Check valve API 6D - API 594

COD. ALW 1000

WAFER CHECK VALVES CLASS **150** 1/2" TO 6"

DESIGN	API594 & API6D
FACE TO FACE	API594 and API6D
FLANGES CONNECTION	ASME B16.5
SHELL WALL THICKNESS	ASME API594
TEST	API-598, API 6D & ISO 15848
CONSTRUCTION	• Wafer Lift Type Disc
	• Other requirements upon request
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Cryogenic services all type of painting and coating.

*** other requirements upon request.**



CLASS 150 DIMENSIONS IN MILIMETERS

ND.	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"
L (WF)	16	19	22	28,5	31,5	40	46	51	60	106
DN	15	20	25	32	40	50	65	80	100	150
D1	48	57	67	76	86	105	124	137	175	222
WEIGHT (KG.) (WF)	0,3	0,35	0,5	0,7	0,9	1,3	2,5	3,4	7,5	16

*** Other measures upon request.**

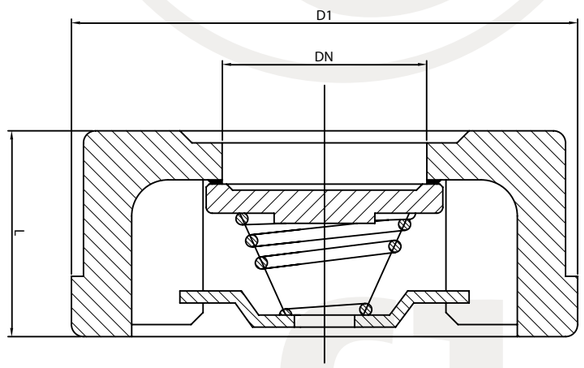
Check valve API 6D - API 594

COD. ALW 3000

WAFER CHECK VALVES CLASS **300** 1/2" TO 6"

DESIGN	API594 & API6D
FACE TO FACE	API594 and API6D
FLANGES CONNECTION	ASME B16.5
SHELL WALL THICKNESS	ASME API594
TEST	API-598, API 6D & ISO 15848
CONSTRUCTION	• Wafer Lift Type Disc
	• Other requirements upon request
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Cryogenic services all type of painting and coating.

*** other requirements upon request.**



CLASS 300 DIMENSIONS IN MILIMETERS

ND.	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"
L (WF)	25	31,5	35,5	40	46	56	63,5	71	80	125
DN	15	20	25	32	40	50	65	80	100	150
D1	54	65	73	81	95	111	130	149	181	251
WEIGHT (KG.) (WF)	0,35	0,45	0,6	0,85	1,2	2,4	3,5	5,9	9,8	21

*** Other measures upon request.**

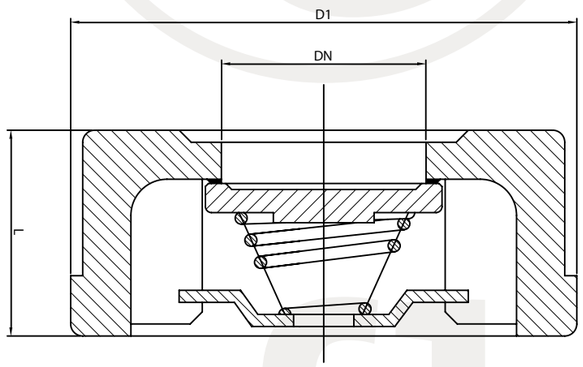
Check valve API 6D - API 594

COD. ALW 6000

WAFER CHECK VALVES CLASS **600** 1/2" TO 6"

DESIGN	API594 & API6D
FACE TO FACE	API594 and API6D
FLANGES CONNECTION	ASME B16.5
SHELL WALL THICKNESS	ASME API594
TEST	API-598, API 6D & ISO 15848
CONSTRUCTION	• Wafer Lift Type Disc
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Cryogenic services all type of painting and coating.

*** other requirements upon request.**



CLASS 600 DIMENSIONS IN MILIMETERS

ND.	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"
L (WF)	25	31,5	35,5	40	46	56	63,5	71	80	125
DN	15	20	25	32	40	50	65	80	100	150
D1	57	65	73	81	95	111	130	149	194	267
WEIGHT (KG.) (WF)	0,38	0,47	0,64	0,9	1,35	2,5	4,2	6,5	12	24

*** Other measures upon request.**

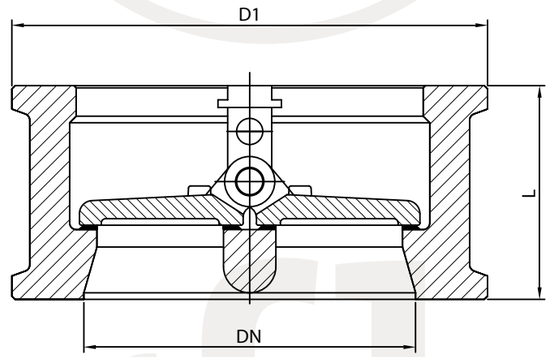
Check valve API 6D - API 594

COD. ADC 1000

WAFER DOUBLE DISC CHECK VALVES CLASS **150** 2" TO 48"

DESIGN	API594 & API6D
FACE TO FACE	API594 and API6D
FLANGES CONNECTION	From 2" to 24" ASME B16.5, upper than 24" ASME B16.47 or MSS SP-44 or upon request
SHELL WALL THICKNESS	ASME API594
TEST	API-598, API 6D & ISO 15848
CONSTRUCTION	• Wafer Double Disc Swing Type • Wafer Lug Double Disc Swing Type • Wafer Double Flanged Double Disc Swing Type
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Cryogenic services all type of painting and coating.

*** other requirements upon request.**



CLASS 150 DIMENSIONS IN MILIMETERS

ND.	2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	42"	48"
L (WF)	60	67	73	73	99	127	146	181	184	190	203	219	222	305	432	524
DN	50	65	80	100	150	200	250	300	350	400	450	500	600	750	1050	1200
D1	105	124	137	175	222	279	340	410	451	514	549	606	718	883	1219	1384
WEIGHT (KG.) (WF)	2,7	3,6	5,4	7,7	17	30	48	85	95	124	146	187	282	530	1270	1995

*** Other measures upon request.**

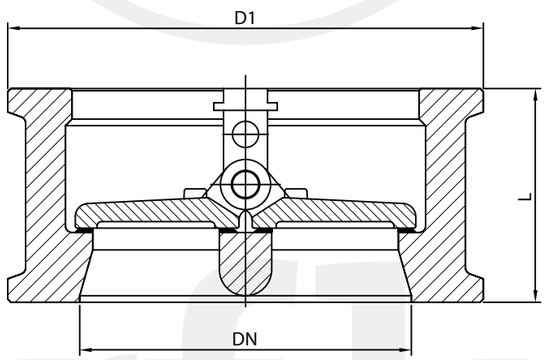
Check valve API 6D - API 594

COD. ADC 3000

WAFER DOUBLE DISC CHECK VALVES CLASS **300** 2" TO 48"

DESIGN	API594 & API6D
FACE TO FACE	API594 and API6D
FLANGES CONNECTION	From 2" to 24" ASME B16.5, upper than 24" ASME B16.47 or MSS SP-44 or upon request
SHELL WALL THICKNESS	ASME API594
TEST	API-598, API 6D & ISO 15848
CONSTRUCTION	• Wafer Double Disc Swing Type • Wafer Lug Double Disc Swing Type • Wafer Double Flanged Double Disc Swing Type
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Cryogenic services all type of painting and coating.

*** other requirements upon request.**



CLASS 300 DIMENSIONS IN MILIMETERS

ND.	2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	42"	48"
L (WF)	60	67	73	73	99	127	146	181	222	232	264	292	318	368	568	629
DN	50	65	80	100	150	200	250	300	350	400	450	500	600	750	1050	1200
D1	111	130	149	181	251	308	362	422	486	540	597	654	775	953	1289	1492
WEIGHT (KG.) (WF)	3,2	4,5	5,4	8,5	17	35	56	95	136	180	294	362	495	950	2610	2835

*** Other measures upon request.**

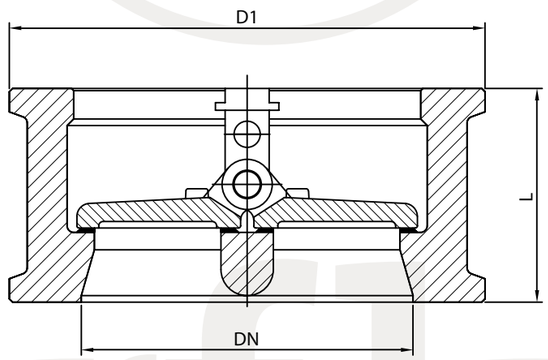
Check valve API 6D - API 594

COD. ADC 6000

WAFER DOUBLE DISC CHECK VALVES CLASS **600** 2" TO 30"

DESIGN	API594 & API6D
FACE TO FACE	API594 and API6D
FLANGES CONNECTION	From 2" to 24" ASME B16.5, upper than 24" ASME B16.47 or MSS SP-44 or upon request
SHELL WALL THICKNESS	ASME API594
TEST	API-598, API 6D & ISO 15848
CONSTRUCTION	• Wafer Double Disc Swing Type • Wafer Lug Double Disc Swing Type • Wafer Double Flanged Double Disc Swing Type
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Cryogenic services all type of painting and coating.

*** other requirements upon request.**



CLASS 600 DIMENSIONS IN MILIMETERS

ND.	2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"
L (WF)	60	67	73	73	137	165	213	229	273	305	362	368	438	505
DN	50	65	79	100	150	200	250	300	350	400	450	500	600	750
D1	111	130	149	194	267	321	400	457	492	565	613	680	791	972
WEIGHT (KG.) (WF)	3,2	4,5	5,4	10	32	68	95	130	180	250	345	600	840	1330

*** Other measures upon request.**

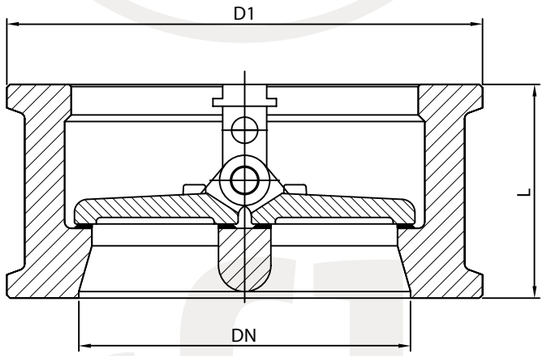
Check valve API 6D - API 594

COD. ADC 9000

WAFER DOUBLE DISC CHECK VALVES CLASS **900** 2" TO 24"

DESIGN	API594 & API6D
FACE TO FACE	API594 and API6D
FLANGES CONNECTION	ASME B16.5
SHELL WALL THICKNESS	ASME API594
TEST	API-598, API 6D & ISO 15848
CONSTRUCTION	• Wafer Double Disc Swing Type • Wafer Lug Double Disc Swing Type • Wafer Double Flanged Double Disc Swing Type
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Cryogenic services all type of painting and coating.

*** other requirements upon request.**



CLASS 900 DIMENSIONS IN MILIMETERS

ND.	2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
L (WF)	70	83	83	102	159	206	241	292	356	384	451	451	495
DN	50	65	80	100	150	200	250	300	350	400	450	500	600
D1	143	465	168	206	289	359	435	498	521	578	638	699	838
WEIGHT (KG.) (WF)	6	7	12	17	48	85	127	165	290	380	490	635	920

*** Other measures upon request.**

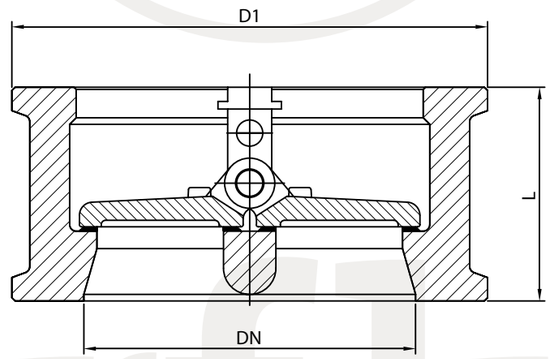
Check valve API 6D - API 594

COD. ADC 4000

WAFER DOUBLE DISC CHECK VALVES CLASS **1500** 2" TO 24"

DESIGN	API594 & API6D
FACE TO FACE	API594 and API6D
FLANGES CONNECTION	ASME B16.5
SHELL WALL THICKNESS	ASME API594
TEST	API-598, API 6D & ISO 15848
CONSTRUCTION	• Wafer Double Disc Swing Type • Wafer Lug Double Disc Swing Type • Wafer Double Flanged Double Disc Swing Type
MATERIALS	WCB, WCC, WC1, WC6, WC9, C5, C12, LCB, LCC, CF8, CF8M, CF3, CF3M, CF8C, Bronze, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials
TRIM	13%Cr, stellite, 304, 304L, 316, 316L, 321, bronze, monel, 4A, 6A, AISI-904L, CK3MCUN, Duplex, Superduplex, exotic materials....
OTHERS	Cryogenic services all type of painting and coating.

*** other requirements upon request.**



CLASS 1500 DIMENSIONS IN MILIMETERS

ND.	2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
L (WF)	70	83	83	102	159	206	248	305	356	384	468	533	559
DN	50	65	80	100	150	200	250	300	350	400	450	500	600
D1	143	465	174	209	282	353	435	521	579	642	705	756	900
WEIGHT (KG.) (WF)	8	11	19	26	51	68	130	210	384	550	635	820	1050

*** Other measures upon request.**

FEATURES OF ARFLU NOZZLE CHECK VALVES:

GENERAL CONSIDERATIONS:

Arflu Nozzle check valves have been designed to provide reliable backflow prevention for the Petrochemical, Energy Gas & Water divisions.

Arflu's Engineering department has create Nozzle check valve with **dymanic quick closing** which reduces the flow return speed. The Axial movement of the disc produces a streamlineflow with venturi effect which reduces the pressure drop with minimal seat leakage and with minimum turbulences.

Our design needs only a very low flow to completely open the valve and guarantees the highest fluid dynamic performances reacting fast to flow alteration.

Arflu Nozzle check valves are available with multiple spring torques increasing considerably its purposes. it has also been conceived to have a really low maintenance costs and high serviceability

APPLICATIONS

- Compressor discharge
- Natural Gas refineries
- Desalination plants
- Pump discharge
- Critical equipment discharge
- Compressor/pump bypass
- Storage facilities
- Water Treatment
- Offshore
- Water Transmission

DYNAMIC QUICK CLOSING

Arflu Nozzle Check valves are design to reduce the fluid flow speed during the closure

MAINTENANCE AND SERVICEABILITY

Arflu valves are designed and developed to have the lowest possible maintenance. If any repair is required, these can easily be accessed without any special tools.

FLUID HAMMER REDUCTION

Thanks to its special design of the disc there is an important fluid hammer reduction which also depends on the spring torque.

DISC SHORT STROKE

All of our Nozzle check valves are developed to have a short stroke of the dics which also means a reduction of the body dimensions which also signifys less material needed.

DISC AXIAL MOVEMENT

The inner shape produces a streamlined flow with Venturi effect which reduces considerably the pressure drop.

MANUFACTURING CAPACITY

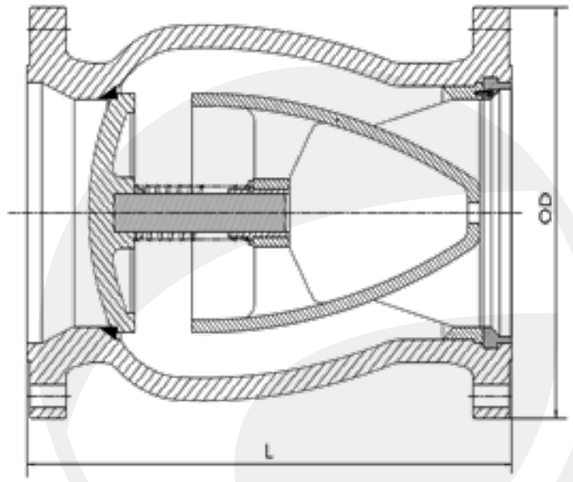
Specialized in projects, Arflu has a great manufacturing capacity beeing able to produce a wide volume of all kind of valves.

technical datas

Nozzle Check Valve

COD. ARN-1000

NOZZLE CHECK **CLASS 150 2” TO 36”**



CLASS 150 DIMENSIONS IN MILIMETERS

ND.	2”	2 1/2”	3”	4”	6"	8”	10”	12”	14”	16”	18”	20”	22”	24"
API 6D L (RF)	203	216	241	292	356	495	622	699	787	864	978	978	1067	1295
API 6D L (RTJ)	216	229	254	305	369	508	635	712	800	877	991	991	1080	1308
API 6D WEIGHT	14	18	24	37	65	115	184	275	367	515	580	810	900	1152
STD ARFLU L (RF)	-	-	-	-	253	295	365	435	475	545	610	675	-	810
STD ARFLU L (RTJ)	-	-	-	-	266	308	378	448	488	558	623	688	-	823
STD ARFLU WEIGHT	-	-	-	-	52	90	145	230	300	420	460	620	-	1000

CLASS 150 DIMENSIONS IN MILIMETERS

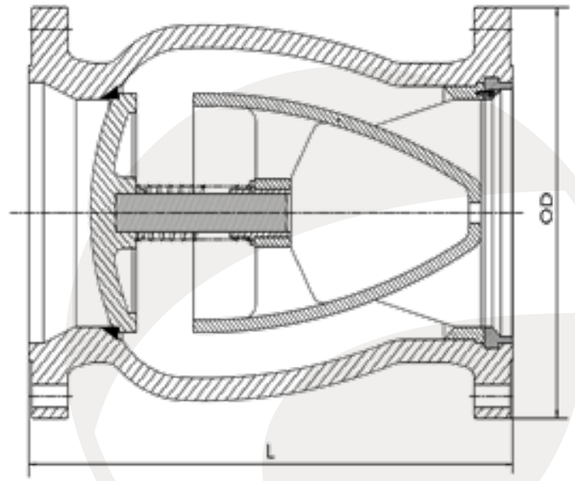
ND.	26”	28”	30”	36”
API 6D L (RF)	1295	1448	1524	1956
API 6D L (RTJ)	-	-	-	-
API 6D WEIGHT	1480	1896	2340	3550
STD ARFLU L (RF)	-	945	1010	1215
STD ARFLU L (RTJ)	-	-	-	-
STD ARFLU WEIGHT	-	1360	1690	2770

