

Forged Steel Valves



Valve Specialists™



Gate, Globe & Check



TRADITION

013



OMB VALVES_{spa} is a company with a family tradition, and this has always been integral

to its success since its foundation in 1973. We have now reached a new era where both my sons are now providing continuity of the management of OMB. Simone, the managing director is now joined by Fabio.

INNOVATION

These changes inside our company coincide with a very many challenges in the hydrocarbon processing valve market, which we are meeting with innovation and commitment.

We very much look forward to working with our customers in the future and I would like to take this opportunity to thank you for your past and continued support.

Roberto Brevi,
President

President Message	
	3
Technology & Flexibility	
	4
Quality & Value	
	6
Technical data	
	8
Materials	
	10
Gate Valves	
	12
Options	
	19
Globe Valves	
	20
Y-Pattern Globe Valves	
	24
Options	
	27
Check Valves	
	28
Y-Pattern Check Valves	
	31
Jis Valves	
	34
Din Valves	
	35
Emission-Free Valves	
	36
Asbestos Free Products	
	36
Flow Coefficient	
	37
Installation and Maintenance	
	37
Tables	
	38
Data Sheet	
	44

R&D AND ENGINEERING

OMB operates a fully computerised ERP system. The system is used throughout our organisation from Sales to Production Planning to Quality Assurance Manufacturing and to Accounting

We have a Computer Aided Design and Machining (CADAM) facility, which allows us to design and develop new products to meet the very demanding requirements of our clients.

The company are also able to evaluate products by means of FE Analysis and all products

which have been developed in conjunction with a sister company within the OMB Group. The Management of OMB are firmly committed to technologi-



cal development which will allow the company to keep up with the very demanding market places which we supply

TECHNOLOGY

are put through a rigorous Failure Mode Analysis Review. Considering the introduction of a positive Quality Management System, investment into Research & Development and computerised system, this has allowed OMB to increase the company's productivity without effecting reliability.

OMB valves are manufactured on modern machine tools and the company has introduced special purpose machines,

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and this will thus guarantee OMB's future into the 20th Century.



MANUFACTURING

OMB are always striving to develop and this can only be achieved by the integration of new technology. Only through

machining facility which allows us to produce valves on extremely short lead times. This is further backed

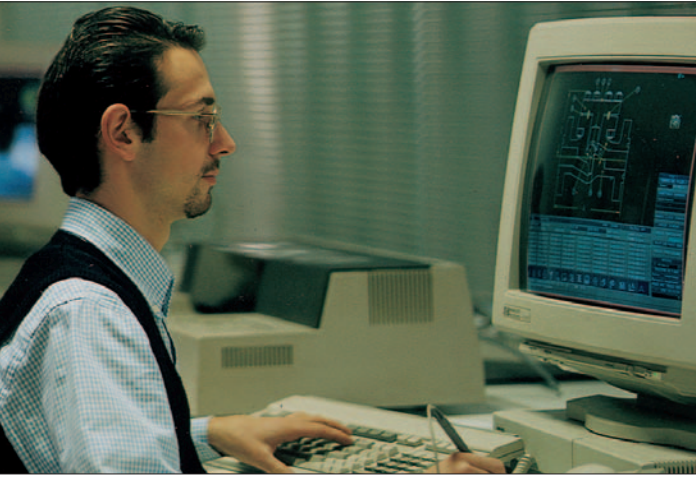
up by customer service.

OMB offer the highest possible service, thus building a good working relationship with each individual customer.

OMB have now become a truly inter-

national company and our products are now being supplied on a global basis.

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FLEXIBILITY





OMB operate a Quality System in strict accordance with ISO9001. The system has been independently approved since 1990, with confirmations in 1993 and 1996. As ISO 9001 covers all the activities of a manufacturing company, our system has been developed to comprise all aspects of OMB activity, from components calculation to finished valve engineering, from manufacturing management to testing and inspection procedures. The workforce is built on an

experienced team of engineers and technicians who oversee all phases of valve manufacture, including assembly and testing. Substantial investment in TQM training achieved our workforce to operate to the highest integrity, thus guaranteeing the quality of our products. All OMB products are fully tested in accordance with International codes, prior to despatch. All valves are designed and tested in accordance with API602, API606 and BS5352.

