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"It takes courage and integrity to dream big and stay true to one's value system.  
And if one can find their calling at work, you have to give it your all"

- Mr. V. R. Shariff



EXCELLENCE THROUGH GENERATIONS



Established in 1978, Niton Industries Private Limited stands testimony to the journey of a small subsistent company to a global solution provider within the valve manufacturing industry.

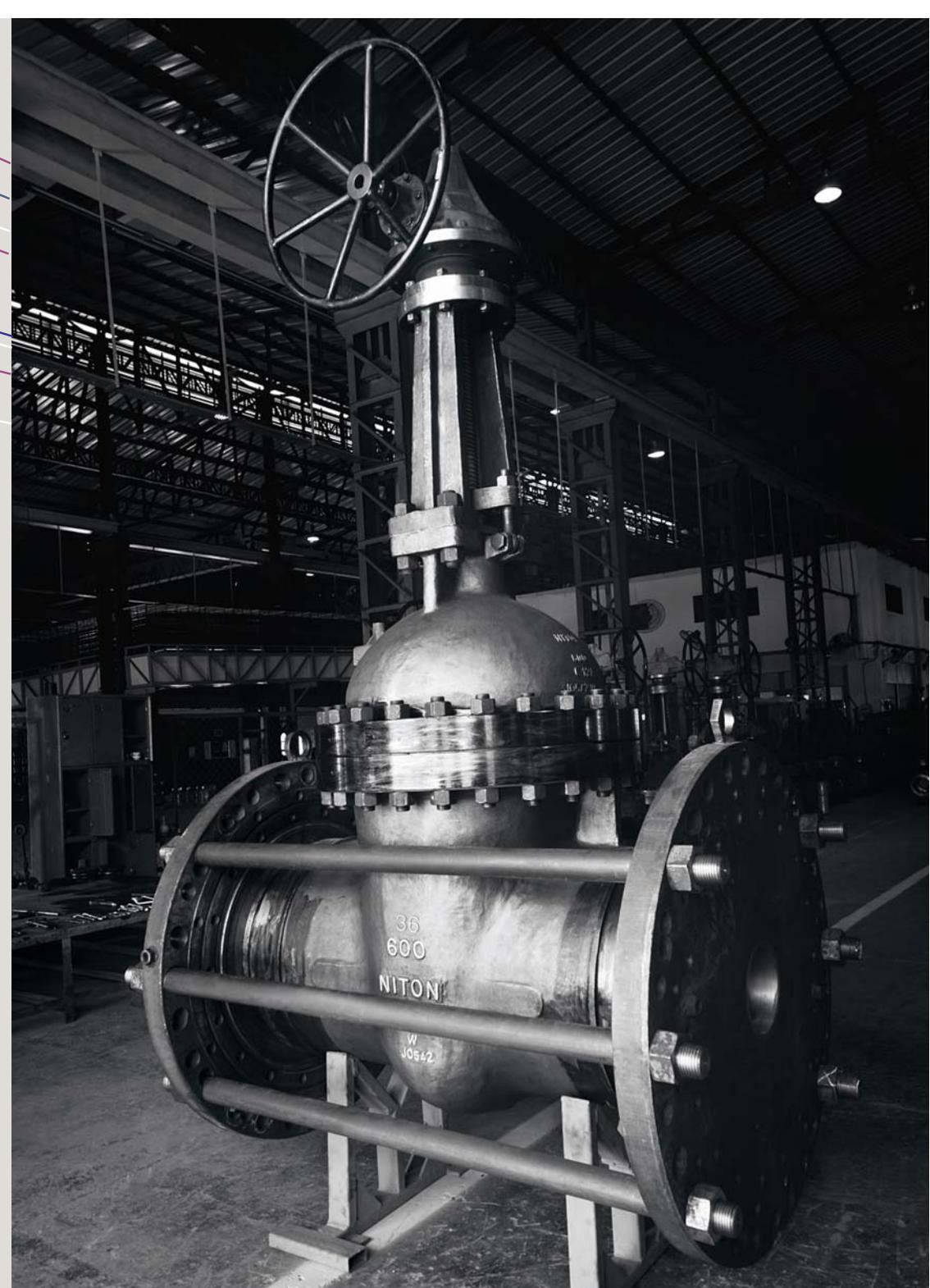


The company was founded by Mr. V.R. Shariff, also known as the 'valve-man' for his penchant for paving solutions through innovative valve designs. Starting his career as a Lathe Operator, Mr. Shariff worked his way up as a foreman, and finally graduated as the owner of the company. Beginning as one man's dream to influence technology, Niton has grown into a brand that applies creativity that is always fuelled with passion.

Niton's core competency lies in being quality conscious and cost-competitive coupled with on-time delivery. Over the years, the brand's valves have played an important role in machinery and equipment across a plethora of industries including Petrochemicals, Power Plants, Offshore Oil Rigs and Refineries, Fertilizers and Pipelines.

In terms of type, we currently manufacture valves from 1/2" to 60" in 150 Class up to 4500 Class in Carbon steel, Stainless steel, Alloy steel, Duplex, Super Duplex, Inconel, Monel and Alloy-20. We also specialize in manufacturing Gate, Globe, Swing Check, Dual Plate Check, Stop Check, Lift Check, Ball, Needle, Jacketed, Cryogenic and Y-Type Valves.

With over 700 employees and six state-of-the-art manufacturing plants, Niton today is one of the largest manufacturers of valves in the Indian sub continent.



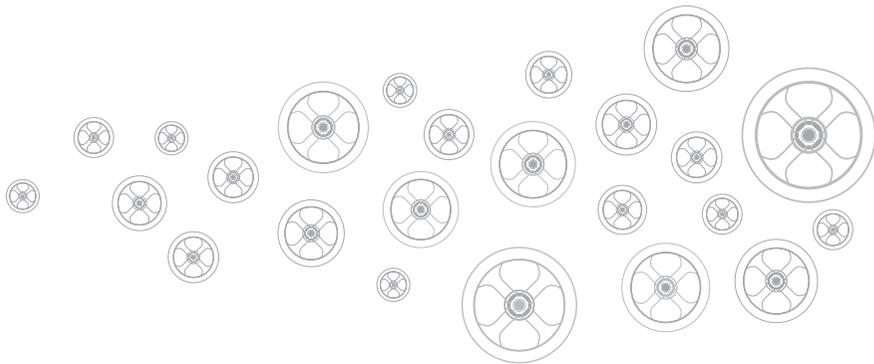
## OUR CHAIRMAN

V.R. Shariff, Chairman and Founder of Niton, has been singlehandedly instrumental in creating the most significant valves manufacturing company in India. Born on 14th August, 1947 with humble beginnings. Starting his career as a Lathe Operator, Mr. Shariff worked his way up as a foreman, and finally graduated as the owner of the company. Expanding his business from a 400 sq ft to a 400,000 sq ft production house with six production plants, and a capacity to produce any type of industry valve, Mr. Shariff has rightfully earned the name of being the 'valve man' of India.

Leading by example, Mr. Shariff is a role model who built a dream with passion and hard work. With a vision to provide solutions across industries through technologically advanced products and services, and with the support of a sound team of efficient professionals, engineers and technicians, the company has been successful in addressing valve requirements within the Oil, Refineries, Petrochemicals, Power, Fertilizer and Gas projects.

Fuelled by his own talent in creating the finest valves in the country, Mr. Shariff says: "I did not make valves to make money. Incidentally I made money because of making excellent valves." He believes that money follows those who follow their heart and continues in his mission to support the impoverished and underprivileged through various avenues.

Niton valves stand as an expression of faith, commitment, services and delivery - Because making a difference needs to come straight from the heart.





KHOPOLI - MAHARASHTRA



OUR PLANTS



MUMBAI



AURANGABAD



VASHI

A wide-angle photograph of a large industrial factory floor. The ceiling is high with a white, ribbed structure and several rows of industrial lights. Yellow overhead cranes with the brand name 'DEMAG' are visible across the top. The floor is grey concrete with yellow safety lines. In the foreground, there are several large, blue industrial valves or components. In the background, there are various pieces of machinery, including what appears to be a lathe or mill, and a few workers in dark clothing. The overall atmosphere is one of a busy, well-equipped manufacturing facility.

## VALVINOX - ITALY

Over the years with nuances introduced in technology and innovation, the valve industry is constantly required to evolve and adapt to the growing needs of dynamic industries that affect global economies. With a need to match up to demands, India continues to import a variety of specialized valves from various other countries.

Niton recognized this as an opportunity to expand its business and provide its customers with quality products at efficient costs. In 2009, the company acquired the controlling stakes in Valvinox, an Italian company that has been a strong player in the Indian market and focuses on creating specialized valves for the offshore industry. This partnership has helped take Niton valves to the next level.

## TECHNOLOGY & INFRASTRUCTURE

At Niton, making technology our best friend is a prerogative. We are always looking to better our products, thus when we engage in new product development, we apply novel design techniques and concurrent engineering practices to reduce the time cycle. Using technology, we carry out certain non-destructive tests like Radiography, Ultrasonic, Magnetic Particle Inspection, Shell thickness checking and Liquid Penetration Test. We also carry out Hydro-Testing, Helium Leak Test, Fugitive Emissions test, Cryogenic Test and other visual inspections on final products which are devised to produce top quality error-free products.

Our facilities are equipped with the latest ultra modern hydro-testing equipments. We also have facilities for Cryogenic Testing, Positive Material Identification [PMI] and NDT along with Helium Mass Spectrometer to test valves for critical applications like the Hydrogen (H2) service. At all levels we have gauge calibration facility to ensure that the process uses calibrated measuring instruments at all times.

In terms of infrastructure, we have six state-of-the-art manufacturing plants with fully integrated operations. With a spacious layout, these plants are fully equipped with modern Vertical Machining Centres & Horizontal Machining Centres, CNC machines, Vertical Turret Lathe (VTL), Special Purpose Machines (SPMs), Automatic Welding Equipments, Inspection Equipments and Testing Facilities that have been installed to ensure quality, reliability and longevity of Niton valves.





# QUALITY ASSESSMENTS AND INSPECTION

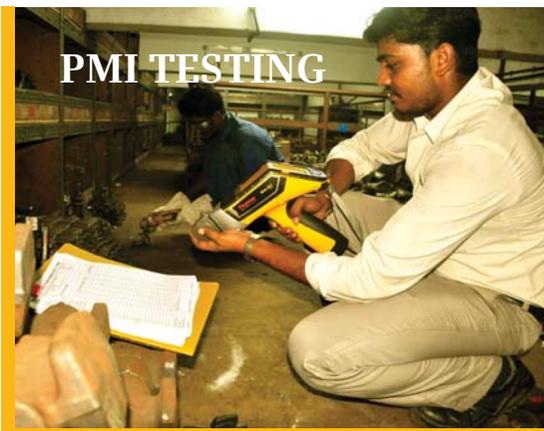
We believe that quality and precision are the raw materials to create a sustainable brand. Through pioneering work in developing and introducing new-age technologies to the valve industry, Niton plays a pivotal role in setting the benchmark for quality checks in India. Niton is an ISO 9001:2008 certified and API 6D & API 600 Monogram Licensee, and goes through routine assessments to ensure that our facilities produce great products.

Each Niton valve is made from the best of materials and is tested rigorously under the scrutiny of highly qualified professionals. The brand ascertains that their large sized higher classes of valves are designed and despatched under the stringent inspection of reputable agencies like Bureau Veritas, DNV, Engineers India Limited (EIL), IBR, IRS, Lloyds, SGS and TUV among others.

Niton Quality Assurance System is created to guarantee the consistent quality expected on an international level. Niton achieves its quality requirements, in part; by selecting sub-suppliers that meet our qualification criteria and that can consistently execute activities in accordance with our Quality Assurance System. Niton can insure that our valves comply with the most sophisticated technical and contractual requirements by coordinating and optimizing control of sub-supplier, manufacture, in process inspections, examinations, through the final pressure test.



## PMI TESTING



### NON DESTRUCTIVE TESTS:

- Dye Penetrant (PT) examination.
- Radiographic examination (RT): Gamma Ray or X-Ray.
- Positive Material Identification (PMI).
- Paint dry film thickness check.
- Magnetic particle (MT) examination (dry, wet or fluorescent methods).
- Ultrasonic Test (UT) examination.

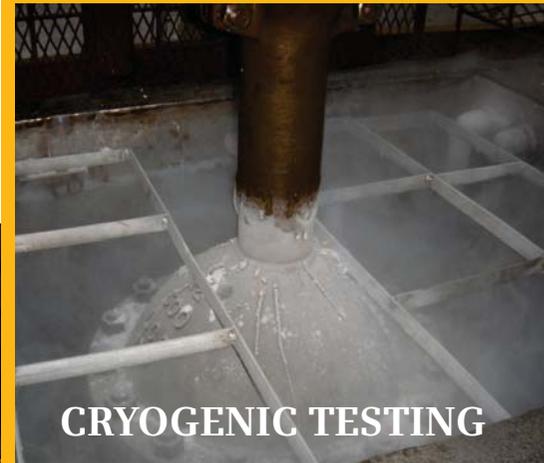
### DESTRUCTIVE TESTS:

- Mechanical tests, Hardness test and Impact Test down to -196 °C.
- Micro examinations by electronic microscope up to x500 magnifications.
- Macro examinations.
- Ferrite check according to E562.
- Pull-off test equipment for paint adhesion check.
- Chemical analysis from CS up to Super Alloys using spectrometer.
- Check analysis, C & S using induction analyzer.
- Corrosion tests (e.g. Pitting, SSCC, Huey, Crevice).

This target is met through a selected top quality and reliable sub-suppliers in the Indian & International market and through qualified and upgraded NDE operators, skilled Quality Control inspectors and QC professional and experienced technicians.

Moreover, an integrated combination and optimization of controls at manufacturers, sub-suppliers, and in process inspections, examinations and final pressure tests (conventional and special tests), assure valves to the highest quality level complying with the most severe technical and contractual requirements.

## CRYOGENIC TESTING

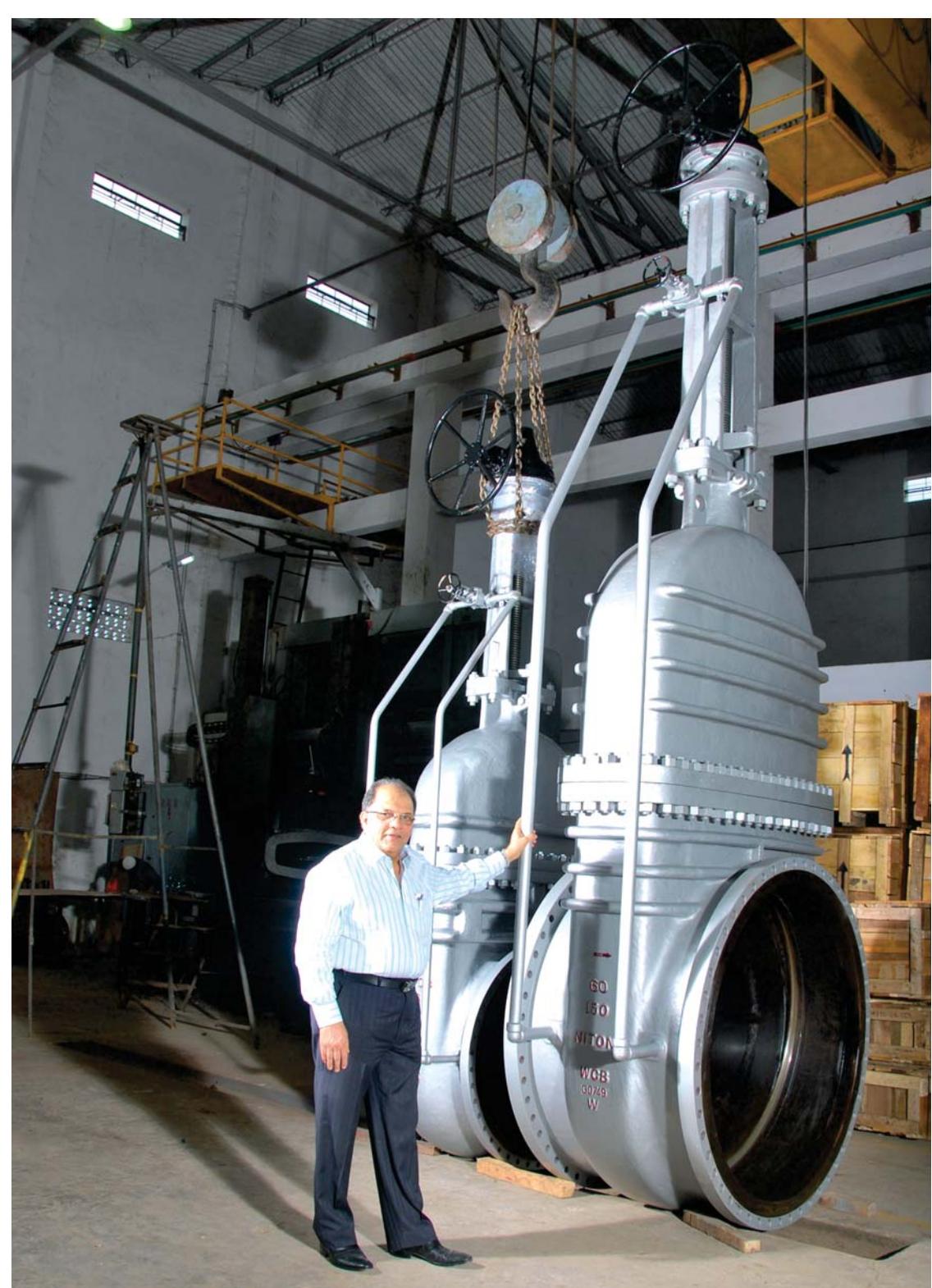


## TEST RIG

## ACCOMPLISHMENTS

Niton has been successful in retaining a strong clientele from around the world. Some of the company's achievements include:

- Niton was the first Indian company to manufacture and deliver the best quality 22" x 600 Class Through Conduit Gate Valves for a refinery in Syria.
- In 1987, under the Inspection of Lloyds, Niton was the first company in India to manufacture and test a fire safe ball valve of size 10".
- Under the Inspection of EIL a decade ago, the company executed orders for Indian Oil Corporation Ltd, Panipat Refinery, for Motor Operated Gate Valves. The weight of each valve was approximately 3 tons.
- Under the supervision of FEDO, Niton completed the assignment of Two-Wire Control System for Kochi Refineries Ltd and a similar execution was done under the supervision of PDIL for Indian Oil Corporation Limited, Jawaharlal Nehru Port Trust. These projects put Niton on top of the list of leading valve manufacturers and further added a feather in the company's cap for being an end-to-end solution provider.
- Niton currently has Cryogenic Testing Facilities at all the manufacturing units to carry out tests upto -196° C for all type of valves. With pioneering efforts, Niton is the only company in India to successfully conduct the cryogenic test on a 50" x 300 Class Gate Valve and a 36" x 600 Class Gate Valve.
- Niton has the expertise and courage to manufacture valves making it a pioneer for many varieties of valves. These include 36" x 900 class Gate Valves and 60" x 150 Class Gate Valve.
- The epitome of innovation was producing 24" x 150 Class Full Jacketed Gate Valve in a country where Jacketed Valves are rarely produced. This doesn't only talk about Niton's expertise but also the faith the company has in its Design and Production processes.
- In India production of Stop Check Valve is ONLY done by Niton. The company has successfully produced a momentous Stop Check Valve of 14" x 2500 Class in C12A Material for a large power plant in Argentina.
- Niton supplied valves made completely in Monel from size 2" to 42" for PEMEX a refinery in Mexico to be used for a highly concentrated Sulphuric Acid line. The Engineering Consultant for this was Dragados from Spain.
- Niton has supplied valves on an extremely short notice for Qatar Petroleum that are being used under highly corrosive conditions with 1000 micron coating and Monel internals to withstand sea water corrosion.



## THE WORK CULTURE

Creating a friendly and healthy work environment, the company ethos takes special efforts in developing long-term bonds with its people. It also pays a lot of attention to educational programs to hone employees skills along with giving them the opportunity for growth. With great diligence and effort in developing these relationships, Niton has successfully created a workforce that comprises of over 700 talented, efficient and loyal employees who are a great asset to the company.

A man with a golden heart, Mr. Shariff truly believes in his manpower and has reinforced the same by providing quality facilities and perks for his employees, some of which include: Community centres, labour housing accommodations along with in-house hygienic dining facilities, medical camps, and educational seminars among other facilities.

Continuing to keep a customer-centric approach along with a method of systematic transparency, Niton works towards delivering the best on a consistent basis. Making the workplace into a fast-paced, challenging environment that persuades open communication, Niton's employees enjoy the privilege of feeling relaxed and growing strongly in their respective careers.

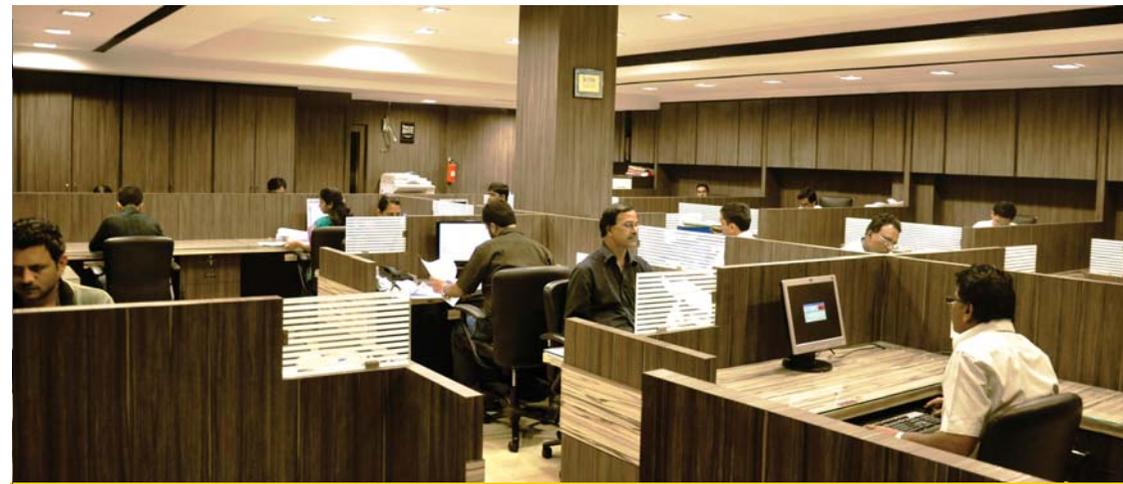
Within and outside of the campus, teams are encouraged to share new ideas and diverse approaches to problem-solving thus ensuring that we multiple perspectives can help the company in developing worldwide impact, as well as take on newer challenges with enthusiasm. With an effectively open communication model, the management ensures that delegation of power and authority at all levels is handled diligently to balance hierarchy effectively.

## HR & MANAGEMENT

We have an integrated team of qualified, experienced and competent engineers, technicians and other professionals that work together in identifying and satisfying customer needs by delivering world class solutions with set deadlines.

A strong and supportive management has always looked at keeping its employees happy. With sound HR policies in place, along with high activity in various social initiatives that benefit staff and workers, Niton enjoys a good employee retention rate. This in turn helps Niton in developing new products in lesser time as compared to competition.

To facilitate a smoother process of management, the company is developing an ERP system in order to centrally monitor multi-location manufacturing facilities at the same time.



## FINANCIAL CREDIBILITY

The Visionary founder of Niton has built the Business Empire over a span of three decades, that has developed our financial credibility which now contributes rich dividends to each area of its business development.

Standing tall with millions of dollars in its annual turnover, Niton is a financially sound brand with easy access to money, both internally and externally. In addition, the organization's core banker has been associated with the management for many years.

On the side of its Supply Chain Management, Niton has Vendors providing best credit terms in line with the best in the industry and make all endeavours to ensure that we continue to enjoy their patronage by facilitating timely deliveries and matching the quality aspirations of the Company.

With around three and a half decades of consistently progressive work, and a reputation in more than 7 industries across the globe, it is the certainty in the service that has sustained a strong trustworthy relationship with our clients.

Niton has been awarded the BBB- rating by the CARE rating agency which guarantees a moderate degree of safety to its lenders. Bankers are enthusiastic about making Niton as a part of their lending portfolio whereas Private Equity firms have identified Niton as a potential company to offer for investment to financial investors.

The brand's commitment for excellence and customer satisfaction gained government recognition in 2010 our when our Chairman bagged the Lifetime Achievement in Business Leadership for outstanding work and excellent performance across industries.



Our Chairman - **Shri V. R. Shariff** receiving the award for Lifetime Achievement in Business Leadership from Hon. Chief Minister of Maharashtra - **Shri Prithviraj Chavan** in presence of Hon. Senior Union Minister Govt. of India & National President of NCP - **Shri Sharad Pawar**, Hon. Deputy Chairman of Rajya Sabha - **Shri K. Rahman Khan**, Chief Editor & Managing Partner Urdu Times - **Shri Saeed Ahmed**.

# CORPORATE SOCIAL RESPONSIBILITY

With patriotism in our heart and sensitivity towards our environment we make conscious effort to minimize our material consumption, waste generation and use of water at our various manufacturing units.

We take up initiatives to help the lesser privileged sections of society. From providing free-of-cost medical care to food & supplies, and educational assistance for thousands of people every year across the country, our specialized teams ensure optimal assessment and execution of all our social initiatives, with professionalism and no bias on the grounds of caste, creed or gender.

Niton Industries Pvt. Ltd. is a company dedicated to creating high quality valves that play a vital role across industries. There is also strong emphasis on improving the quality of lives of the workforce and their families as well as of the local community and society at large.

We focus on improving the livelihood of the underprivileged. From basic infrastructure facilities, hygiene and sanitation, food, water and education, we contribute to the communities around our unit sites. We have developed initiatives to provide them with services that will improve their lifestyle and standard of living.

The company's newest endeavour is the 'Integrated Niton Campus' which assures quality production and the finest growth environment for our workforce. This includes state-of-the-art manufacturing facilities, residences for our workforce along with a community centre. The community centre will conduct training programs on safety and soft skills like motivation, team building, and leadership and also fitness programs like yoga and aerobics. Other Industries will also be invited as we want to make this a way of life for all.

Within the valve industry, Niton conducts pioneering work by establishing the first-ever green plant or unit within its facility, and have received a letter of appreciation from MIDC (Maharashtra Industrial Development Corporation) for initiating the first ever Green Plant in the zone. We will also be using renewable energy extensively and applicable water harvesting zones that suffice the entire unit. In addition, the company has an organic farm and a horticulture garden to ensure employee satisfaction along with increasing the area's aesthetic value.





**GATE VALVE.**  
**GLOBE VALVE.**  
**SWING CHECK VALVE.**  
**DUAL PLATE CHECK VALVE.**  
**STOP CHECK VALVE.**  
**LIFT CHECK VALVE.**  
**BALL VALVE.**  
**NEEDLE VALVE.**  
**THROUGH CONDUIT GATE VALVE.**  
**Y-TYPE GLOBE VALVE.**  
**DEAD-MAN VALVE.**  
**JACKETED VALVE.**  
**ANGLE VALVE.**

Construction :- Forged & Cast.

Size Range: - ½ Inch to 60 Inches

Class :- 150, 300, 600, 800, 900, 1500, 2500 and 4500

Materials :- Carbon Steel, Stainless Steel, Alloy Steel, Low Temperature Carbon Steel, Duplex Stainless Steel, Inconel, Monel, and Alloy 20

01

**GLOBE VALVE**

14" x 2500 Class made in C12A Material for a Power Project in Argentina.



04

**GLOBE VALVE**

12" x 1500 Class made in WCB Material for an Offshore Platform in India.



02

**TRUNION MOUNTED BALL VALVE**

24" x 900 Class made in Super Duplex Material for an Offshore Platform in Europe.



05

**SHUTDOWN BALL VALVE**

24" x 300 Class made in WCB Material for a Oil Drilling Company in India.



03

**CHECK VALVE WITH DASH POT ARRANGEMENT**

10" x 2500 Class made in WCC Material for an Oil Refinery Project in India.



06

**CRYOGENIC SERVICE GATE VALVE**

50" x 300 Class made in CF8 Material for a Chemical Plant in India.





07

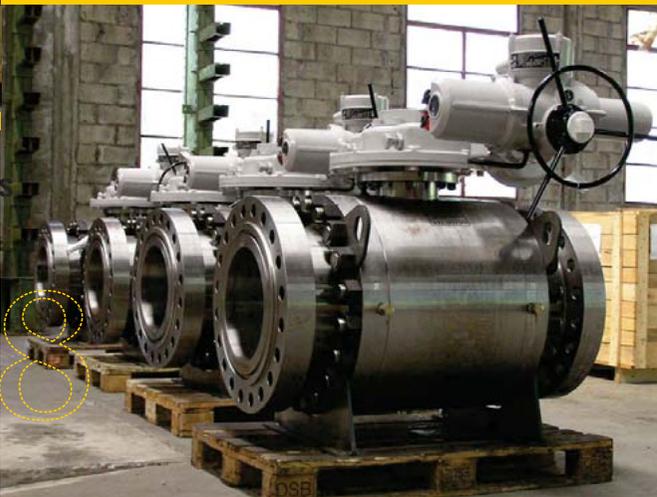
**SPRING LOADED PISTON TYPE GLOBE VALVE**

14" x 600 Class made in CF8C Material for a Space Research Organization Project in India.

**TRUNION MOUNTED BALL VALVE**

24" x 900 Class made in Duplex Material for an Offshore Platform in Europe.

08



**DUAL PLATE CHECK VALVES WITH SEA WATER RESISTANT COATING**

30" x 150 Class made in WCB Material & Bronze internals for a Oil Refinery Project in India.

10



**SWING CHECK VALVES**

18" x 900 Class made in WCB Material for a Oil Refinery Project in India.

11



**GLOBE VALVES WITH STEM EXTENSION FOR U/G SERVICE**

16" x 600 Class made in LCB Material for a Pipeline Project in India.

09



**PRESSURE SEAL GATE VALVE**

12" x 2500 Class made in C12A Material for an Oil Refinery Project in India.