*** Other measures upon request.**

Nozzle Check Valve

COD. ARN-3000

NOZZLE CHECK **CLASS 300 2” TO 36”**



CLASS 300 DIMENSIONS IN MILIMETERS

ND.	2”	2 1/2”	3”	4”	6"	8”	10”	12”	14”	16”	18”	20”	22”	24"
API 6D L (RF)	267	292	318	356	445	533	622	711	838	864	978	1016	1118	1346
API 6D L (RTJ)	283	308	334	372	461	549	638	727	854	880	994	1035	1140	1368
API 6D WEIGHT	18	26	34	57	105	175	270	365	490	662	910	1180	1410	1785
STD ARFLU L (RF)	-	-	-	-	253	295	365	435	475	545	610	675	-	810
STD ARFLU L (RTJ)	-	-	-	-	269	311	381	451	491	561	626	694	-	832
STD ARFLU WEIGHT	-	-	-	-	76	125	192	294	390	536	620	810	-	1330

CLASS 300 DIMENSIONS IN MILIMETERS

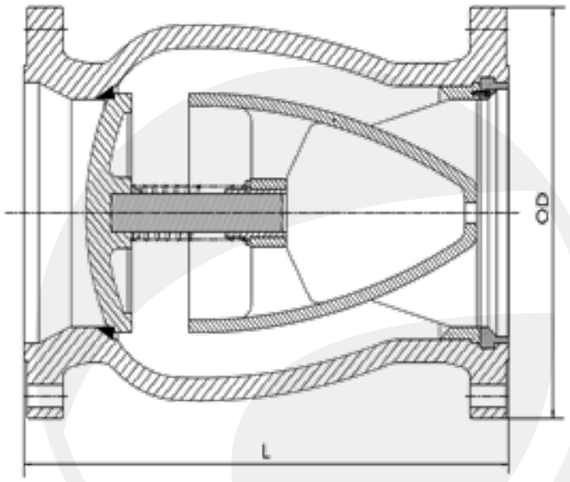
ND.	26”	28”	30”	36”
API 6D L (RF)	1346	1449	1524	2083
API 6D L (RTJ)	1371	1524	1549	-
API 6D WEIGHT	2140	2350	2810	4376
STD ARFLU L (RF)	-	945	1010	1215
STD ARFLU L (RTJ)	-	970	1035	1244
STD ARFLU WEIGHT	-	1705	2085	3260

*** Other measures upon request.**

Nozzle Check Valve

COD. ARN-6000

NOZZLE CHECK **CLASS 600 2” TO 36”**



CLASS 600 DIMENSIONS IN MILIMETERS

ND.	2”	2 1/2”	3”	4”	6"	8”	10”	12”	14”	16”	18”	20”	22”	24"
API 6D L (RF)	292	330	356	432	559	660	787	838	889	991	1092	1194	1295	1397
API 6D L (RTJ)	295	333	359	435	562	663	790	841	892	994	1095	1200	1305	1407
API 6D WEIGHT	24	48	44	76	167	280	445	580	715	1060	1442	1840	2140	2513
STD ARFLU L (RF)	-	-	-	-	253	295	365	435	475	545	610	675	-	810
STD ARFLU L (RTJ)	-	-	-	-	256	298	368	438	478	548	613	681	-	819
STD ARFLU WEIGHT	-	-	-	-	105	166	277	359	450	646	808	1046	-	1670

CLASS 600 DIMENSIONS IN MILIMETERS

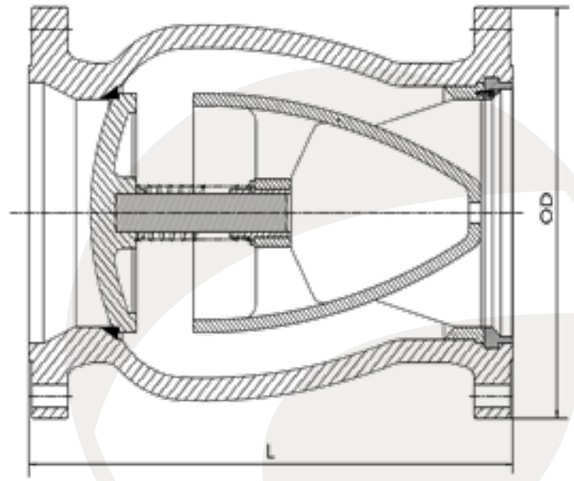
ND.	26”	28”	30”	36”
API 6D L (RF)	1448	1600	1651	2083
API 6D L (RTJ)	1461	1613	1664	-
API 6D WEIGHT	3100	3830	4564	6360
STD ARFLU L (RF)	-	945	1010	1215
STD ARFLU L (RTJ)	-	958	1023	1231
STD ARFLU WEIGHT	-	2295	2736	4310

*** Other measures upon request.**

Nozzle Check Valve

COD. ARN-9000

NOZZLE CHECK **CLASS 900 2” TO 24”**



CLASS 900 DIMENSIONS IN MILIMETERS

ND.	2”	2 1/2”	3”	4”	6”	8”	10”	12”	14”	16”	18”	20”	24”
API 6D L (RF)	368	419	381	457	610	737	838	965	1029	1130	1219	1321	1549
API 6D L (RTJ)	371	422	384	460	613	740	841	968	1039	1140	1232	1334	1568
API 6D WEIGHT	39	50	63	92	197	390	560	870	1104	1407	1960	2422	3661
STD ARFLU L (RF)	-	-	-	235	300	335	385	435	475	545	610	675	810
STD ARFLU L (RTJ)	-	-	-	238	306	344	394	451	494	567	632	697	838
STD ARFLU WEIGHT	-	-	-	72	146	260	404	491	665	882	1126	1495	2680

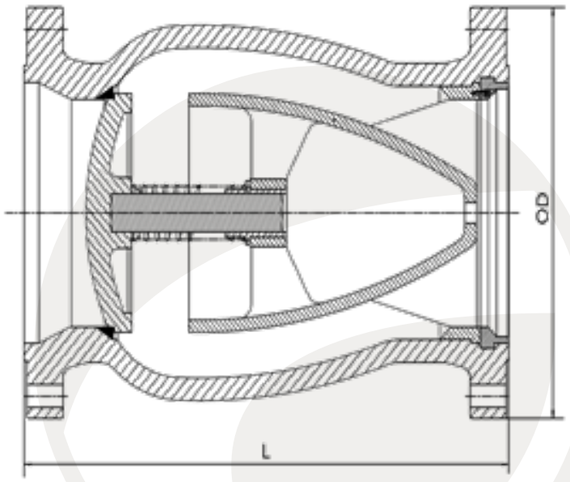
*** Other measures upon request.**

technical datas

Nozzle Check Valve

COD. ARN-4000

NOZZLE CHECK **CLASS 1500 2” TO 24”**



CLASS 1500 DIMENSIONS IN MILIMETERS

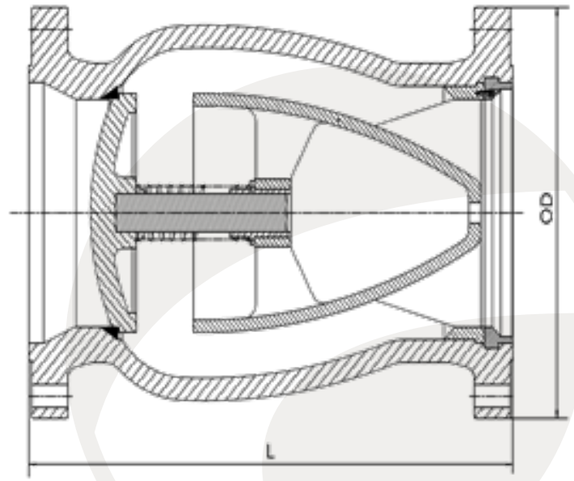
ND.	2”	2 1/2”	3”	4”	6"	8”	10”	12”	14”	16”	18”	20”	24”
API 6D L (RF)	368	419	470	546	705	832	991	1130	1257	1384	1537	1664	1943
API 6D L (RTJ)	371	422	473	549	711	841	1000	1146	1276	1407	1559	1686	1972
API 6D WEIGHT	39	50	67	121	246	421	730	1250	2114	3010	3922	5124	6962
STD ARFLU L (RF)	-	-	-	235	300	335	385	435	475	545	610	675	810
STD ARFLU L (RTJ)	-	-	-	238	306	344	394	451	494	567	632	697	838
STD ARFLU WEIGHT	-	-	-	93	196	335	565	866	1168	1562	2030	2634	4300

*** Other measures upon request.**

Nozzle Check Valve

COD. ARN-7000

NOZZLE CHECK **CLASS 2500 2” TO 12”**



CLASS 2500 DIMENSIONS IN MILIMETERS

ND.	2”	2 1/2”	3”	4”	6"	8”	10”	12”
API 6D L (RF)	451	508	578	673	914	1022	1270	1422
API 6D L (RTJ)	454	514	584	683	927	1038	1292	1445
API 6D WEIGHT	54	81	120	196	487	743	1173	1750
STD ARFLU L (RF)	-	-	-	295	390	430	540	595
STD ARFLU L (RTJ)	-	-	-	304	403	446	562	617
STD ARFLU WEIGHT	-	-	-	160	395	595	1120	1580

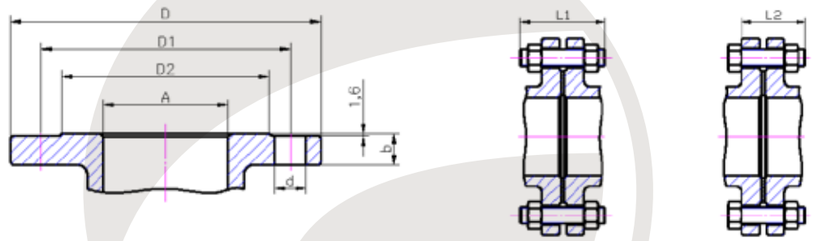
*** Other measures upon request.**

Technical datas

DIMENSIONS

Flanges ASME B 16.5 RF

Class 150 lbs | Class 300 lbs



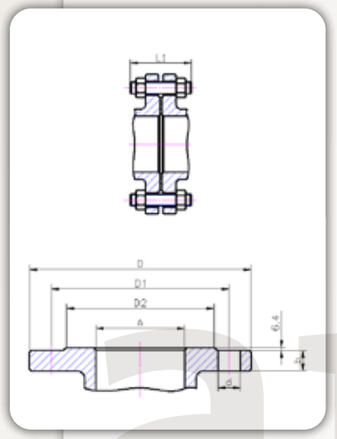
Class 150 lbs

Nominal size			A	D	D1	D2	b	d	Bolt		L1	L2
			Size of port valve	Flanges diameter	Holes circle diameter	Raised diameter	Flange thickness	Diameter of holes	Number of holes	Diameter of bolts	Length stud bolts	Length machine bolts
NPS	DN											
1/2"	15	inch.	1/2	3,50	2,38	1,38	0,38	0,62	4	1/2"	2,50	2,00
		mm.	13	88,90	60,45	35,05	9,65	15,75			63,50	50,80
3/4"	20	inch.	3/4	3,88	2,75	1,69	0,41	0,62	4	1/2"	2,50	2,25
		mm.	20	98,55	69,85	42,93	10,41	15,75			63,50	57,15
1"	25	inch.	1	4,25	3,12	2,00	0,44	0,62	4	1/2"	2,75	2,25
		mm.	25	107,95	79,25	50,80	11,18	15,75			69,85	57,15
1 1/4"	32	inch.	1 1/4	4,62	3,50	2,50	0,50	0,62	4	1/2"	2,75	2,50
		mm.	32	117,35	88,90	63,50	12,70	15,75			69,85	63,50
1 1/2"	40	inch.	1 1/2	5,00	3,88	2,88	0,56	0,62	4	1/2"	3,00	2,50
		mm.	38	127,00	98,55	73,15	14,22	15,75			76,20	63,50
2"	50	inch.	2	6,00	4,75	3,62	0,62	0,75	4	5/8"	3,25	2,75
		mm.	50	152,40	120,65	91,95	15,75	19,05			82,55	69,85
2 1/2"	65	inch.	2 1/2	7,00	5,50	4,12	0,69	0,75	4	5/8"	3,50	3,00
		mm.	65	177,80	139,70	104,65	17,53	19,05			88,90	76,20
3"	80	inch.	3	7,50	6,00	5,00	0,75	0,75	4	5/8"	3,50	3,25
		mm.	77	190,50	152,40	127,00	19,05	19,05			88,90	82,55
3 1/2"	90	inch.	3 1/2	8,50	7,00	5,50	0,81	0,75	8	5/8"	3,50	3,25
		mm.	90	215,90	177,80	139,70	20,57	19,05			88,90	82,55
4"	100	inch.	4	9,00	7,50	6,19	0,94	0,75	8	5/8"	3,50	3,25
		mm.	102	228,60	190,50	157,23	23,88	19,05			88,90	82,55
5"	125	inch.	5	10,00	8,50	7,31	0,94	0,88	8	3/4"	3,75	3,25
		mm.	127	254,00	215,90	185,67	23,88	22,35			95,25	82,55
6"	150	inch.	6	11,00	9,50	8,50	1,00	0,88	8	3/4"	4,00	3,50
		mm.	152	279,40	241,30	215,90	25,40	22,35			101,60	88,90
8"	200	inch.	8	13,50	11,75	10,62	1,12	0,88	8	3/4"	4,25	3,75
		mm.	203	342,90	298,45	269,75	28,45	22,35			107,95	95,25
10"	250	inch.	10	16,00	14,25	12,75	1,19	1,00	12	7/8"	4,50	4,00
		mm.	254	406,40	361,95	323,85	30,23	25,40			114,30	101,60
12"	300	inch.	12	19,00	17,00	15,00	1,25	1,00	12	7/8"	4,75	4,25
		mm.	305	482,60	431,80	381,00	31,75	25,40			120,65	107,95
14"	350	inch.	13 1/4	21,00	18,75	16,25	1,38	1,12	12	1"	5,25	4,50
		mm.	337	533,40	476,25	412,75	35,05	28,45			133,35	114,30
16"	400	inch.	15 1/4	23,50	21,25	18,50	1,44	1,12	16	1"	5,25	4,75
		mm.	387	596,90	539,75	469,90	36,58	28,45			133,35	120,65
18"	450	inch.	17 1/4	25,00	22,75	21,00	1,56	1,25	16	1 1/8"	5,75	5,00
		mm.	438	635,00	577,85	533,40	39,62	31,75			146,05	127,00
20"	500	inch.	19 1/4	27,50	25,00	23,00	1,69	1,25	20	1 1/8"	6,25	5,50
		mm.	489	698,50	635,00	584,20	42,93	31,75			158,75	139,70
24"	600	inch.	23 1/4	32,00	29,50	27,25	1,88	1,38	20	1 1/4"	6,75	6,00
		mm.	591	812,80	749,30	692,15	47,75	35,05			171,45	152,40

Class 300 lbs

Nominal size			A	D	D1	D2	b	d	Bolt		L1	L2
			Size of port valve	Flanges diameter	Holes circle diameter	Raised diameter	Flange thickness	Diameter of holes	Number of holes	Diameter of bolts	Length stud bolts	Length machine bolts
NPS	DN											
1/2"	15	inch.	1/2	3,75	2,62	1,38	0,56	0,62	4	1/2"	2,75	2,25
		mm.	13	95,25	66,55	35,05	14,22	15,75			69,85	57,15
3/4"	20	inch.	3/4	4,62	3,25	1,69	0,62	0,75	4	5/8"	3,00	2,50
		mm.	20	117,35	82,55	42,93	15,75	19,05			76,20	63,50
1"	25	inch.	1	4,88	3,50	2,00	0,69	0,75	4	5/8"	3,25	2,50
		mm.	25	123,95	88,90	50,80	17,53	19,05			82,55	63,50
1 1/4"	32	inch.	1 1/4	5,25	3,88	2,50	0,75	0,75	4	5/8"	3,25	2,75
		mm.	32	133,35	98,55	63,50	19,05	19,05			82,55	69,85
1 1/2"	40	inch.	1 1/2	6,12	4,50	2,88	0,81	0,88	4	3/4"	3,75	3,00
		mm.	38	155,45	114,30	73,15	20,57	22,35			95,25	76,20
2"	50	inch.	2	6,50	5,00	3,62	0,88	0,75	8	5/8"	3,50	3,00
		mm.	50	165,10	127,00	91,95	22,35	19,05			88,90	76,20
2 1/2"	65	inch.	2 1/2	7,50	5,88	4,12	1,00	0,88	8	3/4"	4,00	3,50
		mm.	65	190,50	149,35	104,65	25,40	22,35			101,60	88,90
3"	80	inch.	3	8,25	6,62	5,00	1,12	0,88	8	3/4"	4,25	3,75
		mm.	77	209,55	168,15	127,00	28,45	22,35			107,95	95,25
3 1/2"	90	inch.	3 1/2	9,00	7,25	5,50	1,19	0,88	8	3/4"	4,50	3,75
		mm.	90	228,60	184,15	139,70	30,23	22,35			114,30	95,25
4"	100	inch.	4	10,00	7,88	6,19	1,25	0,88	8	3/4"	4,50	4,00
		mm.	102	254,00	200,15	157,23	31,75	22,35			114,30	101,60
5"	125	inch.	5	11,00	9,25	7,31	1,38	0,88	8	3/4"	4,75	4,25
		mm.	127	279,40	234,95	185,67	35,05	22,35			120,65	107,95
6"	150	inch.	6	12,50	10,62	8,50	1,44	0,88	12	3/4"	5,00	4,25
		mm.	152	317,50	269,75	215,90	36,58	22,35			127,00	107,95
8"	200	inch.	8	15,00	13,00	10,62	1,62	1,00	12	7/8"	5,50	4,75
		mm.	203	381,00	330,20	269,75	41,15	25,40			139,70	120,65
10"	250	inch.	10	17,50	15,25	12,75	1,88	1,12	16	1"	6,25	5,50
		mm.	254	444,50	387,35	323,85	47,75	28,45			158,75	139,70
12"	300	inch.	12	20,50	17,75	15,00	2,00	1,25	16	1 1/8"	6,75	6,00
		mm.	305	520,70	450,85	381,00	50,80	31,75			171,45	152,40
14"	350	inch.	13 1/4	23,00	20,25	16,25	2,12	1,25	20	1 1/8"	7,00	6,25
		mm.	337	584,20	514,35	412,75	53,85	31,75			177,80	158,75
16"	400	inch.	15 1/4	25,50	22,50	18,50	2,25	1,38	20	1 1/4"	7,50	6,50
		mm.	387	647,70	571,50	469,90	57,15	35,05			190,50	165,10
18"	450	inch.	17	28,00	24,75	21,00	2,38	1,38	24	1 1/4"	7,75	6,75
		mm.	432	711,20	628,65	533,40	60,45	35,05			196,85	171,45
20"	500	inch.	19	30,50	27,00	23,00	2,50	1,38	24	1 1/4"	8,25	7,25
		mm.	483	774,70	685,80	584,20	63,50	35,05			209,55	184,15
24"	600	inch.	23	36,00	32,00	27,25	2,75	1,62	24	1 1/2"	9,25	8,00
		mm.	584	914,40	812,80	692,15	69,85	41,15			234,95	203,20