QUALITY



ISO 9001



Certified since 1990

OMB are fully committed to product quality and reliability and are always striving to offer our clients valves at economical prices, without effecting



product integrity. OMB have an internal Research & Development Department

testing, which enables OMB to give their clients accurate CV coefficients and special testing equipment for valve bellows to enable us to evaluate their life

span. All in all we are able to offer all activities. Our QA staff are fully qualified and overlook all such testing and verification work in accordance with our Quality System and international standard. OMB also have the facilities in-house to carry

out rigorous non-destructive examination, firesafe testing and helium leak testing.



VALUE

which is operated in conjunction with the Quality Assurance Department. OMB are always looking to improve product reliability by investing into Research & Development, thus guaranteeing our long term market position. Internally we have a fully equipped laboratory and inspection area that enables OMB to carry out all necessary testing on valves and component parts. We are able to carry out low temperature testing, high temperature testing, material verification by chemical and mechanical methods, flow co-efficient

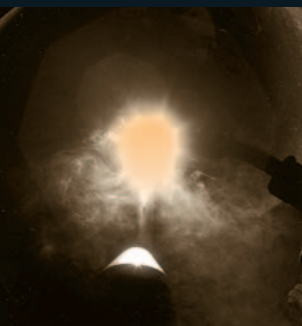


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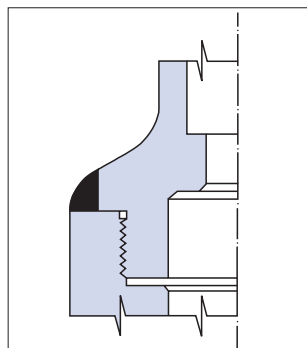
Certified since 1994

WELDING

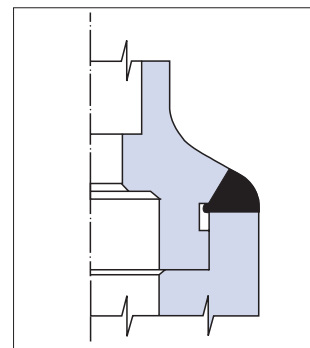


All OMB welding procedures are performed by operators qualified according to ASME IX.

OMB Welded Bonnet Valves are supplied in the standard type with threaded in and fillet welded bonnet as per "L" version. On request Full Penetration Welding as per "WPL" version can be supplied.



"L" Version



"WPL" Version

PICKLING & PHOSPHATIZING



All OMB stainless steel valves undergo a pickling process in a concentrated acid solution which cleans perfectly the surface of the forged components and easily allows a visual inspection of each piece.

All OMB carbon and alloy steel bodies and bonnets undergo a phosphatization process according to the table.

PHOSPHATIZING SPECIFICATION (zinc base) FOR CARBON STEEL PROTECTION			
Bath	Type of operation Product used	Min. time	Temp. °C
1	Alkaline degreasing - Italbonder 011	8'	95°
2	Cold washing - Water air (current)	1'-3'	20°
3	Bonderizing - Bonder A2 - PS	8'-10'	80°
4	Cold washing - Water air (current)	1'-3'	20°
5	Oiling - Emulsifiable protoil RE	3'	50°
6	Drying	5'	20°
Phosphatization is carried out on all forged bodies and bonnets in carbon and alloy steel.			

SPECIAL SERVICES



SPECIAL SERVICE APPLICATIONS		
Service	Note	OMB procedures
Bellows Seal	Bellows seal valves have been developed and tested according the EPA-API ANSI and BS specifications.	SV - 001
Hydrogen	Special heat treatment and gas testing procedures.	SV - 002
Oxygen	Special procedures guarantee a perfect cleanliness of the valve and protection during shipping.	SV - 003
Vacuum	Close manufacturing tolerances and special extended packingbox and lantern ring assure tight sealing. Test performed at 10 (-4) bar.	SV - 004
Actuator	Pneumatic, Hydraulic and Electric actuators are available upon customer request.	SV - 005
Chlorine	Special degreasing procedure, dry-air testing, packing in moisture absorbing materials, as suggested by the Chlorine Institute.	SV - 006
Steam	Special procedures cover all the applications for steam service	SV - 007
Cryogenic	Complete range of special designs and testing procedures for service down to -521F/-196C.	SV - 008
Sour Oil and Gas	Valves are manufactured strictly in accordance with NACE specifications MR-01-75.	SV - 009
High Temperature	Special grade of steel for use up to 1500F/800C.	SV - 010
Alkylation	Special procedures to select materials and assure a perfect cleanliness of valves.	SV - 011

Without prior notice OMB reserves the right to make modifications or changes to its production.