12





### Standard Product Range

Valve Type	ANSI Class	Design Standard	Size
Gate	150	API 600/ BS 1414/ASME B 16.34	2" NB TO 60" NB
	300		2" NB TO 50" NB
	600		2" NB TO 36" NB
	900		2" NB TO 24" NB
	1500		2" NB TO 24" NB
Globe	150	BS 1873/ ASME B 16.34	2" NB TO 36" NB
	300		2" NB TO 36" NB
	600		2" NB TO 36" NB
	900		2" NB TO 24" NB
	1500		2" NB TO 16" NB
Swing Check	150	BS 1868/ API 6D/ASME B 16.34	2" NB TO 36" NB
	300		2" NB TO 36" NB
	600		2" NB TO 36" NB
	900		2" NB TO 24" NB
	1500		2" NB TO 24" NB
Dual Plate	150	BS 5352/ASME B 16.34	2" NB TO 60" NB
	300		2" NB TO 60" NB
	600		2" NB TO 60" NB
	900		2" NB TO 24" NB
	1500		2" NB TO 24" NB
Conduit Gate	150	API 6D/ASME B 16.34	2" NB TO 36" NB
	300		2" NB TO 24" NB
	600		2" NB TO 22" NB
Ball	150	BS 5351/ API 6D/ASME B 16.34	1/2" NB TO 24" NB
	300		1/2" NB TO 36" NB
	600		1/2" NB TO 36" NB
	800		1/4" NB TO 2" NB
	900		1/2" NB TO 24" NB
Forged Steel Gate	1500	API 602/ ISO 15761/ BS 5352/ ASME B16.34	1/4" NB TO 1 1/2" NB
	2500-4500		1/4" NB TO 1 1/2" NB
Forged Steel Globe	800	API 602/ ISO 15761/ BS 5352/ ASME B16.34	1/4" NB TO 1 1/2" NB
	1500-4500		1/4" NB TO 1 1/2" NB
Forged Steel Lift Check	800	API 602/ ISO 15761/ BS 5352/ ASME B16.34	1/4" NB TO 1 1/2" NB
	1500-4500		1/4" NB TO 1 1/2" NB

Note : Applicable standards are referred where size range exceeds design standard

#### Valve Shell Materials

Besides its Standard material ASTM A 216 (WCB)/A 105, NITON cast steel, Forged steel & Alloy Steel Valves are optionally available with the material listed below:

ASTM Cast	ASTM Forged	Material Designation	Working Temperature* ° F / ° C ASME B16.34
A216 WCB	A105	Carbon Steel	800/ 875 Maximum
A217 WC1	A182 F1	C-0.5 Mo	875
A217 WC5	A182 F11	1.25 Cr-1/2 Mo	1100/ 593 Maximum
A217 WC9	A182 F22	2.25 Cr-1Mo	
A217 C5	A 182 F5	5Cr-0.5 Mo	1200/ 649 Maximum
A217 C12	A 182 F9	9Cr-1Mo	
A352 LCB	A 350 LF2	Carbon Steel	-50/ -46 Minimum
A352 LCC	-	Carbon Steel	
A352 LC1	-	C-0.5 Mo	-75/ -59 Minimum
A352 LC2	-	2.5 Ni	-100/ -73 Minimum
A352 LC3	-	3.5 Ni	-150/ -101 Minimum
A351 CF8M	A 182 F316	13 Cr, 9Ni	1500/ 816 Maximum
A351 CF8	A 182 F304	18Cr, 8Ni	1500/ 816 Maximum
A351 CF3M	A 182 F316L	16Cr-12Ni - 2Mo	850/ 454 Maximum
A351 CF3	A 182 F304L	18Cr, 8Ni	800/ 427 Maximum
A351 CN7M		29Ni-20.5Cr-3.5Cu-2.5Mo	300/ 149 Maximum

### General Design Specification

Items	American Std.	British Std.
Shell wall thickness and general valve design specifications, Cast Steel, Forged Steel.	API 600 / API 6D/API 602/ASME B 16.34	BS 1414 (Gate valve) BS 1873 (Globe Valve) BS 1868 (Check valve) BS 5352
Pressure-temperature rating	ASME B16.34/ API 602/ API 6D	BS1560 / BS 5352
Face-to-Face dimensions Flanged End End-to-end dimensions Butt Weld End @	ANSI B16.10/ API 6D	BS 2080
End Flange dimensions Gasket contact facing	ANSI B16.5*	BS 3293/ BS1560
Welding end dimensions Butt Weld	ANSI B16.25	BS1414 (Gate valve) BS1873 (Globe Valve) BS1868 (Check valve)
Welding end dimensions Socket Weld	ANSI B16.11	
Radiograph & NDT requirements	ASME B16.34	
Inspection and Testing Standard	API 598/ API 6D	BS 6755

\* MSS SP-44 for 22" and API 605 for 26" large, for end flange dimensions.

@ End to End of Butt Weld end & socket weld end for forged steel valves as per manufacture standard.

#### Valve Trim

API 600 and BS 1414 / 1873 / 1868 specify the following valve components parts as the valve trim

Description	Gate Valve	Globe Valve	Check Valve
Wedge/Disc seat surface	○	○	○
Body seat surface	○	○	○
Bonnet bush (Backseat)	○	○	---
Stem	○	○	---
Others	Internal small parts	Plug nut	Hinge pin

#### Trim Material

API 600 Trim Number	Symbol	Wedge/ Disc Surface	Seat Surface	Stem Material
1	1	13% Cr.	13% Cr.	ASTM A 276 -T410
2	2	18% Cr.8% Ni	18% Cr.8% Ni	ASTM A 276 -T304
5	5	Stellite	Stellite	ASTM A 276 -T410
8	8	13% Cr.	Stellite	ASTM A 276 -T410
9	9	Monel	Monel	Ni Cu Alloy Monel
10	10	18% Cr.8% Ni	18% Cr.8% Ni	ASTM A 276 - T316
12	12	18% Cr.8% Ni	Stellite	ASTM A 276 - T316
13	13	Alloy 20 19% Cr.29% Ni.	Alloy 20 19% Cr.29% Ni.	ASTM B473
16	16	Stellite	Stellite	ASTM A 276 - T316

#### Gland Packing Materials

Graphite with sacrificial inhibitor & inconel wire reinforcement, is the standard gland packing material for NITON cast and forged steel valves. However various special Gland Packing material shall be used depending on service conditions.

Packing Material	
Inconel wire Graphite Asbestos	1200 / 649 high pressure
PTFE impregnated asbestos	450 / 232 corrosion resistant
Virgin PTFE	450 / 232 corrosion resistant
Graphite asbestos	850 / 343 medium pressure
Grafoil	1500 / 816 corrosion resistant
Gore - Tex	(-400 -520) (-240 + 270) corrosion resistant
Inconel wire Graphite Non Asbestos	1200 / 649 High pressure

Gasket Material	ANSI Class					
	150	300	600	900	1500	2500
Corrugated metal	●	○				
Oct. Ring metal			○	○	●	●
Spiral wound metal grafoil filler	○	○	○	○		
Spiral wound metal PTFE filler		○	○	○		
Seal Ring (Pr. Seal Bonnet)				●	●	●
Virgin PTFE	○	○				
Glass filled PTFE	○	○				

● : Niton Standard

○ : Option



**Pressure Temperature Ratings**

ASME B 16.34  
 Maximum Allowable Non-Shock Pressure, psig / kg / cm2 g.

Service Temperature		Class 150					Class 300					Class 600				
°F	°C	WCB (a)	WC1 (b)(c)	WC6 (c)	WC9 (c)	C5 (c)	WCB (a)	WC1 (b)(c)	WC6 (c)	WC9 (c)	C5 (c)	WCB (a)	WC1 (b)(c)	WC6 (c)	WC9 (c)	C5 (c)
-20 to 100	-29 to 38	285	265	290	290	290	740	695	750	750	750	1480	1390	1500	1500	1500
100	38	285	265	290	290	290	740	695	750	750	750	1480	1390	1500	1500	1500
200	93	260	260	260	260	260	675	680	750	750	745	1350	1360	1500	1500	1490
300	149	230	230	230	230	230	655	655	720	730	715	1315	1305	1445	1455	1430
400	204	200	200	200	200	200	635	640	695	705	705	1270	1280	1385	1410	1410
500	260	170	170	170	170	170	600	620	665	665	665	1200	1245	1330	1330	1330
600	316	140	140	140	140	140	550	605	605	605	605	1095	1210	1210	1210	1210
650	343	125	125	125	125	125	535	590	590	590	590	1075	1175	1175	1175	1175
700	371	110	110	110	110	110	535	570	570	570	570	1065	1135	1135	1135	1135
750	399	95	95	95	95	95	505	530	530	530	530	1010	1065	1065	1065	1055
800	427	80	80	80	80	80	410	510	510	510	510	825	1015	1015	1015	1015
850	454	65	65	65	65	65	270	485	485	485	485	535	975	975	975	965
900	482	50	50	50	50	50	170	450	450	450	450	345	900	900	900	740
950	510	35	35	35	35	35	105	280	320	375	275	205	560	640	755	550
1000	538	20	20	20	20	20	50	165	215	260	200	105	330	430	520	400
1050	566	20	20*	20*	20*	20*	145	175	145				290	350	290	
1100	593		20*	20*	20*	20*		95	110	100			190	220	200	
1150	621									60					125	
1200	649									35					70	
Hydrostatic Shell Test Pressure		450	425	450	450	450	1125	1075	1150	1150	1150	2250	2100	2275	2275	154
Valve Closure Test Pressure	Fluid	315	300	320	320	320	825	770	830	830	830	1630	1535	1655	1655	
	Air	22.00	21.00	22.5	22.5	22.5	58	54	58	58	58	114	107	116	116	

Service Temperature		Class 900					Class 1500					Class 2500				
°F	°C	WCB (a)	WC1 (b)(c)	WC6 (c)	WC9 (c)	C5 (c)	WCB (a)	WC1 (b)(c)	WC6 (c)	WC9 (c)	C5 (c)	WCB (a)	WC1 (b)(c)	WC6 (c)	WC9 (c)	C5 (c)
-20 to 100	-29 to 38	2220	2085	2250	2250	2250	3705	3470	3750	3750	3750	6170	5785	6250	6250	6250
100	38	2220	2085	2250	2250	2250	3705	3470	3750	3750	3750	6170	5785	6250	6250	6250
200	93	2025	2035	2250	2250	2235	3375	3395	3750	3750	3725	5625	5660	6250	6250	6205
300	149	1970	1955	2165	2185	2150	3280	3260	3610	3640	3580	5470	5435	6015	6070	5965
400	204	1900	1920	2080	2115	2115	3170	3200	3465	3530	3530	5280	5330	5775	5880	5880
500	260	1795	1865	1995	1995	1995	2995	3105	3425	3325	3325	4990	5180	5540	5540	5540
600	316	1640	1815	1815	1815	1815	2735	3025	3025	3025	3025	4560	5040	5040	5040	5040
650	343	1610	1765	1765	1765	1765	2685	2940	2940	2940	2940	4475	4905	4905	4905	4905
700	371	1600	1705	1705	1705	1705	2665	2840	2840	2840	2840	4440	4730	4730	4730	4730
750	399	1510	1595	1595	1595	1585	2520	2660	2660	2660	2640	4200	4430	4430	4430	4400
800	427	1235	1525	1525	1525	1525	2060	2540	2540	2540	2540	3430	4230	4230	4230	4230
850	454	805	1460	1460	1460	1460	1340	2435	2435	2435	2415	2230	4060	4060	4030	4030
900	482	515	1350	1350	1350	1350	860	2245	2245	2245	1850	1430	3745	3745	3085	3085
950	510	310	845	955	1130	825	515	1405	1595	1885	1370	860	2345	2655	3145	2285
1000	538	155	495	650	780	595	260	825	1080	1305	995	430	1370	1800	2170	1655
1050	566			430	525	430			720	875	720			1200	1455	1200
1100	593			290	330	300			480	550	495			800	915	830
1150	621				205	185					310					515
1200	649				125	105					170					285
Hydrostatic Shell Test Pressure		3350	3150	3375	3375	3375	5575	5525	5650	5650	5650	9275	8700	9375	9375	656
Valve Closure Test Pressure	Fluid	2445	2295	2475	2475	2475	4080	3817	4130	4130	4130	6780	6365	6875	6875	
	Air	171	160.5	173	173	173	286	267	280	280	280	475	445	481	481	

Notes: (a) --- Permissible, but not recommended for prolonged usage above 800° F. Upon prolonged exposure to temperature above 800° F, the carbide phase of carbon steel may be converted to graphite.

(b) --- Permissible, but not recommended for prolonged usage above 850° F.

(c) --- Use normalized and tempered material only.  
 \* For welding end valves only. Flanged end ratings terminate at 1,000° F.

**Pressure Temperature Ratings**

ASME B 16.34  
 Maximum Allowable Non-Shock Pressure, psig / kg / cm2 g.

Service Temperature		Class 150				Class 300				Class 600			
°F	°C	CF8		CF8M		CF8		CF8M		CF8		CF8M	
		psig	kgf / cm2	psig	kgf / cm2	psig	kgf / cm2	psig	kgf / cm2	psig	kgf / cm2	psig	kgf / cm2
-20 to 100	-29 to 38	275	19.2	275	19.2	720	50.4	720	50.4	1440	100.8	1440	100.8
100	38	275	19.2	275	19.2	720	50.4	720	50.4	1440	100.8	1440	100.8
200	93	230	16.1	235	16.45	600	42	620	43.4	1200	84	1240	86.8
300	149	205	14.3	215	15.05	540	37.8	560	39.2	1080	75.6	1120	78.4
400	204	190	13.3	195	13.65	495	34.7	515	36.05	995	69.65	1025	71.75
500	260	170	11.9	170	11.9	465	32.55	480	33.6	930	65.1	955	66.85
600	316	140	9.8	140	9.8	435	30.45	450	31.5	875	61.25	900	63
650	343	125	8.75	125	8.75	430	30.1	445	31.15	860	60.2	890	62.3
700	371	110	7.7	110	7.7	425	29.75	430	30.1	850	59.5	870	60.9
750	399	95	6.65	95	6.65	415	29.05	425	29.75	830	58.1	855	59.85
800	427	80	5.6	80	5.6	405	28.35	420	29.4	805	56.35	845	59.15
850	454	65	4.55	65	4.55	395	27.65	420	29.4	790	55.3	835	58.45
900	482	50	3.5	50	3.5	390	27.3	415	29.05	780	54.6	830	58.1
950	510	35	2.45	35	2.45	380	26.6	385	26.95	765	53.55	775	54.25
1000	538	20	1.4	20	1.4	320	22.4	350	24.5	640	44.8	700	49.0
1050	566	20*	1.4	20*	1.4	310	21.7	345	24.15	615	43.05	685	47.95
1100	593	20*	1.4	20*	1.4	255	17.85	305	21.35	515	36.05	610	42.7
1150	621	20*	1.4	20*	1.4	200	14	235	16.45	400	28	475	33.25
1200	649	20*	1.4	20*	1.4	155	10.85	185	12.95	310	21.7	370	25.9
1250	677	20*	1.4	20*	1.4	115	8.05	145	10.15	225	15.75	295	20.65
1300	704	20*	1.4	20*	1.4	85	6.0	115	8.05	170	11.9	235	16.45
1350	732	20*	1.4	20*	1.4	60	4.2	95	6.65	125	8.75	190	13.3
1400	760	20*	1.4	20*	1.4	50	3.5	75	5.25	95	6.65	150	10.5
1450	788	15*	1.4	20*	1.4	35	2.5	60	4.2	70	4.9	115	8.05
1500	816	10*	0.7	15*	1.4	25	1.75	40	2.8	55	3.85	85	5.95
Hydrostatic Shell Test Pressure		425 / 30				1100 / 78				2175 / 153			
Valve Closure Test Pressure	Hydrostatic	305 / 22				795 / 56				1585 / 115			
	Air	100 / 7				100 / 7				100 / 7			

Service Temperature		Class 900				Class 1500			
°F	°C	CF8		CF8M		CF8		CF8M	
		psig	kgf / cm2	psig	kgf / cm2	psig	kgf / cm2	psig	kgf / cm2
-20 to 100	-29 to 38	2160	151.2	2160	151.2	3600	252	3600	252
100	38	2160	151.2	2160	151.2	3600	252	3600	252
200	93	1800	126	1860	130.2	3000	210	3095	216.65
300	149	1620	113.4	1680	117.6	2700	189	2795	195.65
400	204	1490	104.3	1540	107.8	2485	174.0	2570	179.9
500	260	1395	97.5	1435	100.4	2330	163.1	2390	167.3
600	316	1310	91.7	1355	94.85	2185	152.95	2255	157.85
650	343	1290	90.3	1330	93.1	2150	150.5	2220	155.4
700	371	1275	89.25	1305	91.4	2125	148.75	2170	151.9
750	399	1245	87.2	1280	89.6	2075	145.25	2135	149.45
800	427	1210	84.7	1265	88.55	2015	141.05	2110	147.7
850	454	1190	83.3	1255	87.85	1980	138.6	2090	146.3
900	482	1165	81.55	1245	87.2	1945	136.15	2075	145.25
950	510</								

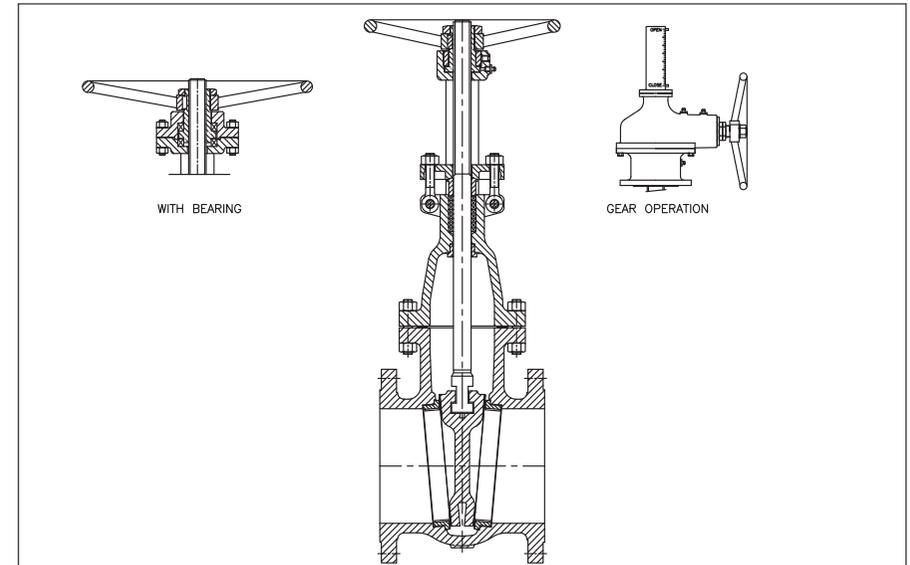
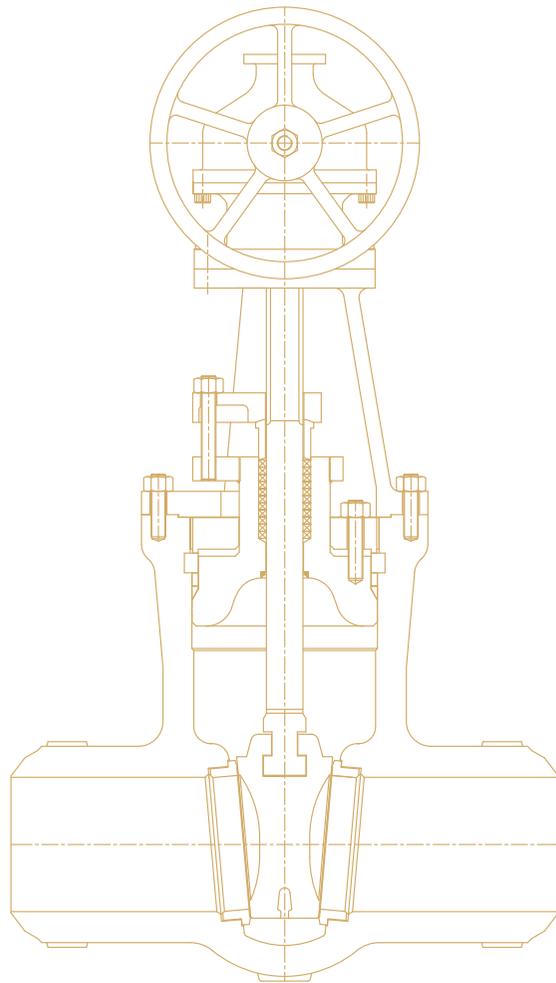
## ASTM Materials

ASTM Code	Chemical Compositions %										Mechanical			
	C	Mn	P	S	Si	Cr	Mo	Ni	Cu	V	Tensile Mpa	Yield Mpa	Elongation	% Reduct. Area
	max.	max.	max.	max.	max.	max.	max.	max.	max.	max.	min	min	min	min
A216 WCB	0.30	1.00	0.040	0.045	0.60	0.50	0.20	0.50	0.30	0.03	485	250	22	35
A216 WCC	0.25	1.20	0.040	0.045	0.60	0.50	0.20	0.50	0.30	0.03	485	275	22	35
A217 WC1	0.25	0.80	0.040	0.045	0.60		0.65		0.50		450	240	24	35
A217 WC5	0.05 0.20	0.40 0.70	0.040	0.045	0.60	0.50 0.90	0.90 1.20	0.60 1.00	0.50	0.10 Tu	485 to 655	275	20	35
A217 WC6	0.20	0.80	0.040	0.045	0.60	1.50	0.65		0.50		485	275	20	35
A217 WC9	0.18	0.70	0.040	0.045	0.60	2.75	1.20		0.50	23	485	275	20	35
A217 C5	0.20	0.70	0.040	0.045	0.75	6.50	0.65		0.50		620	415	18	35
A217 CA15	0.15	1.00	0.040	0.040	1.50	14.00	0.50	1.00			620	450	18	30
A351 CF8	0.08	1.50	0.040	0.040	2.00	21.00	0.50	11.00			485	205	35	
A351 CF8M	0.08	1.50	0.040	0.040	1.50	21.00	3.00	12.00			485	205	30	
A351 CF3	0.03	1.50	0.040	0.040	2.00	21.00	0.50	12.00			485	205	35	
A351 CF3M	0.03	1.50	0.040	0.040	1.50	21.00	3.00	13.00			485	205	30	
A351 CN7M	0.07	1.50	0.040	0.040	1.50	22.00	3.00	30.50	4.00		425	170	35	
A352 LCB	0.30	1.00	0.040	0.045	0.60	0.50	0.20	0.50	0.30	0.03	450	240	24	35
A352 LCC	0.25	1.20	0.040	0.045	0.60	0.50	0.20	0.50	0.30	0.03	485	275	22	35
A105	0.35	1.05	0.035	0.040	0.35	0.30	0.12	0.40	0.40	0.05	485	250	30	30
A182 F304	0.08	2.00	0.040	0.030	1.00	20.00		11.00			515	205	30	50
A182 F316	0.08	2.00	0.040	0.030	1.00	18.00	3.00	14.00			515	205	30	50
A182 F304L	0.04	2.00	0.040	0.030	1.00	20.00		13.00			485	170	30	50
A182 F316L	0.04	2.00	0.040	0.030	1.00	18.00	3.00	15.00			485	170	30	50
A182 F5	0.15	0.30 0.60	0.030	0.030	0.500	4.00 6.00	0.44 0.65	0.50			485	275	20	35
A182 F11 Cl1	0.05 0.15	0.30 0.61	0.030	0.030	0.50 1.00	1.00 1.50	0.44 0.65				415	205	20	45
A182 F11 Cl2	0.10	0.30	0.040	0.040	0.50	1.00	0.44				485	276	20	30
A182 F11 Cl3	0.20	0.80	0.040	0.040	1.00	1.50	0.65				515	310	20	30
A182 F22 Cl1	0.05 0.15	0.30 0.60	0.040	0.040	0.50	2.00 2.50	0.87 1.13				415	205	20	35
A182 F22 Cl2	0.15 0.16	0.30 0.61	0.040	0.040	0.50	2.00 2.51	0.87 1.14				515	310	20	30
A350 LF2	0.03	0.60 1.35	0.035	0.040	0.15 0.30	0.30	0.12	0.40	0.40	0.02 0.03	485 to 655	250	30	197
A276 410	0.15	1.00	0.040	0.030	1.00	11.5 13.5					690	550	15	45
A276 420	>0.15	1.00	0.040	0.030	1.00	14.00								
A193 B7	0.49	1.10	0.035	0.040	0.35	1.20	0.25				860	720	16	50
A193 B7M	0.49	1.10	0.035	0.040	0.35	1.20	0.25				690	550	18	50
A193 B8	0.08	2.00	0.045	0.030	1.00	20.00		10.50			515	205	30	50
A193 B8M	0.08	2.00	0.045	0.030	1.00	18.00	3.00	14.00			515	205	30	50
A194 2H	0.40	1.00	0.040	0.050	0.40									
A194 2HM	0.40	1.00	0.040	0.050	0.40									
A320 L7	0.48	1.00	0.035	0.040	0.35	1.10	0.25				860	725	16	50
A320 L7M	0.48	1.00	0.035	0.040	0.35	1.10	0.25				690	550	18	50
A194 8	0.08	2.00	0.045	0.030	1.00	20.00		10.50						

## DETAILS ABOUT ITEM CODING STRUCTURE

Our item code consist of 10 digits, each digit have contained some important, the following are the step by step explanation of each digit

I	II	III	IV	V	VI	VII	
[I] TYPES OF VALVES 2 DIGIT		[II] CLASS OF VALVES 1 DIGIT		[III] BODY MATERIALS - 2 DIGIT			
1	GATE VALVE	0	125 CLASS	01	WCB	02	A105
2	GLOBE VALVE	1	150 CLASS	03	CF8	04	CF8M
3	SWING CHECK VALVE	2	300 CLASS	05	LCB	06	WC6
4	LIFT CHECK VALVE	3	400 CLASS	07	WC9	08	A182 F 304
5	BALL VALVE	4	600 CLASS	09	AF182 F316	10	CF3
6	FLUSH BOTTOM VALVE	5	800 CLASS	11	CF3M	12	C5
7	NEEDLE VALVE	6	900 CLASS	13	ALLOY-20	14	HASTELLOY-B
8	THROUGH CONDUIT GATE	7	1500 CLASS	15	HASTELLOY-C	16	CAST IRON
9	DUAL PLATE CHECK VALVE	8	2500 CLASS	17	C.S.BARSTOCK	18	S.S.304
10	STOP CHECK VALVE	9	4500 CLASS	19	S.S.316	20	WCI
11	Y-TYPE GLOBE VALVE			21	F304L	22	F316L
12	ANGLE VALVE			23	C12	24	CF8C
13	DEAD MAN VALVE			25	CN7M	26	CF10
				27	LC3	28	MONEL
				29	CD4N-CU	30	F5
				31	F9	32	F11
				33	WC5	34	F22
				35	F321	37	A350 LF2
[IV] TRIM MATERIAL 2 DIGITS		[V] WEDGE/DISC/BALL 1 DIGIT		[VI] END CONNECTIONS 1 DIGIT			
01	13% CR SS	1	SOLID WEDGE	1	FLANGED END - B 16.5		
02	C.S 13% CR. FACING	2	FLEXIBLE WEDGE	2	FLANGED END DIN		
03	S.S.304	3	PLUG TYPE DISC	3	BUTT WELD END		
04	S.S.316	4	REGULATING PLUG/ PARABOLIC PLUG	4	SOCKET WELD END		
05	S.S.410	5	FULL BORE	5	SCREWED END BSP		
06	S.S.304L	6	REGULAR BORE	6	SCREWED END NPT		
07	S.S.316L	7	PARALLEL SLIDE	7	FLANGED END RING TYPE JOINT B16.5		
08	ALLOY-20	8	DOUBLE DISC	8	NIPPLE WELD		
09	BRONZE			9	FE B 16.5 FLANGES WELDED THEREON		
10	S.S.304 TI			0	WAFER TYPE		
11	S.S.316 TI						
12	HASTELLOY-B						
13	HASTELLOY-C						
16	S.S.321						
17	S.S.304 H						
18	MONEL						
[VII] SPECIAL REQUIREMENT 1 DIGIT (ALPHA NUMERIC)							
A	ACTUATOR	B	BY PASS	C	CHAIN WHEEL OPERATED		
D	DEEP STUFFING BOX	E	EXTENSION SPINDLE	F	STELLITED SEAT & DISC		
G	GEAR OPERATED	H	HYDRAULIC CYLINDER	I	I.B.R		
J	JACKETED	K	GRAFOIL GLAND PACKING	L	GLAND SEALING		
M	DRAIN PLUG AS PER MSS-SP-54	N	FIRE SAFE DESIGN	O	OTHERS		
P	PNEUMATIC CYLINDER	R	RADIOGRAPHY	S	STELLITED SEAT		
T	OPEN INTO TANK	V	OPEN INTO VALVE	W	STELLITED WEDGE		
X	STELLITED PLUG	Y	STELLITED SEAT & WEDGE	Z	STELLITED SEAT & PLUG		
1	OPEN INTO TANK WITH STELLITED SEAT			2	OPEN INTO TANK WITH STELLITED SEAT & PLUG		
3	OPEN INTO VALVE WITH STELLITED SEAT			4	OPEN INTO VALVE WITH STELLITED SEAT & PLUG		
5	REDUCE BORE			6	STELLITED SEAT WITH MOTOR OPERATED MOUNTING		
				7	EXTENDED BONNET		



MATERIAL SPECIFICATION

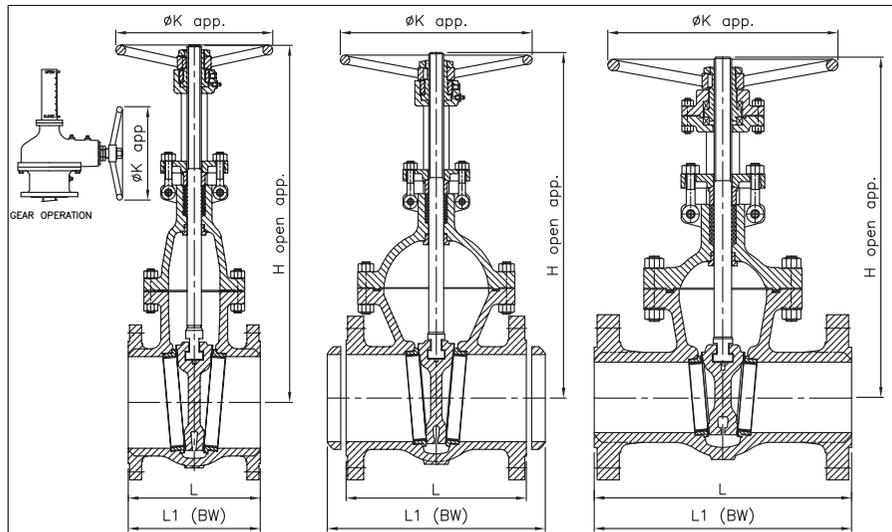
PART NAME	MATERIAL		MATERIAL	
BODY	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
BONNET	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
YOKE <sup>1</sup>	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
WEDGE	13%Cr. FACING ON WCB	13%Cr. FACING ON WC6	A 351 CF8	A 351 CF8M
SEAT RING <sup>2</sup>	13%Cr. FACING ON A 515-70	S.S 304	T304/CF8	T316/CF8M
BACK SEAT	T410	T410	INTEGRAL	INTEGRAL
SPINDLE	T410	T410	T304	T316
GLAND BUSH	T410	T410	T304	T316
GLAND FLANGE	CARBON STEEL/WCB	CARBON STEEL/WCB	S.S 304	
YOKE SLEEVE	A 439 Gr.D2		AL-BRONZE	
YOKE NUT	ASTM A 515-70		S.S 304	
CASING COVER	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
HAND WHEEL	CARBON STEEL		CARBON STEEL	
HAND WHEEL NUT	CARBON STEEL		S.S 304	
STUD & NUT	A 193 B7/A 194 2H	A 193 Gr.B16/A 194 Gr.7	A 193 B8/A 194 Gr.8	
EYE BOLT & NUT	A 193 B7/A 194 2H		A 193 B7/A 194 2H	
CROSS BOLT & NUT	A 193 B7/A 194 2H		A 193 B7/A 194 2H	
GASKET	SPW SS 304/316 WITH GRAPHOIL			
GLAND PACKING	GRAPHOIL			
GRUB SCREW	STEEL			
GREASE NIPPLE	BRASS/STEEL			
NAME PLATE	ALUMINIUM/S.S.			
BEARING	STANDARD			

1 - SEPERATE YOKE 14"NB & ABOVE      3 - RENEWABLE BACK SEAT FOR AUSTENITIC STEEL VALVE OPTIONAL  
2 - SEAL WELD 3"NB & ABOVE      4 - SEAT AND WEDGE STELLITING OPTIONAL  
5 - BY-PASS ARRANGEMENT OPTIONAL

# 01 GATE VALVE

GATE VALVE CLASS 150, 300, 600.