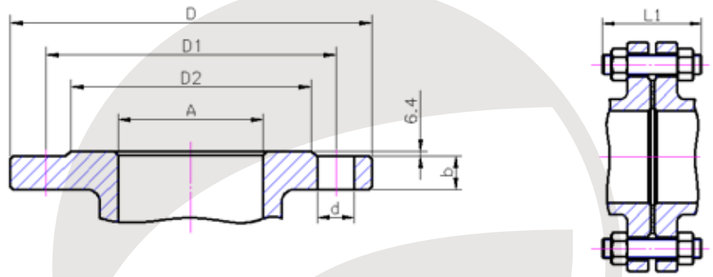
Class 600 lbs



Nominal size			A	D	D1	D2	b	d	Bolt		L1
			Size of port valve	Flanges diameter	Holes circle diameter	Raised diameter	Flange thickness	Diameter of holes	Number of holes	Diameter of bolts	Length stud bolts
NPS	DN										
1/2"	15	inch.	1/2	3,75	2,62	1,38	0,56	0,62	4	1/2"	3,25
		mm.	13	95,25	66,55	35,05	14,22	15,75			82,55
3/4"	20	inch.	3/4	4,62	3,25	1,69	0,62	0,75	4	5/8"	3,50
		mm.	20	117,35	82,55	42,93	15,75	19,05			88,90
1"	25	inch.	1	4,88	3,50	2,00	0,69	0,75	4	5/8"	3,75
		mm.	25	123,95	88,90	50,80	17,53	19,05			95,25
1 1/4"	32	inch.	1 1/4	5,25	3,88	2,50	0,81	0,75	4	5/8"	4,00
		mm.	32	133,35	98,55	63,50	20,57	19,05			101,60
1 1/2"	40	inch.	1 1/2	6,12	4,50	2,88	0,88	0,88	4	3/4"	4,25
		mm.	38	155,45	114,30	73,15	22,35	22,35			107,95
2"	50	inch.	2	6,50	5,00	3,62	1,00	0,75	8	5/8"	4,25
		mm.	50	165,10	127,00	91,95	25,40	19,05			107,95
2 1/2"	65	inch.	2 1/2	7,50	5,88	4,12	1,12	0,88	8	3/4"	4,75
		mm.	65	190,50	149,35	104,65	28,45	22,35			120,65
3"	80	inch.	3	8,25	6,62	5,00	1,25	0,88	8	3/4"	5,00
		mm.	77	209,55	168,15	127,00	31,75	22,35			127,00
3 1/2"	90	inch.	3 1/2	9,00	7,25	5,50	1,38	1,00	8	7/8"	5,50
		mm.	90	228,60	184,15	139,70	35,05	25,40			139,70
4"	100	inch.	4	10,75	8,50	6,19	1,50	1,00	8	7/8"	5,75
		mm.	102	273,05	215,90	157,23	38,10	25,40			146,05
5"	125	inch.	5	13,00	10,50	7,31	1,75	1,12	8	1"	6,50
		mm.	127	330,20	266,70	185,67	44,45	28,45			165,10
6"	150	inch.	6	14,00	11,50	8,50	1,88	1,12	12	1"	6,75
		mm.	152	355,60	292,10	215,90	47,75	28,45			171,45
8"	200	inch.	7 7/8	16,50	13,75	10,62	2,19	1,25	12	1 1/8"	7,75
		mm.	200	419,10	349,25	269,75	55,63	31,75			196,85
10"	250	inch.	9 3/4	20,00	17,00	12,75	2,50	1,38	16	1 1/4"	8,50
		mm.	248	508,00	431,80	323,85	63,50	35,05			215,90
12"	300	inch.	11 3/4	22,00	19,25	15,00	2,62	1,38	20	1 1/4"	8,75
		mm.	299	558,80	488,95	381,00	66,55	35,05			222,25
14"	350	inch.	12 7/8	23,75	20,75	16,25	2,75	1,50	20	1 3/8"	9,25
		mm.	327	603,25	527,05	412,75	69,85	38,10			234,95
16"	400	inch.	14 3/4	27,00	23,75	18,50	3,00	1,62	20	1 1/2"	10,00
		mm.	375	685,80	603,25	469,90	76,20	41,15			254,00
18"	450	inch.	16 1/2	29,25	25,75	21,00	3,25	1,75	20	1 5/8"	10,75
		mm.	419	742,95	654,05	533,40	82,55	44,45			273,05
20"	500	inch.	18 1/4	32,00	28,50	23,00	3,50	1,75	24	1 5/8"	11,50
		mm.	464	812,80	723,90	584,20	88,90	44,45			292,10
24"	600	inch.	22	37,00	33,00	27,25	4,00	2,00	24	1 7/8"	13,00
		mm.	559	939,80	838,20	692,15	101,60	50,80			330,20

Flanges ASME B 16.5 RF

Class 600 lbs | Class 900 lbs | Class 1500 lbs | Class 2500 lbs



Class 900 lbs

Nominal size			A	D	D1	D2	b	d	Bolt		L1
			Size of port valve	Flanges diameter	Holes circle diameter	Raised diameter	Flange thickness	Diameter of holes	Number of holes	Diameter of bolts	Length stud bolts
NPS	DN										
1/2"	15	inch.	1/2	4,75	3,25	1,38	0,88	0,88	4	3/4"	4,25
		mm.	13	120,65	82,55	35,05	22,35	22,35			107,95
3/4"	20	inch.	11/16	5,12	3,50	1,69	1,00	0,88	4	3/4"	4,50
		mm.	17,5	130,05	88,90	42,93	25,40	22,35			114,30
1"	25	inch.	7/8	5,88	4,00	2,00	1,12	1,00	4	7/8"	5,00
		mm.	22	149,35	101,60	50,80	28,45	25,40			127,00
1 1/4"	32	inch.	1 1/8	6,25	4,38	2,50	1,12	1,00	4	7/8"	5,00
		mm.	28,5	158,75	111,25	63,50	28,45	25,40			127,00
1 1/2"	40	inch.	1 3/8	7,00	4,88	2,88	1,25	1,12	4	1"	5,50
		mm.	35	177,80	123,95	73,15	31,75	28,45			139,70
2"	50	inch.	1 7/8	8,50	6,50	3,62	1,50	1,00	8	7/8"	5,75
		mm.	47,5	215,90	165,10	91,95	38,10	25,40			146,05
2 1/2"	65	inch.	2 1/4	9,62	7,50	4,12	1,62	1,12	8	1"	6,25
		mm.	57	244,35	190,50	104,65	41,15	28,45			158,75
3"	80	inch.	2 7/8	9,50	7,50	5,00	1,50	1,00	8	7/8"	5,75
		mm.	73	241,30	190,50	127,00	38,10	25,40			146,13
4"	100	inch.	3 7/8	11,50	9,25	6,19	1,75	1,25	8	1 1/8"	6,75
		mm.	99	292,10	234,95	157,23	44,45	31,75			171,45
5"	125	inch.	4 3/4	13,75	11,00	7,31	2,00	1,38	8	1 1/4"	7,50
		mm.	121	349,25	279,40	185,67	50,80	35,05			190,50
6"	150	inch.	5 3/4	15,00	12,50	8,50	2,19	1,25	12	1 1/8"	7,50
		mm.	146	381,00	317,50	215,90	55,63	31,75			190,50
8"	200	inch.	7 1/2	18,50	15,50	10,62	2,50	1,50	12	1 3/8"	8,75
		mm.	191	469,90	393,70	269,75	63,50	38,10			222,25
10"	250	inch.	9 3/8	21,50	18,50	12,75	2,75	1,50	16	1 3/8"	9,25
		mm.	238	546,10	469,90	323,85	69,85	38,10			234,95
12"	300	inch.	11 1/8	24,00	21,00	15,00	3,12	1,50	20	1 3/8"	10,00
		mm.	283	609,60	533,40	381,00	79,25	38,10			254,00
14"	350	inch.	12 1/4	25,25	22,00	16,25	3,38	1,62	20	1 1/2"	10,75
		mm.	311	641,35	558,80	412,75	85,85	41,15			273,05
16"	400	inch.	14	27,75	24,25	18,50	3,50	1,75	20	1 5/8"	11,25
		mm.	356	704,85	615,95	469,90	88,90	44,45			285,75
18"	450	inch.	15 3/4	31,00	27,00	21,00	4,00	2,00	20	1 7/8"	12,75
		mm.	400	787,40	685,80	533,40	101,60	50,80			323,85
20"	500	inch.	17 1/2	33,75	29,50	23,00	4,25	2,12	20	2"	13,75
		mm.	445	857,25	749,30	584,20	107,95	53,85			349,25
24"	600	inch.	21	41,00	35,50	27,25	5,50	2,62	20	2 1/2"	17,25
		mm.	534	1.041,40	901,70	692,15	139,70	66,55			438,15

Class 1500 lbs

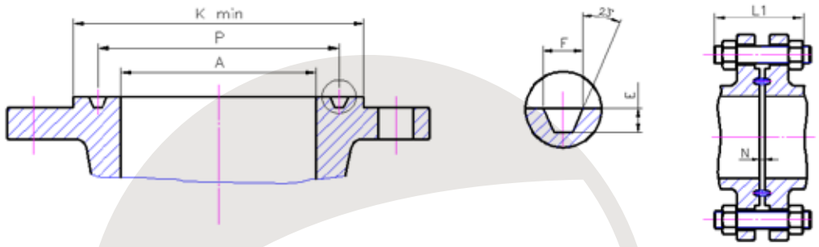
Nominal size			A	D	D1	D2	b	d	Bolt		L1
			Size of port valve	Flanges diameter	Holes circle diameter	Raised diameter	Flange thickness	Diameter of holes	Number of holes	Diameter of bolts	Length stud bolts
NPS	DN										
1/2"	15	inch.	1/2	4,75	3,25	1,38	0,88	0,88	4	3/4"	4,25
		mm.	13	120,65	82,55	35,05	22,35	22,35			107,95
3/4"	20	inch.	11/16	5,12	3,50	1,69	1,00	0,88	4	3/4"	4,50
		mm.	17,5	130,05	88,90	42,93	25,40	22,35			114,30
1"	25	inch.	7/8	5,88	4,00	2,00	1,12	1,00	4	7/8"	5,00
		mm.	22	149,35	101,60	50,80	28,45	25,40			127,00
1 1/4"	32	inch.	1 1/8	6,25	4,38	2,50	1,12	1,00	4	7/8"	5,00
		mm.	28,5	158,75	111,25	63,50	28,45	25,40			127,00
1 1/2"	40	inch.	1 3/8	7,00	4,88	2,88	1,25	1,12	4	1"	5,50
		mm.	35	177,80	123,95	73,15	31,75	28,45			139,70
2"	50	inch.	1 7/8	8,50	6,50	3,62	1,50	1,00	8	7/8"	5,75
		mm.	47,5	215,90	165,10	91,95	38,10	25,40			146,05
2 1/2"	65	inch.	2 1/4	9,62	7,50	4,12	1,62	1,12	8	1"	6,25
		mm.	57	244,35	190,50	104,65	41,15	28,45			158,75
3"	80	inch.	2 3/4	10,50	8,00	5,00	1,88	1,25	8	1 1/8"	7,00
		mm.	70	266,70	203,20	127,00	47,75	31,75			177,80
4"	100	inch.	3 5/8	12,25	9,50	6,19	2,12	1,38	8	1 1/4"	7,75
		mm.	92	311,15	241,30	157,23	53,85	35,05			196,85
5"	125	inch.	4 3/8	14,75	11,50	7,31	2,88	1,62	8	1 1/2"	9,75
		mm.	111	374,65	292,10	185,67	73,15	41,15			247,65
6"	150	inch.	5 3/8	15,50	12,50	8,50	3,25	1,50	12	1 3/8"	10,25
		mm.	137	397,70	317,50	215,90	82,55	38,10			260,35
8"	200	inch.	7	19,00	15,50	10,62	3,62	1,75	12	1 5/8"	11,50
		mm.	178	482,60	393,70	269,75	91,95	44,45			292,10
10"	250	inch.	8 3/4	23,00	19,00	12,75	4,25	2,00	12	1 7/8"	13,25
		mm.	222	584,20	482,60	323,85	107,95	50,80			336,55
12"	300	inch.	10 3/8	26,50	22,50	15,00	4,88	2,12	16	2"	14,75
		mm.	263	673,10	571,50	381,00	123,95	53,85			374,65
14"	350	inch.	11 3/8	29,50	25,00	16,25	5,25	2,38	16	2 1/4"	16,00
		mm.	289	749,30	635,00	412,75	133,35	60,45			406,40
16"	400	inch.	13	32,50	27,75	18,50	5,75	2,62	16	2 1/2"	17,50
		mm.	330	825,50	704,85	469,90	146,05	66,55			444,50
18"	450	inch.	14 5/8	36,00	30,50	21,00	6,38	2,88	16	2 3/4"	19,50
		mm.	371	914,40	774,70	533,40	162,05	73,15			495,30
20"	500	inch.	16 3/8	38,75	32,75	23,00	7,00	3,12	16	3"	21,50
		mm.	416	984,25	831,85	584,20	177,80	79,25			546,10
24"	600	inch.	19 5/8	46,00	39,00	27,25	8,00	3,62	16	3 1/2"	24,50
		mm.	499	1.168,40	990,60	692,15	203,20	91,95			622,30

Class 2500 lbs

Nominal size			A	D	D1	D2	b	d	Bolt		L1
			Size of port valve	Flanges diameter	Holes circle diameter	Raised diameter	Flange thickness	Diameter of holes	Number of holes	Diameter of bolts	Length stud bolts
NPS	DN										
1/2"	15	inch.	7/16	5,25	3,50	1,38	1,19	0,88	4	3/4"	5,25
		mm.	11	133,35	88,90	35,05	30,23	22,35			133,35
3/4"	20	inch.	9/16	5,50	3,75	1,69	1,25	0,88	4	3/4"	5,25
		mm.	14,5	139,70	95,25	42,93	31,75	22,35			133,35
1"	25	inch.	3/4	6,25	4,25	2,00	1,38	1,00	4	7/8"	5,75
		mm.	20	158,75	107,95	50,80	35,05	25,40			146,05
1 1/4"	32	inch.	1	7,25	5,12	2,50	1,50	1,12	4	1"	6,25
		mm.	25,5	184,15	130,05	63,50	38,10	28,45			158,75
1 1/2"	40	inch.	1 1/8	8,00	5,75	2,88	1,75	1,25	4	1 1/8"	7,00
		mm.	28,5	203,20	146,05	73,15	44,45	31,75			177,80
2"	50	inch.	1 1/2	9,25	6,75	3,62	2,00	1,12	8	1"	7,25
		mm.	38	234,95	171,45	91,95	50,80	28,45			184,15
2 1/2"	65	inch.	1 7/8	10,50	7,75	4,12	2,25	1,25	8	1 1/8"	8,00
		mm.	47,5	266,70	196,85	104,65	57,15	31,75			203,20
3"	80	inch.	2 1/4	12,00	9,00	5,00	2,62	1,38	8	1 1/4"	9,00
		mm.	57	304,80	228,60	127,00	66,55	35,05			228,60
4"	100	inch.	2 7/8	14,00	10,75	6,19	3,00	1,62	8	1 1/2"	10,25
		mm.	73	355,60	273,05	157,23	76,20	41,15			260,35
5"	125	inch.	3 5/8	16,50	12,75	7,31	3,62	1,88	8	1 3/4"	12,00
		mm.	92	419,10	323,85	185,67	91,95	47,75			304,80
6"	150	inch.	4 3/8	19,00	14,50	8,50	4,25	2,12	8	2"	13,75
		mm.	111	15,00	368,30	215,90	107,95	53,85			349,25
8"	200	inch.	5 3/4	21,75	17,25	10,62	5,00	2,12	12	2"	15,25
		mm.	146	552,45	438,15	269,75	127,00	53,85			387,35
10"	250	inch.	7 1/4	26,50	21,25	12,75	6,50	2,62	12	2 1/2"	19,50
		mm.	184	673,10	539,75	323,85	165,10	66,55			495,30
12"	300	inch.	8 5/8	30,00	24,38	15,00	7,25	2,88	12	2 3/4"	21,50
		mm.	219	762,00	619,25	381,00	184,15	73,15			546,10

Flanges ASME B 16.5 RTJ

Class 150 lbs | Class 300 lbs | Class 600 lbs
Class 900 lbs | Class 1500 lbs | Class 2500 lbs



Class 150 lbs

Nominal size			Ring number	A	K	P	E	F	R	N	L1
NPS	DN			Size of port valve	Raised diameter	Pitch diameter	Depth	Width	Radius at bottom	Distance between flanges	Length stud bolts
1"	25	inch.	R-15	1	2,50	1,88	0,25	0,34	0,03	0,16	3,00
		mm.		25	63,50	47,63	6,35	8,74	0,76	4,06	76,20
1 1/4"	32	inch.	R-17	1 1/4	2,88	2,25	0,25	0,34	0,03	0,16	3,25
		mm.		32	73,15	57,15	6,35	8,64	0,76	4,06	82,55
1 1/2"	40	inch.	R-19	1 1/2	3,25	2,56	0,25	0,34	0,03	0,16	3,25
		mm.		38	82,55	65,07	6,35	8,64	0,76	4,06	82,55
2"	50	inch.	R-22	2	4,00	3,25	0,25	0,34	0,03	0,16	3,75
		mm.		50	101,60	82,55	6,35	8,64	0,76	4,06	95,25
2 1/2"	65	inch.	R-25	2 1/2	4,75	4,00	0,25	0,34	0,03	0,16	4,00
		mm.		65	120,65	101,60	6,35	8,64	0,76	4,06	101,60
3"	80	inch.	R-29	3	5,25	4,50	0,25	0,34	0,03	0,16	4,00
		mm.		77	133,35	114,30	6,35	8,64	0,76	4,06	101,60
3 1/2"	90	inch.	R-33	3 1/2	6,06	5,19	0,25	0,34	0,03	0,16	4,00
		mm.		90	153,92	131,78	6,35	8,64	0,76	4,06	101,60
4"	100	inch.	R-36	4	6,75	5,88	0,25	0,34	0,03	0,16	4,00
		mm.		102	171,45	149,23	6,35	8,64	0,76	4,06	101,60
5"	125	inch.	R-40	5	7,62	6,75	0,25	0,34	0,03	0,16	4,25
		mm.		127	193,55	171,45	6,35	8,64	0,76	4,06	107,95
6"	150	inch.	R-43	6	8,62	7,63	0,25	0,34	0,03	0,16	4,50
		mm.		152	218,95	193,68	6,35	8,64	0,76	4,06	114,30
8"	200	inch.	R-48	8	10,75	9,75	0,25	0,34	0,03	0,16	4,75
		mm.		203	273,05	247,65	6,35	8,64	0,76	4,06	120,65
10"	250	inch.	R-52	10	13,00	12,00	0,25	0,34	0,03	0,16	5,00
		mm.		254	330,20	304,80	6,35	8,64	0,76	4,06	127,00
12"	300	inch.	R-56	12	16,00	15,00	0,25	0,34	0,03	0,16	5,25
		mm.		305	406,40	381,00	6,35	8,64	0,76	4,06	133,35
14"	350	inch.	R-59	13 1/4	16,75	15,63	0,25	0,34	0,03	0,12	5,75
		mm.		337	425,45	396,88	6,35	8,64	0,76	3,05	146,05
16"	400	inch.	R-64	15 1/4	19,00	17,88	0,25	0,34	0,03	0,12	5,75
		mm.		387	482,60	454,03	6,35	8,64	0,76	3,05	146,05
18"	450	inch.	R-68	17 1/4	21,50	20,38	0,25	0,34	0,03	0,12	6,25
		mm.		438	546,10	517,53	6,35	8,64	0,76	3,05	158,75
20"	500	inch.	R-72	19 1/4	23,50	22,00	0,25	0,34	0,03	0,12	6,75
		mm.		489	596,90	558,80	6,35	8,64	0,76	3,05	171,45
24"	600	inch.	R-76	23 1/4	28,00	26,50	0,25	0,34	0,03	0,12	7,25
		mm.		591	711,20	673,10	6,35	8,64	0,76	3,05	184,15

Class 300 lbs

Nominal size			Ring number	A	K	P	E	F	R	N	L1
NPS	DN			Size of port valve	Raised diameter	Pitch diameter	Depth	Width	Radius at bottom	Distance between flanges	Length stud bolts
1/2"	15	inch.	R-11	1/2	2,00	1,34	0,22	0,28	0,03	0,12	3,00
		mm.		13	50,80	34,14	5,56	7,14	0,76	3,05	76,20
3/4"	20	inch.	R-13	3/4	2,50	1,69	0,25	0,34	0,03	0,16	3,50
		mm.		20	63,50	42,88	6,35	8,74	0,76	4,06	88,90
1"	25	inch.	R-16	1	2,75	2,00	0,25	0,34	0,03	0,16	3,50
		mm.		25	69,85	50,80	6,35	8,74	0,76	4,06	88,90
1 1/4"	32	inch.	R-18	1 1/4	3,12	2,38	0,25	0,34	0,03	0,16	3,75
		mm.		32	79,25	60,33	6,35	8,64	0,76	4,06	95,25
1 1/2"	40	inch.	R-20	1 1/2	3,56	2,69	0,25	0,34	0,03	0,16	4,00
		mm.		38	90,42	68,28	6,35	8,64	0,76	4,06	101,60
2"	50	inch.	R-23	2	4,25	3,25	0,31	0,47	0,03	0,22	4,00
		mm.		50	107,95	82,55	7,92	11,91	0,76	5,59	101,60
2 1/2"	65	inch.	R-26	2 1/2	5,00	4,00	0,31	0,47	0,03	0,22	4,50
		mm.		65	127,00	101,60	7,92	11,94	0,76	5,59	114,30
3"	80	inch.	R-31	3	5,75	4,88	0,31	0,47	0,03	0,22	4,75
		mm.		77	146,05	123,83	7,87	11,94	0,76	5,59	120,65
3 1/2"	90	inch.	R-34	3 1/2	6,25	5,19	0,31	0,47	0,03	0,22	5,00
		mm.		90	158,75	131,78	7,87	11,94	0,76	5,59	127,00
4"	100	inch.	R-37	4	6,88	5,88	0,31	0,47	0,03	0,22	5,00
		mm.		102	174,75	149,23	7,87	11,94	0,76	5,59	127,00
5"	125	inch.	R-41	5	8,25	7,13	0,31	0,47	0,03	0,22	5,25
		mm.		127	209,55	180,98	7,87	11,94	0,76	5,59	133,35
6"	150	inch.	R-45	6	9,50	8,31	0,31	0,47	0,03	0,22	5,50
		mm.		152	241,30	211,12	7,87	11,94	0,76	5,59	139,70
8"	200	inch.	R-49	8	11,88	10,63	0,31	0,47	0,03	0,22	6,00
		mm.		203	301,75	269,88	7,87	11,94	0,76	5,59	152,40
10"	250	inch.	R-53	10	14,00	12,75	0,31	0,47	0,03	0,22	6,75
		mm.		254	355,60	323,85	7,87	11,94	0,76	5,59	171,45
12"	300	inch.	R-57	12	16,25	15,00	0,31	0,47	0,03	0,22	7,25
		mm.		305	412,75	381,00	7,87	11,94	0,76	5,59	184,15
14"	350	inch.	R-61	13 1/4	18,00	16,50	0,31	0,47	0,03	0,22	7,50
		mm.		387	457,20	419,10	7,87	11,94	0,76	5,59	190,50
16"	400	inch.	R-65	15 1/4	20,00	18,50	0,31	0,47	0,03	0,22	8,00
		mm.		432	508,00	469,90	7,87	11,94	0,76	5,59	203,20
18"	450	inch.	R-69	17	22,62	21,00	0,31	0,47	0,03	0,22	8,25
		mm.		432	574,55	533,40	7,87	11,94	0,76	5,59	209,55
20"	500	inch.	R-73	19	25,00	23,00	0,38	0,53	0,06	0,22	8,75
		mm.		483	635,00	584,20	9,53	13,49	1,52	5,59	222,25
24"	600	inch.	R-77	23	29,50	27,75	0,44	0,66	0,06	0,25	10,00
		mm.		584	749,30	704,85	11,13	16,66	1,52	6,35	254,00

Class 600 lbs

Nominal size			Ring number	A	K	P	E	F	R	N	L1
NPS	DN			Size of port valve	Raised diameter	Pitch diameter	Depth	Width	Radius at bottom	Distance between flanges	Length stud bolts
1/2"	15	inch.	R-11	1/2	2,00	1,34	0,22	0,28	0,03	0,12	3,00
		mm.		13	50,80	34,14	5,56	7,14	0,76	3,05	76,20
3/4"	20	inch.	R-13	3/4	2,50	1,69	0,25	0,34	0,03	0,16	3,50
		mm.		20	63,50	42,88	6,35	8,74	0,76	4,06	88,90
1"	25	inch.	R-16	1	2,75	2,00	0,25	0,34	0,03	0,16	3,50
		mm.		25	69,85	50,80	6,35	8,74	0,76	4,06	88,90
1 1/4"	32	inch.	R-18	1 1/4	3,12	2,38	0,25	0,34	0,03	0,16	3,75
		mm.		32	79,25	60,33	6,35	8,64	0,76	4,06	95,25
1 1/2"	40	inch.	R-20	1 1/2	3,56	2,69	0,25	0,34	0,03	0,16	4,25
		mm.		38	90,42	68,28	6,35	8,64	0,76	4,06	107,95
2"	50	inch.	R-23	2	4,25	3,25	0,31	0,47	0,03	0,19	4,25
		mm.		50	107,95	82,55	7,92	11,91	0,76	4,83	107,95
2 1/2"	65	inch.	R-26	2 1/2	5,00	4,00	0,31	0,47	0,03	0,19	4,75
		mm.		65	127,00	101,60	7,92	11,94	0,76	4,83	120,65
3"	80	inch.	R-31	3	5,75	4,88	0,31	0,47	0,03	0,19	5,00
		mm.		77	146,05	123,83	7,87	11,94	0,76	4,83	127,00
3 1/2"	90	inch.	R-34	3 1/2	6,25	5,19	0,31	0,47	0,03	0,19	5,75
		mm.		90	158,75	131,78	7,87	11,94	0,76	4,83	146,05
4"	100	inch.	R-37	4	6,88	5,88	0,31	0,47	0,03	0,19	5,75
		mm.		102	174,75	149,23	7,87	11,94	0,76	4,83	146,05
5"	125	inch.	R-41	5	8,25	7,13	0,31	0,47	0,03	0,19	6,50
		mm.		127	209,55	180,98	7,87	11,94	0,76	4,83	165,10
6"	150	inch.	R-45	6	9,50	8,31	0,31	0,47	0,03	0,19	6,75
		mm.		152	241,30	211,12	7,87	11,94	0,76	4,83	171,45
8"	200	inch.	R-49	7 7/8	11,88	10,63	0,31	0,47	0,03	0,19	7,75
		mm.		200	301,75	269,88	7,87	11,94	0,76	4,83	196,85
10"	250	inch.	R-53	9 3/4	14,00	12,75	0,31	0,47	0,03	0,19	8,50
		mm.		248	355,60	323,85	7,87	11,94	0,76	4,83	215,90
12"	300	inch.	R-57	11 3/4	16,25	15,00	0,31	0,47	0,03	0,19	8,75
		mm.		299	412,75	381,00	7,87	11,94	0,76	4,83	222,25
14"	350	inch.	R-61	12 7/8	18,00	16,50	0,31	0,47	0,03	0,19	9,25
		mm.		327	457,20	419,10	7,87	11,94	0,76	4,83	234,95
16"	400	inch.	R-65	14 3/4	20,00	18,50	0,31	0,47	0,03	0,19	10,00
		mm.		375	508,00	469,90	7,87	11,94	0,76	4,83	254,00
18"	450	inch.	R-69	16 1/2	22,62	21,00	0,31	0,47	0,03	0,19	10,75
		mm.		419	574,55	533,40	7,87	11,94	0,76	4,83	273,05
20"	500	inch.	R-73	18 1/4	25,00	23,00	0,38	0,53	0,06	0,19	11,50
		mm.		464	635,00	584,20	9,53	13,49	1,52	4,83	292,10
24"	600	inch.	R-77	22	29,50	27,75	0,44	0,66	0,06	0,22	13,25
		mm.		559	749,30	704,85	11,13	16,66	1,52	5,59	336,55

Technical datas

Class 900 lbs

Nominal size			Ring number	A	K	P	E	F	R	N	L1
NPS	DN			Size of port valve	Raised diameter	Pitch diameter	Depth	Width	Radius at bottom	Distance between flanges	Length stud bolts
3"	80	inch.	R-31	2 7/8	6,12	4,88	0,31	0,47	0,03	0,16	5,75
		mm.		73	155,45	123,83	7,87	11,91	0,76	4,06	146,05
4"	100	inch.	R-37	3 7/8	7,12	5,88	0,31	0,47	0,03	0,16	6,75
		mm.		99	180,85	149,23	7,87	11,94	0,76	4,06	171,45
5"	125	inch.	R-41	4 3/4	8,50	7,13	0,31	0,47	0,03	0,16	7,50
		mm.		121	215,90	180,98	7,87	11,94	0,76	4,06	190,50
6"	150	inch.	R-45	5 3/4	9,50	8,31	0,31	0,47	0,03	0,16	7,75
		mm.		146	241,30	211,12	7,87	11,94	0,76	4,06	196,85
8"	200	inch.	R-49	7 1/2	12,11	10,63	0,31	0,47	0,03	0,16	8,75
		mm.		191	307,64	269,88	7,87	11,94	0,76	4,06	222,25
10"	250	inch.	R-53	9 3/8	14,25	12,75	0,31	0,47	0,03	0,16	9,25
		mm.		238	361,95	323,85	7,87	11,94	0,76	4,06	234,95
12"	300	inch.	R-57	11 1/8	16,50	15,00	0,31	0,47	0,03	0,16	10,00
		mm.		283	419,10	381,00	7,87	11,94	0,76	4,06	254,00
14"	350	inch.	R-62	12 1/4	18,38	16,50	0,44	0,66	0,06	0,16	11,00
		mm.		311	466,85	419,10	11,13	16,66	1,52	4,06	279,40
16"	400	inch.	R-66	14	20,62	18,50	0,44	0,66	0,06	0,16	11,50
		mm.		356	523,75	469,90	11,18	16,66	1,52	4,06	292,10
18"	450	inch.	R-70	15 3/4	23,38	21,00	0,50	0,78	0,06	0,19	13,25
		mm.		400	593,85	533,40	12,70	19,84	1,52	4,83	336,55
20"	500	inch.	R-74	17 1/2	25,50	23,00	0,50	0,78	0,06	0,19	14,25
		mm.		445	647,70	584,20	12,70	19,84	1,52	4,83	361,95
24"	600	inch.	R-78	21	30,38	27,25	0,63	1,06	0,09	0,22	18,00
		mm.		534	771,65	692,15	15,88	26,97	2,29	5,59	457,20

Class 2500 lbs

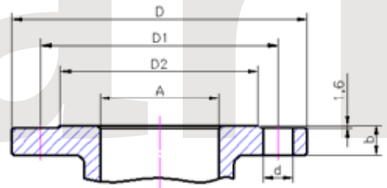
Nominal size			Ring number	A	K	P	E	F	R	N	L1
NPS	DN			Size of port valve	Raised diameter	Pitch diameter	Depth	Width	Radius at bottom	Distance between flanges	Length stud bolts
1/2"	15	inch.	R-11	7/16	2,56	1,69	0,25	0,34	0,03	0,16	5,25
		mm.		11	65,02	42,88	6,35	8,74	0,76	4,06	133,35
3/4"	20	inch.	R-13	9/16	2,88	2,00	0,25	0,34	0,03	0,16	5,25
		mm.		14,5	73,15	50,80	6,35	8,74	0,76	4,06	133,35
1"	25	inch.	R-16	3/4	3,25	2,38	0,25	0,34	0,03	0,16	5,50
		mm.		20	82,55	60,33	6,35	8,74	0,76	4,06	139,70
1 1/4"	32	inch.	R-18	1	4,00	2,84	0,31	0,47	0,03	0,12	6,00
		mm.		25,5	101,60	72,24	7,92	11,91	0,76	3,05	152,40
1 1/2"	40	inch.	R-20	1 1/8	4,50	3,25	0,31	0,47	0,03	0,12	6,75
		mm.		28,5	114,30	82,55	7,92	11,91	0,76	3,05	171,45
2"	50	inch.	R-23	1 1/2	5,25	4,00	0,31	0,47	0,03	0,12	7,00
		mm.		38	133,35	101,60	7,92	11,91	0,76	3,05	177,80
2 1/2"	65	inch.	R-26	1 7/8	5,88	4,38	0,38	0,53	0,06	0,12	8,00
		mm.		47,5	149,35	111,13	9,53	13,49	1,52	3,05	203,20
3"	80	inch.	R-31	2 1/4	6,62	5,00	0,38	0,53	0,06	0,12	9,00
		mm.		57	168,15	127,00	9,53	13,49	1,52	3,05	228,60
4"	100	inch.	R-37	2 7/8	8,00	6,19	0,44	0,66	0,06	0,16	10,25
		mm.		73	203,20	157,18	11,13	16,66	1,52	4,06	260,35
5"	125	inch.	R-41	3 5/8	9,50	7,50	0,50	0,78	0,06	0,16	12,25
		mm.		92	241,30	190,50	12,70	19,84	1,52	4,06	311,15
6"	150	inch.	R-45	4 3/8	11,00	9,00	0,50	0,78	0,06	0,16	14,00
		mm.		111	279,40	228,60	12,70	19,84	1,52	4,06	355,60
8"	200	inch.	R-49	5 3/4	13,38	11,00	0,56	0,91	0,06	0,19	15,50
		mm.		146	339,85	279,40	14,27	23,01	1,52	4,83	393,70
10"	250	inch.	R-53	7 1/4	16,75	13,50	0,69	1,19	0,09	0,25	20,00
		mm.		184	425,45	342,90	17,48	30,18	2,29	6,35	508,00
12"	300	inch.	R-57	8 5/8	19,50	16,00	0,69	1,31	0,09	0,31	22,00
		mm.		219	495,30	406,40	17,48	33,32	2,29	7,87	558,80

Class 1500 lbs

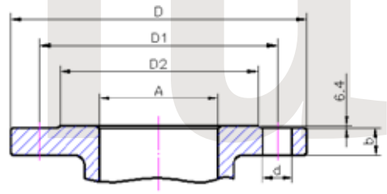
Nominal size			Ring number	A	K	P	E	F	R	N	L1
NPS	DN			Size of port valve	Raised diameter	Pitch diameter	Depth	Width	Radius at bottom	Distance between flanges	Length stud bolts
1/2"	15	inch.	R-11	1/2	2,38	1,56	0,25	0,34	0,03	0,16	4,25
		mm.		13	60,45	39,67	6,35	8,74	0,76	4,06	107,95
3/4"	20	inch.	R-13	11/16	2,62	1,75	0,25	0,34	0,03	0,16	4,50
		mm.		17,5	66,55	44,45	6,35	8,74	0,76	4,06	114,30
1"	25	inch.	R-16	7/8	2,81	2,00	0,25	0,34	0,03	0,16	5,00
		mm.		22	71,37	50,80	6,35	8,74	0,76	4,06	127,00
1 1/4"	32	inch.	R-18	1 1/8	3,19	2,38	0,25	0,34	0,03	0,16	5,00
		mm.		28,5	81,03	60,33	6,35	8,64	0,76	4,06	127,00
1 1/2"	40	inch.	R-20	1 3/8	3,62	2,69	0,25	0,34	0,03	0,16	5,50
		mm.		35	91,95	68,28	6,35	8,64	0,76	4,06	139,70
2"	50	inch.	R-23	1 7/8	4,88	3,75	0,31	0,47	0,03	0,12	5,75
		mm.		47,5	123,95	95,25	7,92	11,91	0,76	3,05	146,05
2 1/2"	65	inch.	R-26	2 1/4	5,38	4,25	0,31	0,47	0,03	0,12	6,25
		mm.		57	136,65	107,95	7,92	11,94	0,76	3,05	158,75
3"	80	inch.	R-31	2 3/4	6,62	5,38	0,31	0,47	0,03	0,12	7,00
		mm.		70	168,15	136,53	7,87	11,94	0,76	3,05	177,80
4"	100	inch.	R-37	3 5/8	7,62	6,38	0,31	0,47	0,03	0,12	7,75
		mm.		92	193,55	161,93	7,87	11,94	0,76	3,05	196,85
5"	125	inch.	R-41	4 3/8	9,00	7,63	0,31	0,47	0,03	0,12	9,75
		mm.		111	228,60	193,68	7,87	11,94	0,76	3,05	247,65
6"	150	inch.	R-45	5 3/8	9,75	8,31	0,38	0,53	0,06	0,12	10,50
		mm.		137	247,65	211,12	9,53	13,49	1,52	3,05	266,70
8"	200	inch.	R-49	7	12,50	10,63	0,44	0,66	0,06	0,16	12,75
		mm.		178	317,50	269,88	11,13	16,66	1,52	4,06	323,85
10"	250	inch.	R-53	8 3/4	14,62	12,75	0,44	0,66	0,06	0,16	13,50
		mm.		222	371,35	323,85	11,13	16,66	1,52	4,06	342,90
12"	300	inch.	R-57	10 3/8	17,25	15,00	0,56	0,91	0,06	0,19	15,25
		mm.		263	438,15	381,00	14,27	23,01	1,52	4,83	387,35
14"	350	inch.	R-61	11 3/8	19,25	16,50	0,63	1,06	0,09	0,22	16,75
		mm.		289	488,95	419,10	15,88	26,97	2,29	5,59	425,45
16"	400	inch.	R-65	13	21,50	18,50	0,69	1,19	0,09	0,31	18,50
		mm.		330	546,10	469,90	17,48	30,18	2,29	7,87	469,90
18"	450	inch.	R-69	14 5/8	24,12	21,00	0,69	1,19	0,09	0,31	20,75
		mm.		371	612,65	533,40	17,48	30,18	2,29	7,87	527,05
20"	500	inch.	R-73	16 3/8	26,50	23,00	0,69	1,31	0,09	0,38	22,25
		mm.		416	673,10	584,20	17,48	33,32	2,29	9,65	565,15
24"	600	inch.	R-77	19 5/8	31,25	27,25	0,81	1,44	0,09	0,44	25,50
		mm.		499	793,75	692,15	20,62	36,53	2,29	11,18	647,70