API 600/ASME B 16.34/BS1414



DIMENSION TABLE 150 CLASS

VALVE SIZE in mm	2	2.5	3	4	5	6	8	10	12	14	16	18	20	22	24	26	28	30	32	36	42	46	48	50	52	54	56	58	60
L	7.0	7.5	8.0	9.0	10.0	10.5	11.5	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	22.0	24.0	24.0	28.0	28.0	32.0	-	35.9	35.9	35.9	35.9	-	-	-
L1	8.5	9.5	11.12	12.0	15.0	15.9	16.5	18.0	19.8	22.5	24.0	26.0	28.0	30.0	32.0	35.5	39.0	39.0	-	48.0	55.0	-	-	-	-	-	-	-	-
H app	400	445	485	600	725	765	985	1220	1395	1500	1775	2000	2210	2530	2725	2800	3130	3300	3420	3975	4370	-	4900	5365	5415	5465	-	-	-
$\phi K_{app}$	200	200	250	250	300	300	350	450	500	500	500	550	600	650	700	750	750	750	750	750	750	-	750	750	750	750	-	-	-
Wt. kg app(F/E)	20	28	33	55	70	90	130	225	330	450	530	625	825	1150	1210	1415	1620	2025	2450	3050	4250	-	-	-	-	-	-	-	-

DIMENSION TABLE 300 CLASS

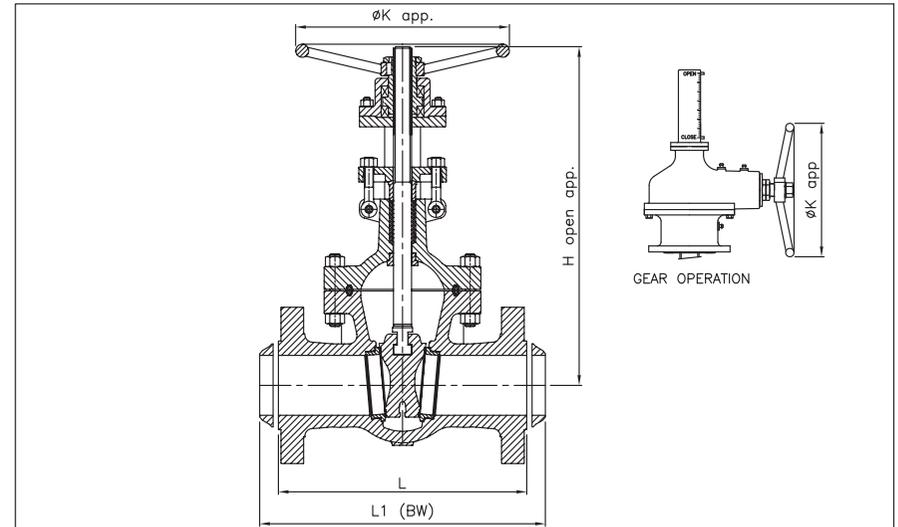
VALVE SIZE in mm	2	2.5	3	4	5	6	8	10	12	14	16	18	20	22	24	26	28	30	32	36	42	46	48	50
L	8.5	9.5	11.12	12.0	15.0	15.88	16.5	18.0	19.8	30.0	33.0	36.0	39.0	43.0	45.0	49.0	52.9	55.0	60.0	-	-	-	-	77.5
L1	8.5	9.5	11.12	12.0	15.0	15.88	16.5	18.0	19.8	30.0	33.0	36.0	39.0	43.0	45.0	49.0	52.9	55.0	60.0	-	-	-	-	77.5
H app	410	450	485	615	725	835	1015	1230	1555	1720	1970	2160	2410	2550	2810	3010	3170	3440	3570	-	-	-	-	5600
$\phi K_{app}$	200	250	250	300	350	350	450	500	500	600	600	700	700	700	750	750	750	750	750	-	-	-	-	750
Wt. kg app(F/E)	32	35	55	80	100	150	225	350	480	745	1060	1325	1725	1900	2570	-	-	-	-	-	-	-	-	-

DIMENSION TABLE 600 CLASS

VALVE SIZE in mm	2	2.5	3	4	5	6	8	10	12	14	16	18	20	22	24	26	28	30	32	36			
L	11.5	13.0	14.0	17.0	20.0	22.0	26.0	31.0	33.0	35.0	39.0	43.0	47.0	51.0	55.0	57.0	60.9	65.0	-	-	-	-	70.8
L1	11.5	13.0	14.0	17.0	20.0	22.0	26.0	31.0	33.0	35.0	39.0	43.0	47.0	51.0	55.0	57.0	60.9	65.0	-	-	-	-	70.8
H app	410	485	560	705	800	895	1125	1400	1535	1825	1955	2140	2310	2680	2725	2850	3130	-	-	-	-	-	4000
$\phi K_{app}$	250	250	350	450	500	500	600	650	650	700	700	750	750	750	750	750	750	750	-	-	-	-	750
Wt. kg app(F/E)	38	56	72	136	170	245	432	780	835	1190	1690	2010	2400	2650	3700	-	-	-	-	-	-	-	-

GATE VALVE CLASS 900, 1500, 2500.

API 600/ASME B 16.34/BS1414



DIMENSION TABLE 900 CLASS

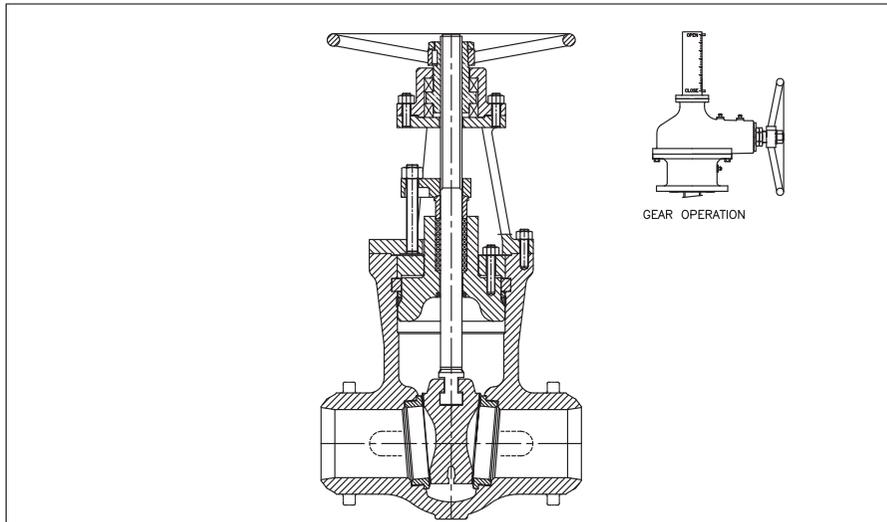
VALVE SIZE in mm	2	3	4	6	8	10	12	14	16	18	20	24
L	14.5	15.0	18.0	24.0	29.0	33.0	38.0	40.5	44.5	48.0	52.0	61.0
L1	14.5	15.0	18.0	24.0	29.0	33.0	38.0	40.5	44.5	48.0	52.0	61.0
H app	440	584	712	927	1220	1600	1752	2286	2362	2450	2600	-
$\phi K_{app}$	250	300	400	500	600	400	450	650	650	700	700	750
Wt. kg app(F/E)	70	105	190	380	595	975	1275	1665	2310	2880	3505	-

DIMENSION TABLE 1500 CLASS

VALVE SIZE in mm	2	3	4	6	8	10	12	14	16	18	20	24
L	14.5	18.5	21.5	27.8	32.7	39.0	44.5	49.5	54.5	60.5	65.5	76.5
L1	14.5	18.5	21.5	27.8	32.7	39.0	44.5	49.5	54.5	60.5	65.5	76.5
H app	500	633	725	1045	1310	1410	1550	2100	2475	-	-	-
$\phi K_{app}$	250	350	400	600	450	450	450	650	700	750	750	750
Wt. kg app(F/E)	80	150	225	625	1115	1430	1955	2690	3830	-	-	-

DIMENSION TABLE 2500 CLASS

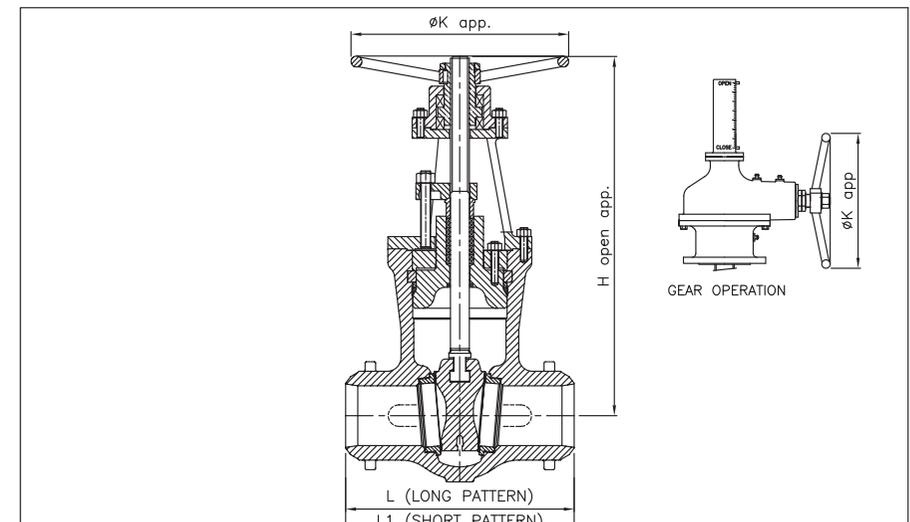
VALVE SIZE in mm	2	3	4	6	8	10	12	14	16
L	17.8	22.8	26.5	36.0	40.3	50.0	55.9	-	-
L1	17.8	22.8	26.5	36.0	40.3	50.0	40.9	44.0	49.0
H app	595	750	805	1200	1346	1500	1720	-	-
$\phi K_{app}$	250	350	400	600	680	910	750	750	750
Wt. kg app(F/E)	130	220	320	815	1405	2550	-	-	-



MATERIAL SPECIFICATION

PART NAME	MATERIAL		MATERIAL	
BODY	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
BONNET	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
YOKE	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
WEDGE	13%Cr. FACING ON WCB+STELLITED	WC6 + STELLITED	A 351 CF8+STELLITED	A 351 CF8M+STELLITED
SEAT RING 1	A 515-70/13%Cr.+STELLITED	S.S 304 + STELLITED	T304 + STELLITED	T316 + STELLITED
BACK SEAT	INTEGRAL		INTEGRAL	
SPINDLE	T410	T410	T304	T316
GLAND BUSH	T410	T410	T304	T316
GLAND FLANGE	CARBON STEEL/WCB		S.S 304	
YOKE SLEEVE	A 439 Gr.D2		AL-BRONZE	
CASING COVER	A 216 WCB	A 216 WCB/A 217 WC6	A 351 CF8	
BONNET PLATE	A 515 70		S.S 304	
HAND WHEEL	CARBON STEEL		CARBON STEEL	
HAND WHEEL NUT	CARBON STEEL		S.S 304	
STUD & NUT	A 193 B7/A 194 2H	A 193 Gr.B16/A 194 Gr.7	A 193 B8/A 194 Gr.8	
GLAND STUD & NUT	A 193 B7/A 194 2H		A 193 B7/A 194 2H	
CASING STUD & NUT	A 193 B7/A 194 2H		A 193 B7/A 194 2H	
YOKE STUD & NUT	A 193 B7/A 194 2H		A 193 B7/A 194 2H	
GLAND PACKING	GRAPHOIL			
SEAL RING	T304		T304	T316
SPACER RING	A 515 70	T304	T304	T316
SEGMENTAL RING	A 515 70	T304	T304	T316
NAME PLATE	ALUMINIUM/S.S.			
BEARING	STANDARD			

1 - SEAL WELDED  
2 - BY-PASS ARRANGEMENT OPTIONAL



DIMENSION TABLE 900 CLASS

VALVE SIZE in mm	2 50	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	24 600
L	14.5 368	15.0 381	18.0 457	24.0 610	29.0 737	33.0 838	38.0 965	40.5 1029	44.5 1130	48.0 1219	52.0 1321	61.0 1549
L1	8.5 216	12.0 305	14.0 356	20.0 508	26.0 660	31.0 787	36.0 914	39.0 991	43.0 1092	-	-	-
H app	545	595	720	970	1140	1345	1615	1651	2362	2450	2550	-
ØK app	250	300	400	500	600	400	450	650	650	700	750	750
Wt. kg app	50	75	130	265	430	680	950	1290	1850	2250	2785	-

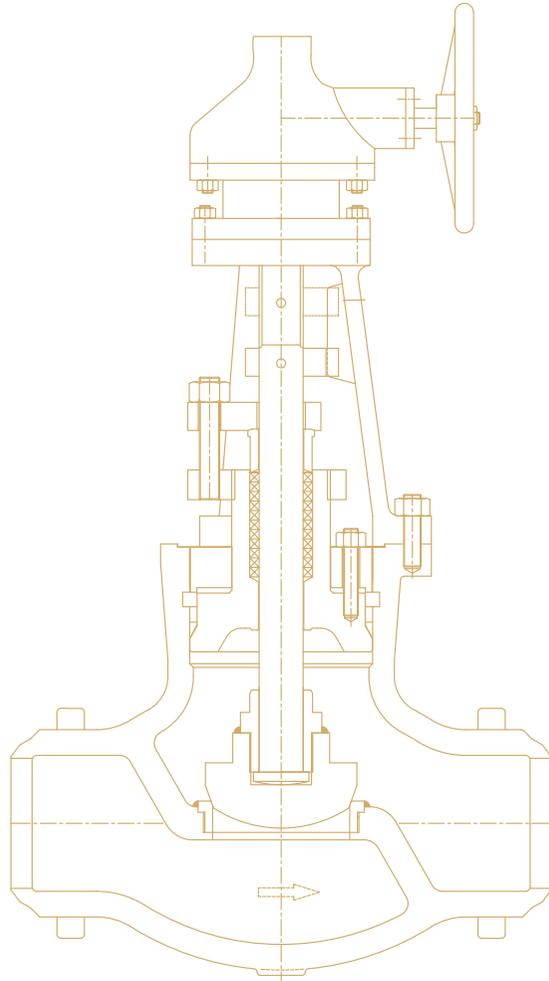
DIMENSION TABLE 1500 CLASS

VALVE SIZE in mm	2 50	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	24 600
L	14.5 368	18.5 470	21.5 546	27.8 705	32.7 832	39.0 991	44.5 1130	49.5 1257	54.5 1384	60.5 1537	65.5 1664	76.4 1943
L1	8.5 216	12.0 305	16.0 406	22.0 559	28.0 711	34.0 863	39.0 991	42.0 1067	47.0 1194	53.0 1346	58.0 1473	-
H app	545	625	900	1085	1290	1420	1580	2100	2457	-	-	-
ØK app	250	350	400	600	450	450	450	650	700	650	700	750
Wt. kg app	55	85	160	440	760	1050	1350	1890	2830	-	-	-

DIMENSION TABLE 2500 CLASS

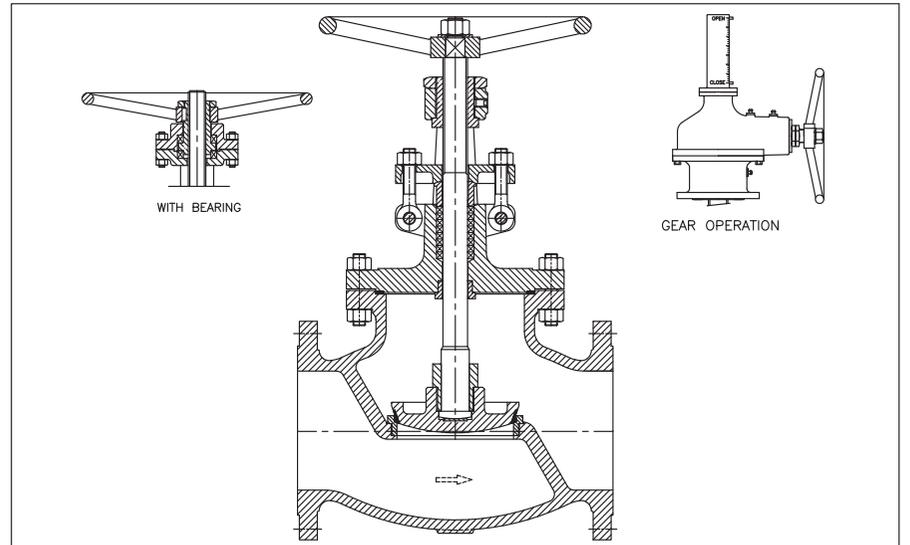
VALVE SIZE in mm	2 50	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16 400	18 450
L	17.8 451	22.8 578	26.5 673	36.0 914	40.3 1022	50.0 1270	56.0 1422	-	-	-
L1	11.0 279	14.5 368	18.0 457	24.0 610	30.0 762	36.0 914	41.0 1041	44.0 1118	49.0 1245	55.0 1397
H app	590	800	865	950	1050	1345	1690	-	-	-
ØK app	250	350	400	600	500	500	550	550	600	650
Wt. kg app	85	120	190	520	980	1600	-	-	-	-

1 - END TO END AS PER L1 UNLESS OTHERWISE SPECIFIED.



02

# GLOBE VALVE



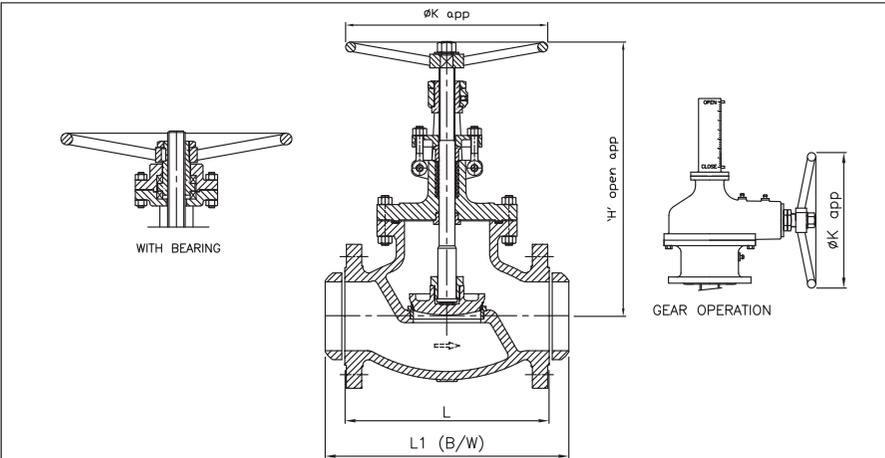
### MATERIAL SPECIFICATION

PARTS	MATERIAL		MATERIAL	
BODY	A 216 Gr.WCB	A 217 WC6	A 351 CF8	A 351 CF8M
BONNET	A 216 Gr.WCB	A 217 WC6	A 351 CF8	A 351 CF8M
PLUG	CA15/ 13% Cr. FACING ON WCB	A 217 WC6+ 13%Cr FACING	A 351 CF8	A 351 CF8M
SEAT RING 1	CA15/A 515-70/ 13%Cr FACING	S.S. 304	A 351 CF8	A 351 CF8M
BACK SEAT	T410		INTEGRAL	INTEGRAL
SPINDLE	T410		T304	T316
GLAND BUSH	T410		T304	T316
GLAND FLANGE	CARBON STEEL/WCB		S.S 304	S.S 304
YOKE NUT	ASTM A 439 D2		AL-BRONZE	
PLUG NUT	T410		T304	T304
HAND WHEEL	CARBON STEEL			
HAND WHEEL NUT	A 194 2H		A 194 Gr.8	
STUD & NUT	A 193 B7/A 194 2H	A 193 B16/A 194 Gr. 7	A 193 B8/A 194 Gr.8	
EYE BOLT & NUT	A 193 B7/A 194 2H		A 193 B7/A 194 2H	
CROSS BOLT & NUT	A 193 B7/A 194 2H		A 193 B7/A 194 2H	
GASKET	SPW S.S 304/ 316 WITH GRAFOIL			
GLAND PACKING	GRAPHOIL			
THRUST WASHER	T410 (HARDENED STEEL)		T304	T316
WASHER	STEEL			
GRUB SCREW	STEEL			
LOCK NUT	STEEL			
NAME PLATE	ALUMINIUM/SS			

1 - SEAL WELD 3"NB & ABOVE.  
2 - INTEGRAL SEAT FOR AUSTENITIC STEEL VALVES OPTIONAL.  
3 - SEAT AND PLUG STELLITING OPTIONAL.

4 - THRUST BEARING, NON-ROTATING STEM WITH YOKE SLEEVE PROVIDED 12"/10"/8"NB & ABOVE SIZES  
5 - GUIDED DISC PROVIDED (12"x150#, 300# & 8"x600#).

GLOBE VALVE CLASS 150, 300, 600.  
BS 1873/ASME B 16.34



DIMENSION TABLE GBV 150 CLASS

VALVE SIZE in mm	2 50	2.5 65	3 80	4 100	5 125	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	22 550	24 600	26 650	28 700	30 750	32 800	36 900	
L	8.0 203	8.5 216	9.5 241	11.5 292	14.0 356	16.0 406	19.5 495	24.5 622	27.5 698	31.0 787	36.0 914	38.5 978	42.0 1067	51.0 1295	51.0 1295	57.0 1448	60.0 1524	-	-	77.0 1956	
L1	8.0 203	8.5 216	9.5 241	11.5 292	14.0 356	16.0 406	19.5 495	24.5 622	27.5 698	31.0 787	36.0 914	38.5 978	42.0 1067	51.0 1295	51.0 1295	57.0 1448	60.0 1524	-	-	77.0 1956	
H app	12.5 320	13.0 330	15.0 380	18.9 480	20.7 525	22.7 575	25.6 650	30.7 780	36.8 935	46.7 1185	49.2 1250	53.1 1350	55.5 1410	60.0 1525	65.0 1650	-	-	-	-	-	-
$\phi K_{app}$	200	200	250	300	300	350	450	500	600	700	800	800	850	900	900	-	-	-	-	-	-
Wt. kg app(F/E)	20	30	38	57	75	98	174	282	395	620	790	925	1800	1910	2220	-	-	-	-	-	-

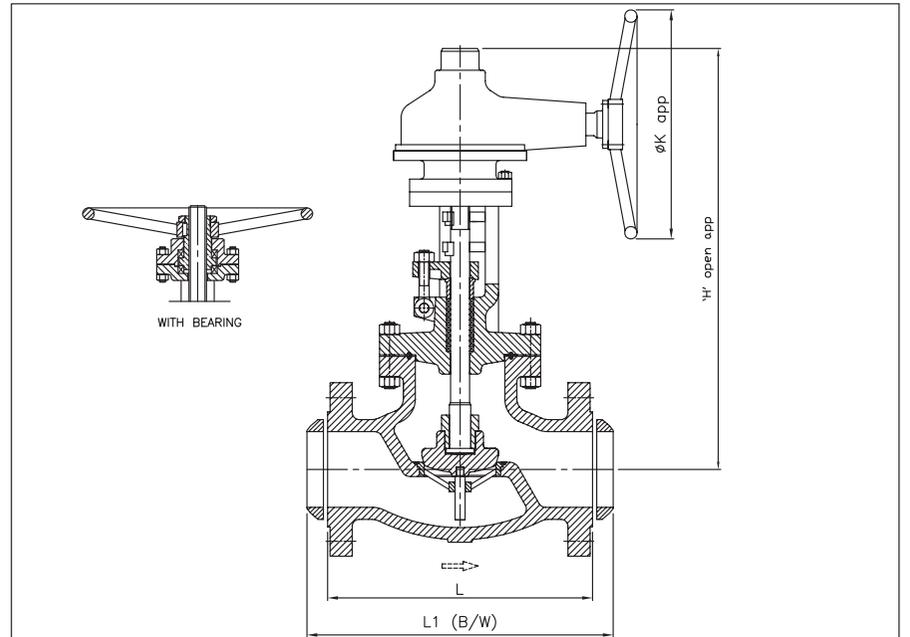
DIMENSION TABLE GBV 300 CLASS

VALVE SIZE in mm	2 50	2.5 65	3 80	4 100	5 125	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	22 550	24 600	26 650	28 700	30 750	32 800	36 900	
L	10.5 267	11.5 292	12.5 318	14.0 356	15.7 400	17.5 444	22.0 559	24.5 622	28.0 711	33.0 838	34.0 864	38.5 978	40.0 1016	44.0 1118	53.0 1346	53.0 1346	59.0 1499	62.7 1594	-	-	82.0 2083
L1	10.5 267	11.5 292	12.5 318	14.0 356	15.7 400	17.5 444	22.0 559	24.5 622	28.0 711	33.0 838	34.0 864	38.5 978	40.0 1016	44.0 1118	53.0 1346	53.0 1346	59.0 1499	62.7 1594	-	-	82.0 2083
H app	14.2 360	16.1 410	17.7 450	20.9 530	23.2 590	25.6 650	29.0 735	32.5 825	37.4 950	45.0 1145	54.0 1370	56.0 1422	58.0 1475	-	-	-	-	-	-	-	-
$\phi K_{app}$	200	250	300	350	400	450	600	700	750	800	800	850	900	-	-	-	-	-	-	-	-
Wt. kg app(F/E)	30	45	60	95	125	150	235	390	590	965	1115	1400	1800	-	-	-	-	-	-	-	-

DIMENSION TABLE GBV 600 CLASS

VALVE SIZE in mm	2 50	2.5 65	3 80	4 100	5 125	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	22 550	24 600	26 650	28 700	30 750	32 800	36 900	
L	11.5 292	13.0 330	14.0 356	17.0 432	20.0 508	22.0 559	26.0 660	31.0 787	33.0 838	35.0 889	39 991	43 1092	47 1194	-	55.0 1397	57.0 1448	63.0 1600	65.0 1651	-	-	82.0 2083
L1	11.5 292	13.0 330	14.0 356	17.0 432	20.0 508	22.0 559	26.0 660	31.0 787	33.0 838	35.0 889	39 991	43 1092	47 1194	-	55.0 1397	57.0 1448	63.0 1600	65.0 1651	-	-	82.0 2083
H app	16.0 400	16.7 425	19.3 490	25.0 635	27.0 685	29.1 740	38.4 975	42.5 1080	48.4 1230	57 1450	58 1470	65.3 1660	70.5 1790	-	-	-	-	-	-	-	-
$\phi K_{app}$	250	300	350	400	450	500	600	650	700	700	700	700	750	-	750	750	750	750	-	-	750
Wt. kg app(F/E)	35	40	68	128	185	250	435	825	910	-	-	-	-	-	-	-	-	-	-	-	-

GLOBE VALVE CLASS 900, 1500, 2500.  
BS 1873/ASME B 16.34



DIMENSION TABLE GBV 900 CLASS

VALVE SIZE in mm	2 50	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	24 600
L	14.5 368	15.0 381	18.0 457	24.0 610	29.0 737	33.0 838	37.9 965	40.5 1029	44.4 1130	47.9 1219	52.0 1321	60.9 1549
L1	14.5 368	15.0 381	18.0 457	24.0 610	29.0 737	33.0 838	37.9 965	40.5 1029	44.4 1130	47.9 1219	52.0 1321	60.9 1549
H app	505	605	710	895	980	1150	-	-	-	-	-	-
$\phi K_{app}$	300	400	500	600	700	735	-	-	-	-	-	-
Wt. kg app(F/E)	85	140	240	450	810	1150	-	-	-	-	-	-

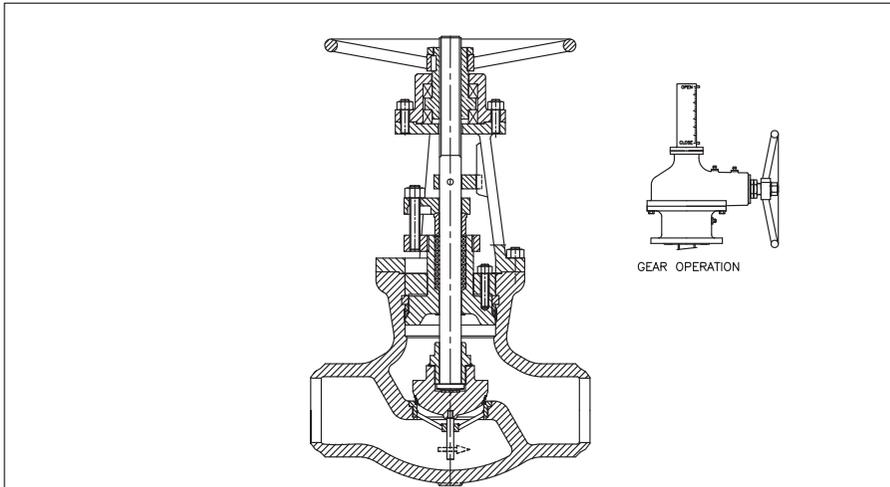
DIMENSION TABLE GBV 1500 CLASS

VALVE SIZE in mm	2 50	3 80	4 100	6 150	8 200	10 250	12 300	16 400
L	14.5 368	18.5 470	21.5 546	27.7 705	32.7 832	39.0 991	44.4 1130	54.4 1384
L1	14.5 368	18.5 470	21.5 546	27.7 705	32.7 832	39.0 991	44.4 1130	54.4 1384
H app	548	750	865	1048	1188	-	1720	-
$\phi K_{app}$	350	450	500	700	800	-	750	-
Wt. kg app(F/E)	95	155	305	550	900	-	-	-

DIMENSION TABLE GBV 2500 CLASS

VALVE SIZE in mm	2 50	3 80	4 100	6 150	8 200	10 250	12 300	16 400
L	17.7 451	22.7 578	26.4 673	36.0 914	40.2 1022	50.0 1270	55.9 1422	-
L1	17.7 451	22.7 578	26.4 673	36.0 914	40.2 1022	50.0 1270	55.9 1422	-
H app	610	795	975	1080	-	-	-	-
$\phi K_{app}$	400	500	700	750	-	-	-	-
Wt. kg app(F/E)	115	346	490	910	-	-	-	-

GLOBE VALVE CLASS 900, 1500, 2500.  
BS 1873/ASME B 16.34

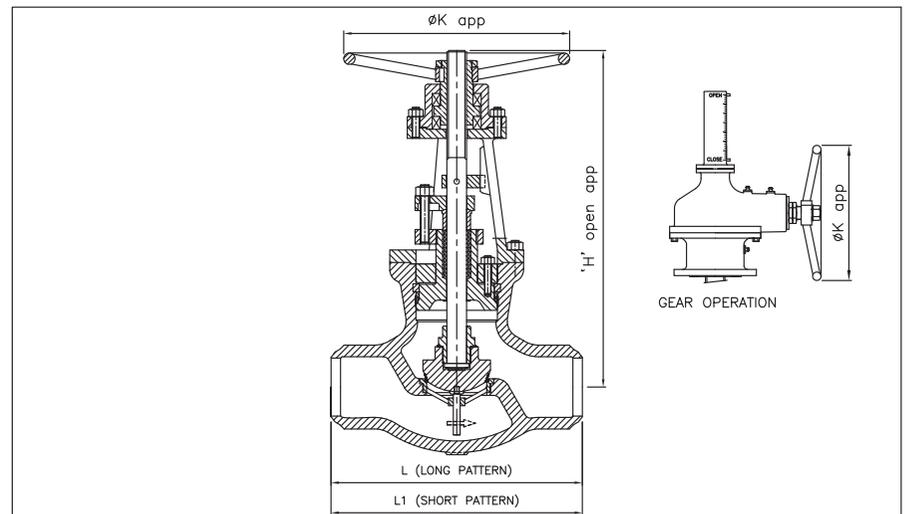


MATERIAL SPECIFICATION

PARTS	MATERIAL		MATERIAL	
BODY	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
BONNET	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
YOKE	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
PLUG	CA15/ 13% Cr. FACING ON WCB+STELLITED	A 217 WC6+STELLITED	A 351 CF8+STELLITED	A 351 CF8M+STELLITED
SEAT RING 1	A 515-70/13%Cr STELLITED	S.S. 304+STELLITED	T304 + STELLITED	T316 + STELLITED
BACK SEAT	INTEGRAL			
SPINDLE	T410		T304	T316
GLAND BUSH	T410		T304	T316
GLAND FLANGE	CARBON STEEL/A 216 WCB		S.S 304	S.S 304
YOKE SLEEVE	ASTM A 439 D2		AL-BRONZE	
CASING COVER	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8
BONNET PLATE	A 515-70/A 216 WCB	SS304/A 216 WCB	SS 304	SS 304
GUIDE PLATE	A 515 70/A 216 WCB			
HAND WHEEL	CARBON STEEL			
HAND WHEEL NUT	CARBON STEEL		S.S 304	S.S 304
STUD & NUT	A 193 B7/A 194 2H	A 193 B16/A 194 Gr.7	A 193 B8/A 194 Gr.8	A 193 B8/A 194 Gr.8
GLAND STUD & NUT	A 193 B7/A 194 2H		A 193 B7/A 194 2H	A 193 B7/A 194 2H
CASING STUD & NUT	A 193 B7/A 194 2H			
YOKE STUD & NUT	A 193 B7/A 194 2H			
GLAND PACKING	GRAPHOIL			
SEAL RING	T304		T316	
SPACER RING	ASTM A 515 70	T304	T304	T316
SEGMENTAL RING	ASTM A 515 70	T304	T304	T316
LOCKING BOLT	Gr.B7			
NAME PLATE	ALUMINIUM/SS			
BEARING	STANDARD			