Flanges ASME B 16.47 Serie A

Class 150 lbs | Class 300 lbs | Class 600 lbs | Class 900 lbs



Class 150 & Class 300 RF Flanges



Class 600 & Class 900 RF Flanges

Class 150 lbs

Class	Nominal size			D	D1	D2	b	d	Bolt	
				Flanges diameter	Holes circle diameter	Raised diameter	Flange thickness	Diameter of holes	Number of holes	Diameter of bolts
	NPS	DN								
150	26"	650	inch.	34,25	31,75	29,50	2,69	1,38	24	1 1/4"
			mm.	869,95	806,5	749,30	68,33	35		
	28"	700	inch.	36,50	34,00	31,50	2,81	1,38	28	1 1/4"
			mm.	927,10	863,6	800,10	71,37	35		
	30"	750	inch.	38,75	36,00	33,75	2,94	1,38	28	1 1/4"
			mm.	984,25	914,4	857,25	74,68	35		
	32"	800	inch.	41,75	35,50	36,00	3,19	1,62	28	1 1/2"
			mm.	1.060,45	901,7	914,40	81,03	41		
	34"	850	inch.	43,75	40,50	38,00	3,25	1,62	32	1 1/2"
			mm.	1.111,25	1028,7	965,20	82,55	41		
	36"	900	inch.	46,00	42,75	40,25	3,56	1,62	32	1 1/2"
			mm.	1.168,40	1085,9	1.022,35	90,42	41		
	38"	950	inch.	48,75	45,25	42,25	3,44	1,62	32	1 1/2"
			mm.	1.238,25	1149,4	1.073,15	87,38	41		
	40"	1000	inch.	50,75	47,25	44,25	3,56	1,62	36	1 1/2"
			mm.	1.289,05	1200,2	1.123,95	90,42	41		
	42"	1050	inch.	53,00	49,50	47,00	3,81	1,62	36	1 1/2"
			mm.	1.346,20	1257,3	1.193,80	96,77	41		
	44"	1100	inch.	55,25	51,75	49,00	4,00	1,62	40	1 1/2"
			mm.	1.403,35	1314,5	1.244,60	101,60	41		
	46"	1150	inch.	57,25	53,75	51,00	4,06	1,62	40	1 1/2"
			mm.	1.454,15	1365,3	1.295,40	103,12	41		
	48"	1200	inch.	59,50	56,00	53,50	4,25	1,62	44	1 1/2"
			mm.	1.511,30	1422,4	1.358,90	107,95	41		
	50"	1250	inch.	61,75	58,25	55,50	4,38	1,88	44	1 3/4"
			mm.	1.568,45	1479,6	1.409,70	111,25	48		
	52"	1300	inch.	64,00	60,50	57,50	4,56	1,88	44	1 3/4"
			mm.	1.625,60	1536,7	1.460,50	115,82	48		
	54"	1350	inch.	66,25	62,75	59,50	4,75	1,88	44	1 3/4"
			mm.	1.682,75	1593,9	1.511,30	120,65	48		
	56"	1400	inch.	68,75	65,00	62,00	4,88	1,88	48	1 3/4"
			mm.	1.746,25	1651,0	1.574,80	123,95	48		
	58"	1450	inch.	71,00	67,25	64,00	5,06	1,88	48	1 3/4"
			mm.	1.803,40	1708,2	1.625,60	128,52	48		
	60"	1500	inch.	73,00	69,25	66,00	5,19	1,88	52	1 3/4"
			mm.	1.854,20	1759,0	1.676,40	131,83	48		

Class 300 lbs

Class	Nominal size			D	D1	D2	b	d	Bolt	
				Flanges diameter	Holes circle diameter	Raised diameter	Flange thickness	Diameter of holes	Number of holes	Diameter of bolts
	NPS	DN								
300	26"	650	inch.	38,25	34,50	29,50	3,12	1,75	28	1 5/8"
			mm.	971,55	876,3	749,30	79,25	44		
	28"	700	inch.	40,75	37,00	31,50	3,38	1,75	28	1 5/8"
			mm.	1.035,05	939,8	800,10	85,85	44		
	30"	750	inch.	43,00	39,25	33,75	3,62	1,88	28	1 3/4"
			mm.	1.092,20	997,0	857,25	91,95	48		
	32"	800	inch.	45,25	41,50	36,00	3,88	2,00	28	1 7/8"
			mm.	1.149,35	1.054,1	914,40	98,55	51		
	34"	850	inch.	47,50	43,50	38,00	4,00	2,00	28	1 7/8"
			mm.	1.206,50	1.104,9	965,20	101,60	51		
	36"	900	inch.	50,00	46,00	40,25	4,12	2,12	32	2"
			mm.	1.270,00	1.168,4	1.022,35	104,65	54		
	38"	950	inch.	46,00	43,00	40,50	4,25	1,62	32	1 1/2"
			mm.	1.168,40	1.092,2	1.028,70	107,95	41		
	40"	1000	inch.	48,75	45,50	42,75	4,50	1,75	32	1 5/8"
			mm.	1.238,25	1.155,7	1.085,85	114,30	44		
	42"	1050	inch.	50,75	47,50	44,75	4,69	1,75	32	1 5/8"
			mm.	1.289,05	1.206,5	1.136,65	119,13	44		
	44"	1100	inch.	53,25	49,75	47,00	4,88	1,88	32	1 3/4"
			mm.	1.352,55	1.263,7	1.193,80	123,95	48		
	46"	1150	inch.	55,75	52,00	49,00	5,06	2,00	28	1 7/8"
			mm.	1.416,05	1.320,8	1.244,60	128,52	51		
	48"	1200	inch.	57,75	54,00	51,25	5,25	2,00	32	1 7/8"
			mm.	1.466,85	1.371,6	1.301,75	133,35	51		
	50"	1250	inch.	60,25	56,25	53,50	5,50	2,12	32	2"
			mm.	1.530,35	1.428,8	1.358,90	139,70	54		
	52"	1300	inch.	62,25	58,25	55,50	5,69	2,12	32	2"
			mm.	1.581,15	1.479,6	1.409,70	144,53	54		
	54"	1350	inch.	62,25	61,00	57,75	6,00	2,38	28	2 1/4"
			mm.	1.581,15	1.549,4	1.466,85	152,40	60		
	56"	1400	inch.	67,25	63,00	59,75	6,06	2,38	28	2 1/4"
			mm.	1.708,15	1.600,2	1.517,65	153,92	60		
	58"	1450	inch.	69,25	65,00	62,00	6,25	2,38	32	2 1/4"
			mm.	1.758,95	1.651,0	1.574,80	158,75	60		
	60"	1500	inch.	71,25	67,00	64,00	6,44	2,38	32	2 1/4"
			mm.	1.809,75	1.701,8	1.625,60	163,58	60		

Class 600 lbs

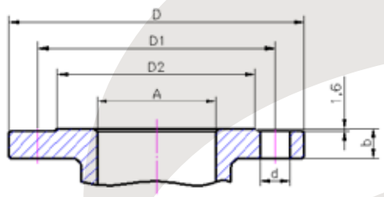
Class	Nominal size			D	D1	D2	b	d	Bolt	
				Flanges diameter	Holes circle diameter	Raised diameter	Flange thickness	Diameter of holes	Number of holes	Diameter of bolts
	NPS	DN								
600	26"	650	inch.	40,00	36,00	29,50	4,25	2,00	28	1 7/8"
			mm.	1.016,00	914,4	749,30	107,95	51		
	28"	700	inch.	42,25	38,00	31,50	4,38	2,12	28	2"
			mm.	1.073,15	965,2	800,10	111,25	54		
	30"	750	inch.	44,50	40,25	33,75	4,50	2,12	28	2"
			mm.	1.130,30	1.022,4	857,25	114,30	54		
	32"	800	inch.	47,00	42,50	36,00	4,62	2,12	28	2"
			mm.	1.193,80	1.079,5	914,40	117,35	54		
	34"	850	inch.	49,00	44,50	38,00	4,75	2,38	28	2 1/4"
			mm.	1.244,60	1.130,3	965,20	120,65	60		
	36"	900	inch.	51,75	47,00	40,25	4,88	2,62	28	2 1/2"
			mm.	1.314,45	1.193,8	1.022,35	123,95	67		
	38"	950	inch.	50,00	45,75	41,50	6,00	2,38	28	2 1/4"
			mm.	1.270,00	1.162,1	1.054,10	152,40	60		
	40"	1000	inch.	52,00	47,75	43,75	6,25	2,38	32	2 1/4"
			mm.	1.320,80	1.212,9	1.111,25	158,75	60		
	42"	1050	inch.	55,25	50,50	46,00	6,62	2,62	28	2 1/2"
			mm.	1.403,35	1.282,7	1.168,40	168,15	67		
	44"	1100	inch.	57,25	52,50	48,25	6,81	2,62	32	2 1/2"
			mm.	1.454,15	1.333,5	1.225,55	172,97	67		
	46"	1150	inch.	59,50	54,75	50,25	7,06	2,62	32	2 1/2"
			mm.	1.511,30	1.390,7	1.276,35	179,32	67		
	48"	1200	inch.	62,75	57,50	52,50	7,44	2,88	32	2 3/4"
			mm.	1.593,85	1.460,5	1.333,50	188,98	73		
	50"	1250	inch.	65,75	60,00	54,50	7,75	3,12	28	3"
			mm.	1.670,05	1.524,0	1.384,30	196,85	79		
	52"	1300	inch.	67,75	62,00	56,50	8,00	3,12	32	3"
			mm.	1.720,85	1.574,8	1.435,10	203,20	79		
	54"	1350	inch.	70,00	64,25	58,75	8,25	3,12	32	3"
			mm.	1.778,00	1.632,0	1.492,25	209,55	79		
	56"	1400	inch.	73,00	66,75	60,75	8,56	3,38	32	3 3/8"
			mm.	1.854,20	1.695,5	1.543,05	217,42	86		
	58"	1450	inch.	75,00	68,76	63,00	8,75	3,38	32	3 3/8"
			mm.	1.905,00	1.746,5	1.600,20	222,25	86		
	60"	1500	inch.	78,50	71,75	65,25	9,19	3,62	28	3 5/8"
			mm.	1.993,90	1.822,5	1.657,35	233,43	92		

Class 900 lbs

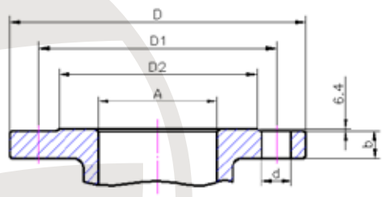
Class	Nominal size			D	D1	D2	b	d	Bolt	
				Flanges diameter	Holes circle diameter	Raised diameter	Flange thickness	Diameter of holes	Number of holes	Diameter of bolts
	NPS	DN								
900	26"	650	inch.	42,75	37,50	29,50	5,50	2,88	20	2 3/4"
			mm.	1.085,85	952,5	749,30	139,70	73		
	28"	700	inch.	46,00	40,25	31,50	5,62	3,12	20	3"
			mm.	1.168,40	1.022,4	800,10	142,75	79		
	30"	750	inch.	48,50	42,75	33,75	5,88	3,12	20	3"
			mm.	1.231,90	1.085,9	857,25	149,35	79		
	32"	800	inch.	51,75	45,50	36,00	6,25	3,38	20	3 3/8"
			mm.	1.314,45	1.155,7	914,40	158,75	86		
	34"	850	inch.	55,00	48,25	38,00	6,50	3,62	20	3 5/8"
			mm.	1.397,00	1.225,6	965,20	165,10	92		
	36"	900	inch.	57,50	50,75	40,25	6,75	3,62	20	3 5/8"
			mm.	1.460,50	1.289,1	1.022,35	171,45	92		

Flanges ASME B 16.47 Serie B

Class 150 lbs | Class 300 lbs | Class 600 lbs | Class 900 lbs



Class 150 & Class 300 RF Flanges



Class 600 & Class 900 RF Flanges

Class 150 lbs

Class	Nominal size			D	D1	D2	b	d	Bolt	
				Flanges diameter	Holes circle diameter	Raised diameter	Flange thickness	Diameter of holes	Number of holes	Diameter of bolts
	NPS	DN								
150	26"	650	inch.	30,94	29,31	28,00	1,62	0,88	36	3/4"
			mm.	785,88	744,5	711,20	41,15	22		
	28"	700	inch.	32,94	31,31	30,00	1,75	0,88	40	3/4"
			mm.	836,68	795,3	762,00	44,45	22		
	30"	750	inch.	34,94	33,31	32,00	1,75	0,88	44	3/4"
			mm.	887,48	846,1	812,80	44,45	22		
	32"	800	inch.	37,06	35,44	34,00	1,81	0,88	48	3/4"
			mm.	941,32	900,2	863,60	45,97	22		
	34"	850	inch.	39,56	37,69	36,25	1,94	1,00	40	7/8"
			mm.	1.004,82	957,3	920,75	49,28	25		
	36"	900	inch.	41,62	39,75	38,25	2,06	1,00	44	7/8"
			mm.	1.057,15	1.009,7	971,55	52,32	25		
	38"	950	inch.	44,25	42,12	40,25	2,12	1,12	40	1"
			mm.	1.123,95	1.069,8	1.022,35	53,85	28		
	40"	1000	inch.	46,25	44,12	42,25	2,19	1,12	44	1"
			mm.	1.174,75	1.120,6	1.073,15	55,63	28		
	42"	1050	inch.	48,25	46,12	44,50	2,31	1,12	48	1"
			mm.	1.225,55	1.171,4	1.130,30	58,67	28		
	44"	1100	inch.	50,25	48,12	46,50	2,38	1,12	52	1"
			mm.	1.276,35	1.222,2	1.181,10	60,45	28		
	46"	1150	inch.	52,81	50,56	48,62	2,44	1,25	40	1 1/8"
			mm.	1.341,37	1.284,2	1.234,95	61,98	32		
	48"	1200	inch.	54,81	52,56	50,75	2,56	1,25	44	1 1/8"
			mm.	1.392,17	1.335,0	1.289,05	65,02	32		
	50"	1250	inch.	56,81	54,56	52,75	2,69	1,25	48	1 1/8"
			mm.	1.442,97	1.385,8	1.339,85	68,33	32		
	52"	1300	inch.	58,81	56,56	54,75	2,75	1,25	52	1 1/8"
			mm.	1.493,77	1.436,6	1.390,65	69,85	32		
	54"	1350	inch.	61,00	58,75	56,75	2,81	1,25	56	1 1/8"
			mm.	1.549,40	1.492,3	1.441,45	71,37	32		
	56"	1400	inch.	63,00	60,75	58,75	2,88	1,25	60	1 1/8"
			mm.	1.600,20	1.543,1	1.492,25	73,15	32		
	58"	1450	inch.	65,94	63,44	60,75	2,94	1,38	48	1 1/4"
			mm.	1.674,88	1.611,4	1.543,05	74,68	35		
	60"	1500	inch.	67,94	65,44	63,00	3,00	1,38	52	1 1/4"
			mm.	1.725,68	1.662,2	1.600,20	76,20	35		

Class 300 lbs

Class	Nominal size			D	D1	D2	b	d	Bolt	
				Flanges diameter	Holes circle diameter	Raised diameter	Flange thickness	Diameter of holes	Number of holes	Diameter of bolts
	NPS	DN								
300	26"	650	inch.	34,12	31,62	29,00	3,50	1,38	32	1 1/4"
			mm.	866,65	803,1	736,60	88,90	35		
	28"	700	inch.	36,25	33,75	31,00	3,50	1,38	36	1 1/4"
			mm.	920,75	857,3	787,40	88,90	35		
	30"	750	inch.	39,00	36,25	33,25	3,69	1,50	36	1 3/8"
			mm.	990,60	920,8	844,55	93,73	38		
	32"	800	inch.	41,50	38,50	35,50	4,06	1,62	32	1 1/2"
			mm.	1.054,10	977,9	901,70	103,12	41		
	34"	850	inch.	43,62	40,62	37,50	4,06	1,62	36	1 1/2"
			mm.	1.107,95	1.031,7	952,50	103,12	41		
	36"	900	inch.	46,12	42,88	39,75	4,06	1,75	32	1 5/8"
			mm.	1.171,45	1.089,2	1.009,65	103,12	44		
	38"	950	inch.	48,12	44,88	41,75	4,38	1,75	36	1 5/8"
			mm.	1.222,25	1.140,0	1.060,45	111,25	44		
	40"	1000	inch.	50,12	46,88	43,88	4,56	1,75	40	1 5/8"
			mm.	1.273,05	1.190,8	1.114,55	115,82	44		
	42"	1050	inch.	52,50	49,00	46,00	4,69	1,88	36	1 3/4"
			mm.	1.333,50	1.244,6	1.168,40	119,13	48		
	44"	1100	inch.	54,50	51,00	48,00	5,00	1,88	40	1 3/4"
			mm.	1.384,30	1.295,4	1.219,20	127,00	48		
	46"	1150	inch.	57,50	53,75	50,00	5,06	2,00	36	1 7/8"
			mm.	1.460,50	1.365,3	1.270,00	128,52	51		
	48"	1200	inch.	59,50	55,75	52,25	5,06	2,00	40	1 7/8"
			mm.	1.511,30	1.416,1	1.327,15	128,52	51		
	50"	1250	inch.	61,50	57,75	54,25	5,44	2,00	44	1 7/8"
			mm.	1.562,10	1.466,9	1.377,95	138,18	51		
	52"	1300	inch.	63,50	59,75	56,25	5,62	2,00	48	1 7/8"
			mm.	1.612,90	1.517,7	1.428,75	142,75	51		
	54"	1350	inch.	65,88	62,12	58,25	5,38	2,00	48	1 7/8"
			mm.	1.673,35	1.577,8	1.479,55	136,65	51		
	56"	1400	inch.	69,50	65,00	60,50	6,06	2,38	36	2 1/4"
			mm.	1.765,30	1.651,0	1.536,70	153,92	60		
	58"	1450	inch.	71,94	67,44	62,75	6,06	2,38	40	2 1/4"
			mm.	1.827,28	1.713,0	1.593,85	153,92	60		
	60"	1500	inch.	73,94	69,44	65,00	5,94	2,38	40	2 1/4"
			mm.	1.878,08	1.763,8	1.651,00	150,88	60		

Class 600 lbs

Class	Nominal size			D	D1	D2	b	d	Bolt	
				Flanges diameter	Holes circle diameter	Raised diameter	Flange thickness	Diameter of holes	Number of holes	Diameter of bolts
	NPS	DN								
600	26"	650	inch.	35,00	31,75	28,62	4,38	1,75	28	1 5/8"
			mm.	889,00	806,5	726,95	111,25	44		
	28"	700	inch.	37,50	34,00	30,88	4,56	1,88	28	1 3/4"
			mm.	952,50	863,6	784,35	115,82	48		
	30"	750	inch.	40,25	36,50	33,12	4,94	2,00	28	1 7/8"
			mm.	1.022,35	927,1	841,25	125,48	51		
	32"	800	inch.	42,75	38,75	35,25	5,12	2,12	28	2"
			mm.	1.085,85	984,3	895,35	130,05	54		
	34"	850	inch.	45,75	41,50	37,50	5,56	2,38	24	2 1/4"
			mm.	1.162,05	1054,1	952,50	141,22	60		
	36"	900	inch.	47,75	43,50	39,75	5,75	2,38	28	2 1/4"
			mm.	1.212,85	1104,9	1.009,65	146,05	60		
	38"	950	inch.	50,00	45,75	41,50	6,00	2,38	28	2 1/4"
			mm.	1.270,00	1.162,1	1.054,10	152,40	60		
	40"	1000	inch.	52,00	47,75	43,75	6,25	2,38	32	2 1/4"
			mm.	1.320,80	1.212,9	1.111,25	158,75	60		
	42"	1050	inch.	55,25	50,50	46,00	6,62	2,62	28	2 1/2"
			mm.	1.403,35	1.282,7	1.168,40	168,15	67		
	44"	1100	inch.	57,25	52,50	48,25	6,81	2,62	32	2 1/2"
			mm.	1.454,15	1.333,5	1.225,55	172,97	67		
	46"	1150	inch.	59,50	54,75	50,25	7,06	2,62	32	2 1/2"
			mm.	1.511,30	1.390,7	1.276,35	179,32	67		
	48"	1200	inch.	62,75	57,50	52,50	7,44	2,88	32	2 3/4"
			mm.	1.593,85	1.460,5	1.333,50	188,98	73		
	50"	1250	inch.	65,75	60,00	54,50	7,75	3,12	28	3"
			mm.	1.670,05	1.524,0	1.384,30	196,85	79		
	52"	1300	inch.	67,75	62,00	56,50	8,00	3,12	32	3"
			mm.	1.720,85	1.574,8	1.435,10	203,20	79		
	54"	1350	inch.	70,00	64,25	58,75	8,25	3,12	32	3"
			mm.	1.778,00	1.632,0	1.492,25	209,55	79		
	56"	1400	inch.	73,00	66,75	60,75	8,56	3,38	32	3 3/8"
			mm.	1.854,20	1.695,5	1.543,05	217,42	86		
	58"	1450	inch.	75,00	68,76	63,00	8,75	3,38	32	3 3/8"
			mm.	1.905,00	1.746,5	1.600,20	222,25	86		
	60"	1500	inch.	78,50	71,75	65,25	9,19	3,62	28	3 5/8"
			mm.	1.993,90	1.822,5	1.657,35	233,43	92		

Class 900 lbs

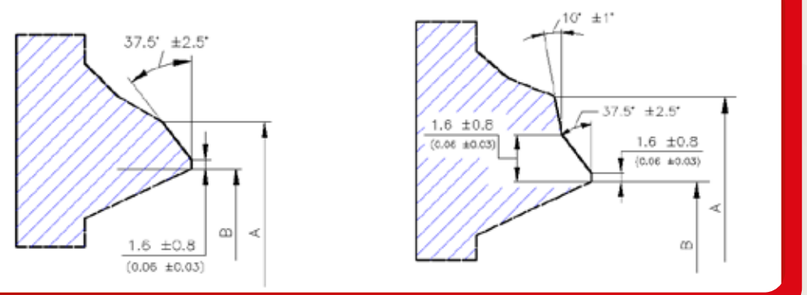
Class	Nominal size			D	D1	D2	b	d	Bolt	
				Flanges diameter	Holes circle diameter	Raised diameter	Flange thickness	Diameter of holes	Number of holes	Diameter of bolts
	NPS	DN								
900	26"	650	inch.	40,25	35,50	30,00	5,31	2,62	20	2 1/2"
			mm.	1.022,35	901,7	762,00	134,87	67		
	28"	700	inch.	43,50	38,25	32,25	5,81	2,88	20	2 3/4"
			mm.	1.104,90	971,6	819,15	147,57	73		
	30"	750	inch.	46,50	40,75	34,50	6,12	3,12	20	3"
			mm.	1.181,10	1035,1	876,30	155,45	79		
	32"	800	inch.	48,75	43,00	36,50	6,31	3,12	20	3"
			mm.	1.238,25	1092,2	927,10	160,27	79		
	34"	850	inch.	51,75	45,50	39,00	6,75	3,38	20	3 3/8"
			mm.	1.314,45	1155,7	990,60	171,45	85		
	36"	900	inch.	53,00	47,25	40,50	6,81	3,12	24	3"
			mm.	1.346,20	1200,2	1.028,70	172,97	79		

BUTT-WELDING ENDS ACC/ASME B16.25

Nominal size		Schedule number	Outside Diameter				Nominal inside diameter		Machined inside diameter		Nominal wall thickness	
			A Wrought or fabricated components		A Cast steel valves		B		C		T	
NPS	DN		inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
2 1/2	65	40	2,88	73	2,96	75	2,469	62,5	2,479	62,93	0,203	5,16
		80					2,323	59	2,351	59,69	0,276	7,01
		160					2,125	54	2,178	55,28	0,375	9,53
		XXS					1,771	45	1,868	47,43	0,552	14,02
3	80	40	3,50	88	3,59	91	3,068	78	3,081	78,25	0,216	5,49
		80					2,900	73,5	2,934	74,53	0,300	7,62
		160					2,624	66,5	2,692	68,38	0,438	11,13
		XXS					2,300	58,5	2,409	61,19	0,600	15,24
4	100	40	4,50	114,3	4,62	117	4,026	102	4,044	102,73	0,237	6,02
		80					3,826	97	3,869	98,28	0,337	8,56
		120					3,624	92	3,692	93,78	0,438	11,13
		160					3,438	87,5	3,530	89,65	0,531	13,49
		XXS					3,152	80	3,279	83,3	0,674	17,12
5	125	40	5,56	141,3	5,69	144	5,047	128	5,070	128,8	0,258	6,55
		80					4,813	122	4,866	123,58	0,375	9,53
		120					4,563	116	4,647	118,04	0,500	12,7
		160					4,313	109,5	4,428	112,47	0,625	15,88
		XXS					4,063	103	4,209	106,92	0,750	19,05
6	150	40	6,62	168,3	6,78	172	6,065	154	6,094	154,82	0,280	7,11
		80					5,761	146,5	5,828	148,06	0,432	10,97
		120					5,501	140	5,600	142,29	0,562	14,27
		160					5,187	132	5,326	135,31	0,719	18,26
		XXS					4,897	124,5	5,072	128,85	0,864	21,95
8	200	40	8,62	219,1	8,78	223	7,981	203	8,020	203,75	0,322	8,18
		60					7,813	198,5	7,873	200,02	0,406	10,31
		80					7,625	193,5	7,709	195,84	0,500	12,7
		100					7,437	189	7,544	191,65	0,594	15,09
		120					7,187	182,5	7,326	186,11	0,719	18,26
		140					7,001	178	7,163	181,98	0,812	20,62
		XXS					6,875	174,5	7,053	179,16	0,875	22,23
		160					6,813	173	6,998	177,79	0,906	23,01
10	250	40	10,75	273	10,94	278	10,020	254,5	10,070	255,74	0,365	9,27
		60					9,750	247,5	9,834	249,74	0,500	12,7
		80					9,562	243	9,670	245,55	0,594	15,09
		100					9,312	236,5	9,451	240,01	0,719	18,26
		120					9,062	230	9,232	234,44	0,844	21,44
		140					8,750	222	8,959	227,51	1,000	25,4
		160					8,500	216	8,740	221,95	1,125	28,58
12	300	STD	12,75	323,8	12,97	329	12,000	305	12,053	306,08	0,375	9,53
		40					11,938	303	11,999	304,72	0,406	10,31
		XS					11,750	298,5	11,834	300,54	0,500	12,7
		60					11,626	295	11,725	297,79	0,562	14,27
		80					11,374	289	11,505	292,17	0,688	17,48
		100					11,062	281	11,232	285,24	0,844	21,44
		120					10,750	273	10,959	278,31	1,000	25,4
		140					10,500	266,5	10,740	272,75	1,125	28,58
		160					10,126	257	10,413	264,45	1,312	33,32
14	350	STD	14,00	355,6	14,25	362	13,250	336,5	13,303	337,88	0,375	9,53
		40					13,124	333,5	13,192	335,08	0,438	11,13
		XS					13,000	330	13,084	332,34	0,500	12,7
		60					12,812	325,5	12,920	328,15	0,594	15,09
		80					12,500	317,5	12,646	321,22	0,750	19,05
		100					12,124	308	12,318	312,86	0,938	23,83
		120					11,812	300	12,044	305,93	1,094	27,79
		140					11,500	292	11,771	299	1,250	31,75
		160					11,188	284	11,498	292,07	1,406	35,71
16	400	STD	16,00	406,4	16,25	413	15,250	387,5	15,303	388,68	0,375	9,53
		40					15,000	381	15,084	383,14	0,500	12,7
		60					14,688	373	14,811	376,21	0,656	16,66
		80					14,312	363,5	14,482	367,84	0,844	21,44
		100					13,938	354	14,155	359,53	1,031	26,19
		120					13,562	344,5	13,826	351,18	1,219	30,96
		140					13,124	333,5	13,442	341,43	1,438	36,53
		160					12,812	325,5	13,170	334,5	1,594	40,49
18	450	STD	18,00	457,2	18,28	464	17,250	438	17,303	439,48	0,375	9,53
		XS					17,000	432	17,084	433,94	0,500	12,7
		40					16,876	428,5	16,975	431,19	0,562	14,27
		60					16,500	419	16,646	422,82	0,750	19,05
		80					16,124	409,5	16,318	414,46	0,938	23,83
		100					15,688	398,5	15,936	404,78	1,156	29,36
		120					15,250	387,5	16,553	395,03	1,375	34,93
		140					14,876	378	15,225	386,77	1,562	39,67
		160					14,438	366,5	14,842	376,99	1,781	45,24
20	500	STD	20,00	508	20,31	516	19,250	489	19,303	490,28	0,375	9,53
		XS					19,000	482,5	19,084	484,74	0,500	12,7
		40					18,812	478	18,920	480,55	0,594	15,09
		60					18,376	467	18,538	470,88	0,812	20,62
		80					17,938	455,5	18,155	461,13	1,031	26,19
		100					17,438	443	17,717	450,02	1,281	32,54
		120					17,000	432	17,334	440,29	1,500	38,1
		140					16,500	419	16,896	429,17	1,750	44,45
		160					16,062	408	16,513	419,44	1,969	50,01
22	550	STD	22,00	558,8	22,34	567	21,250	539	21,303	541,08	0,375	9,53
		XS					21,000	533	21,084	535,54	0,500	12,7
		60					20,250	514	20,428	518,86	0,875	22,23
		80					19,750	501	19,990	507,75	1,125	28,58
		100					19,250	488,5	19,553	496,63	1,375	34,93
		120					18,750	476	19,115	485,52	1,625	41,28
		140					18,250	463	18,678	474,41	1,875	47,63
		160					17,750	450,5	18,240	463,3	2,125	53,98
24	600	STD	24,00	609,6	24,38	619	23,250	590,5	23,303	591,88	0,375	9,53
		XS					23,000	584	23,084	586,34	0,500	12,7
		30					22,876	581	22,975	583,59	0,562	14,27
		40					22,624	574,5	22,755	577,97	0,688	17,48
		60					22,062	560,5	22,263	565,49	0,969	24,61
		80					21,562	547,5	21,826	554,38	1,219	30,96
		100					20,938	532	21,280	540,49	1,531	38,89
		120					20,376	517,5	20,788	528,03	1,812	46,02
		140					19,876	505	20,350	516,91	2,062	52,37
		160					19,312	490,5	19,857	504,37	2,344	59,54

BUTT-WELDING ENDS ACC/ASME B16.25

BUTT-WELDING ENDS ACC/ASME B16.25



TECHNICAL HELP

FORGED STEEL STANDARDS COMPARISON

ASTM	UNS/AISI	DIN	AFNOR	BS	JIS
A105	AISI 1020	C22 1.0402	A48 – XC18S	1503-221-490 (En 3A)	SF50 (SC30)-(S28C)
A182-F1	K12822	15 Mo 3 1.5415	–	1503-240-420	SFHV 12 B – G 3213
A182-F5	K41545	12 CrMo 19.5 1.7733	Z 12 CD.5	1503-625-520	SFHV 25 -G 3213
A182-F11	K11572	24 CrMoV-55 1.7733	15 CD 5.05	1506-661-440	SFHV 23 B -G 3213
A182-F22	K21590	10 CrMo9.10 1.7380	12 CD 9.10	1503-622-490	SFHV 24 B -G3213
A182-F304	S30400	X5 CrNi 18.9 1.4301	Z6 CN 18.09	1503-304-S15	SUS 304 -G 4303
A182-F304H	S30409	X5 CrNi 18.9 1.4301	Z6 CN 18.09	1503-304-S49	SUS 304H -G 4303
A182-F304L	S30403	X2 CrNi 18.9 1.4306	Z2 CN 18.10	1503-304-S12	SUS 304L – G 4303
A182-F316	S31600	X5 CrNiMo 18.9 1.4401	Z6 CND 17.11	1503-316-S16	SUS 316 -G 4303
A182-F316H	S31609	X5 CrNiMo 18.12	–	1503-316-S49	SUS 316H -G 4303
A182-F316L	S31603	X2 CrNiMo 18.10 1.4404	Z2 CND 17.12	1503-316-S12	SUS 316L -G 4303
A182-F321	S32100	X10 CrNiTi 18.9 1.4541	Z6 CNT 18.10	1503-321-S31	SUS 321
A182-F347	S34700	X10 CrNiNb 18.9 1.4550	Z6 CN Nb 18.10	1503-347-S17	SUS 347
A193-B6 (A276 – Type 410)	AISI 410 S41000	X10 Cr 13 1.4006	Z10 C 13	410-S21	SUS 410 -G 4303
A193-B7	AISI 4140	42 CrMo 4 1.7225	42 CD 4	1506-621-A	SNB 7 – G 4107 (SMC 4)
A193-B8	AISI 304	X5 CrNi 18.9 1.4301	Z6 CN 18.09	1506-801-B	SUS 304 -G 4303
A193-B8M	AISI 316	X5 CrNiMo 18.10 1.4401	Z6 CND 17.11	1506-845	SUS 316 -G 4303
A193-B16	–	24 CrMoV55 1.7733	38 CDV 4.05	1506-661	SNB 16 G4107
A194-2H	–	C45 1.0503	A60/CC45	1506-162	S45C – G4051
A194-Gr. 4	–	24 CrMo 5 1.7258	40 D2	1506-240	–
A194-Gr. 8	AISI 304	X5 CrNi 18.9 1.4301	Z6 CN 18.09	1506-801-B	SUS 304 – G 4303
A194-Gr. 8M	AISI 316	X5 CrNiMo 18.10 1.4401	Z6 CND 17.11	1506-845	SUS 316 – G 4303
A276-Type 420	AISI 420 S42000	X30 Cr 13 1.4028	Z30 C13	420-S45	SUS 420 J2
A320-L7	AISI 4140	42 CrMo 4 1.7225	42 CD 4	1506-621-A	SCM3 – G4105
A350-LF2	–	TT St E 36 1.0508	A48 FP1 (A 36-208)	1503-223-410 (32A LT50)	–
A276-Type 420	AISI 303 S30300	X10 CrNiS 18.9 1.4305	Z10 CNF 18.09	303-S21	SUS 303
Type 416	AISI 416 S41600	X12 CrS 13 1.4005	Z12 CF13	416-S21	SUS 416

CAST IRON

CHEMICAL REQUIREMTS (%)

	Carbon	Manga-nese	Phos-phorus	Sulfur	Silicon	Nickel	Chro-mium	Copper	Alloying Ele-ments
HI-STRENGTH CAST IRON									
Min.	....	....	....	....	....	....	....	....	....
Max	....	....	0.75	0.15	....	....	....	....	....
3% NICKEL IRON									
Min.	....	....	....	....	....	2.75	....	....	....
Max	....	....	0.40	0.12	....	3.25	....	....	....
AUSTENITIC GRAY IRON. (Ni-Resist)									
Min.	....	0.50	....	....	1.00	18.0	1.5	....	ASTM
Max	3.0	1.50	....	0.12	2.80	22.0	2.5	0.50	A126, Clase B

MECHANICAL PROPERTIES

Tensile Strength				Transverse Test Load		Transverse Test Deflection at Center	
Ksi	Mpa			lbs	kN	in	mm.
UNS F12102				ASTM A126, Clase B			
31	214			3300	14.65	0.12	3.0
....	....			....	....	....	....
31	214			3300	14.65	0.12	3.0
....	....			....	....	....	....
					ASTM A436, Type 2		
25	172			....	....	....	....
....	....			....	....	....	....