1 - SEAL WELDED

GLOBE VALVE CLASS 900, 1500, 2500.  
BS 1873/ASME B 16.34



DIMENSION TABLE GBV 900 CLASS

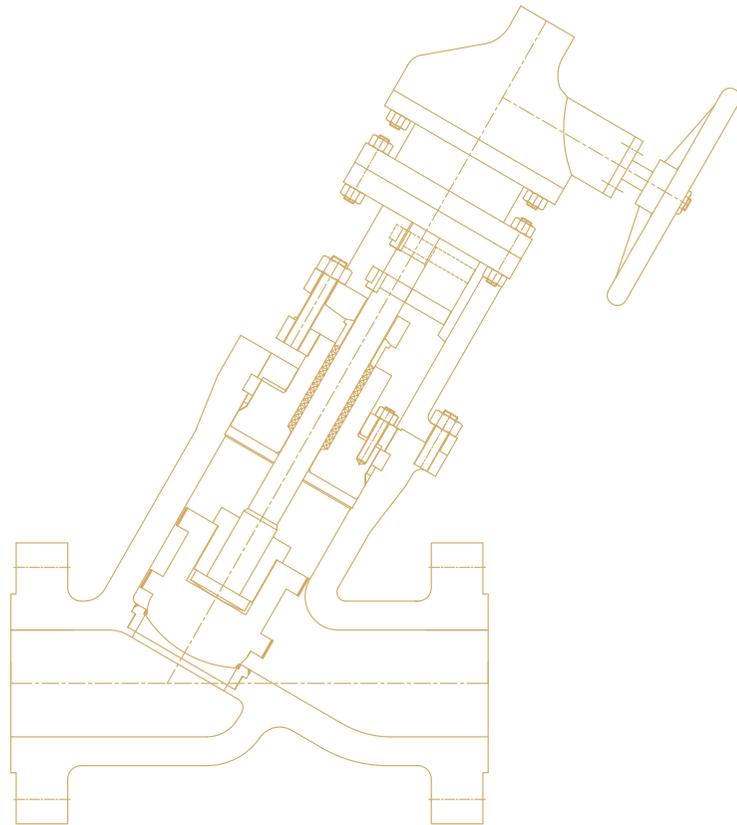
VALVE SIZE	in	2	3	4	6	8	10	12	14	16	18	20	24
mm	50	80	100	150	200	250	300	350	400	450	500	600	610
L	14.5	15.0	18.0	24.0	29.0	33.0	38.0	40.5	44.5	48.0	52.0	61.0	61.0
	368	381	457	610	737	838	965	1029	1130	1219	1321	1549	
L1	14.5	12.0	14.0	20.0	26.0	31.0	36.0	39.0	43.0	-	-	-	-
	368	305	356	508	660	787	914	991	1092				
H app	460	600	740	860	1040	1120	1475	-	-	-	-	-	-
$\phi K_{app}$	300	400	500	600	700	735	650	-	-	-	-	-	-
Wt. kg app	60	90	170	310	550	770	-	-	-	-	-	-	-

DIMENSION TABLE GBV 1500 CLASS

VALVE SIZE	in	2	3	4	6	8	10	12	14	16	18	20	24
mm	50	80	100	150	200	250	300	350	400	450	500	600	600
L	14.5	18.5	21.5	27.5	32.7	39.0	44.4	49.4	54.4	60.5	65.5	76.4	76.4
	368	470	546	705	832	991	1130	1257	1384	1537	1664	1943	
L1	8.5	12.0	16.0	22.0	28.0	34.0	39.0	42.0	47.0	-	-	-	-
	216	305	406	559	711	864	991	1067	1194				
H app	480	785	790	1080	1150	-	-	-	-	-	-	-	-
$\phi K_{app}$	350	450	500	700	800	-	-	-	-	-	-	-	-
Wt. kg app	65	95	235	340	600	-	-	-	-	-	-	-	-

DIMENSION TABLE GBV 2500 CLASS

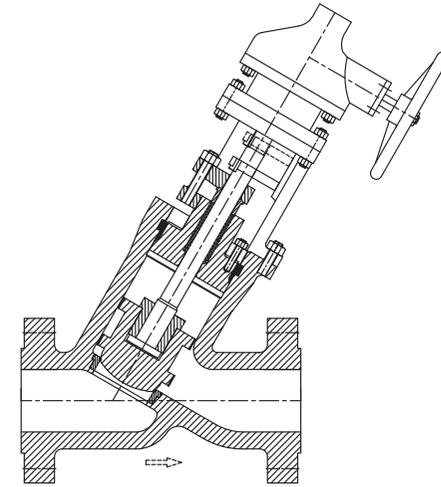
VALVE SIZE	in	2	3	4	6	8	10	12	14	16	18	20	24
mm	50	80	100	150	200	250	300	350	400	450	500	600	600
L	17.7	22.7	26.5	36.0	40.2	50.0	56.0	-	-	-	-	-	-
	451	578	673	914	1022	1270	1422						
L1	11.0	14.5	18.0	24.0	30	36.0	41.0	-	-	-	-	-	-
	279	368	457	610	762	914	1041						
H app	610	795	975	1120	1330	1600	1690	-	-	-	-	-	-
$\phi K_{app}$	400	500	700	750	750	750	550	-	-	-	-	-	-
Wt. kg app	80	270	375	610	-	-	-	-	-	-	-	-	-



# 03

## Y TYPE GLOBE VALVE

'Y' TYPE GLOBE VALVE CLASS 900, 1500, 2500, 4500.  
BS 1873/ASME B 16.34

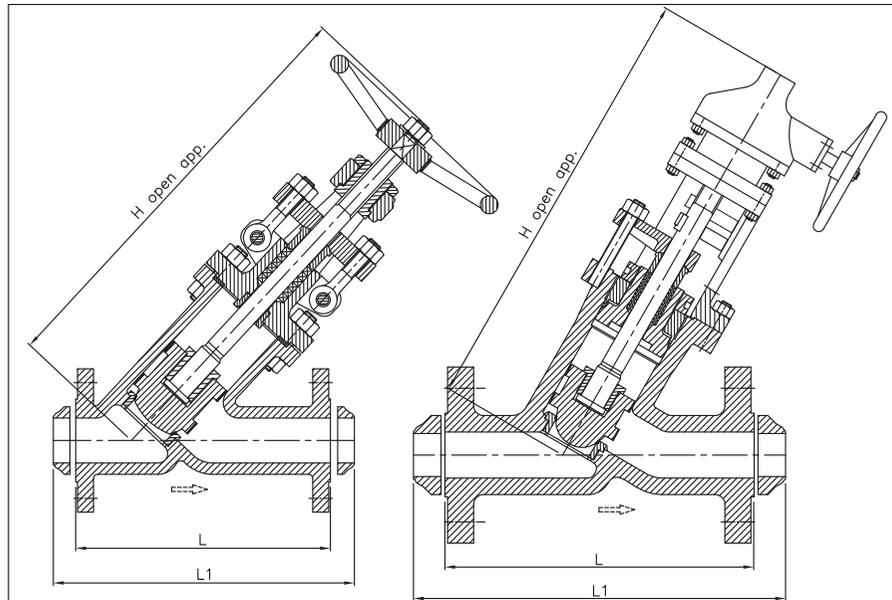


MATERIAL SPECIFICATION

PARTS	MATERIAL			
BODY	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
BONNET	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
YOKE	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
PLUG	CA15/13%Cr. FACING ON WCB+STELLITED	A 217 WC6+STELLITED	A 351 CF8+STELLITED	A 351 CF8M+STELLITED
SEAT RING	A 105/13%Cr. +STELLITED	S.S 304+STELLITED	SS 304+STELLITED	SS 316+STELLITED
BACK SEAT	T410	T410	INTEGRAL	INTEGRAL
SPINDLE	T410	T410	T304	T316
GLAND BUSH	T410	T410	T304	T316
GLAND FLANGE	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
YOKE SLEEVE	A 439 Gr.D2		AL-BRONZE	
PLUG NUT	T410		T304	T316
BONNET PLATE	A 515-70		S.S 304	
GLAND PLATE	A 515-70		S.S 304	
GUIDE PLATE	A 515-70		S.S 304	
HAND WHEEL	CARBON STEEL		CARBON STEEL	
STUD & NUT	A 193 B7/A 194 2H	A 193 B16/A 194 Gr. 7	A 193 B8/A 194 Gr.8	
GLAND STUD & NUT	A 193 B7/A 194 2H		A 193 B7/A 194 2H	
YOKE STUD & NUT	A 193 B7/A 194 2H		A 193 B7/A 194 2H	
MOUNTING STUD & NUT	A 193 B7/A 194 2H		A 193 B7/A 194 2H	
GLAND PACKING	GRAFOIL			
SEAL RING	T304		T304	T316
SPACER RING	A 515-70		SS 304	
SEGMENTAL RING	A 515-70		SS 304	
KEY	C40			
NAME PLATE	ALUMINIUM/S.S.			
GEAR BOX. ASSLY.	NITON MAKE			

'Y' TYPE GLOBE VALVE CLASS 150, 300, 600.

BS 1873



DIMENSION TABLE 150 CLASS

VALVE SIZE in mm	2 50	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	22 550	24 600
L	9.0 229	12.5 318	14.4 368	18.5 470	23.5 597	26.5 673	30.5 775	-	-	-	-	-	-
L1	9.0 229	12.5 318	14.4 368	18.5 470	23.5 597	26.7 673	30.5 775	-	-	-	-	-	-
H app	455	495	530	575	620	665	-	-	-	-	-	-	-
Wt. kg app(F/E)	-	-	-	-	-	-	-	-	-	-	-	-	-

DIMENSION TABLE 300 CLASS

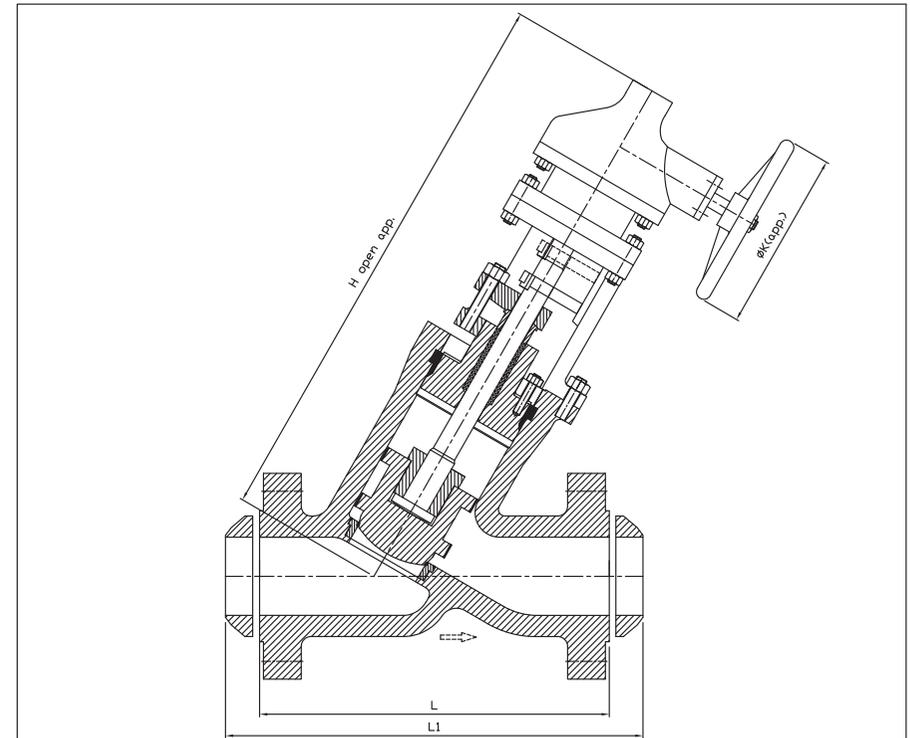
VALVE SIZE in mm	2 50	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	22 550	24 600
L	10.5 267	12.5 318	14.0 356	17.5 444	22.0 559	24.5 622	-	-	-	-	-	-	-
L1	10.5 267	12.5 318	14.0 356	17.5 444	22.0 559	24.5 622	-	-	-	-	-	-	-
H app	410	480	520	590	650	710	-	-	-	-	-	-	-
Wt. kg app(F/E)	-	-	-	-	-	-	-	-	-	-	-	-	-

DIMENSION TABLE 600 CLASS

VALVE SIZE in mm	2 50	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	22 550	24 600
L	11.5 292	14.0 356	17.0 432	22.0 559	26.0 660	31.0 787	-	-	-	-	-	-	-
L1	11.5 292	14.0 356	17.0 432	22.0 559	26.0 660	31.0 787	-	-	-	-	-	-	-
H app	430	510	545	635	680	740	-	-	-	-	-	-	-
Wt. kg app(F/E)	-	-	-	-	-	-	-	-	-	-	-	-	-

'Y' TYPE GLOBE VALVE CLASS 900, 1500, 2500, 4500.

BS 1873/ASME B 16.34



DIMENSION TABLE 900 CLASS

VALVE SIZE in mm	2 50	3 80	4 100	6 150	8 200	10 250	12 300
L	14.4 368	15.0 381	17.9 457	24.0 610	29.0 737	32.9 838	-
L1	-	-	-	-	-	-	-
H app	540	590	650	750	1175	1380	-
øK app	350	400	500	600	700	750	-
Wt. kg app(F/E)	-	-	-	-	-	-	-

DIMENSION TABLE 1500 CLASS

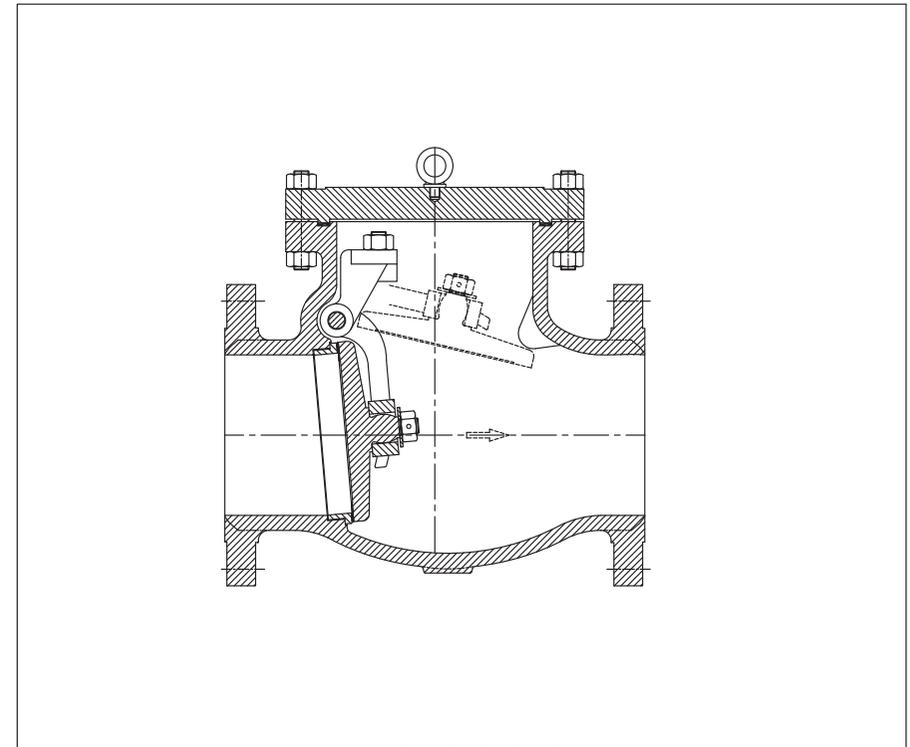
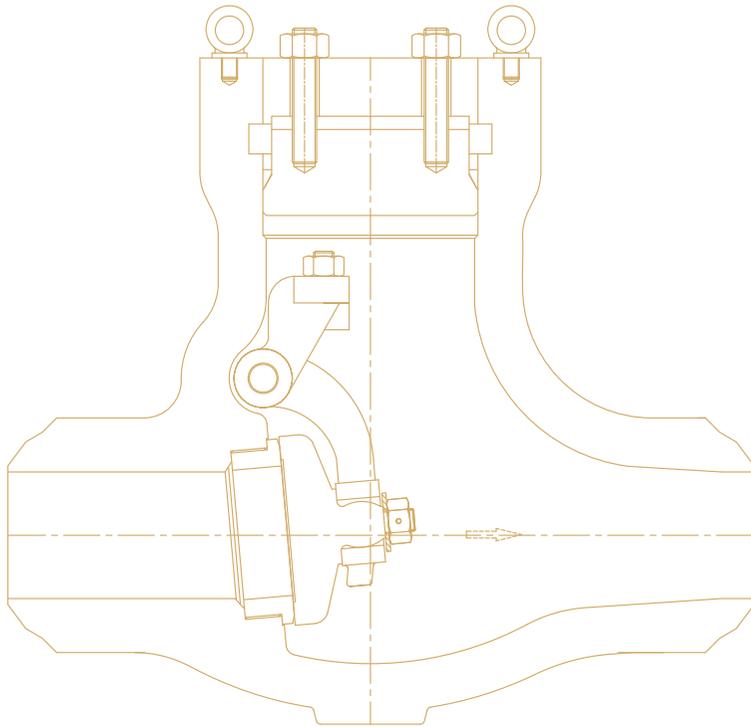
VALVE SIZE in mm	2 50	3 80	4 100	6 150	8 200	10 250	12 300
L	14.4 368	18.5 470	21.4 546	27.7 705	32.7 832	39.0 991	-
L1	14.4 368	18.5 470	21.4 546	27.7 705	32.7 832	39.0 991	-
H app	540	590	675	775	1210	1415	-
øK app	350	450	550	650	750	750	-
Wt. kg app(F/E)	-	-	-	-	-	-	-

DIMENSION TABLE 2500 CLASS

VALVE SIZE in mm	2 50	3 80	4 100	6 150	8 200	10 250	12 300
L	17.7 451	22.7 578	26.4 673	35.9 914	40.2 1022	-	-
L1	-	-	-	-	-	-	-
H app	580	770	960	1000	1150	1390	-
øK app	-	-	-	-	-	-	-
Wt. kg app(F/E)	-	-	-	-	-	-	-

DIMENSION TABLE 4500 CLASS

VALVE SIZE in mm	2 50	3 80	4 100	6 150	8 200	10 250	12 300
L	-	-	-	-	-	-	-
L1	-	-	-	-	-	-	-
H app	-	-	-	-	-	-	-
øK app	-	-	-	-	-	-	-
Wt. kg app(F/E)	-	-	-	-	-	-	-



MATERIAL SPECIFICATION

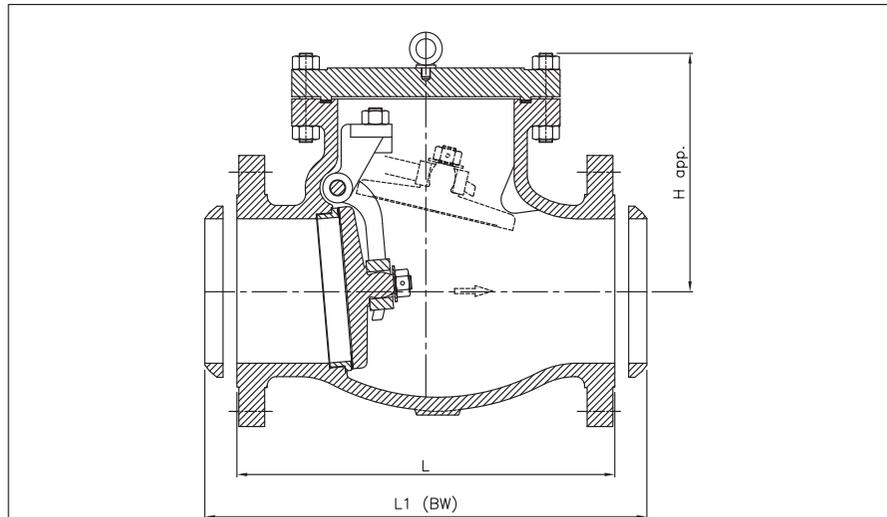
PART NAME	MATERIAL		MATERIAL	
BODY	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
DISC	CA15/13% Cr FACING ON WCB	WC6+13% Cr.	A 351 CF8	A 351 CF8M
SEAT RING 1	CA15/A 515 70+ 13%Cr. FACING	SS 304	T304	T316
TOP COVER	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
STUD & NUT	A 193 B7/A 194 2H	A 193 B16/A 194 Gr.7	A 193 B8/A 194 Gr.8	
BRACKET STUD & NUT	A 193 B8/A 194 8		A 193 B8/A 194 Gr.8	
GASKET	SPW SS 304/316 WITH GRAFOIL		SPW SS 304/316 WITH GRAFOIL	
WASHER	T410	T304	T304	T316
DISC NUT	A 194 Gr.8		A 194 Gr.8	
HINGE PIN	T410	T304	T304	T316
SPLIT PIN	T410	T304	T304	T316
NAME PLATE	ALUMINIUM/S.S.		ALUMINIUM/S.S.	
HINGE	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
HINGE BRACKET	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
LIFTING EYE BOLT 2	ASTM A 105		ASTM A 105	

1- SEAL WELD 3"NB AND ABOVE  
2- LIFTING EYE BOLT 8"/6"NB AND ABOVE  
3- DISC & SEAT STELLITING OPTIONAL

4- DRAIN PLUG OPTIONAL  
5- DASHPOT ARRANGEMENT OPTIONAL

04

# SWING CHECK VALVE



**DIMENSION TABLE 150 CLASS**

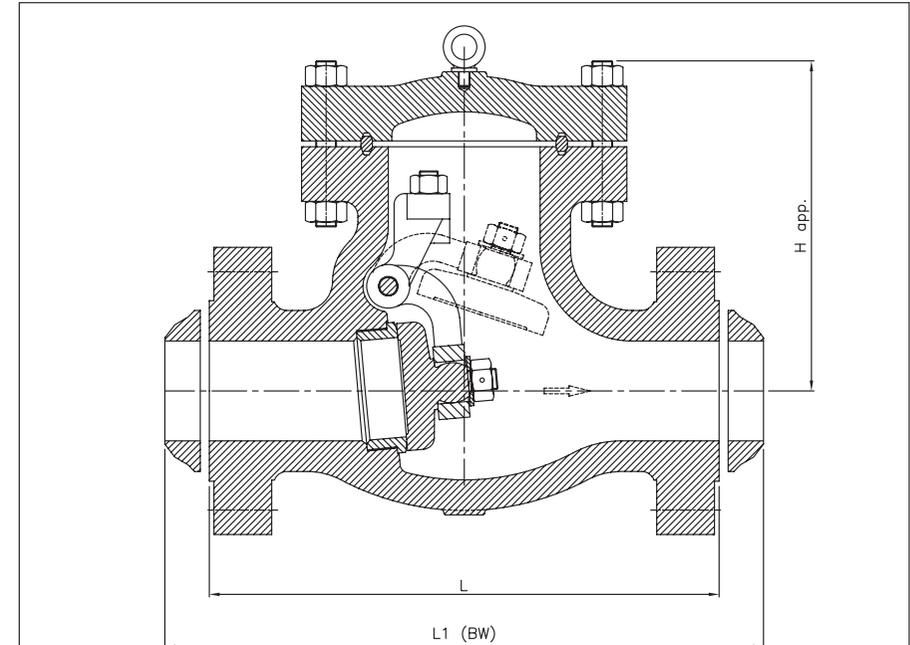
VALVE SIZE in mm	2 50	2.5 65	3 80	4 100	5 125	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	22 550	24 600	26 650	28 700	30 750	32 800	36 900
L	8.0 203	8.5 216	9.5 241	11.5 292	13 330	14.0 356	19.5 495	24.5 622	27.5 698	31.0 787	34.0 864	38.5 978	38.5 978	42.0 1067	51.0 1295	51.0 1295	57.0 1448	60.0 1524	—	77.0 1956
L1	8.0 203	8.5 216	9.5 241	11.5 292	13 330	14.0 356	19.5 495	24.5 622	27.5 698	31.0 787	34.0 864	38.5 978	38.5 978	42.0 1067	51.0 1295	51.0 1295	57.0 1448	60.0 1524	—	77.0 1956
H app	145	165	170	205	225	255	300	340	485	465	595	545	600	695	750	775	800	825	—	900
Wt. kg app(F/E)	18	25	32	50	70	85	126	220	315	450	570	725	1050	1255	1310	1500	1650	1865	—	—

**DIMENSION TABLE 300 CLASS**

VALVE SIZE in mm	2 50	2.5 65	3 80	4 100	5 125	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	22 550	24 600	26 650	28 700	30 750	36 900
L	10.5 267	11.5 292	12.5 318	14.0 356	15.7 400	17.5 444	21.0 533	24.5 622	28.0 711	33.0 838	34.0 864	38.5 978	40.0 1016	44.0 1118	53.0 1346	53.0 1346	59.0 1499	62.7 1594	82.0 2083
L1	10.5 267	11.5 292	12.5 318	14.0 356	15.7 400	17.5 444	21.0 533	24.5 622	28.0 711	33.0 838	34.0 864	38.5 978	40.0 1016	44.0 1118	52.9 1346	52.9 1346	59.0 1499	62.7 1594	82.0 2083
H app	155	215	185	220	245	275	300	375	430	520	560	686	610	—	—	—	—	—	—
Wt. kg app(F/E)	25	40	60	80	105	130	215	345	470	685	998	1050	1220	—	—	—	—	—	—

**DIMENSION TABLE 600 CLASS**

VALVE SIZE in mm	2 50	2.5 65	3 80	4 100	5 125	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	22 550	24 600	26 650	28 700	30 750	36 900
L	11.5 292	13.0 330	14.0 356	17.0 432	20.0 508	22.0 559	26.0 660	31.0 787	33.0 838	35.0 889	39.0 991	43.0 1092	47.0 1194	50.9 1295	55.0 1397	57.0 1448	63.0 1600	65.0 1651	82.0 2083
L1	11.5 292	13.0 330	14.0 356	17.0 432	20.0 508	22.0 559	26.0 660	31.0 787	33.0 838	35.0 889	39.0 991	43.0 1092	47.0 1194	50.9 1295	55.0 1397	57.0 1448	62.9 1600	65.0 1651	82.0 2083
H app	160	260	230	280	290	330	360	475	555	580	665	420	450	475	480	—	—	—	—
Wt. kg app(F/E)	29	55	65	115	145	250	405	620	815	970	1215	1750	2360	—	3820	—	—	—	—



**DIMENSION TABLE 900 CLASS**

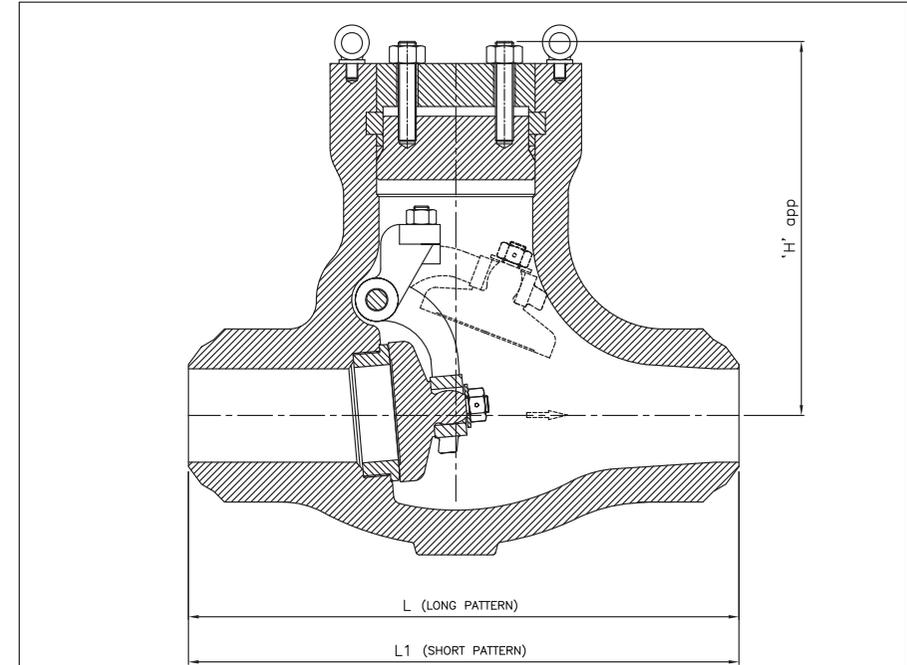
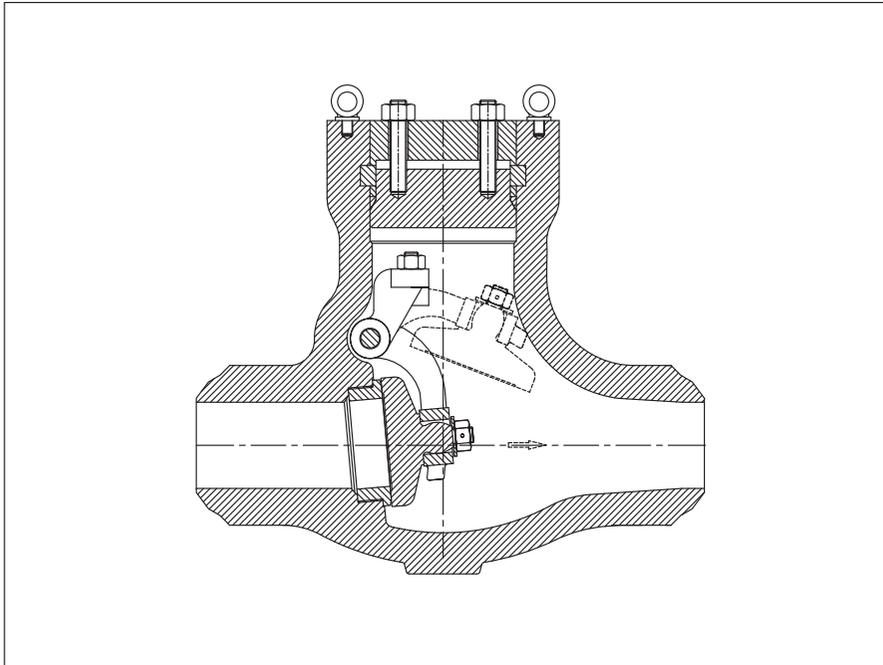
VALVE SIZE in mm	2 50	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	22 550	24 600
L	14.5 368	15.0 381	18.0 457	24.0 610	29.0 737	33.0 838	38.0 965	40.5 1029	44.5 1130	47.9 1219	52.0 1321	—	60.9 1549
L1	14.5 368	15.0 381	18.0 457	24.0 610	29.0 737	33.0 838	38.0 965	40.5 1029	44.5 1130	47.9 1219	52.0 1321	—	60.9 1549
H app	220	280	350	450	525	600	675	750	825	—	—	—	—