CAST DUCTILE IRONS AND MALLEABLE IRONS

CHEMICAL REQUIREMTS (%)

	Carbon	Manga-nese	Phos-phorus	Silicon	Nickel	Chro-mium
FERRITIC DUCTILE IRON						
Min.	3.0	....	....	....	....	....
Max	....	....	0.08	2.50	....	....
DUCTILE IRON *						
Min.	....	....	....	....	....	....
Max	....	....	....	....	....	....
AUSTENITIC NODULAR IRON *						
Min.	....	0.70	....	1.5	18.0	1.75
Max	3.0	1.25	0.8	3.0	22.0	2.75
FERRITIC MALLEABLE IRON *						
Min.	....	....	....	....	....	....
Max	....	....	....	....	....	....
MALLEABLE IRON *						
Min.	....	....	....	....	....	....
Max	....	....	....	....	....	....

MECHANICAL PROPERTIES

Tensile Strength		Yield Strenght		Elongation in 2" (50 mm)
Ksi	Mpa	Ksi	Mpa	
UNS F32800				ASTM A395
60	414	40	276	18%
....	....	....	....	....
UNS F33100				ASTM A536, Grade 65-45-12
65	448	45	310	12%
....	....	....	....	....
UNS F43000				ASTM A439, Type D-2
58	400	30	207	8%
....	....	....	....	....
UNS F22200				(ASTM A47, Grade 32510
50	345	32.5	224	10%
....	....	....	....	....
				ASTM A197
40	276	30	207	5%
....	....	....	....	....

* Chemical requirements are subordinate to the mechanical properties.

FERRITIC STEELS

CHEMICAL REQUIREMTS (%)

	Carbon	Manga-nese	Phos-phorus	Sulfur	Silicon	Nickel	Chro-mium	Molyb-denum
CAST CARBON STEEL								
Min.	....	....	....	....	....	....	....	....
Max	0.30	1.00	0.040	0.045	0.60	0.50	0.50	0.20
FORGED CARBON STEEL								
Min.	....	0.60	....	....	....	....	....	....
Max	0.35	1.05	0.040	0.05	0.35	0.40	0.30	0.12
CAST CARBON STEEL FOR LOW TEMPERATURES								
Min.	....	....	....	....	....	....	....	....
Max	0.30	1.00	0.040	0.045	0.60	0.50	0.50	0.20
CAST 2 1/2% NICKEL STEEL FOR LOW TEMPERATURES								
Min.	....	0.50	....	....	....	2.0	....	....
Max	0.25	0.80	0.040	0.045	0.60	3.0	....	....
CAST 3 1/2% NICKEL STEEL FOR LOW TEMPERATURES								
Min.	....	0.50	....	....	....	3.0	....	....
Max	0.15	0.80	0.040	0.045	0.60	4.0	....	....
CAST 1 1/4% CR-1/2% MO ALLOY STEEL								
Min.	0.05	0.50	....	....	....	....	1.00	0.45
Max	0.20	0.80	0.040	0.045	0.60	0.60	1.50	0.65
FORGED/ROLLED 1 1/4% CR-1/2% MO ALLOY STEEL								
Min.	0.10	0.30	....	....	0.50	....	1.00	0.44
Max	0.20	0.80	0.040	0.040	1.00	....	1.50	0.65
CAST 2 1/4% CR-1% MO ALLOY STEEL								
Min.	....	0.40	....	....	....	....	2.00	0.90
Max	0.18	0.70	0.040	0.045	0.60	0.50	2.75	1.20
FORGED /ROLLED 2 1/4% CR-1% MO ALLOY STEEL								
Min.	....	0.30	....	....	....	....	2.00	0.87
Max	0.15	0.60	0.040	0.040	0.50	....	2.50	1.13
CAST 4-6% CR ALLOY STEEL								
Min.	....	0.40	....	....	....	....	4.00	0.45
Max	0.20	0.70	0.040	0.045	0.75	0.50	6.50	0.65
FORGED /ROLLED 4-6% CR ALLOY STEEL								
Min.	....	....	....	....	....	....	4.00	0.44
Max	0.25	0.60	0.040	0.030	0.50	0.50	6.00	0.65
CAST 12-14% CR STAINLESS STEEL								
Min.	....	....	....	....	....	....	11.5	....
Max	0.15	1.00	0.040	0.040	1.50	1.00	14.0	0.50
FORGE/ROLLED 12-14% CR STAINLESS STEEL								
Min.	....	....	....	....	....	....	11.5	....
Max	0.12	1.00	0.040	0.030	1.00	0.50	14.0	....
FEE-MACHINING 12-14% STAINLESS STEEEL BARS								
Min.	....	....	....	0.15	....	....	12.0	....
Max	0.15	1.25	0.06	....	1.00	....	14.0	
RESULFURIZED STEEL BARS								
Min.	0.14	1.00	....	0.08	....	....	....	....
Max	0.20	3.00	0.04	0.13	....	....	....	....

MECHANICAL PROPERTIES

Tensile Strength		Yield Strenght		Elongation in 2" (5 0 mm)
Ksi	Mpa	lbs	kN	
UNS J03002		ASTM A216, Grade WCB		
70	485 655	36	250	22%
95		,	,	....
UNS K03504		ASTM A105		
70	485	36	250	22%
....		,	,	....
UNS J03003		ASTM A352, Grade LCB*		
65	450 620	35	240	24%
90		,	,	....
UNS J22500		ASTM A352, Grade LC2*		
70	485 655	40	275	24%
95		,	,	....
UNS J31550		ASTM A352, Grade LC3*		
70	485 655	40	275	24%
95		,	,	....
UNS J12072		ASTM A217, Grade WC6		
70	485	40	275	20%
....	....	,	,	....
UNS K11572		ASTM A182, Grade F11		
70	485	40	275	20%
....	....	,	,	....
UNS K21890		ASTM A217, Grade WC9		
70	485 655	40	276	20%
95		,	,	....
UNS K21590		ASTM A182, Grade F22		
75	515	45	310	20%
....		,	,	....
UNS J42045		ASTM A217, Grade C5		
90	620	60	415	18%
115	795	,	,	....
UNS K42544		ASTM A182, Grade F5a		
90	620	65	450	22%
....		,	,	....
UNS J91150		ASTM A217, Grade CA15		
90	620	65	450	18%
115	795	,	,	....
		ASTM A182, Grade F6a, Class 3		
110	760	85	585	15%
....	....	,	,	....
UNS S41600		ASTM A582, Type 416		
75†	515†	40†	275†	30% †
110‡	760‡	85‡	585‡	18 % ‡
UNS G11170		AISI Type C1117		
....	(121 BHN)	....	....	23%
....			....	....

* Usual minimum service temperatura:LCB at -50F (-45,6C). LC2 at -100 f (-73.3 C). LC3 at -150 F (-101.1C)
† Annealed representive mechancal properties.
‡ Temperaed representive mechanical properties.

COPPER ALLOYS

	Cooper	Tin	Lead	Iron	Nickel	Manga-nese	Alum-inum	Zinc	Silicon	Other	Tensile Strength Ksi	Tensile Strength Mpa	Yield Strenght Ksi	Yield Strenght Mpa	Elongation in 2" (50 mm)
STEM OR VALVE BRONZE CASTINGS								**UNS C92200**					**ASTM B61, Alloy 922**		
Min.	86.0	5.5	1.0	,,,,	,,,,	,,,,	,,,,	3.0	,,,,	,,,,	34	235	16	110	24%
Max	90.0	6.5	2.0	0.25	1.0	,,,,	0.005	5.0	0.005	0.05*	,,,,	,,,	,,,,	,,,,	,,,,
COMPSOTION BRONZE CASTINGS								**UNS C83600**					**ASTM B62, Alloy 836**		
Min.	84.0	4.0	4.0	,,,,	,,,,	,,,,	,,,,	4.0	,,,,	,,,,	30	205	14	95	20%
Max	86.0	6.0	6.0	0.30	1.0	,,,,	0.005	6.0	0.005	0.05*	,,,,	,,,	,,,,	,,,,	,,,,
COMPOSTION CAST BRONZE ROD															
Min.	82.20	4.0	4.0	,,,,	,,,,	,,,,	,,,,	4.0	,,,,	,,,,	50	,,,,	25	,,,,	14%
Max	83.50	6.0	6.0	0.30	1.0	,,,,	,,,,	6.0	,,,,	1.5		,,,,		,,,,	
SEMI-RED BRASS CASTINGS								**UNS C84800**					**ASTM B584, Alloy 848**		
Min.	75.0	2.0	5.5	,,,,	,,,,	,,,,	,,,,	13.0	,,,,	,,,,	28	193	12	83	16%
Max	77.0	3.0	7.0	0.40	1.0	,,,,	0.005	17.0	0.005	0.80**	,,,,	,,,,	,,,,	,,,,	,,,,
SILICON BRONZE CASTINGS								**UNS C87600**					**ASTM B584, Alloy 876**		
Min.	88.0	,,,,	,,,,	,,,,	,,,,	,,,,	,,,,	4.0	3.5	,,,,	60	414	30	207	16%
Max	....	,,,,	0.50	,,,,	,,,,	,,,,	,,,,	7.0	5.5	0.50**	,,,,	,,,,	,,,,	,,,,	,,,,
LEADED MANGANESES BRONZE CATINGS								**UNS C86400**					**ASTM B584, Alloy 864**		
Min.	56.0	0.5	0.5	0.4	,,,,	0.1	0.5	32.0	,,,,	,,,,	60	414	20	138	15%
Max	62.0	1.5	1.5	2.0	1.0	1.0	1.5	427.0	,,,,	1.0**	,,,,	,,,,	,,,,	,,,,	,,,,
ALUMINUM BRONZE CASTINGS								**UNS C95400**					**ASTM B148, Alloy 954**		
Min.	Balance	,,,,	,,,,	3.0	,,,,	,,,,	10.0	,,,,	,,,,	,,,,	75	515	30	205	12%
Max		,,,,	,,,,	5.0	1.5	0.5	11.5	,,,,	,,,,	,,,,	,,,,	,,,,	,,,,	,,,,	,,,,
NAVAL BRASS ROD/BAR								**UNS C48200**					**ASTM B21, Alloy 482, Hard Temper**		
Min.	59.0	0.5	0.4	,,,,	,,,,	,,,,	,,,,	Balance	,,,,	,,,,	‡	‡	‡	‡	‡
Max	62.0	1.0	1.0	0.15	,,,,	,,,,	,,,,		,,,,	1.0**	.....	.....	.....	.....	.....
NAVAL BRASS ROD/BAR								**UNS C46400**					**ASTM B21, Alloy 464**		
Min.	59.0	0.5	....	,,,,	,,,,	,,,,	,,,,	Balance	,,,,	,,,,	‡	‡	‡	‡	‡
Max	62.0	1.0	0.20	0.15	,,,,	,,,,	,,,,		,,,,	1.0**	.....	.....	.....	.....	.....
FREE CUTTING BRASS ROD/BAR								**UNS C36000**					**ASTM B16, Alloy 360**		
Min.	60.0	,,,,	2.5	,,,,	,,,,	,,,,	,,,,	Balance	,,,,	,,,,	‡	‡	‡	‡	‡
Max	63.0	,,,,	3.7	0.35	,,,,	,,,,	,,,,		,,,,	0.50**	.....	.....	.....	.....	.....
FORGING BRASS								**UNS C37700**					**ASTM B.124, Alloy 377**		
Min.	58.0	,,,,	1.5	,,,,	,,,,	,,,,	,,,,	Balance	,,,,	,,,,	,,,,	,,,,	,,,,	,,,,	,,,,
Max	61.0	,,,,	2.5	0.30	,,,,	,,,,	,,,,		,,,,	0.50**	,,,,	,,,,	,,,,	,,,,	,,,,
MANGANESE BRONZE ROD/BAR								**UNS C67500**					**ASTM B124, ALLOY 675**		
Min.	57.0	0.5	....	0.8	,,,,	0.05	....	Balance	,,,,	,,,,	,,,,	,,,,	,,,,	,,,,	,,,,
Max	60.0	1.0	0.20	2.0	,,,,	0.5	0.25		,,,,	0.50**	,,,,	,,,,	,,,,	,,,,	,,,,
LEADED RED BRASS ROD/BAR								**UNS C32000**					**ASTM B140, Alloy 320**		
Min.	83.5	,,,,	1.5	,,,,	....	,,,,	,,,,	Balance	,,,,	,,,,	‡	‡	‡	‡	‡
Max	86.5	,,,,	2.2	0.10	0.25	,,,,	,,,,		,,,,		.....	.....	.....	.....	.....
COPPER SILICON ALLOY WIRE								**UNS C65100**					**ASTM B99, Alloy 651, eighth-Hard**		
Min.	Balance	,,,,	....	,,,,	,,,,	,,,,	,,,,	,,,,	0.8	,,,,	50	.344	,,,,	,,,,	20%
Max		,,,,	0.05	0.8	,,,,	0.7	,,,,	1.5	2.0 †	0.50**	65	448	,,,,	,,,,	
COPPER-ZIN SILICON ALLY ROD								**UNSC69400**					**ASTM B371, Alloy 694**		
Min.	80.0		....	,,,,	,,,,	,,,,	,,,,	Balance	3.5	,,,,	75	515	35	240	15%
Max	83.0		0.30	0.20	,,,,	,,,,	,,,,		4.5	,,,,	....	...	,,,,	.....	
LEADED SEMI-RED BRASS								**UNS C84400**					**ASTM B584, Alloy 844**		
Min.	78.0	2.3	6.0	,,,,	,,,,	,,,,	,,,,	7.0		,,,,	29	200	13	90	18%
Max	82.0	3.5	8.0	0.40	1.0,	,,,,	0.005	10.0		0.80**	....	...	,,,,	.....	

* Also may include maximum of 0.05/phosphrus.
Also may include maximum of 0.25, antimony, 0.08% sulfur, and 0.02% phosphorous.
** Maximun percent of elements permissible other than those indicated.
† Maximum of 2.6% silicon permissible provinding sum of all elements other than copper, iron , and silicon does not exceed 0.3%.
‡ Deppends on diameter of thickness (surface to surface) of material; data on request.

AUSTENITIC STEELS

	Carbon	Manga-nese	Phos-phorus	Sulfur	Silicon	Nickel	Chro-mium	Molyb-denum	Copper and Colum-bium	Tensile Strength Ksi	Tensile Strength Mpa	Yield Strenght lbs	Yield Strenght kN	Elongation in 2" (5 0 mm)		Reduction of Area
STAINLESS STEEEL WITH MOLYBDENUM BAR										**UNS S31600**				**ASTM A216, Type 316**		
Min.	,,,,	,,,,	....	,,,,	,,,,	10.0	16.0	2.0	....	*	*	*	*	*	*	*
Max	0.08	2.00	0.045	0.030	1.00	14.0	18.0	3.0	....	....	....	....	....	....	....	....
STAINLESS STEEEL WITH MOLYBDENUM BAR										**UNS S31600**				**ASTM A479, Type 316**		
Min.	,,,,	,,,,	....	,,,,	,,,,	10.0	16.0	2.0	....	75	515	30	205	30%		40%
Max	0.08	2.00	0.045	0.030	1.00	14.0	18.0	3.0	....	....	....	,,,,	,,,,	....		....
CAST STAINLESS STEEL										**UNS J92600**				**ASTM A351, Grade CF8***		
Min.	,,,,	,,,,	....	,,,,	,,,,	8.0	18.0	....	....	70	485	30	205	35%		....
Max	0.08	1.50	0.040	0.040	2.00	11.0	21.0	0.50	....	....	....	,,,,	,,,,	....		....
CAST STAINLESS STEEL										**UNS J92710**				**ASTM A351, Grade CF8C**		
Min.	,,,,	,,,,	....	,,,,	,,,,	9.0	18.0	....	**	70	485	30	205	30%		....
Max	0.08	1.50	0.040	0.040	2.00	12.0	21.0	0.50		....	....	,,,,	,,,,	....		....
CAST STAINLESS STEEL WITH MOLYBDENUM										**UNS J92900**				**ASTM A351, Grade CF8M**		
Min.	,,,,	,,,,	....	,,,,	,,,,	9.0	18.0	2.0	....	70	485	30	205	30%		....
Max	0.08	1.50	0.040	0.040	1.50	12.0	21.0	3.0	....	....	....	,,,,	,,,,	....		....
CAST LOW CARBON STAINLESS STEEL										**UNS J92500**				**ASTM A351, Grade CF3**		
Min.	,,,,	,,,,	....	,,,,	,,,,	8.0	17.0	....	....	70	485	30	205	35%		....
Max	0.03	1.50	0.040	0.040	2.00	12.0	21.0	0.50	....	....	....	,,,,	,,,,	....		....
CAST LOW CARBON STAINLESS STEEL WITH MOLYBDENUM										**UNS J92800**				**ASTM A351, Grade CF3M**		
Min.	....	....	....	....	....	9.0	17.0	2.0	....	70	485	30	205	30%		....
Max	0.03	1.50	0.040	0.040	1.50	12.0	21.0	3.0	....	....	....	,,,,	,,,,	....		....
CAST ALLOY 20 STAINLESS STEEL										**UNS J95150**				**ASTM A351, Grade CN7M**		
Min.	,,,,	,,,,	....	,,,,	,,,,	27.5	19.0	2.0	3.0	62	425	25	170	35%		....
Max	0.07	1.50	0.040	0.040	1.50	30.5	22.0	3.0	4.0	....	....	,,,,	,,,,	....		....
ALLOY 20 STAINLESS STEEL BAR										**UNS N08020**				**ASTM B473**		
Min.	,,,,	,,,,	....	,,,,	,,,,	32.0	19.0	2.0	3.0***	80	550	35	240	30%		50%
Max	0.07	2.00	0.045	0.035	1.00	38.0	21.0	3.0	4.0	....	....	,,,,	,,,,	....		....
CAST STAINLESS STEEL WITH MOLYBDENUM AND COPPER										**UNS J93370**				**ASTM A351, Grade CD-4MCU**		
Min.	,,,,	,,,,	....	,,,,	,,,,	4.75	24.5	1.75	2.75	100	690	70	485	16%		....
Max	0.04	1.00	0.04	0.04	1.00	6.00	26.5	2.25	3.25	....	....	,,,,	...	....		....
STAINLESSS STEEEL WITH FREE MACHININIG BAR										**UNS S30300**				**ASTM A582, Type 303**		
	....	...	....	0.15	,,,,	8.00	17.00	....	....	....	....	....	....	....	....	....
	0.15	2.00	0.20	....	1.00	10.00	19.00	....	....	....	....	....	....	....	....	....
CAST STAINLESS STEEL FREE MACHINING										**UNS J92701**				**ASTM A743, Grade CF16F**		
	....	....	....	,,,,	,,,,	9.00	18.00	....	....	70	485	30	205	25		....
	0.16	1.50	0.04	0.040	2.00	12.00	21.00	....	....	....	....	,,,,	,,,,	....		....