**DIMENSION TABLE 1500 CLASS**

VALVE SIZE in mm	2 50	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	22 550	24 600
L	14.5 368	18.5 470	21.5 546	27.7 705	32.7 832	39.0 991	44.5 1130	49.4 1257	54.4 1384	60.5 1537	65.5 1664	—	76.4 1943
L1	14.5 368	18.5 470	21.5 546	27.7 705	32.7 832	39.0 991	44.5 1130	49.4 1257	54.4 1384	60.5 1537	65.5 1664	—	76.4 1943
H app	220	280	370	450	600	660	750	—	—	—	—	—	—

**DIMENSION TABLE 2500 CLASS**

VALVE SIZE in mm	2 50	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16 400
L	17.7 451	22.7 578	26.5 673	36.0 914	40.2 1022	50.0 1270	55.9 1422	—	—
L1	17.7 451	22.7 578	26.5 673	36.0 914	40.2 1022	50.0 1270	55.9 1422	—	—
H app	305	390	415	565	640	—	—	—	—



MATERIAL SPECIFICATION

PART NAME	MATERIAL		MATERIAL	
BODY	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
DISC	CA15/13% Cr FACING ON WCB+STELLITED	WC6+STELLITED	A 351 CF8+STELLITED	A 351 CF8M+STELLITED
SEAT RING 1	A 515-70/13%Cr.+STELLITED	SS 304+STELLITED	T304+STELLITED	T316+STELLITED
TOP COVER	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
INNER PLATE	A 216 WCB/A 515 70	A 217 WC6	SS 304	
STUD & NUT	A 193 B7/A 194 2H	A 193 B16/A 194 Gr.7	A 193 B8/A 194 Gr.8	
BRACKET STUD & NUT	A 193 B8/A 194 Gr.8		A 193 B8/A 194 Gr.8	
SEAL RING	T304		T304	T316
SPACER RING	A 515 70	T304	T304	T316
SEGMENTAL RING	A 515 70	T304	T304	T316
WASHER	SS 304		T304	T316
DISC NUT	A 194 Gr.8		A 194 Gr.8	
HINGE PIN	T410	T304	T304	T316
SPLIT PIN	T304		T304	T316
NAME PLATE	ALUMINIUM/S.S.		ALUMINIUM/S.S.	
HINGE	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
HINGE BRACKET	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
LIFTING EYE BOLT 2	ASTM A 105		ASTM A 105	

1- SEAL WELD  
2- LIFTING EYE BOLT 4"NB AND ABOVE  
3- DASHPOT ARRANGEMENT OPTIONAL

DIMENSION TABLE 900 CLASS

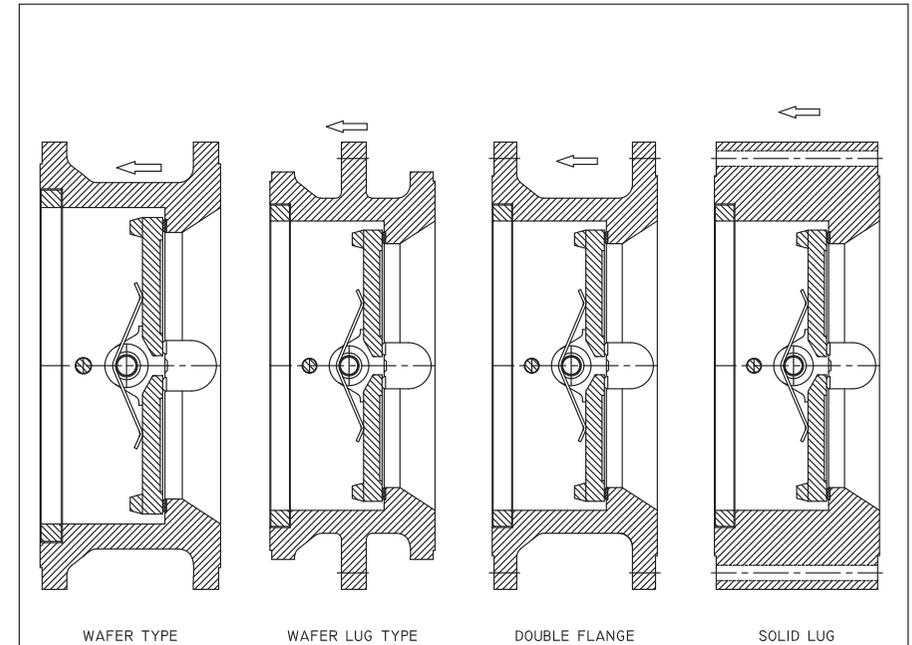
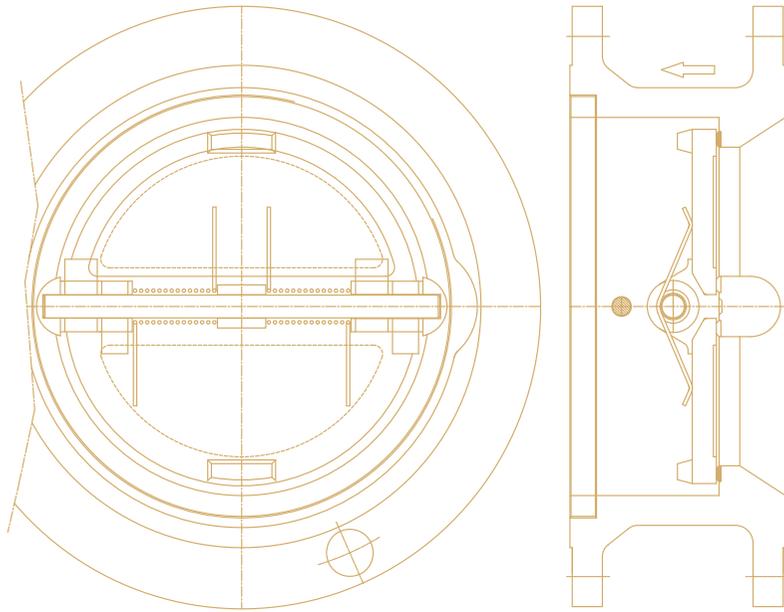
VALVE SIZE in mm	2 50	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	22 550	24 600
L	14.5 368	15.0 381	18.0 457	24.0 610	29.0 737	33.0 838	38.0 965	40.5 1029	44.5 1130	-	-	-	-
L1	8.5 216	12.0 305	14.0 356	20.0 508	26.0 660	31.0 787	36.0 914	39.0 991	43.0 1092	-	-	-	-
H app	240	280	350	450	525	600	710	825	930	-	-	-	-

DIMENSION TABLE 1500 CLASS

VALVE SIZE in mm	2 50	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	22 550	24 600
L	14.5 368	18.5 470	21.5 546	27.7 705	32.7 832	39.0 991	44.5 1130	-	-	-	-	-	-
L1	8.5 216	12.0 305	16.0 406	22.0 559	28.0 711	34.0 864	39.0 991	42.0 1067	47.0 1194	-	-	-	-
H app	260	300	370	460	615	660	750	-	-	-	-	-	-

DIMENSION TABLE 2500 CLASS

VALVE SIZE in mm	2 50	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16 400
L	17.7 451	22.7 578	26.5 673	36.0 914	40.2 1022	50.0 1270	-	-	-
L1	11.0 279	14.5 368	18.0 457	24.0 610	30.0 762	36.0 914	41.0 1041	-	-
H app	330	368	432	508	762	640	-	-	-



WAFER TYPE

WAFER LUG TYPE

DOUBLE FLANGE

SOLID LUG

MATERIAL SPECIFICATION

PART NAME	MATERIAL		MATERIAL	
	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
BODY	A 216 WCB	A 217 WC6	A 351 CF8	A 351 CF8M
PLATE	A 216 WCB+13%Cr.	A 217 WC6+13%Cr.	A 351 CF8	A 351 CF8M
SEAT	A 216 WCB+13%Cr.	A 217 WC6+13%Cr.	A 351 CF8	A 351 CF8M
DISC BEARING	T410		T304	T316
SPACER BUSH	T410		T304	T316
SPRING BEARING	T410		T304	T316
BODY BEARING	T410		T304	T316
HINGE PIN	T304		T304	T316
STOPPER PIN	T304		T304	T316
LIFTING HOOK	ASTM A 105			
CARRIER PLATE	T410		T304	T316
LOCKING RING	ASTM A 515 Gr.70	SS304	SS304	SS316
SPRING	INCONEL			

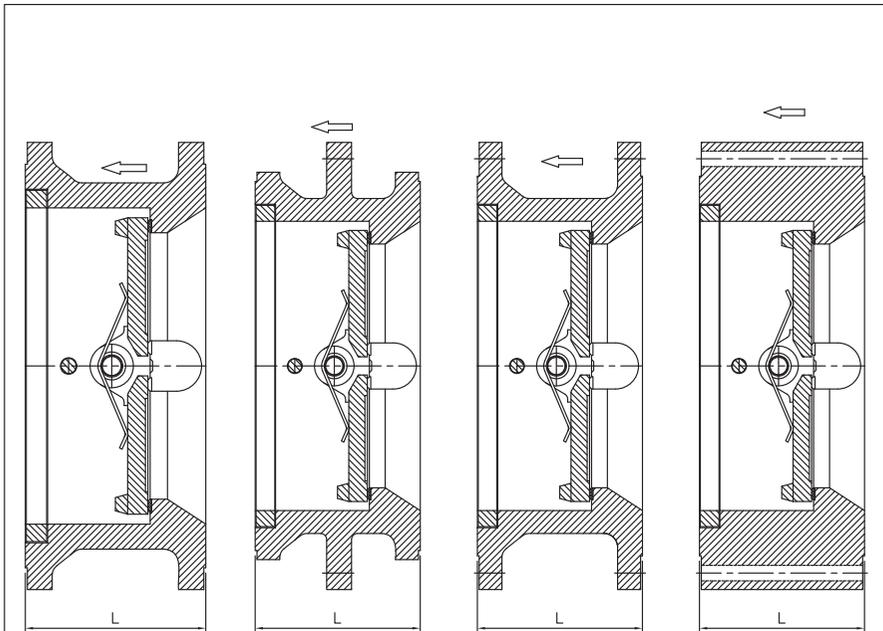
1- SEAT INTEGRAL

05

# DUAL PLATE CHECK VALVE

DUAL PLATE CHECK VALVE CLASS 150, 300, 600.

API 594



WAFER TYPE

WAFER LUG TYPE

DOUBLE FLANGE

SOLID LUG

DIMENSION TABLE 150 CLASS

VALVE SIZE in mm	2 50	2.5 65	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	24 600	30 750	36 900	42 1050	48 1200	54 1350	60 1500
L	2.38 60	2.62 67	2.88 73	2.88 73	3.88 98	5.0 127	5.75 146	7.12 181	7.25 184	7.50 191	8.0 203	8.62 219	8.75 222	12.0 305	14.5 368	17.0 432	20.6 524	*	*

DIMENSION TABLE 300 CLASS

VALVE SIZE in mm	2 50	2.5 65	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	24 600	30 750	36 900	42 1050	48 1200	54 1350	60 1500
L	2.38 60	2.62 67	2.88 73	2.88 73	3.88 98	5.0 127	5.75 146	7.12 181	7.25 222	7.50 232	8.0 264	8.62 292	8.75 318	12.0 368	14.5 483	17.0 568	20.6 629	*	*

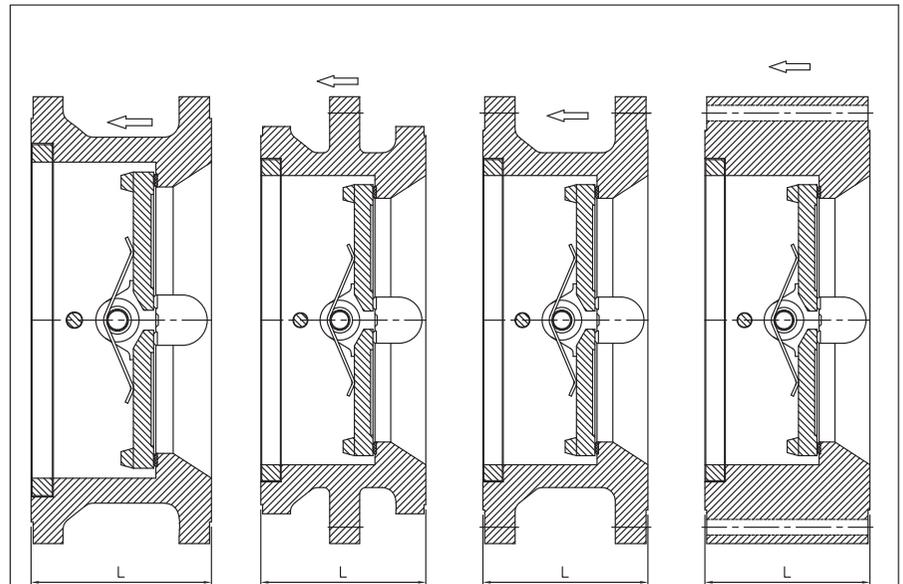
DIMENSION TABLE 600 CLASS

VALVE SIZE in mm	2 50	2.5 65	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	24 600	30 750	36 900	42 1050	48 1200	54 1350	60 1500
L	2.38 60	2.62 67	2.88 73	3.12 79	5.38 136	6.5 165	8.38 213	9.0 229	10.75 273	12.0 305	14.25 362	14.5 368	17.25 438	19.88 505	25.0 635	27.5 701	-	-	-

\* DIMENSIONAL INFORMATION TO BE AGREED BETWEEN PURCHASER AND MANUFACTURER.

DUAL PLATE CHECK VALVE CLASS 900, 1500, 2500.

API 594



WAFER TYPE

WAFER LUG TYPE

DOUBLE FLANGE

SOLID LUG

DIMENSION TABLE 900 CLASS

VALVE SIZE in mm	2 50	2.5 65	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	24 600
L	2.75 70	3.25 83	3.25 83	4.0 102	6.25 159	8.12 206	9.5 241	11.5 292	14.0 356	15.12 384	17.75 451	17.75 451	19.5 495

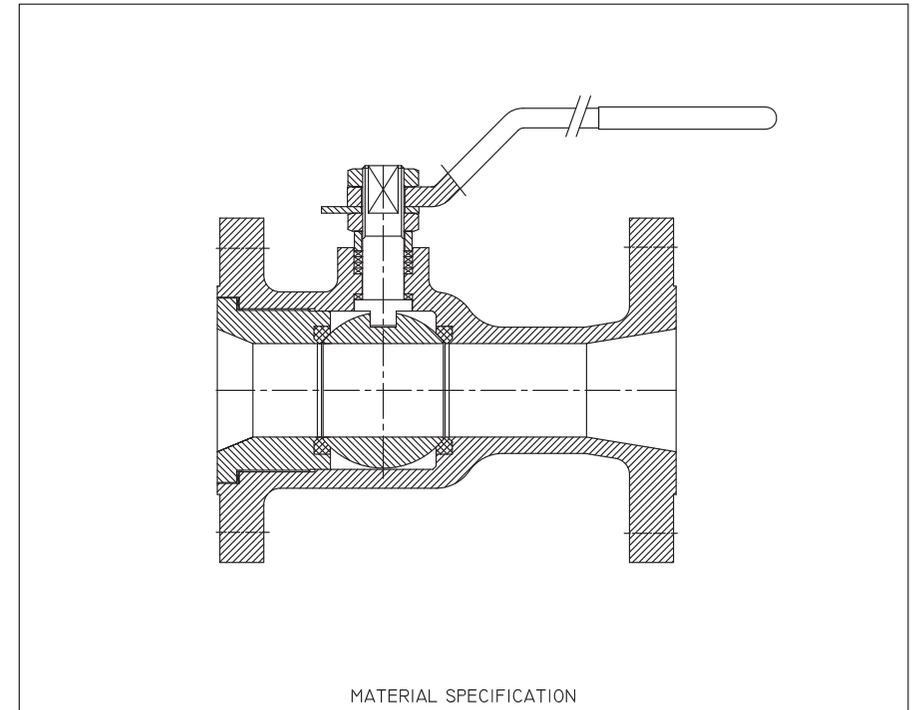
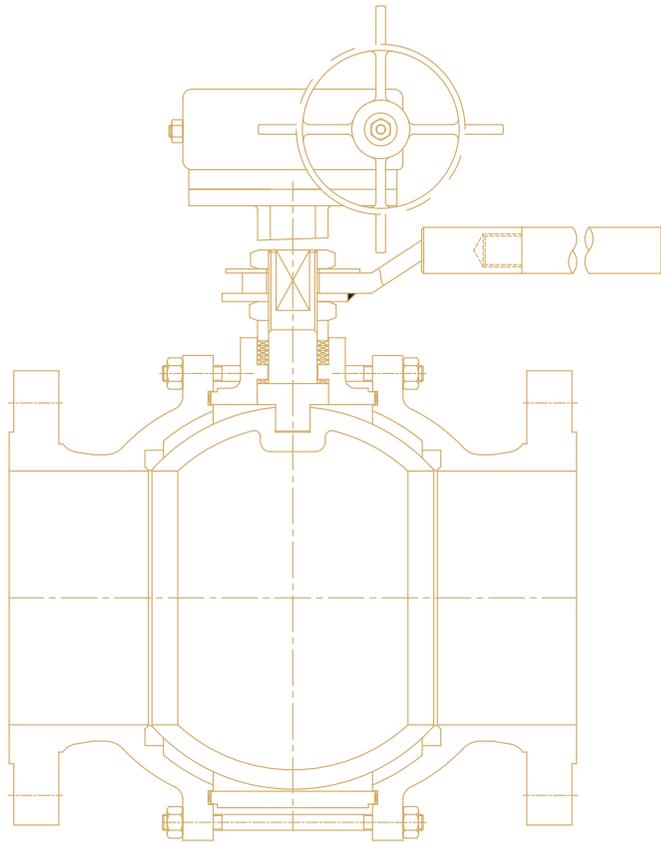
DIMENSION TABLE 1500 CLASS

VALVE SIZE in mm	2 50	2.5 65	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	24 600
L	2.75 70	3.25 83	3.25 83	4.0 102	6.25 159	8.12 206	9.75 248	12.0 305	14.0 356	15.12 384	18.44 468	21.0 533	22.0 559

DIMENSION TABLE 2500 CLASS

VALVE SIZE in mm	2 50	2.5 65	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16 400
L	2.75 70	3.25 83	3.38 86	4.12 105	6.25 159	8.12 206	10.0 254	12.0 305	-	-

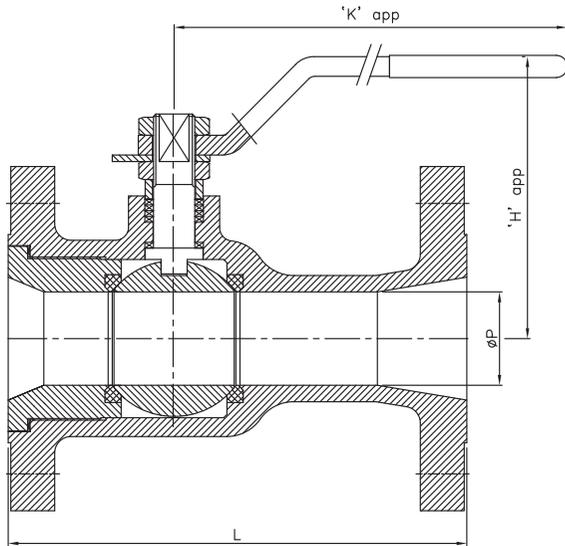
\* DIMENSIONAL INFORMATION TO BE AGREED BETWEEN PURCHASER AND MANUFACTURER.



MATERIAL SPECIFICATION

PARTS	MATERIAL		
BODY	A 216 WCB	A 351 CF8	A 351 CF8M
BALL	T304/A 351 CF8		T316/A 351 CF8M
SEAT	PTFE		
SPINDLE	T410	T304	T316
GLAND BUSH	T410	T304	T316
HANDLE	STEEL WITH PVC CAP		
HANDLE NUT	STEEL	T304	
GASKET	PTFE		
GLAND PACKING	PTFE		
BOTTOM WASHER	PTFE		
END PIECE	A 216 WCB	A 351 CF8	A 351 CF8M
GLAND NUT	CARBON STEEL	T304	T316
NAME PLATE	ALUMINIUM/SS		
POSITION INDICATOR	ALUMINIUM/SS		

06  
**BALL VALVE**



DIMENSION TABLE 150 CLASS

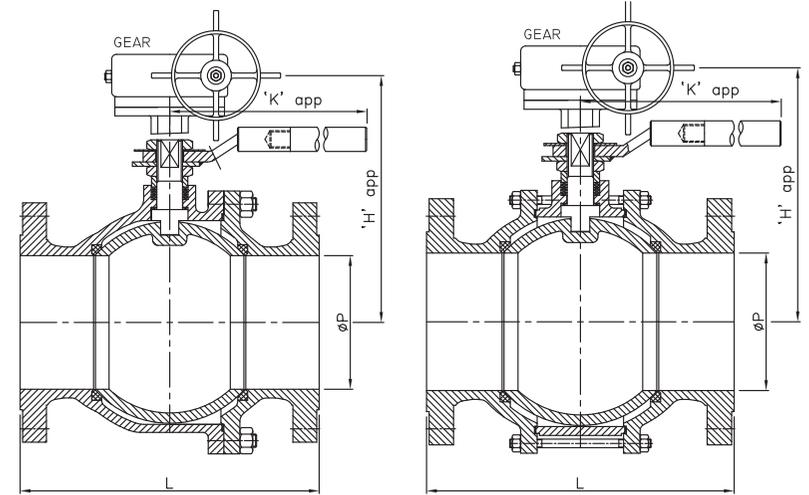
VALVE SIZE in mm	1 25	1.5 40	2 50	2.5 65	3 80	4 100	6 150
L	5.0 127	6.5 165	7.0 178	7.5 190	8.0 203	9.0 229	10.5 267
H app	95	100	125	140	175	195	235
K app	220	220	220	320	320	385	500
øP	17	28	36	50	57	75	98
Wt. kg app(F/E)	3	6	8.5	17	21	30	42

DIMENSION TABLE 300 CLASS

VALVE SIZE in mm	1 25	1.5 40	2 50	2.5 65	3 80	4 100	6 150
L	6.5 165	7.5 190	8.5 216	9.5 241	11.1 282	12.0 305	15.9 403
H app	95	100	125	140	175	195	235
K app	220	220	220	320	320	385	500
øP	17	28	36	50	57	75	98
Wt. kg app(F/E)	6	9	16	29	33	45	85

DIMENSION TABLE 600 CLASS

VALVE SIZE in mm	1.5 40	2 50	2.5 65	3 80	4 100	6 150
L	9.5 241	11.5 292	13.0 330	14.0 356	17.0 432	22.0 559
H app	125	135	150	200	250	450
K app	220	320	350	400	450	450
øP	28	36	50	57	75	98
Wt. kg app(F/E)	-	-	-	-	-	-



2-PIECE CONSTRUCTION

3-PIECE CONSTRUCTION

DIMENSION TABLE 150 CLASS

VALVE SIZE in mm	1.5 40	2 50	2.5 65	3 80	4 100	6 150	8 200	10 250	12 300
L	6.5 165	7.0 178	7.5 191	8.0 203	8.0 229	9.0 394	10.5 457	18.0 533	21.0 610
H app	100	125	140	150	180	270	325	390	540
K app	220	220	320	320	385	500	600	450	450
øP	37	49	64	75	98	148	198	248	298
Wt. kg app(F/E)	9	14	20	27	40	90	165	225	325

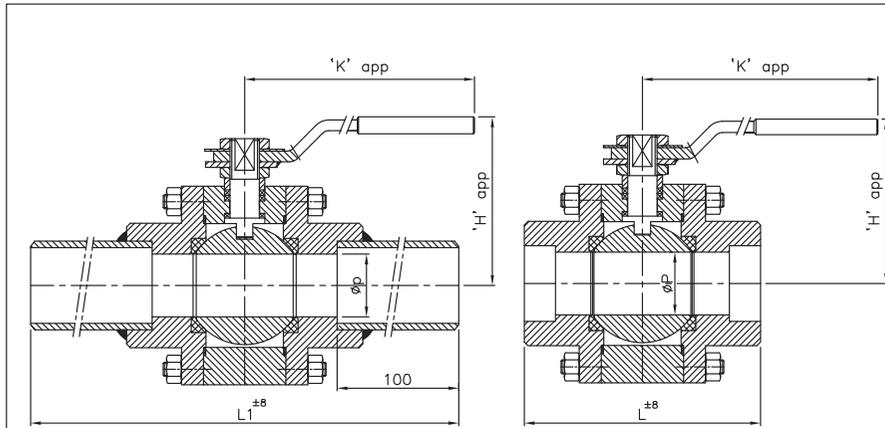
DIMENSION TABLE 300 CLASS

VALVE SIZE in mm	1.5 40	2 50	2.5 65	3 80	4 100	6 150	8 200
L	7.5 190	8.5 216	9.5 241	11.1 282	12.0 305	15.9 403	19.75 502
H app	120	135	150	170	190	300	360
K app	220	220	320	320	385	500	450
øP	37	49	64	75	98	148	198
Wt. kg app(F/E)	12	18	28	35	55	110	235

DIMENSION TABLE 600 CLASS

VALVE SIZE in mm	1.5 40	2 50	2.5 65	3 80	4 100
L	9.5 241	11.5 292	13.0 330	14.0 356	17.0 432
H app	125	135	150	200	250
K app	220	320	350	400	450
Wt. kg app(F/E)	22	30	35	55	75

**BALL VALVE 800 CLASS**  
BS 5351/API6D/BS EN ISO 17292



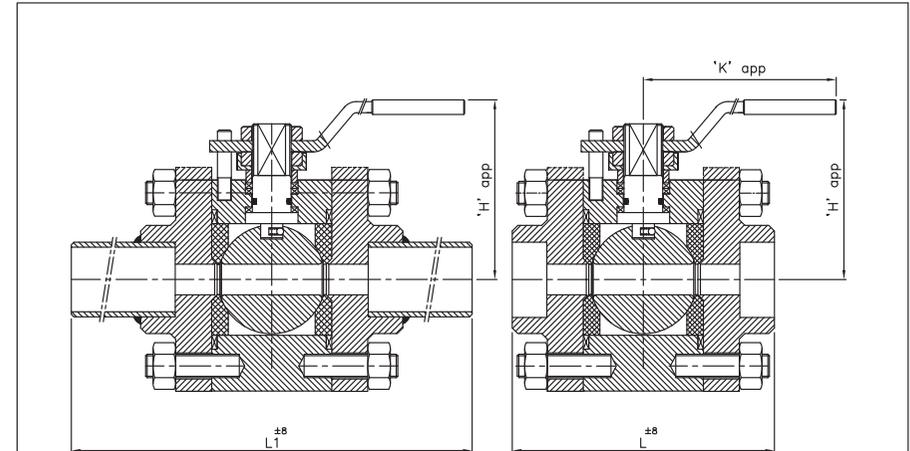
**MATERIAL SPECIFICATION**

PARTS	MATERIAL		
BODY	A 105	A 182 F304	A 182 F316
BALL	T304	A 182 F304	A 182 F316
SEAT	T304		T316
SPINDLE	T410	T304	T316
GLAND BUSH	T410	T304	T316
HANDLE	STEEL		
HANDLE NUT	T410	T304	
STUD & NUT	A 193 B7/A 194 2H	A 193 B8/A 194 Gr.8	
GASKET	PTFE		
GLAND PACKING	PTFE		
BOTTOM WASHER	PTFE		
END PIECE	A 105	A 182 F304	A 182 F316
GLAND NUT	T410	T304	T316
NAME PLATE	ALUMINIUM/SS		
POSITION INDICATOR	ALUMINIUM/SS		
EXTENDED PIPE	ASTM A 106 Gr.B	ASTM A 312 TP 304	ASTM A 312 TP 304

**DIMENSION TABLE 800 CLASS**

VALVE SIZE	0.5	0.75	1	1.25	1.5	2
in	15	20	25	40	40	40
mm	15	20	25	40	40	40
L	2.9	3.1	3.5	5.1	5.1	5.9
	75	80	90	130	130	150
L1	10.0	10.0	10.3	11.9	11.9	12.5
	255	254	264	304	304	318
'H' app	70	80	90	100	110	115
K app	130	140	160	240	240	240
φP	12	19	24	30	37	50
Wt.kg (app)	1.4	2	3.5	6	7	8

**BALL VALVE 900, 1500, 2500 CLASS**  
BS 5351/API6D



**DIMENSION TABLE 900 CLASS**

VALVE SIZE	0.5	0.75	1	1.5
in	15	20	25	40
mm	15	20	25	40
L	3.7	3.7	4.1	4.3
	95	95	105	110
L1	10.8	10.8	10.9	11.1
	275	275	279	284
'H' app	75	85	115	115
K app	125	150	175	240
Wt.kg (app)	-	-	-	-

**DIMENSION TABLE 1500 CLASS**

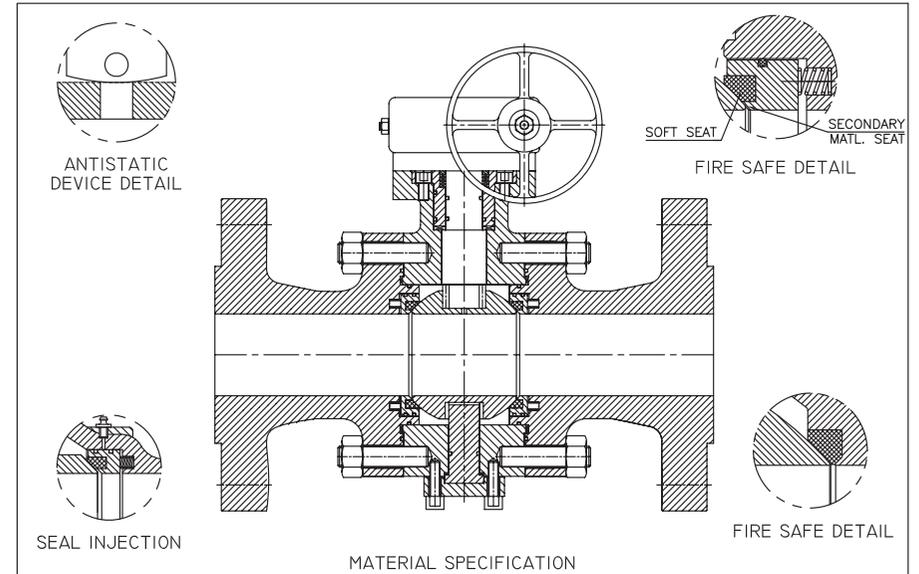
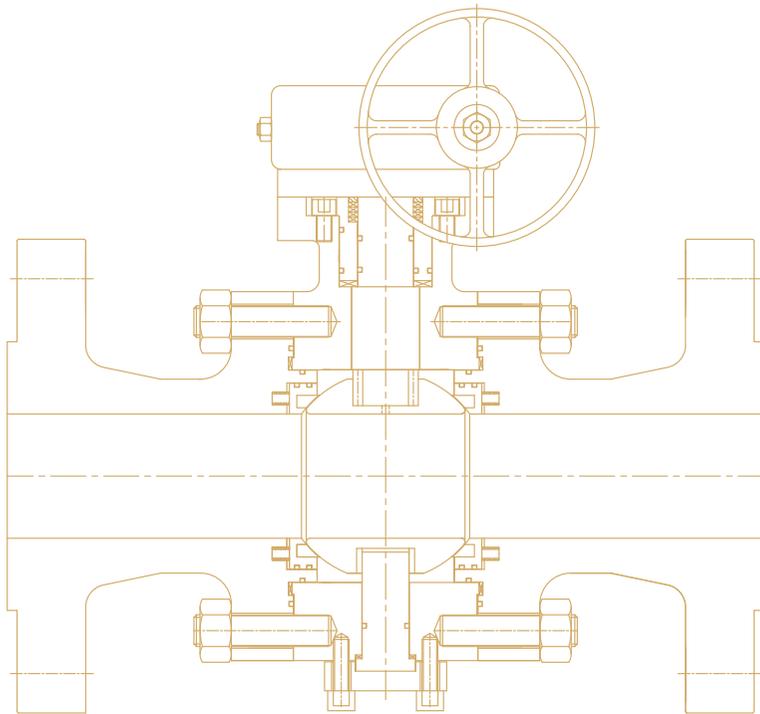
VALVE SIZE	0.5	0.75	1	1.5
in	15	20	25	40
mm	15	20	25	40
L	3.7	3.7	4.1	4.3
	95	95	105	110
L1	10.8	10.8	10.9	11.1
	275	275	279	284
'H' app	75	85	115	115
K app	125	150	175	240
Wt.kg (app)	-	-	-	-