NICKEL ALLOYS

	Carbon	Manga-nese	Phos-phorus	Sulfur	Silicon	Nickel	Chro-mium	Molyb-denum	Iron	Tensile Strength Ksi	Tensile Strength Mpa	Yield Strenght lbs	Yield Strenght kN	Elongation in 2" (5 0 mm)		Reduction of Area
CAST NICKEL-MOLYBDENUM ALLOY (HASTELLOY B*)										**UNS N10001**				**ASTM A494, Grade N-12MV**		
Min.	,,,,	,,,,	....	,,,,	,,,,	Balance	....	26.0	4,00	76	525	40	275	6%	*	....
Max	0.12	1.00	0.04	0.03	1.00		1.00	30.0	6,00	...	....	....	....	....	....	....
CAST NICKEL-MOLYBDENUM-CHROMIUM ALLOY (HASTELLOY C*)														**ASTM A494, Grade CW-12MW**		
Min.	,,,,	,,,,	....	,,,,	,,,,	Balance	15.5	16.0	4.50	72	495	40	275	4%	*	....
Max	0.12	1.00	0.04	0.03	1.00		17.5	18.0	7.50	...	....	....	....	....	....	....
CAST NICKEL										**UNS N02100**				**ASTM A494, Grade CZ-100**		
Min.	,,,,	,,,,	....	,,,,	,,,,	95.0	....	....	....	50	345	18	125	10%		....
Max	1.00	1.50	0.03	0.03	2.00	....	....	....	3.00	....	....	,,,,	,,,,	....		....
CAST NICKEL-CHROMIUM-IRON ALLY (Inconel)**										**UNS N06040**				**ASTM A494, Grade CY-40**		
Min.	,,,,	,,,,	....	,,,,	,,,,	Balance	14.0	....	....	70	485	28	195	30%		....
Max	0.40	1.50	0.03	0.03	0.03		17.0	....	11.00	....	....	,,,,	,,,,	....		....

* Hasteeloy is a trademark of Cabot Corporation.
** Incotel is a trademark of International Nickel Company.

NICKEL-COPPER ALLOYS

	Copper	Tin	Iron	Nickel	Manga-nese	Phos-phorus	Silicon	Sulfur	Carbon	Tensile Strength Ksi	Tensile Strength Mpa	Yield Strenght Ksi	Yield Strenght Mpa	Elongation in 2" (5 0 mm)	
CAST MONEL *													**ASTM A494, Grade M-35-1**		
Min.	26.0,	....	....	remainder	,,,,	....	....	....	....	65	450	25	170	25%	*
Max	33.0	....	3.5		1.5	0.03	1.25	0.03	0.35	...	....	....	....	....	....
NICKEL COPPER ALLOY ROD													**ASTM A494, Grade M-35-1**		
Min.	28.0,	....	....	63.0	....	....	....	0.025	....	85	585	50	345	15%	*
Max	34.0	....	2.5	....	2.0	....	0.50	0.060	0.030	...	....	....	....	....	....

* Monel is a resitered trade mark of the International Nickel Company, Inc.

PRESSURE - TEMPERATURE RATINGS

CLASS 150 -300- 600

Pressure - Temperature Ratings
(comply with ASME B16,34-1981- Standard Class)
STEEL, NICKEL ALLOY and OTHER SPECIAL ALLOYS

WORKING PRESSURE, PSIG

CLASS	TEMP °F	A216 WCB A105	A217 C5	A217 WC6 A182 F11	A217 WC9 A182 F22	A352 LCB	A352 LC3 A350 LF3	A351 CF8M A182 F316	A351 CF3M	A351 CF8 A182 F304	A351 CF3	A351 CF8C	A351 CN7M
CLASS 150	-20 to 100 °	285	290	290	290	265	290	275	275	275	275	275	230
	200	260	260	260	260	250	260	240	245	235	235	245	215
	300	230	230	230	230	230	230	215	215	205	205	225	200
	400	200	200	200	200	200	200	195	195	180	180	200	-
	500	170	170	170	170	170	170	170	170	170	170	170	-
	600	140	140	140	140	140	140	140	140	140	140	140	-
	650	125	125	125	125	125	125	125	125	125	125	125	-
	700	110	110	110	110	-	-	110	110	110	110	110	-
	750	95	95	95	95	-	-	95	95	95	95	95	-
	800	80	80	80	80	-	-	80	80	80	80	80	-
	850	65[1]	65	65	65	-	-	65	65	65	-	65	-
	900	50[1]	50	50	50	-	-	50	-	50	-	50	-
	950	35[1]	35	35	35	-	-	35	-	35	-	35	-
	1000	20[1]	20	20	20	-	-	20	-	20	-	20	-
	1050	-	20[2]	20[2]	20[2]	-	-	20[2]	-	20[2]	-	20[2]	-
	1100	-	20[2]	20[2]	20[2]	-	-	20[2]	-	20[2]	-	20[2]	-
	1150	-	20[2]	-	-	-	-	20[2]	-	20[2]	-	20[2]	-
	1200	-	20[2]	-	-	-	-	20[2]	-	20[2]	-	20[2]	-
	1250	-	-	-	-	-	-	20[2]	-	20[2]	-	20[2]	-
	1300	-	-	-	-	-	-	20[2]	-	20[2]	-	20[2]	-
	1350	-	-	-	-	-	-	20[2]	-	20[2]	-	20[2]	-
	1400	-	-	-	-	-	-	20[2]	-	20[2]	-	20[2]	-
	1450	-	-	-	-	-	-	20[2]	-	15[2]	-	20[2]	-
	1500	-	-	-	-	-	-	15[2]	-	10[2]	-	15[2]	-
CLASS 300	-20 to 100 °	740	750	750	750	695	750	720	720	720	720	720	600
	200	675	750	710	715	655	750	620	620	600	600	635	555
	300	655	730	675	675	640	730	560	560	530	530	590	525
	400	635	705	660	650	620	705	515	515	470	470	555	-
	500	600	665	640	640	585	665	480	480	435	435	520	-
	600	550	605	605	605	535	605	450	450	415	415	490	-
	650	535	590	590	590	525	590	445	445	410	410	480	-
	700	53	570	570	570	-	-	430	430	405	405	470	-
	750	505	530	530	530	-	-	425	425	400	400	460	-
	800	410	500	510	510	-	-	415	415	395	395	455	-
	850	270[1]	440	485	485	-	-	405	405	390	-	445	-
	900	170[1]	355	450	450	-	-	395	-	385	-	430	-
	950	105[1]	260	380	380	-	-	385	-	375	-	385	-
	1000	50[1]	190	225	270	-	-	365	-	325	-	365	-
	1050	-	140	140	200	-	-	360	-	310	-	360	-
	1100	-	105	95	115	-	-	325	-	260	-	325	-
	1150	-	70	-	-	-	-	275	-	195	-	275	-
	1200	-	45	-	-	-	-	205	-	155	-	170	-
	1250	-	-	-	-	-	-	180	-	110	-	125	-
	1300	-	-	-	-	-	-	140	-	85	-	95	-
	1350	-	-	-	-	-	-	105	-	60	-	70	-
	1400	-	-	-	-	-	-	75	-	50	-	50	-
	1450	-	-	-	-	-	-	60	-	35	-	40	-
	1500	-	-	-	-	-	-	40	-	25	-	35	-
CLASS 600	-20 to 100 °	1480	1500	1500	1500	1390	1500	1440	1440	1440	1440	1440	1200
	200	1350	1500	1425	1430	1315	1500	1240	1240	1200	1200	1270	1115
	300	1315	1455	1345	1355	1275	1455	1120	1120	1055	1055	1175	1045
	400	1270	1410	1315	1295	1235	1410	1030	1030	940	940	1110	-
	500	1200	1330	1285	1280	1165	1330	955	955	875	875	1035	-
	600	1095	1210	1210	1210	1065	1210	905	905	830	830	985	-
	650	1075	1175	1175	1175	1045	1175	890	890	815	815	960	-
	700	1065	1135	1135	1135	-	-	865	865	805	805	935	-
	750	1010	1065	1065	1065	-	-	845	845	795	795	920	-
	800	825	995	1015	1015	-	-	830	830	790	790	910	-
	850	535[1]	880	975	975	-	-	810	810	780	-	890	-
	900	345[1]	705	900	900	-	-	790	-	770	-	865	-
	950	205[1]	520	755	755	-	-	775	-	750	-	775	-
	1000	105[1]	385	445	535	-	-	725	-	645	-	725	-
	1050	-	280	275	400	-	-	720	-	620	-	720	-
	1100	-	205	190	225	-	-	645	-	515	-	645	-
	1150	-	140	-	-	-	-	550	-	390	-	550	-
	1200	-	90	-	-	-	-	410[3]	-	310[3]	-	345	-
	1250	-	-	-	-	-	-	365	-	220	-	245	-
	1300	-	-	-	-	-	-	275	-	165	-	185	-
	1350	-	-	-	-	-	-	205	-	125	-	135	-
	1400	-	-	-	-	-	-	150	-	95	-	105	-
	1450	-	-	-	-	-	-	112	-	70	-	80	-
	1500	-	-	-	-	-	-	85	-	50	-	70	-

1 Permissible, but not recommeded for prolonged usage above about 800a C
2 For Welding End Valves only, flanged and ratings terminate al 1000 o C

PRESSURE - TEMPERATURE RATINGS

CLASS 900 - 1500 - 2500

Pressure - Temperature Ratings
(comply with ASME B16,34-1981- Standard Class)
STEEL, NICKEL ALLOY and OTHER SPECIAL ALLOYS

WORKING PRESSURE, PSIG

CLASS	TEMP °F	A216 WCB A105	A217 C5	A217 WC6 A182 F11	A217 WC9 A182 F22	A352 LCB	A352 LC3 A350 LF3	A351 CF8M A182 F316	A351 CF3M	A351 CF8 A182 F304	A351 CF3	A351 CF8C	A351 CN7M
CLASS 900	-20 to 100 °	2220	2250	2250	2250	2085	2250	2160	2160	2160	2160	2160	1800
	200	2025	2250	2135	2150	1970	2250	1860	1860	1800	1800	1910	1670
	300	1970	2185	2020	2030	1915	2185	1540	1540	1410	1410	1765	1570
	400	1900	2115	1975	1945	1850	2115	1540	1540	1410	1410	1665	-
	500	1795	1995	1925	1920	1745	1995	1435	1435	1310	1310	1555	-
	600	1640	1815	1815	1815	1600	1815	1355	1355	1245	1245	1475	-
	650	1610	1765	1765	1765	1570	1765	1330	1330	1225	1225	1440	-
	700	1600	1705	1705	1705	-	-	1295	1295	1210	1210	1405	-
	750	1510	1595	1595	1595	-	-	1270	1270	1195	1195	1385	-
	800	1235	1490	1525	1525	-	-	1245	1245	1180	1180	1370	-
	850	805[1]	1315	1460	1460	-	-	1215	1215	1165	-	1330	-
	900	515[1]	1060	1350	1350	-	-	1180	-	1150	-	1295	-
	950	310[1]	780	1130	1130	-	-	1160	-	1125	-	1160	-
	1000	155[1]	575	670	805	-	-	1090	-	965	-	1090	-
	1050	-	420	410	595	-	-	1080	-	925	-	1080	-
	1100	-	310	290	340	-	-	965	-	770	-	965	-
	1150	-	205	-	-	-	-	825	-	585	-	825	-
	1200	-	135	-	-	-	-	620[3]	-	465	-	515	-
	1250	-	-	-	-	-	-	545	-	330	-	370	-
	1300	-	-	-	-	-	-	410	-	245	-	280	-
	1350	-	-	-	-	-	-	310	-	185	-	205	-
	1400	-	-	-	-	-	-	225	-	145	-	155	-
	1450	-	-	-	-	-	-	175	-	105	-	125	-
	1500	-	-	-	-	-	-	125	-	70	-	105	-
CLASS 1500	-20 to 100 °	3705	3750	3750	3750	3470	3750	3600	3600	3600	3600	3600	3000
	200	3375	3750	3560	3580	3280	3750	3095	3095	3000	3000	3180	2785
	300	3280	3640	3365	3385	3190	3640	2795	2795	2640	2640	2940	2615
	400	3170	3530	3290	3240	3085	3530	2570	2570	2350	2350	2770	-
	500	2995	3325	3210	3200	2910	3325	2390	2390	2185	2185	2590	-
	600	2735	3025	3025	3025	2665	3025	2255	2255	2075	2075	2460	-
	650	2685	2940	2940	2940	2615	2940	2220	2220	2040	2040	2400	-
	700	2665	2840	2840	2840	-	-	2160	2160	2015	2015	2340	-
	750	2520	2660	2660	2660	-	-	2110	2110	1990	1990	2305	-
	800	2060	2485	2540	2540	-	-	2075	2075	1970	1970	2280	-
	850	1340[1]	2195	2435	2435	-	-	2030	2030	1945	-	2220	-
	900	860[1]	1765	2245	2245	-	-	1970	-	1920	-	2160	-
	950	515[1]	1305	1885	1885	-	-	1930	-	1870	-	1930	-
	1000	260[1]	960	1115	1340	-	-	1820	-	1610	-	1820	-
	1050	-	705	685	995	-	-	1800	-	1545	-	1800	-
	1100	-	515	480	565	-	-	1610	-	1285	-	1610	-
	1150	-	345	-	-	-	-	1370	-	980	-	1370	-
	1200	-	225	-	-	-	-	1030[3]	-	770	-	855	-
	1250	-	-	-	-	-	-	910	-	550	-	615	-
	1300	-	-	-	-	-	-	685	-	410	-	465	-
	1350	-	-	-	-	-	-	515	-	310	-	345	-
	1400	-	-	-	-	-	-	380	-	240	-	255	-
	1450	-	-	-	-	-	-	290	-	170	-	205	-
	1500	-	-	-	-	-	-	205	-	120	-	170	-
CLASS 2500	-20 to 100 °	6170	6250	6250	6250	5785	6250	6000	6000	6000	6000	6000	5000
	200	5625	6250	5930	5965	5470	6250	5160	5160	5000	5000	5300	4640
	300	5470	6070	5605	5640	5315	6070	4660	4660	4400	4400	4900	4360
	400	5280	5880	5485	5400	5145	5880	4280	4280	3920	3920	4620	-
	500	4990	5540	5350	5330	4850	5540	3980	3980	3640	3640	4320	-
	600	4560	5040	5040	5040	4440	5040	3760	3760	3460	3460	4100	-
	650	4475	4905	4905	4905	4355	4905	3700	3700	3400	3400	4000	-
	700	4440	4730	4730	4730	-	-	3600	3600	3360	3360	3900	-
	750	4200	4430	4430	4430	-	-	3520	3520	3320	3320	3840	-
	800	3430	4145	4230	4320	-	-	3460	3460	3280	3280	3800	-
	850	2230[1]	3660	4060	4060	-	-	3320	3320	3240	-	3700	-
	900	1430[1]	2945	3745	3745	-	-	3280	-	3200	-	3600	-
	950	860[1]	2170	3145	3145	-	-	3220	-	3120	-	3220	-
	1000	430[1]	1600	1860	2230	-	-	3330	-	2685	-	3330	-
	1050	-	1170	1145	1660	-	-	3000	-	2570	-	3000	-
	1100	-	860	800	945	-	-	2685	-	2145	-	2685	-
	1150	-	570	-	-	-	-	2285	-	1630	-	2285	-
	1200	-	370	-	-	-	-	1715	-	1285	-	1430	-
	1250	-	-	-	-	-	-	1515	-	915	-	1030	-
	1300	-	-	-	-	-	-	1145	-	685	-	770	-
	1350	-	-	-	-	-	-	860	-	515	-	570	-
	1400	-	-	-	-	-	-	630	-	400	-	430	-
	1450	-	-	-	-	-	-	485	-	285	-	345	-
	1500	-	-	-	-	-	-	345	-	200	-	285	-

1 Permissible, but not recommeded for prolonged usage above about 800a C

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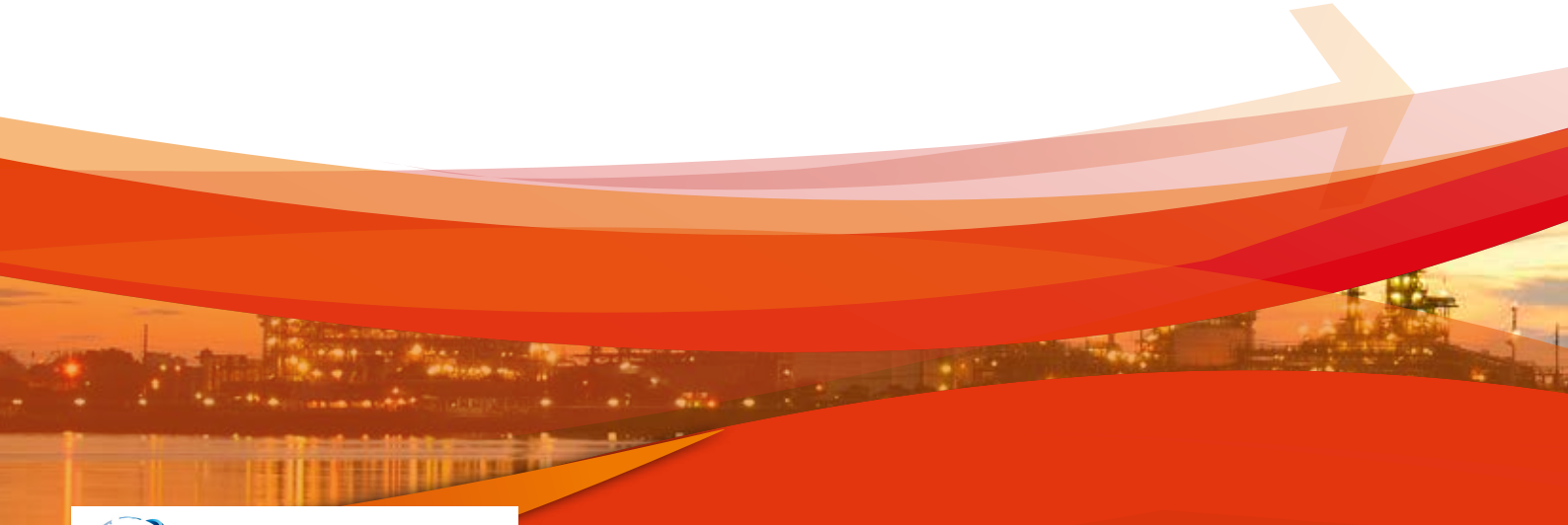

GLOBAL SupplyLine

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