**DIMENSION TABLE 2500 CLASS**

VALVE SIZE	0.5	0.75	1	1.5
in	15	20	25	40
mm	15	20	25	40
L	3.7	3.7	4.1	4.3
	95	95	105	-
L1	10.8	10.8	10.9	11.1
	275	275	279	-
'H' app	85	85	115	-
K app	125	150	175	-
Wt.kg (app)	-	-	-	-



TRUNION MOUNTED BALL VALVE  
 2/3-PIECE FULL BORE/REDUCE BORE  
 CLASS 150,300,600,900,1500,2500.  
 BS 5351/API 6D

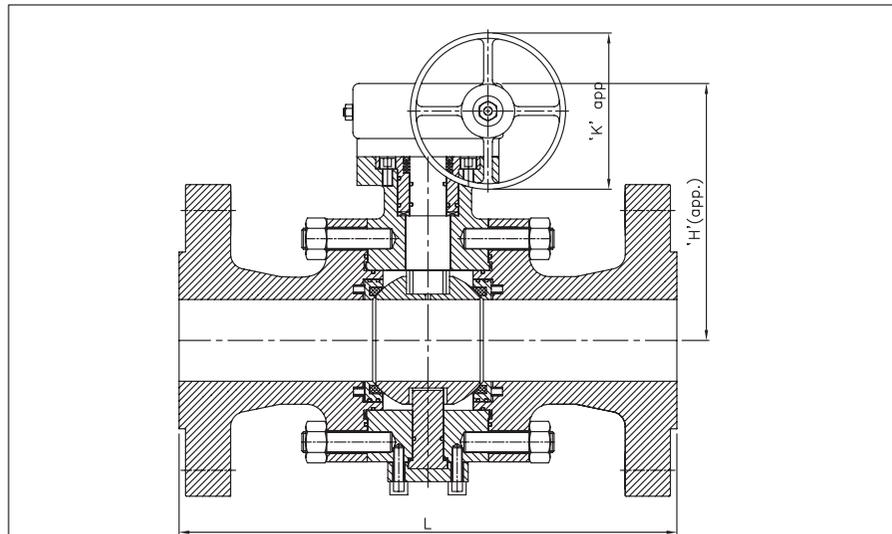


PARTS	MATERIAL		
	A 216 WCB	A 351 CF8	A 351 CF8M
BODY	A 216 WCB	A 351 CF8	A 351 CF8M
BALL	A 351 CF8		A 351 CF8M
SEAT	PTFE		
SPINDLE	T410	T304	T316
GLAND BUSH	T410	T304	T316
GLAND FLANGE	CARBON STEEL		
HAND WHEEL	CARBON STEEL		
STUD & NUT	A 193 B7/A 194 2H	A 193 B8/A 194 Gr.8	
GLAND STUD & NUT	A 193 B7/A 194 2H	A 193 B8/A 194 Gr.8	
YOKE STUD & NUT	A 193 B7/A 194 2H		
MOUNTING BOLTS	A 193 B7		
TRUNION STUD & NUT	A 193 B7/A 194 2H		
GASKET	SPW SS 304/316 WITH PTFE FILLER/PTFE		
GLAND PACKING	PTFE		
BOTTOM WASHER	PTFE		
END PIECE	A 216 WCB	A 351 CF8	A 351 CF8M
NAME PLATE	ALUMINIUM/SS		
SEAT RETAINER	CARBON STEEL	T304	T316
TRUNION SUPPORT	A 515 Gr.70	T304	T316
GEAR BOX ASSLY.	NITON MAKE		
SPRING	SS 304		SS 316
'O' RING	NEOPRENE		
BOTTOM GASKET	SPW SS 304/316 WITH PTFE FILLER		

1- FLOATING BALL OPTIONAL

07

# BALL VALVE (TRUNION)



DIMENSION TABLE 150 CLASS

VALVE SIZE in mm	12 300	14 350	16 400	18 450	20 500	24 600
L	24.0 610	28.0 686	30.0 762	34.0 864	36.0 914	42.0 1067
H app	441	481	598	643	708	863
K app	500	500	500	500	500	550
Wt. kg app(F/E)	410	570	710	9050	1220	1650

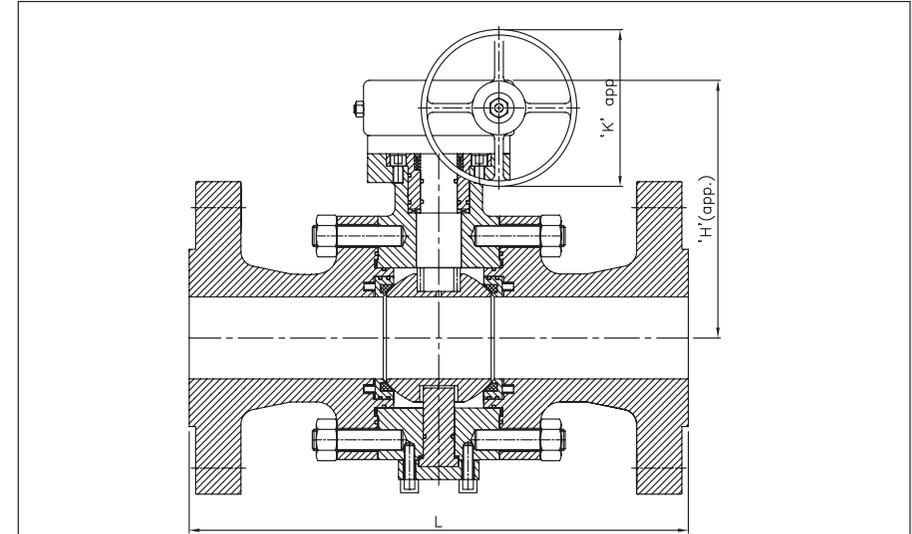
DIMENSION TABLE 300 CLASS

VALVE SIZE in mm	12 300	14 350	16 400	18 450	20 500	24 600	26 650	28 700	30 750	32 800	34 850	36 900
L	25.5 648	30.0 762	33.0 838	-	-	45.0 1143	49.0 1245	53.0 1346	55.0 1397	60.0 1524	64.0 1626	68.0 1727
H app	441	481	598	-	-	1175	-	-	-	-	-	-
K app	500	500	500	-	-	-	-	-	-	-	-	-
Wt. kg app(F/E)	675	1055	1425	-	-	-	-	-	-	-	-	-

DIMENSION TABLE 600 CLASS

VALVE SIZE in mm	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500	22 550	24 600	26 650	28 700	30 750	32 800	34 850	36 900
L	22.0 559	26.0 660	31.0 787	33.0 838	35.0 889	39.0 991	43.0 1092	47.0 1194	51.0 1295	55.0 1397	57.0 1448	61.0 1549	65.0 1651	70.0 1778	76.0 1930	82.0 2083
H app	450	500	700	-	-	-	-	-	-	-	-	-	-	-	-	-
K app	450	500	550	-	-	-	-	-	-	-	-	-	-	-	-	-
Wt. kg app(F/E)	165	325	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1- REDUCE BORE ON OPTIONAL



DIMENSION TABLE 900 CLASS

VALVE SIZE in mm	2 50	3 80	4 350	6 400	8 450	10 500	12 600	14 350	16 400	18 450	20 500	22 550	24 600
L	14.5 368	15.0 381	18.0 457	24.0 610	29.0 737	33.0 838	38.0 965	40.5 1029	44.5 1130	48.0 1219	52.0 1321	-	61.0 1549
H app	180	205	-	-	-	-	-	-	-	-	-	-	-
K app	-	-	-	-	-	-	-	-	-	-	-	-	-
Wt. kg app(F/E)	-	-	-	-	-	-	-	-	-	-	-	-	-

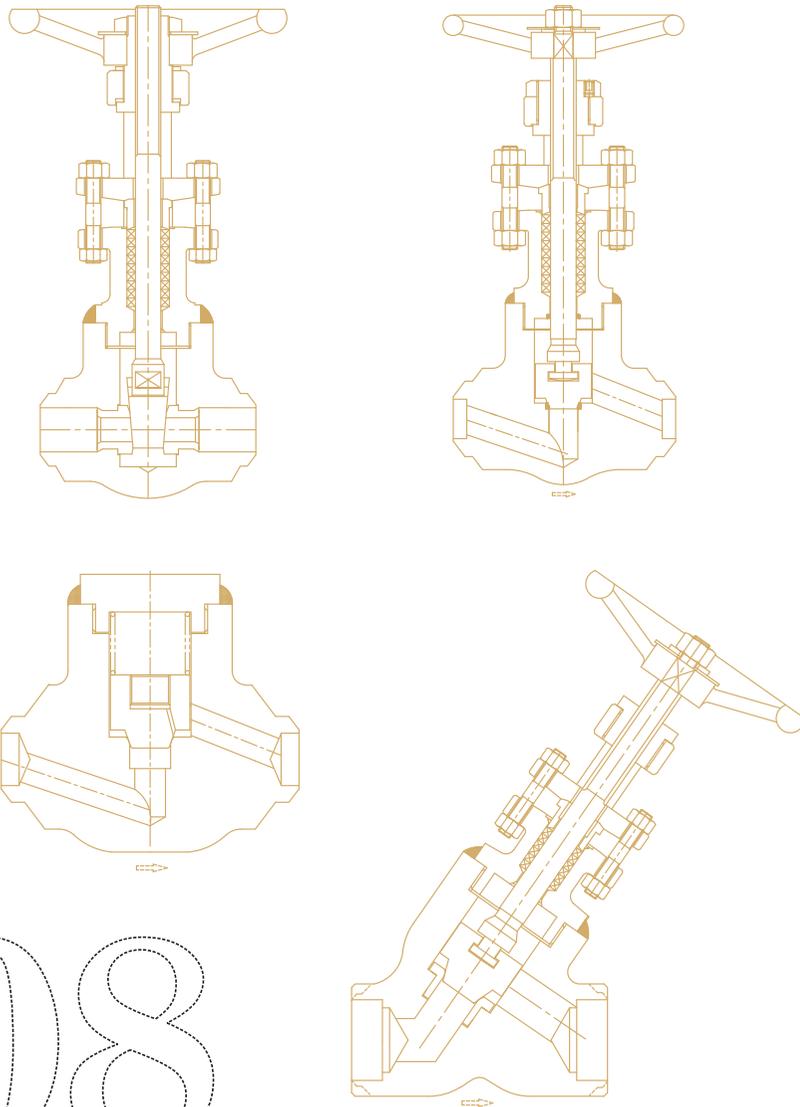
DIMENSION TABLE 1500 CLASS

VALVE SIZE in mm	2 50	3 80	4 350	6 400	8 450	10 500	12 600	14 350	16 400	18 450	20 500	22 550	24 600
L	14.5 368	18.5 470	21.5 546	27.7 705	32.7 832	39.0 991	44.5 1130	49.5 1257	54.5 1384	-	-	-	-
H app	-	-	-	-	-	-	-	-	-	-	-	-	-
K app	-	-	-	-	-	-	-	-	-	-	-	-	-
Wt. kg app(F/E)	-	-	-	-	-	-	-	-	-	-	-	-	-

DIMENSION TABLE 2500 CLASS

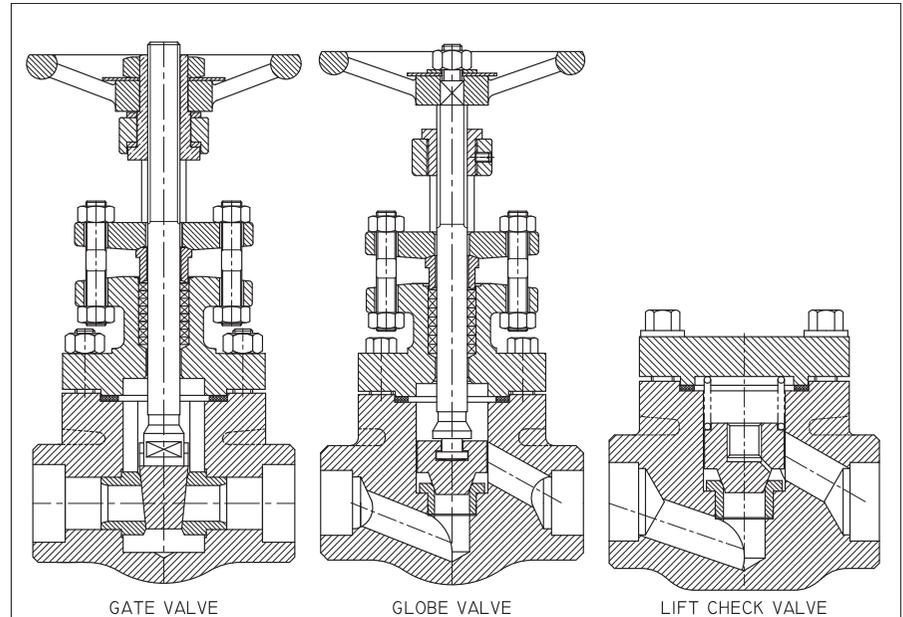
VALVE SIZE in mm	2 50	3 80	4 350	6 400	8 450	10 500	12 600	14 350	16 400	18 450	20 500	22 550	24 600
L	17.7 451	22.7 578	26.5 673	36.0 914	40.2 1022	50.0 1270	56.0 1422	-	-	-	-	-	-
H app	-	-	-	-	-	-	-	-	-	-	-	-	-
K app	-	-	-	-	-	-	-	-	-	-	-	-	-
Wt. kg app(F/E)	-	-	-	-	-	-	-	-	-	-	-	-	-

1- REDUCE BORE ON OPTIONAL



08

# FORGED -GATE/ GLOBE/CHECK VALVE



GATE VALVE

GLOBE VALVE

LIFT CHECK VALVE

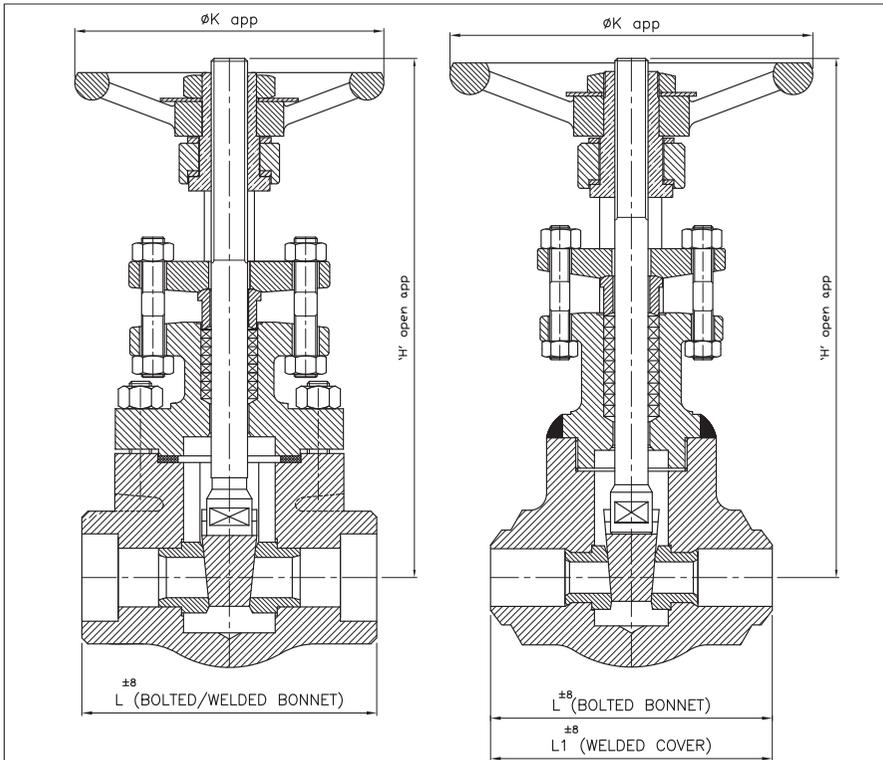
### MATERIAL SPECIFICATION

PARTS	MATERIAL		
BODY	A 105	A 182 F304	A 182 F316
BONNET/COVER	A 105	A 182 F304	A 182 F316
WEDGE/PLUG	13% Cr.	T304	T316
SEAT RING	13% Cr.	T304	T316
SPINDLE	T410	T304	T316
GLAND BUSH	T410	T304	T316
GLAND FLANGE	A 105	ASTM A 182 F304	
YOKE SLEEVE	A 439 D2	AL-BRONZE	
HAND WHEEL	CARBON STEEL		
HAND WHEEL NUT	A 194 Gr.2H/AISI 1020		
COLLAR BOLT / STUD & NUT	A 193 B7/A 194 2H	A 193 B8/A 194 8 OR A 193 B7/A 194 2H	
GLAND STUD & NUT	A 193 B7/A 194 2H	A 193 B8/A 194 8	
GASKET	SPW SS 304 / SS 316 WITH CAF / GRAFOIL		
GLAND PACKING	GRAPHITE ASBESTOS INHIB. & INCONEL WIRE REIN.		
SCREW/RIVET & WASHER	STEEL		
BEARING WASHER	HARDENED STEEL	T304	T316
GRUB SCREW	A 193 B7		
GREASE NIPPLE	C.S (NICKLE PLATED)		
NAME PLATE	ALUMINIUM / SS		

1 - STELLITED ON WEDGE / SEAT OPTIONAL

GATE VALVE CLASS 800, 1500, 2500, 4500.

API 602/BS EN ISO 15761/B 16.34



DIMENSION TABLE 800 CLASS

VALVE SIZE in mm	0.25 08	0.37 10	0.5 15	0.75 20	1 25	1.5 40	2 50
L	3.2 81	3.2 81	3.2 81	3.4 86	4 100	110/ 128	5.6 142
H app	165	165	165	175	215	270	285
$\phi K_{app}$	95	95	95	95	105	150	150
Wt. kg app	2.0	2.0	2.0	2.5	3.5	7.5	9.0

DIMENSION TABLE 2500 CLASS

VALVE SIZE in mm	0.25 08	0.37 10	0.5 15	0.75 20	1 25	1.5 40	2 50
L	3.3 86	3.3 86	3.9 100	110/ 128	5.5 142	5.5 142	-
L1	3.3 86	3.3 86	3.7 95	3.9 100	110/ 128	5.5 142	-
H app	165	165	210	265	280	280	-
$\phi K_{app}$	105	105	140	150	150	150	-
Wt. kg app	2.6	2.6	3.6	7.6	7.6	10	-

DIMENSION TABLE 1500 CLASS

VALVE SIZE in mm	0.25 08	0.37 10	0.5 15	0.75 20	1 25	1.5 40	2 50
L	3.3 86	3.3 86	3.3 86	3.9 100	110/ 128	5.5 142	-
L1	3.3 86	3.3 86	3.7 95	3.7 95	3.9 100	5.5 142	-
H app	165	165	210	210	265	280	-
$\phi K_{app}$	105	105	140	140	150	150	-
Wt. kg app	2.6	2.6	3.6	3.6	7.6	10	-

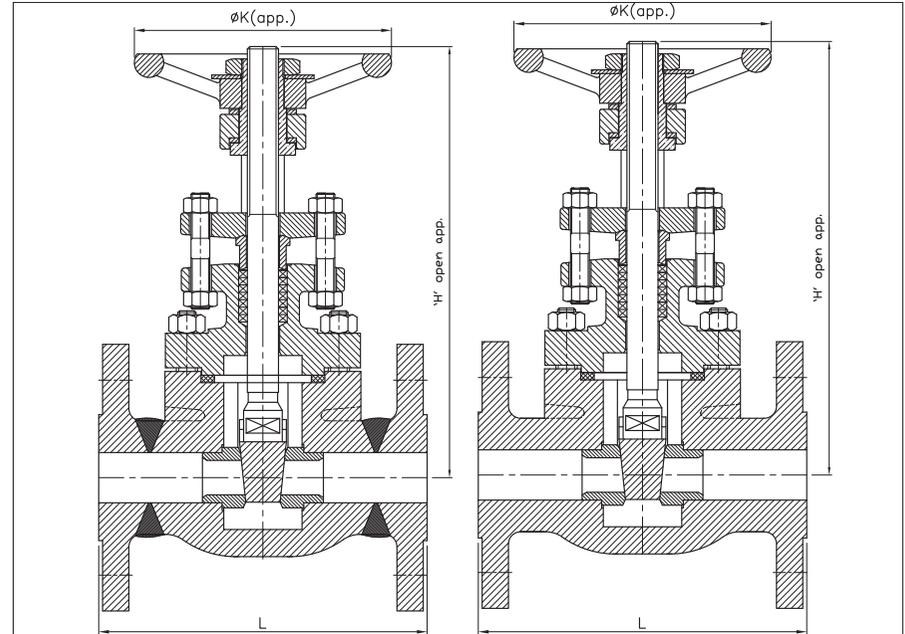
DIMENSION TABLE 4500 CLASS

VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40	2 50
L	5.0 128	5.0 128	-	6.3 160	7.9 200
H app	300	310	-	335	550
$\phi K_{app}$	150	150	-	150	300
Wt. kg app	-	-	-	-	-

INTEGRAL/WELDED FLANGE GATE VALVE

CLASS 150, 300, 600, 900, 1500, 2500.

API 602/BS EN ISO 15761



DIMENSION TABLE 150 CLASS

VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40	2 50
L	4.2 108	4.6 118	5.0 127	6.4 165	8.5 216
H app	165	175	215	270	280
K app	95	95	105	150	150
Wt. kg (app)	3.0	4.5	6.0	10.0	15

DIMENSION TABLE 300 CLASS

VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40	2 50
L	5.5 140	7.0 152.5	6.5 165	7.5 190	8.5 216
H app	165	175	215	270	280
K app	95	95	105	150	150
Wt. kg (app)	4.0	5.0	7.5	13.5	15

DIMENSION TABLE 600 CLASS

VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40	2 50
L	6.5 165	7.5 190	8.5 216	9.4 241	11.4 292
H app	165	175	215	270	280
K app	95	95	105	150	150
Wt. kg (app)	4.5	5.5	8.5	17.5	20

DIMENSION TABLE 900 CLASS

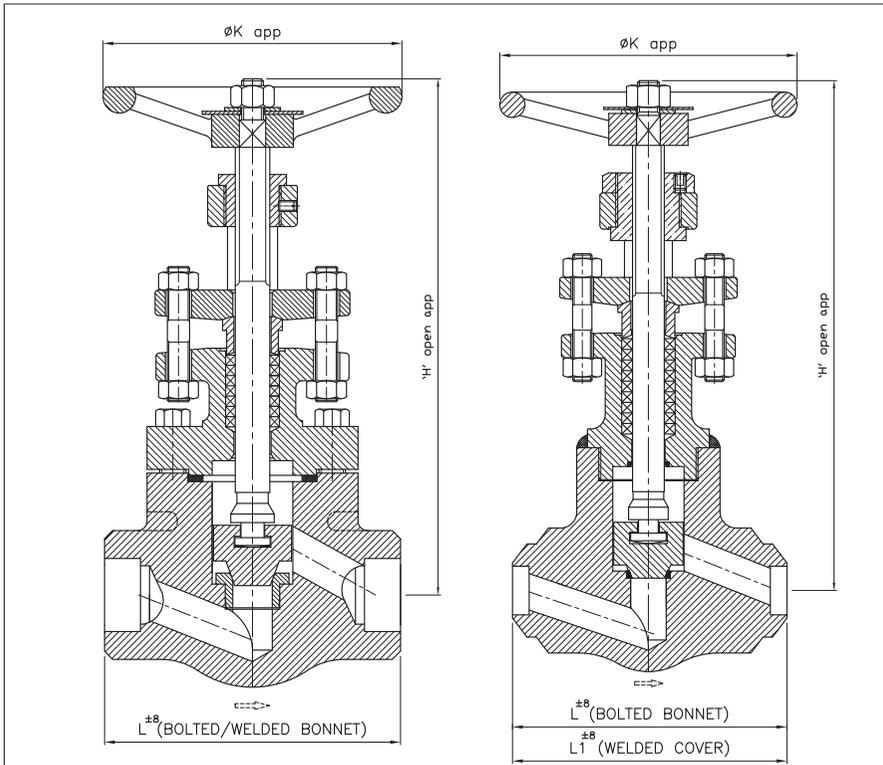
VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40
L	-	9.0 229	10 254	12 305
H app	-	260	260	275
K app	-	150	150	150
Wt. kg (app)	-	13	15.5	24

DIMENSION TABLE 1500 CLASS

VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40
L	-	9.0 229	10 254	12 305
H app	-	260	260	275
K app	-	150	150	150
Wt. kg (app)	-	13	15.5	24

DIMENSION TABLE 2500 CLASS

VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40
L	10.3 264	10.7 273	12.1 308	15.1 384
H app	205	270	270	280
K app	140	150	150	150
Wt. kg (app)	11.6	16.5	19.5	34



DIMENSION TABLE 800 CLASS

VALVE SIZE in mm	0.25 08	0.37 10	0.5 15	0.75 20	1 25	1.5 40	2 50
L	3.2 81	3.2 81	3.2 81	3.4 86	3.9 100	110/ 128	5.6 142
H app	170	170	170	180	210	280	290
øK app	6.0	6.0	9.0	12.0	17.5	29.5	35.0
Wt. kg app	2.0	2.0	2.0	2.5	4.0	8.5	9.0

DIMENSION TABLE 2500 CLASS

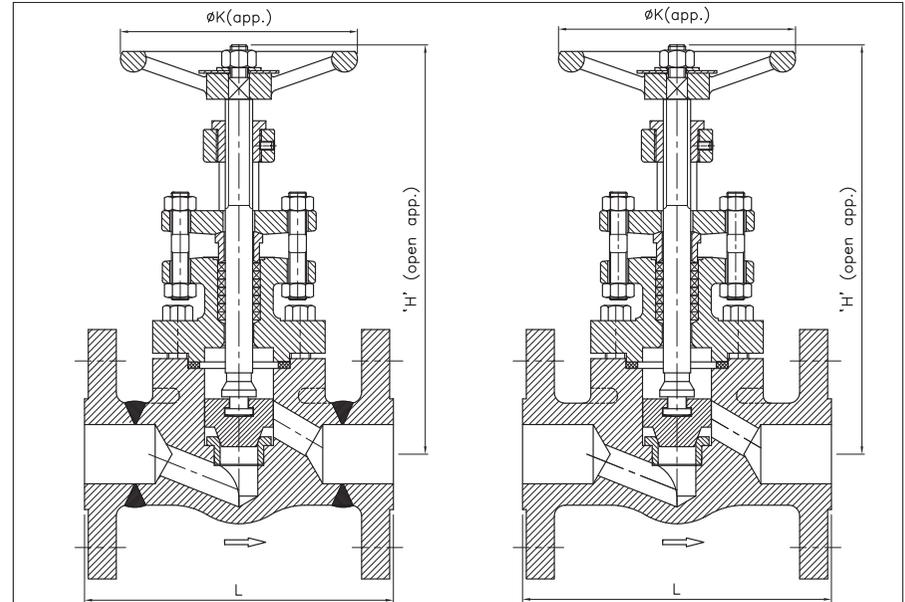
VALVE SIZE in mm	0.25 08	0.37 10	0.5 15	0.75 20	1 25	1.5 40	2 50
L	3.3 86	3.3 86	3.9 100	110/ 128	5.5 142	5.5 142	-
L1	3.3 86	3.3 86	3.7 95	3.9 100	110/ 128	5.5 142	-
H app	165	165	210	275	285	285	-
øK app	105	105	140	150	150	150	-
Wt. kg app	2.6	2.6	3.6	7.6	7.6	10	-

DIMENSION TABLE 1500 CLASS

VALVE SIZE in mm	0.25 08	0.37 10	0.5 15	0.75 20	1 25	1.5 40	2 50
L	3.3 86	3.3 86	3.3 86	3.9 100	110/ 128	5.5 142	-
L1	3.3 86	3.3 86	3.7 95	3.7 95	3.9 100	5.5 142	-
H app	165	165	210	210	275	285	-
øK app	105	105	140	140	150	150	-
Wt. kg app	2.6	2.6	3.6	3.6	7.6	10	-

DIMENSION TABLE 4500 CLASS

VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40	2 50
L	5.0 128	5.0 128	-	6.3 160	7.9 200
H app	290	295	-	325	510
øK app	150	150	-	150	300
Wt. kg app	-	-	-	-	-



DIMENSION TABLE 150 CLASS

VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40	2 50
L	4.25 108	4.6 117	5 127	6.5 165	7.9 203
'H' app	170	180	210	280	280
K app	95	95	105	150	150
Wt.kg (app)	3.0	4.5	6.0	10.0	15

DIMENSION TABLE 900 CLASS

VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40
L	216	9.0 229	10.0 254	12.0 305
'H' app	205	205	270	280
K app	140	140	150	150
Wt.kg (app)	8.6	13	15.5	24

DIMENSION TABLE 300 CLASS

VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40	2 50
L	6.0 152	7.0 178	8.0 203	9.0 229	10.5 267
'H' app	170	180	210	280	280
K app	95	95	105	150	150
Wt.kg (app)	4.0	6.0	8.0	17.0	20

DIMENSION TABLE 1500 CLASS

VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40
L	8.5 216	9.0 229	10.0 254	12.0 305
'H' app	205	205	270	280
K app	140	140	150	150
Wt.kg (app)	8.6	13	15.5	24

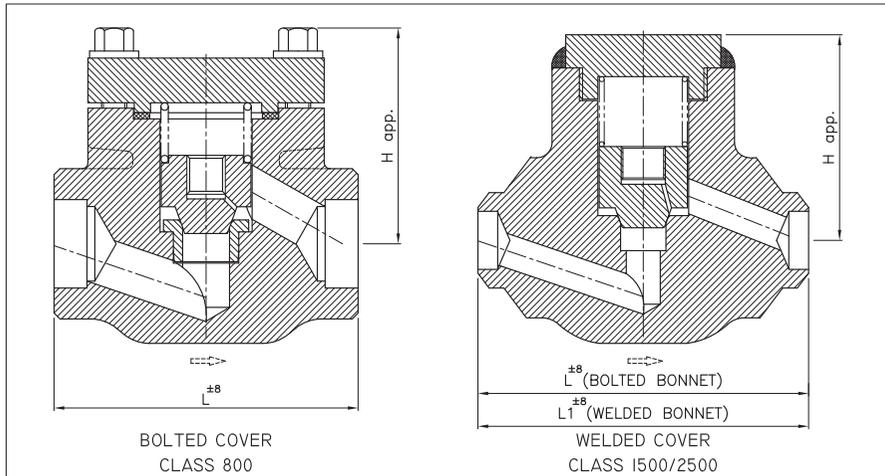
DIMENSION TABLE 600 CLASS

VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40	2 50
L	6.5 165	7.5 190	8.5 216	9.5 241	11.4 292
'H' app	180	210	280	290	290
K app	95	105	150	150	150
Wt.kg (app)	4.5	6.5	8.5	17.5	22

DIMENSION TABLE 2500 CLASS

VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40
L	10.3 264	10.7 273	12.1 308	15.1 384
'H' app	205	270	270	280
K app	140	150	150	150
Wt.kg (app)	11.6	16.5	19.5	34

FORGED STEEL LIFT CHECK VALVE  
CLASS 800, 1500, 2500,4500.  
BS EN ISO 15761/B 16.34



MATERIAL SPECIFICATION

PART NAME	MATERIAL		
BODY	A 105	A 182 F304	A 182 F316
PLUG	13% Cr.	T304	T316
SEAT RING	13% Cr.	T304	T316
COVER	ASTM A 105	A 182 F304	A 182 F316
COLLER BOLT/ STUD & NUT	B7/2H	B8/8 OR B7/2H	
GASKET	SPW S.S 304/316 WITH GRAFOIL		
NAME PLATE	ALUMINIUM/S.S.		
SPRING	T304/T316		

MATERIAL SPECIFICATION

PART NAME	MATERIAL		
BODY	A 105	A 182 F304	A 182 F316
PLUG	13% Cr. STELLITED	T304 STELLITED	T316 STELLITED
SEAT RING	STELLITED	STELLITED	STELLITED
TOP COVER	ASTM A 105	A 182 F304	A 182 F316
NAME PLATE	ALUMINIUM/S.S.		
SPRING	T304/T316		

DIMENSION TABLE 800 CLASS

VALVE SIZE in mm	0.25 08	0.37 10	0.5 15	0.75 20	1 25	1.5 40	2 50
L	3.1 81	3.1 81	3.1 81	3.3 86	3.9 100	110/ 128	5.6 142
H app	60	60	60	70	80	105	115
Wt. kg app	1.5	1.5	1.5	2.0	2.5	6	8

DIMENSION TABLE 1500 CLASS

VALVE SIZE in mm	0.25 08	0.37 10	0.5 15	0.75 20	1 25	1.5 40	2 50
L	3.3 86	3.3 86	3.3 86	3.9 100	110/ 128	5.6 142	—
L1	3.3 86	3.3 86	3.7 95	3.7 95	3.9 100	5.6 142	—
H app	70	70	70	100	100	125	—
Wt. kg app	2	2	2	4	8	10	—

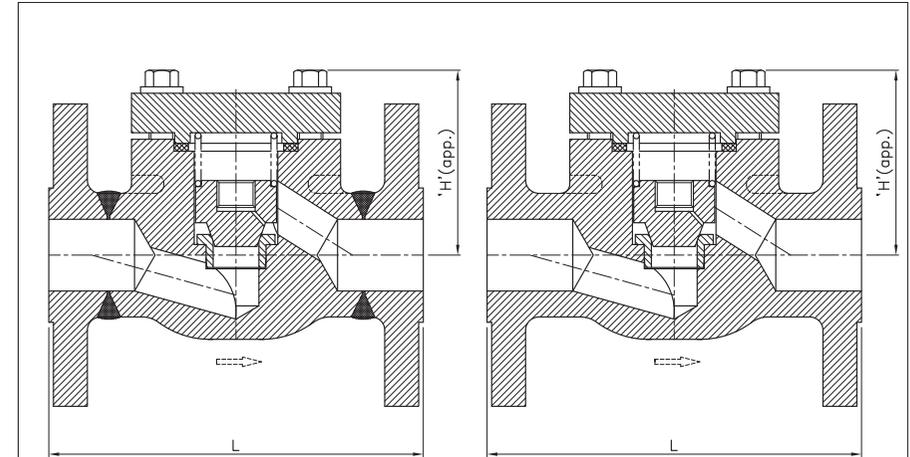
DIMENSION TABLE 2500 CLASS

VALVE SIZE in mm	0.25 08	0.37 10	0.5 15	0.75 20	1 25	1.5 40	2 50
L	3.3 86	3.3 86	3.3 100	3.9 128	110/ 142	5.6 142	—
L1	3.3 86	3.3 86	3.7 95	3.7 100	3.9 128	5.6 142	—
H app	70	70	70	100	125	125	—
Wt. kg app	2	2	4	8	10	10	—

DIMENSION TABLE 4500 CLASS

VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40	2 50
L	5.0 128	5.0 128	—	6.3 160	7.9 200
H app	120	125	—	150	175
Wt. kg app	—	—	—	—	—

FORGED STEEL LIFT CHECK VALVE  
CLASS 150, 300, 600, 900, 1500, 2500.  
BS EN ISO 15761/ASME B 16.34



DIMENSION TABLE 150 CLASS

VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40
L	4.25 108	4.6 117	5 127	6.5 165
H app	60	70	80	105
Wt. kg app	2	3	3.8	11.5

DIMENSION TABLE 300 CLASS

VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40
L	6.0 152	7.0 178	8.0 203	9.0 229
H app	60	70	80	105
Wt. kg app	2.5	3.5	7.5	12

DIMENSION TABLE 600 CLASS

VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40
L	6.5 165	7.5 190	8.5 216	9.5 241
H app	70	80	105	115
Wt. kg app	2.75	3.7	8.5	13.5

DIMENSION TABLE 900 CLASS

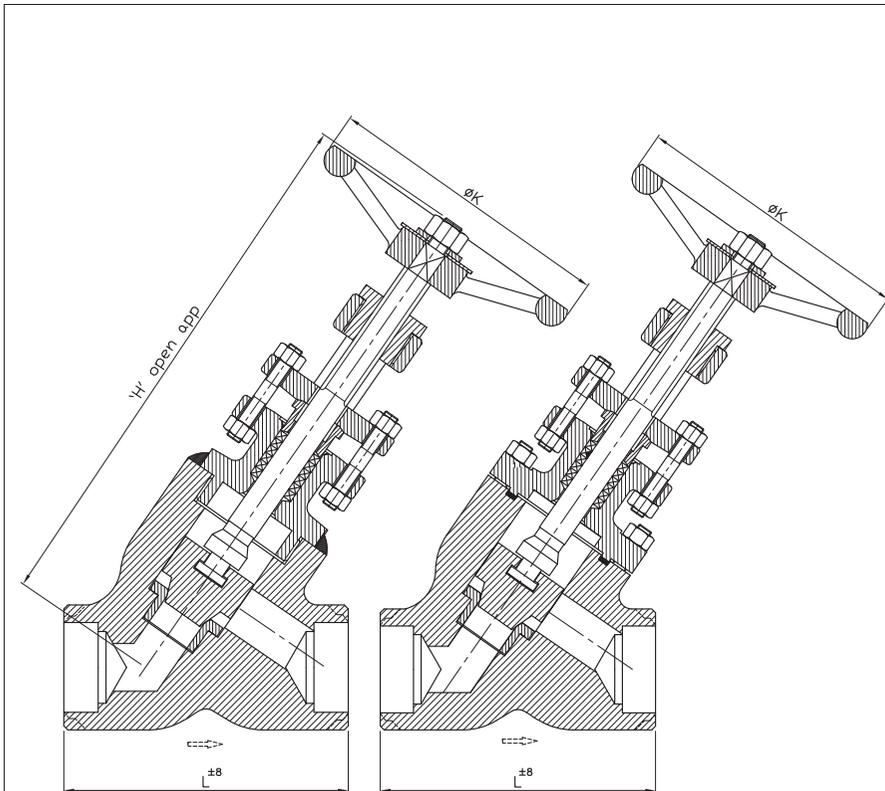
VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40
L	—	9.0 229	10.0 254	12.0 305
H app	—	80	105	115
Wt. kg app	—	3.7	8.5	13.5

DIMENSION TABLE 1500 CLASS

VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40
L	8.5 216	8.9 227	10.0 254	12.0 305
H app	70	80	105	115
Wt. kg app	2.7	3.7	8.5	13.5

DIMENSION TABLE 2500 CLASS

VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40
L	10.3 264	10.7 273	12.1 308	15.1 384
H app	70	80	105	115
Wt. kg app	2.7	3.7	8.5	13.5



**DIMENSION TABLE 800 CLASS**

VALVE SIZE in mm	0.75 20	1 25	1.5 40	2 50
L	3.9 100	5.1 130	5.7 145	-
H app	200	270	270	-
ØK	105	150	150	-

**DIMENSION TABLE 1500 CLASS**

VALVE SIZE in mm	0.75 20	1 25	1.5 40	2 50
L	-	-	-	-
H app	-	-	-	-
ØK	-	-	-	-

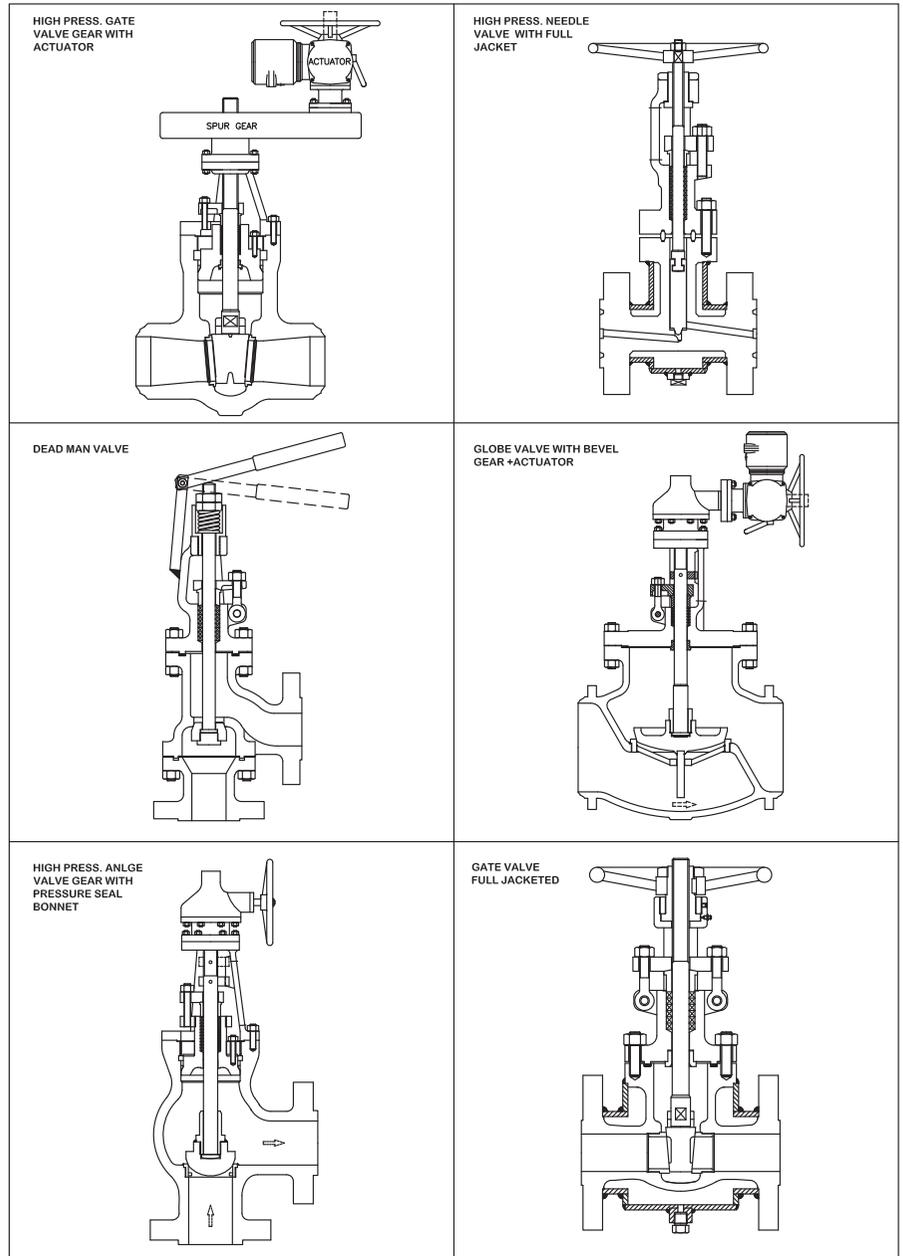
**DIMENSION TABLE 2500 CLASS**

VALVE SIZE in mm	0.75 20	1 25	1.5 40	2 50
L	5.7 145	-	-	-
H app	300	-	-	-
ØK	150	-	-	-

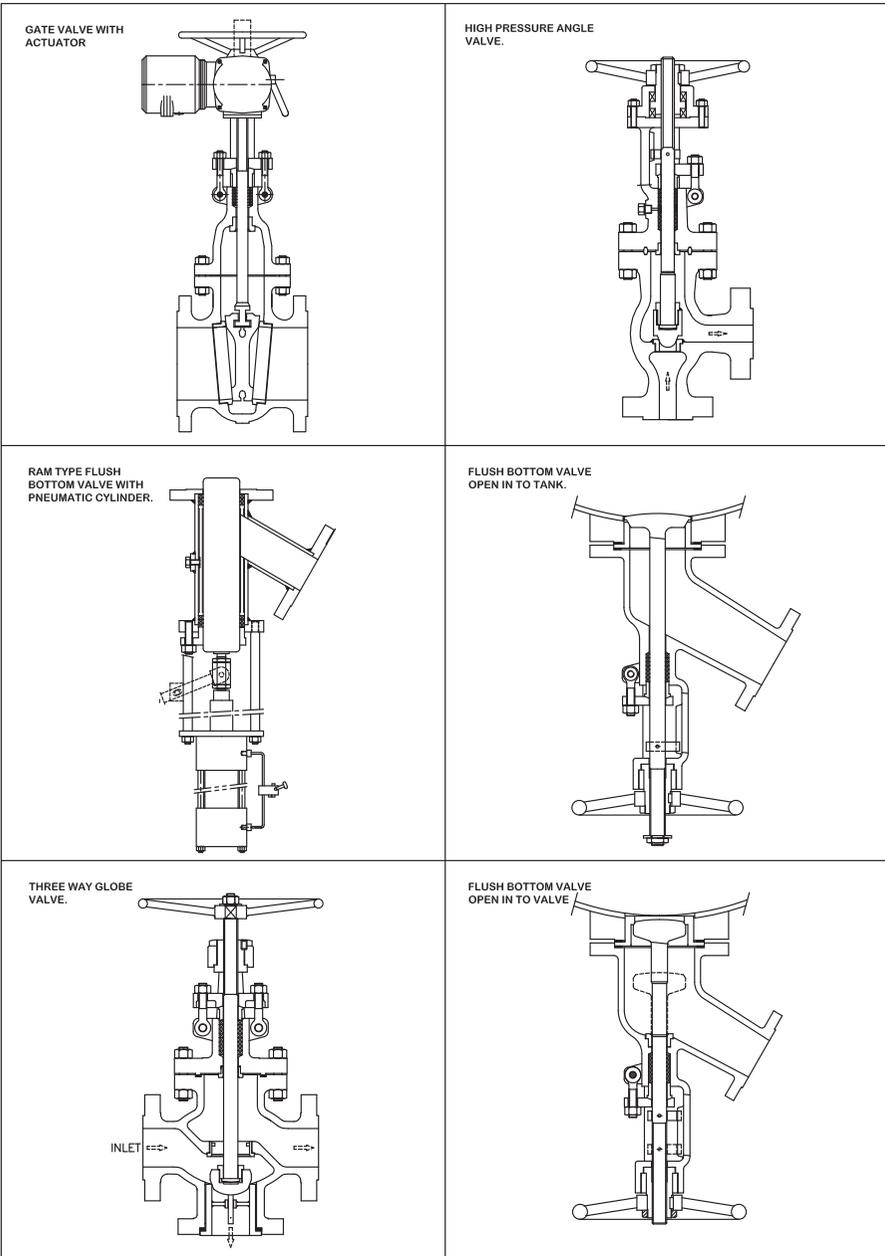
**DIMENSION TABLE 4500 CLASS**

VALVE SIZE in mm	0.5 15	0.75 20	1 25	1.5 40	2 50
L	-	-	-	-	-
H app	-	-	-	-	-
ØK app	-	-	-	-	-

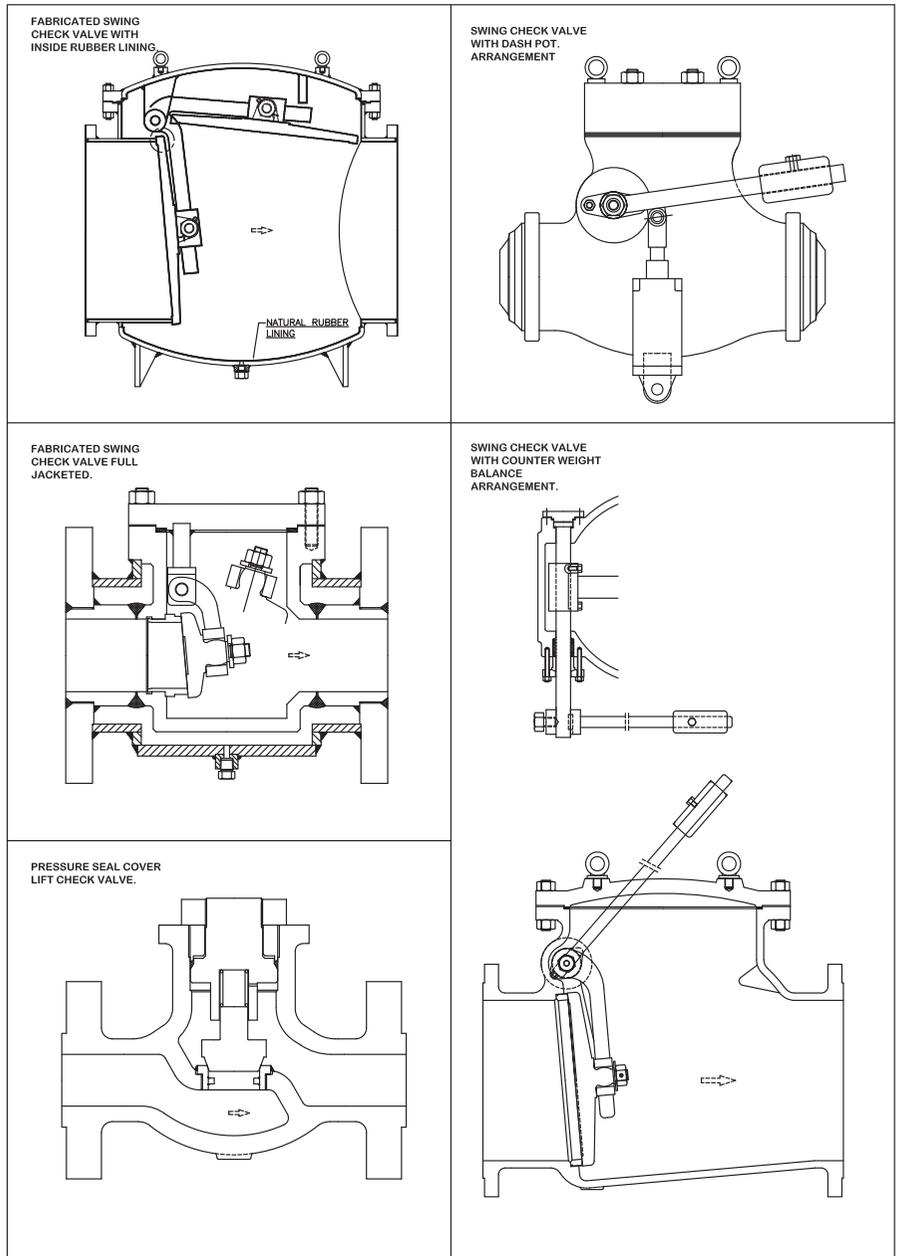
SPECIAL VALVES



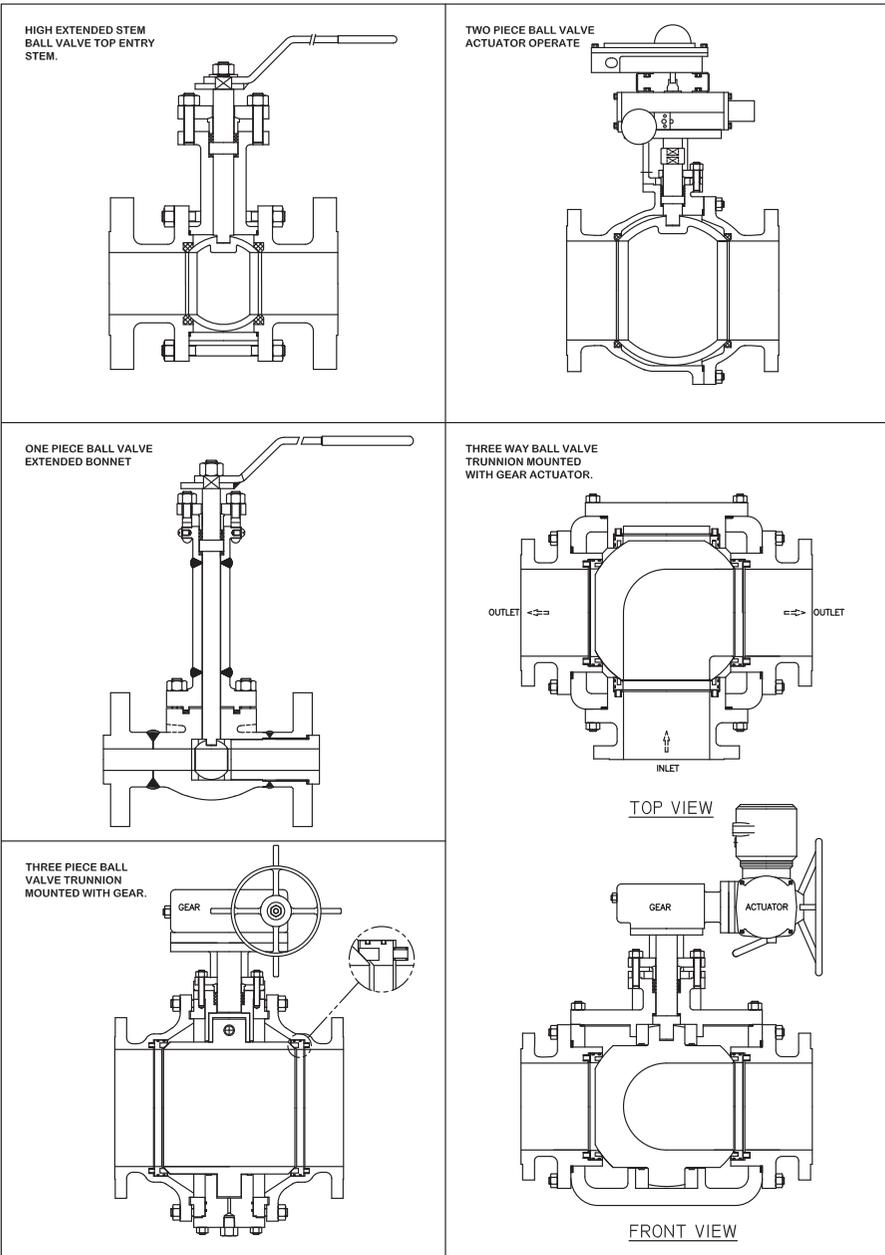
SPECIAL VALVES



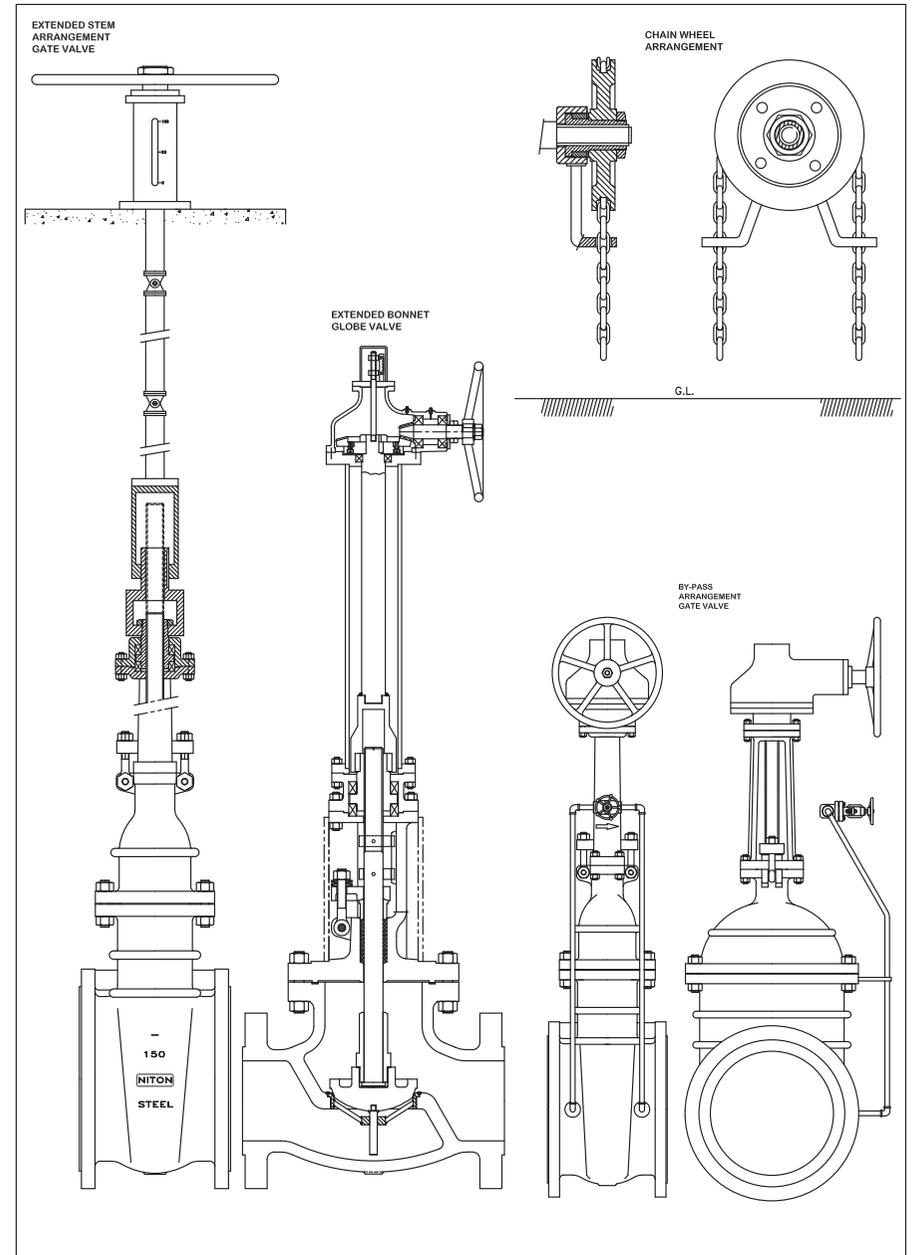
SPECIAL VALVES



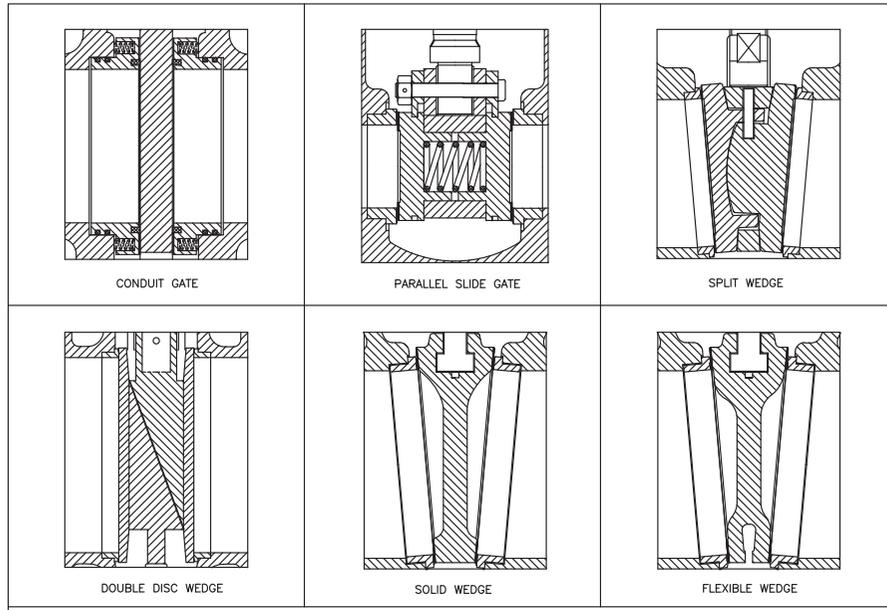
SPECIAL VALVES



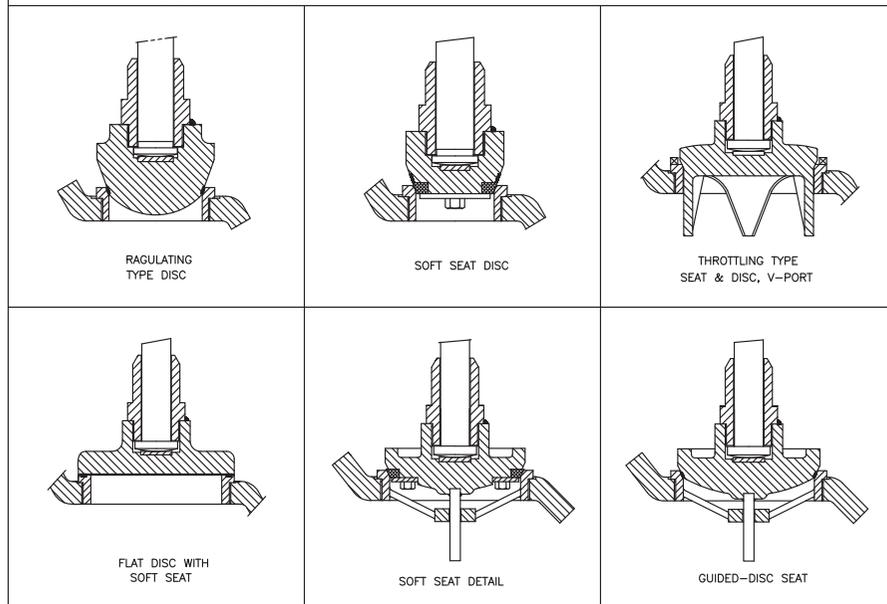
SPECIAL COMPONENT & ACCESSORIES



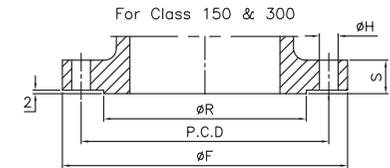
### VARIOUS WEDGE DESIGNS



### VARIOUS PLUG DESIGNS



### ASME B 16.5



#### Class 150 Steel Flange Dimensions

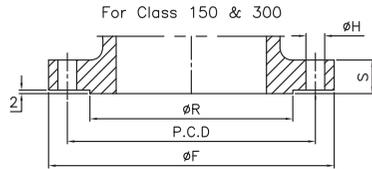
Nominal Size		øF		PCD		øR		S		øH		N	STUD
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No.	Size (in)
1/2	15	3.50	90	2.38	60.5	1.38	35	0.45	11.5	0.62	16	4	1/2
3/4	20	3.88	100	2.75	70.0	1.69	43	0.51(0.45)	13.1(11.5)	0.62	16	4	1/2
1	25	4.25	110	3.12	79.2	2.00	51	0.58(0.45)	14.7(11.5)	0.62	16	4	1/2
1 1/4	32	4.62	115	3.50	89.0	2.50	64	0.64(0.51)	16.3(13.1)	0.62	16	4	1/2
1 1/2	40	5.00	125	3.88	98.5	2.88	73	0.70(0.58)	17.9(14.7)	0.62	16	4	1/2
2	50	6.00	150	4.75	120.5	3.62	92	0.77(0.64)	19.5(16.3)	0.75	19	4	5/8
2 1/2	65	7.00	180	5.50	139.5	4.12	105	0.89(0.70)	22.7(17.9)	0.75	19	4	5/8
3	80	7.50	190	6.00	152.5	5.00	127	0.95(0.77)	24.3(19.5)	0.75	19	4	5/8
4	100	9.00	230	7.50	190.5	6.19	157	0.95	24.3	0.75	19	8	5/8
5	125	10.00	255	8.50	216.0	7.31	188	0.95	24.3	0.88	22	8	3/4
6	150	11.00	280	9.50	241.5	8.50	216	1.01	25.8	0.88	22	8	3/4
8	200	13.50	345	11.75	298.5	10.62	270	1.14	29.0	0.88	22	8	3/4
10	250	16.00	405	14.25	362.0	12.75	324	1.20	30.6	1.00	25	12	7/8
12	300	19.00	485	17.00	432.0	15.00	381	1.27	32.2	1.00	25	12	7/8
14	350	21.00	535	18.75	476.0	16.26	413	1.39	35.4	1.12	29	12	1
16	400	23.50	595	21.25	539.5	18.50	470	1.45	37.0	1.12	29	16	1
18	450	25.00	635	22.75	578.0	21.00	533	1.58	40.1	1.25	32	16	1 1/8
20	500	27.50	700	25.00	635.0	23.00	584	1.70	43.3	1.25	32	20	1 1/8
24	600	32.00	815	29.50	749.5	27.25	692	1.89	48.1	1.38	35	20	1 1/4

#### Class 300 Steel Flange Dimensions

DIMENSION IN ( ) ARE FOR VALVE FLANGES ONLY

Nominal Size		øF		PCD		øR		S		øH		N	STUD
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No.	Size (in)
1/2	15	3.75	95	2.62	66.5	1.38	35	0.58	14.7	0.62	16	4	1/2
3/4	20	4.62	115	3.25	82.5	1.69	43	0.64	16.3	0.75	19	4	5/8
1	25	4.88	125	3.50	89.0	2.00	51	0.70	17.9	0.75	19	4	5/8
1 1/4	32	5.25	135	3.88	98.5	2.50	64	0.77	19.5	0.75	19	4	5/8
1 1/2	40	6.12	155	4.50	114.5	2.88	73	0.83	21.1	0.88	22	4	3/4
2	50	6.50	165	5.00	127.0	3.62	92	0.89	22.7	0.75	19	8	5/8
2 1/2	65	7.50	190	5.88	149.0	4.12	105	1.01	25.8	0.88	22	8	3/4
3	80	8.25	210	6.62	168.0	5.00	127	1.14	29.0	0.88	22	8	3/4
4	100	10.00	255	7.88	200.0	6.19	157	1.27	32.2	0.88	22	8	3/4
5	125	11.00	280	9.25	235.0	7.31	186	1.39	35.4	0.88	22	8	3/4
6	150	12.50	320	10.62	270.0	8.50	216	1.45	37.0	0.88	22	12	3/4
8	200	15.00	380	13.00	330.0	10.62	270	1.64	41.7	1.00	25	12	7/8
10	250	17.50	445	15.25	387.5	12.75	324	1.89	48.1	1.12	29	16	1
12	300	20.50	520	17.75	451.0	15.00	381	2.00	51.2	1.25	32	16	1 1/8
14	350	23.00	585	20.25	514.5	16.25	413	2.14	54.4	1.25	32	20	1 1/8
16	400	25.50	650	22.50	571.5	18.50	470	2.27	57.6	1.38	35	20	1 1/4
18	450	28.00	710	24.75	628.5	21.00	533	2.39	60.8	1.38	35	24	1 1/4
20	500	30.50	775	27.00	686.0	23.00	584	2.51	63.9	1.38	35	24	1 1/4
24	600	36.00	915	32.00	813.0	27.25	692	2.77	70.3	1.62	41	24	1 1/2

### API 605



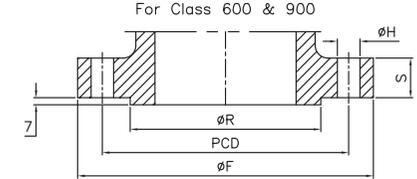
#### Class 150 Steel Flange Dimensions (26" & Larger)

Nominal Size		$\phi F$		PCD		$\phi R$		S		$\phi H$		N	STUD
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No.	Size (in)
26	650	30.94	786	29.31	744.5	28.00	711.2	1.64	41.7	0.88	22.2	36	3/4
28	700	32.94	837	31.31	795.3	30.00	762.0	1.76	44.8	0.88	22.2	40	3/4
30	750	34.94	887	33.31	846.1	32.00	812.8	1.76	44.8	0.88	22.2	44	3/4
32	800	37.06	941	35.44	900.1	34.00	863.6	1.82	46.4	0.88	22.2	48	3/4
34	850	39.56	1005	37.69	957.3	36.25	920.8	1.95	49.6	1.00	25.4	40	7/8
36	900	41.62	1057	39.75	1009.6	38.25	971.6	2.07	52.8	1.00	25.4	44	7/8
38	950	44.25	1124	42.12	1070.0	40.25	1022.4	2.14	54.4	1.12	28.6	40	1
40	1000	46.25	1175	44.12	1120.8	42.50	1079.5	2.20	56.0	1.12	28.6	44	1
42	1050	48.25	1226	46.12	1171.6	44.50	1130.3	2.32	59.1	1.12	28.6	48	1
44	1100	50.25	1276	48.12	1222.4	46.50	1181.1	2.39	60.7	1.12	28.6	52	1
46	1150	52.81	1341	50.56	1284.3	48.62	1235.1	2.45	62.3	1.25	31.8	40	1 1/8
48	1200	54.81	1392	52.56	1335.1	50.75	1289.0	2.58	65.5	1.25	31.8	44	1 1/8
50	1250	56.81	1443	54.56	1385.9	52.75	1339.8	2.70	68.7	1.25	31.8	48	1 1/8
52	1300	58.81	1494	56.56	1436.7	54.75	1390.8	2.76	70.2	1.25	31.8	52	1 1/8
54	1350	61.00	1549	58.75	1492.2	56.75	1441.1	2.82	71.8	1.25	31.8	56	1 1/8
56	1400	63.00	1600	60.75	1543.0	58.75	1492.3	2.89	73.4	1.25	31.8	60	1 1/8
58	1450	65.94	1675	63.44	1611.3	60.75	1543.0	2.95	75.0	1.38	34.9	48	1 1/4
60	1500	67.94	1726	65.44	1662.1	63.00	1600.2	3.01	76.6	1.38	34.9	52	1 1/4

#### Class 300 Steel Flange Dimensions (26" & Larger)

Nominal Size		$\phi F$		PCD		$\phi R$		S		$\phi H$		N	STUD
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No.	Size (in)
26	650	34.12	867	31.62	803.3	29.00	736.6	3.51	89.3	1.38	34.9	32	1 1/4
28	700	36.25	921	33.75	857.2	31.00	787.4	3.51	89.3	1.38	34.9	36	1 1/4
30	750	39.00	991	36.25	920.8	33.25	844.6	3.70	94.1	1.50	38.1	36	1 3/8
32	800	41.50	1054	38.50	977.9	35.50	901.7	4.07	103.6	1.62	41.3	32	1 1/2
34	850	43.62	1108	40.62	1031.9	37.50	952.5	4.07	103.6	1.62	41.3	36	1 1/2
36	900	46.12	1172	42.88	1089.0	39.75	1009.6	4.07	103.6	1.75	44.4	32	1 5/8
38	950	48.12	1222	44.88	1139.8	41.75	1060.4	4.39	111.5	1.75	44.4	36	1 5/8
40	1000	51.12	1273	46.88	1190.6	43.88	1114.4	4.58	116.3	1.75	44.4	40	1 5/8
42	1050	52.50	1334	49.00	1244.6	46.00	1168.4	4.70	119.5	1.88	47.6	36	1 3/4
44	1100	54.50	1384	51.00	1295.4	48.00	1219.2	5.01	127.4	1.88	47.6	40	1 3/4
46	1150	57.50	1460	53.75	1365.2	50.00	1270.2	5.07	129.0	2.00	50.8	36	1 7/8
48	1200	59.50	1511	55.75	1416.0	52.25	1327.2	5.07	129.0	2.00	50.8	40	1 7/8
50	1250	61.50	1562	57.75	1466.8	54.25	1378	5.44	138.2	2.00	50.8	44	1 7/8

### ASME B 16.5



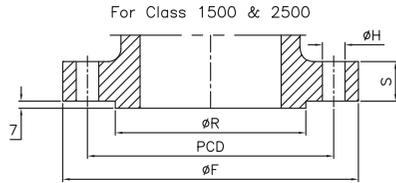
#### Class 600 Steel Flange Dimensions

Nominal Size		$\phi F$		PCD		$\phi R$		S		$\phi H$		N	STUD
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No.	Size (in)
1/2	15	3.75	95	2.62	66.5	1.38	35	0.56	14.3	0.62	16	4	1/2
3/4	20	4.62	115	3.25	82.5	1.69	43	0.62	15.9	0.75	19	4	5/8
1	25	4.88	125	3.50	89.0	2.00	51	0.69	17.5	0.75	19	4	5/8
1 1/4	32	5.25	135	3.88	98.5	2.50	64	0.81	20.7	0.75	19	4	5/8
1 1/2	40	6.12	155	4.50	114.5	2.88	73	0.88	22.3	0.88	22	4	3/4
2	50	6.50	165	5.00	127.0	3.62	92	1.00	25.4	0.75	19	8	5/8
2 1/2	65	7.50	190	5.88	149.0	4.12	105	1.12	28.6	0.88	22	8	3/4
3	80	8.25	210	6.62	168.0	5.00	127	1.25	31.8	0.88	22	8	3/4
4	100	10.75	275	8.50	216.0	6.19	157	1.50	38.1	1.00	25	8	7/8
5	125	13.00	330	10.50	266.5	7.31	186	1.75	44.5	1.12	29	8	1
6	150	14.00	355	11.50	292.0	8.50	216	1.88	47.7	1.12	29	12	1
8	200	16.50	420	13.75	349.0	10.62	270	2.19	55.6	1.25	32	12	1 1/8
10	250	20.00	510	17.00	432.0	12.75	324	2.50	63.5	1.38	35	16	1 1/4
12	300	22.00	560	19.25	489.0	15.00	381	2.62	66.7	1.38	35	20	1 1/4
14	350	23.75	605	20.75	527.0	16.25	413	2.75	69.9	1.50	38	20	1 3/8
16	400	27.00	685	23.75	603.0	18.50	470	3.00	76.2	1.62	41	20	1 1/2
18	450	29.25	745	25.75	654.0	21.00	533	3.25	82.6	1.75	45	20	1 5/8
20	500	32.00	815	28.50	724.0	23.00	584	3.50	88.9	1.75	45	24	1 5/8
24	600	37.00	940	33.00	838.0	27.25	692	4.00	101.6	2.00	51	24	1 7/8

#### Class 900 Steel Flange Dimensions

Nominal Size		$\phi F$		PCD		$\phi R$		S		$\phi H$		N	STUD
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No.	Size (in)
2	50	8.50	215	6.50	165.0	3.62	92	1.50	38.1	1.00	25	8	7/8
2 1/2	65	9.62	245	7.50	190.5	4.12	105	1.62	41.2	1.12	29	8	1
3	80	9.50	240	7.50	190.5	5.00	127	1.50	38.1	1.00	25	8	7/8
4	100	11.50	290	9.25	235.0	6.19	157	1.75	44.5	1.25	32	8	1 1/8
5	125	13.75	350	11.00	279.5	7.31	186	2.00	50.8	1.38	35	8	1 1/4
6	150	15.00	380	12.50	317.5	8.50	216	2.19	55.6	1.25	32	12	1 1/8
8	200	18.50	470	15.50	393.5	10.62	270	2.50	63.5	1.50	38	12	1 3/8
10	250	21.50	545	18.50	470.0	12.75	324	2.75	69.9	1.50	38	16	1 3/8
12	300	24.00	610	21.00	533.5	15.00	381	3.12	79.2	1.50	38	20	1 3/8
14	350	25.25	640	22.00	559.0	16.25	413	3.38	85.9	1.62	41	20	1 1/2
16	400	27.75	705	24.25	616.0	18.50	470	3.50	88.9	1.75	45	20	1 5/8
18	450	31.00	785	27.00	686.0	21.00	533	4.00	101.6	2.00	51	20	1 7/8
20	500	33.75	855	29.50	749.5	23.00	584	4.25	108.0	2.12	54	20	2
24	600	41.00	1040	35.50	901.5	27.25	692	5.50	139.7	2.62	67	20	2 1/2

### ASME B 16.5



#### Class 1500 Steel Flange Dimensions

Nominal Size	$\phi F$		PCD		$\phi R$		S		$\phi H$		N	STUD	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No.	Size (in)
2	50	8.50	215	6.50	165.0	3.62	92	1.50	38.1	1.00	25	8	7/8
2 1/2	65	9.62	245	7.50	190.0	4.12	105	1.62	41.2	1.12	29	8	1
3	80	10.50	265	8.00	203.0	5.00	127	1.88	47.8	1.25	32	8	1 1/8
4	100	12.25	310	9.50	241.5	6.19	157	2.12	53.9	1.38	35	8	1 1/4
5	125	14.75	375	11.50	292.0	7.31	186	2.88	73.2	1.62	41	8	1 1/2
6	150	15.50	395	12.50	317.5	8.50	216	3.25	82.6	1.50	38	12	1 3/8
8	200	19.00	485	15.50	393.5	10.62	270	3.62	92.0	1.75	45	12	1 5/8
10	250	23.00	585	19.00	482.5	12.75	324	4.25	108.0	2.00	51	12	1 7/8
12	300	26.50	675	22.50	571.5	15.00	381	4.88	124.0	2.12	54	16	2
14	350	29.50	750	25.00	635.0	16.25	413	5.25	133.4	2.38	60	16	2 1/4
16	400	32.50	825	27.75	705.0	18.50	470	5.75	146.1	2.62	67	16	2 1/2
18	450	36.00	915	30.50	774.5	21.00	533	6.38	162.1	2.88	73	16	2 3/4
20	500	38.75	985	32.75	832.0	23.00	584	7.00	177.8	3.12	79	16	3
24	600	46.00	1170	39.00	990.5	27.25	692	8.00	203.2	3.62	92	16	3 1/2

#### Class 2500 Steel Flange Dimensions

Nominal Size	$\phi F$		PCD		$\phi R$		S		$\phi H$		N	STUD	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No.	Size (in)
2	50	9.25	235	6.75	171.5	3.62	92	2.00	50.8	1.12	29	8	1
2 1/2	65	10.50	265	7.75	197.0	4.12	105	2.25	57.2	1.25	32	8	1 1/8
3	80	12.00	305	9.00	228.5	5.00	127	2.62	66.5	1.38	35	8	1 1/4
4	100	14.00	355	10.75	273.0	6.19	157	3.00	76.2	1.62	41	8	1 1/2
5	125	16.50	420	12.75	324.0	7.31	186	3.62	91.9	1.88	48	8	1 3/4
6	150	19.00	485	14.50	368.5	8.50	216	4.25	108.0	2.12	54	8	2
8	200	21.75	550	17.25	438.0	10.62	270	5.00	127.0	2.12	54	12	2
10	250	26.50	675	21.25	540.0	12.75	324	6.50	165.1	2.62	67	12	2 1/2
12	300	30.00	760	24.38	629.5	15.00	381	7.25	184.2	2.88	73	12	2 3/4

#### MSS SP-44 Class 150, 300, & 600 RF Dimensions

##### Class 150 Steel Flange Dimensions

Nominal Size	$\phi F$		PCD		$\phi R$		S		$\phi H$		N	STUD	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No.	Size (in)
22	550	29.5	750	27.25	692	25.25	641	1.81	46	1.38	35	20	1 1/4

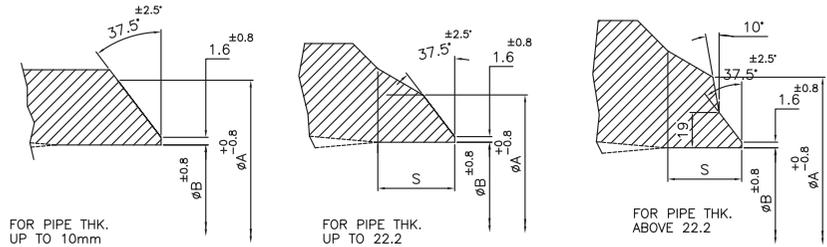
##### Class 300 Steel Flange Dimensions

Nominal Size	$\phi F$		PCD		$\phi R$		S		$\phi H$		N	STUD	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No.	Size (in)
22	550	33.0	838	29.25	742.9	25.25	641	2.62	66.5	1.62	41	24	1 1/2

##### Class 600 Steel Flange Dimensions

Nominal Size	$\phi F$		PCD		$\phi R$		S		$\phi H$		N	STUD	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	No.	Size (in)
22	550	34.25	870	30.62	777.7	25.25	641	3.75	95.2	1.88	48.0	44	1 3/4

### BUTT WELD END DIMENSION'S ASME B 16.25

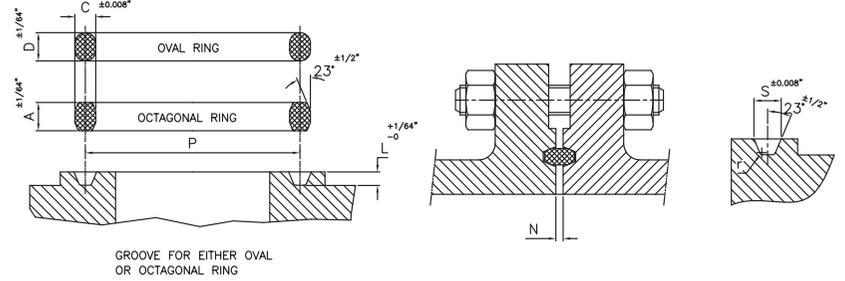


PIPE SIZE	SCH.	PIPE O.D.	$\phi A$	$\phi B$	S	PIPE SIZE	SCH.	PIPE O.D.	$\phi A$	$\phi B$	S				
1"	40	33.4	35	26.59	5.1	2.5"	40	73.0	75	62.6	7.8				
	60			24.4	6.75		60			59	10.5				
	80						80								
	100						100								
	120						120								
	140						140								
	160						20.7			9.52	160			54	14.25
XXS			15.2	13.65	XXS			45	21						
1.25"	40	42.4	44	35.0	5.4	3"	40	88.9	91.2	77.93	8.23				
	60			32.4	7.35		60			73.66	11.43				
	80						80								
	100						100								
	120						120								
	140						29.5			9.52	140			66.65	16.68
	160						22.78			14.55	160			58.42	22.86
XXS					XXS										
1.5"	40	48.3	50	40.9	5.55	4"	40	114.3	117.4	102.26	9.03				
	60			38.1	7.65		60			97.18	12.84				
	80						80								
	100						100								
	120						120								
	140						34.0			10.72	140			92.05	16.68
	160						27.9			15.3	160			87.33	20.23
XXS					XXS			80.06	25.68						
2"	40	60.3	62	52.5	5.85	5"	40	141.2	144.5	128.19	10				
	60			49.3	8.25		60			122.25	14.2				
	80						80								
	100						100								
	120						120								
	140						42.9			13.05	140			115.9	19
	160						38.1			16.65	160			109.55	23.81
XXS					XXS			103.2	28.57						

### BUTT WELD END DIMENSION'S ASME B 16.25

PIPE SIZE	SCH.	PIPE O.D.	øA	øB	S	PIPE SIZE	SCH.	PIPE O.D.	øA	øB	S						
6"	40	168.3	172.2	154.05	10.66	16"	40	406.4	413	381	19.05						
	60						373.08			24.99							
	80			146.33	16.45		80			363.58	32.11						
	100						100			354.03	39.28						
	120			139.73	21.40		120			344.47	46.44						
	140						140			333.35	54.78						
	160			131.80	27.36		160			325.42	60.73						
	XXS			124.38	32.91	XXS											
8"	40	219.1	223	202.72	12.27	18"	40	457.2	464	428.65	21.4						
	60			198.45	15.46		60			419.1	28.57						
	80			193.67	19.05		80			409.6	35.7						
	100			188.89	22.63		100			398.48	44.04						
	120			182.6	27.36		120			387.35	52.38						
	140			177.83	30.93		140			377.85	59.5						
	160			173.05	34.51		160			366.73	67.86						
				XXS						174.62	33.33	XXS					
										431.8	19.05	XS					
10"	40	273	278	254.51	13.90	20"	40	508	516	477.88	22.63						
	60			247.65	19.05		60			466.75	30.93						
	80			242.93	22.63		80			455.63	39.28						
	100			236.52	27.36		100			442.93	48.81						
	120			230.17	32.11		120			431.8	57.15						
	140			222.2	38.1		140			419.1	66.67						
	160			215.90	42.85		160			407.97	74.98						
				XXS								XXS			482.6	19.05	
12"	40	323.8	329	303.23	15.46	22"	40	559	567								
	60			295.3	21.40		60			514.35	33.33						
	80			288.95	26.17		80			501.65	42.86						
	100			280.97	32.11		100			488.95	52.38						
	120			273.05	38.1		120			476.25	61.9						
	140			266.7	42.85		140			463.55	71.43						
	160			257.2	49.98		160			450.85	80.96						
				XS						298.45	19.05	XS			533.4	19.05	
14"	40	355.6	362	333.35	16.68	24"	40	610	619	574.7	26.17						
	60			325.48	22.63		60			560.43	36.88						
	80			317.5	28.5		80			547.73	46.41						
	100			308	35.7		100			531.83	58.33						
	120			300.02	41.68		120			517.55	69.03						
	140			292.1	47.62		140			504.85	78.55						
	160			284.18	53.56		160			490.58	89.26						
				XS						330.2	19.05	XS			584.2	19.05	

### DIMENSION OF RING JOINT



Ring No.	P		S		L		r max.		A		C		D		N	
	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	300#	600#
R11	34.1	1 11/32	7.1	9/32	5.5	7/32	1	1/32	9.5	3/8	6.4	1/4	11.1	7/16	3.2	3.2
R12	39.7	1 9/16	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	4	4
R13	42.9	1 11/16	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	3.9	3.9
R14	44.4	1 3/4	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	4	4
R15	47.6	1 7/8	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	4	4
R16	50.8	2	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	3.9	3.9
R17	57.1	2 1/4	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	4	4
R18	60.3	2 3/8	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	3.9	3.9
R19	65.1	2 9/16	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	4	4
R20	68.3	2 11/16	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	3.9	3.9
R21	72.2	2 27/32	11.9	15/32	7.9	5/16	1	1/32	15.9	5/8	11.1	7/16	17.5	11/16	4	4
R22	82.5	3 1/4	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	4	4
R23	82.5	3 1/4	11.9	15/32	7.9	5/16	1	1/32	15.9	5/8	11.1	7/16	17.4	11/16	5.9	4.8
R24	95.2	3 3/4	11.9	15/32	7.9	5/16	1	1/32	15.9	5/8	11.1	7/16	17.5	11/16	3.2	3.2
R25	101.6	4	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	4	4
R26	101.6	4	11.9	15/32	7.9	5/16	1	1/32	15.9	5/8	11.1	7/16	17.5	11/16	5.5	4.8
R27	107.9	4 1/4	11.9	15/32	7.9	5/16	1	1/32	15.9	5/8	11.1	7/16	17.5	11/16	3.2	3.2
R28	111.1	4 3/4	13.5	17/32	9.5	3/8	1.5	1/16	17.5	11/16	12.7	1/2	19.1	3/4	3.2	3.2
R29	114.3	4 1/2	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	4	4
R30	117.5	4 5/8	11.9	15/32	7.9	5/16	1	1/32	15.9	5/8	11.1	7/16	17.5	11/16	4	4
R31	123.8	4 7/8	11.9	15/32	7.9	5/16	1	1/32	15.9	5/8	11.1	7/16	17.5	11/16	5.5	4.8
R32	127	5	13.5	17/32	9.5	3/8	1.5	1/16	17.5	5/8	12.7	1/2	19.1	3/4	3.2	3.2
R33	131.8	5 3/16	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	4	4
R34	131.8	5 3/16	11.9	15/32	7.9	5/16	1	1/32	15.9	5/8	11.1	7/16	17.5	11/16	5.5	4.8
R35	136.5	5 31/8	11.9	15/32	7.9	5/16	1	1/32	15.9	5/8	11.1	7/16	17.5	11/16	3.2	3.2
R36	149.2	5 7/8	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	4	4
R37	149.2	5 7/8	11.9	15/32	7.9	5/16	1	1/32	15.9	5/8	11.1	7/16	17.5	11/16	4	4
R38	157.1	6 3/16	16.7	21/32	11.1	7/16	1.5	1/16	20.6	3/16	15.9	5/8	22.2	7/8	4	4
R39	161.9	6 3/8	11.9	15/32	7.9	5/16	1	1/32	15.9	5/8	11.1	7/16	17.5	11/16	3.2	3.2
R40	171.4	6 3/4	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	4	4
R41	181	7 1/8	11.9	15/32	7.9	5/16	1	1/32	15.9	5/8	11.1	7/16	17.4	11/16	5.5	4.8
R42	190.5	7 1/2	19.8	25/32	12.7	1/2	1.5	1/16	23.8	15/16	19.1	3/4	25.4	1	4	4
R43	193.7	7 5/8	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	4	4
R44	193.7	7 5/8	11.9	15/32	7.9	5/16	1	1/32	15.9	5/16	11.1	7/16	17.5	11/16	3.2	3.2
R45	211.1	8 5/16	11.9	15/32	7.9	5/16	1	1/32	15.9	5/16	11.1	7/16	17.4	11/16	4	4
R46	211.1	8 51/6	13.5	17/32	9.5	3/8	1.5	1/16	17.5	11/16	12.7	1/2	19.1	3/4	3.2	3.2

### DIMENSION OF RING JOINT

Ring No.	P		S		L		r max.		A		C		D		N	
	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	300#	600#
R47	228.6	9	19.8	25/32	12.7	1/2	1.5	1/16	23.8	15/16	19.1	3/4	25.4	1	4	4
R48	247.6	9 3/4	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	4	4
R49	269.9	10 5/8	11.9	15/32	7.9	5/16	1	1/32	15.9	5/8	11.1	7/16	17.4	11/16	5.5	4.8
R50	269.9	10 5/8	16.7	21/32	11.1	7/16	1.5	1/16	20.6	13/16	15.9	5/8	22.2	7/8	4	4
R51	279.4	11	23	29/32	14.3	9/16	1.5	1/16	27	1 1/16	22.2	7/8	28.6	1 1/8	4.8	4.8
R52	304.8	12	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	4	4
R53	323.8	12 3/4	11.9	15/32	7.9	5/16	1	1/32	15.9	5/8	11.1	7/16	17.4	11/16	5.5	4.8
R54	323.8	12 3/4	16.7	21/32	11.1	7/16	1.5	1/16	20.6	13/16	15.9	5/8	22.2	7/8	4	4
R55	342.9	13 1/2	30.2	1 3/16	17.4	11/16	2.5	3/32	34.9	1 3/8	28.6	1 1/8	36.5	1 7/16	6.4	6.4
R56	381	15	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	4	4
R57	381	15	11.9	15/32	7.9	5/16	1	1/32	15.9	5/8	11.1	7/16	17.4	11/16	5.5	4.8
R58	381	15	23	29/32	14.3	9/16	1.5	1/16	27	1 1/16	22.2	7/8	28.6	1 1/8	4.8	4.8
R59	396.9	15 3/8	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	3.2	3.2
R60	406.4	16	33.3	1 5/16	17.4	11/16	2.5	3/32	38.1	1 1/2	31.8	1 1/4	39.7	1 9/16	7.9	7.9
R61	419.1	16 1/2	11.9	15/32	7.9	5/16	1	1/32	15.9	5/8	11.1	7/16	17.4	11/16	5.5	4.8
R62	419.1	16 1/2	16.7	21/32	11.1	7/16	1.5	1/16	20.6	13/16	15.9	5/8	22.2	7/8	4	4
R63	419.1	16 1/2	27	1 1/16	15.9	5/8	2.5	3/32	31.8	1 1/4	25.4	1	33.3	1 5/16	5.5	5.5
R64	454	17 7/8	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	3.2	3.2
R65	469.9	18 1/2	11.9	15/32	7.9	5/16	1	1/32	15.9	5/8	11.1	7/16	17.4	11/16	5.5	5.5
R66	469.9	18 1/2	16.7	21/32	11.1	7/16	1.5	1/16	20.6	13/16	15.9	5/8	22.2	7/8	4	4
R67	469.9	18 1/2	30.2	1 3/16	17.4	11/16	2.5	3/32	34.9	1 3/8	28.6	1 1/8	36.5	1 7/16	7.9	7.9
R68	517.5	20 3/8	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	3.2	3.2
R69	533.4	21	11.9	15/32	7.9	5/16	1	1/32	15.9	5/8	11.1	7/16	17.4	11/16	5.5	4.8
R70	533.4	21	19.8	25/32	12.7	1/2	1.5	1/16	23.8	15/16	19.1	3/4	25.4	1	4.8	4.8
R71	533.4	21	30.2	1 3/16	17.4	11/16	2.5	3/32	34.9	1 3/8	28.6	1 1/8	36.5	1 7/16	7.9	7.9
R72	558.8	22	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	3.2	3.2
R73	584.2	23	13.5	17/32	9.5	3/8	1.5	1/16	17.4	11/16	12.7	1/2	19.1	3/4	5.5	4.8
R74	584.2	23	19.8	25/32	12.7	1/2	1.5	1/16	23.8	15/16	19.1	3/4	25.4	1	4.8	4.8
R75	584.2	23	33.3	1 5/16	17.4	11/16	2.5	3/32	38.1	1 1/2	31.8	1 1/4	39.7	1 9/16	9.5	9.5
R76	673.1	26 1/2	8.7	11/32	6.3	1/4	1	1/32	12.7	1/2	7.9	5/16	14.3	9/16	3.2	3.2
R77	692.1	27 1/4	16.7	21/32	11.1	7/16	1.5	1/16	20.6	13/16	15.9	5/8	22.2	7/8	6.4	5.5
R78	692.1	27 1/4	27	1 1/16	15.9	5/8	2.5	3/32	31.8	1 1/4	25.4	1	33.3	1 5/16	5.5	5.5
R79	692.1	27 1/4	36.5	1 7/16	20.6	13/16	2.5	3/32	41.3	1 5/8	34.9	1 3/8	44.5	1 3/4	11.1	11.1