Each valve is identified by proper marking on the name plate according to MSS SP25 specifications. Nameplate contains information regarding valve type, body-bonnet material, seat-wedge and stem composition, class and diameter. On the nameplate the relevant CE mark is incorporated. Each valve when tested is stamped on the nameplate with the QC operator code for reference.



NAME PLATE

On request valve can be supplied with tags made on customer specification to provide easier identification of products.



SPECIAL TAGS

Material designation and heat codes are forged on both body and bonnet. Bodies are marked with the OMB logo. Upon customer request further marking can be applied.



HEAT CODE

DESCRIPTIVE CODE

A computerized code help identify the product type to simplify the offers and order processing. In the present catalogue the following coding system is used to define the figure numbers found on each dimensional table. Please refer to the tables on the opening page of each section for Gate, Globe, Check Valves codes.

PRODUCT LINE	SERVICE	TYPE	CLASS	SIZE	ENDS
X	X	X	X	X	X
A Gate OS & Y	A Standard	A Bolted Bonnet Full Port	1 150	A 1/8	S Socket Weld
B Gate IS & Y	B Extended Bonnet	B Bolted Bonnet Regular Port	3 300	1 1/4	N NPT
C Globe OS & Y	C Cryogenic	E Welded Bonnet Full Port	6 600	2 3/8	D SW-NPT
D Globe IS & Y	L Angle	F Welded Bonnet Regular Port	8 800	3 1/2	E NPT-SW
E Y Globe OS & Y	M Jacketed	M Ring Joint Full Port	9 900	4 3/4	B BW
F Y Globe IS & Y	N Instrumentation	N Ring Joint Regular Port	A 1000	5 1	A BW B16.10
G Check Valve	R Self-Closed	P Round B.B. Full Port	5 1500	6 1 1/4	F Int. Flanged
H Ball Valve	S Bellows Seal	Q Round B.B. Regular Port	B 2000	7 1 1/2	G I.F. Groove
M Through OS & Y	V Vacuum		2 2500	8 2	
N Through IS & Y			4 4500	9 2 1/2	
P Eco-L-Valve®	Check Valve		D 5000	B 3	
	B Ball		H 6000	C 3 1/2	
	P Piston		E 10000	D 4	
	Q Y Piston				
	S Swing				
	U UV				



OMB valves are manufactured in a wide range of materials, supplied by the best available steel mills, forged by well known forgery with outstanding equipment and experience. All the material can be certified in the chemical composition and the mechanical characteristic.

BODY AND BONNET MATERIALS								
Material Group	Common Name	Nominal Type	UNS	Forging Spec.	Casting Spec. Equivalent	DIN	DIN W. No	Application Notes
Carbon Steel	CS	C-Mn-Fe	K03504	A105N	A216-WCB	C22.8 DIN 17243	1.0460	General non-corrosive service from -20F(-29C) to 800F(427C)
Low Temperature Carbon Steel	LTCS	C-Mn-Fe	K03011	A350-LF2	A352-LCA A352-LCB A352-LCC	TSTE 355 DIN 18103	1.0566	General non-corrosive service from -50F (-46C) to 650F(340C), LF2 to 800F(427C).
Low Temperature Alloy Steel	Nickel Steel	3.1/2Ni	K32025	A350-LF3	A352-LC3	10Ni14	1.5637	-150F(-101C) to 650F(340C)
Low Alloy Steel	Moly Steel	C-1/2Mo	K12822	A182-F1	A217-WC1	15MO3	1.5415	Up to 875F(468C)
	Alloy Steel Chrome Moly	1.1/4Cr-1/2Mo	K11572	A182-F11 d2	A217-WC6	13CRMO44	1.7335	Up to 1100F(593C)
		2.1/4Cr-1Mo	K21590	A182-F22 d3	A217-WC9	10CRMO910	1.7380	Up to 1100F(593C), HP steam
		5Cr-1/2Mo	K41545	A182-F5	A217-C5	12CRMO195	1.7362	High temp refinery service
		9Cr-1Mo	K90941	A182-F9	A217-C12	X 12 CrMo 9 1	1.7386	High temp erosive refinery service
	9Cr-1Mo-V		A182-F91	A217-C12A	X 10 CrMoVNb 9 1	1.4903	High pressure steam	
Stainless Steel	Austenitic S.Steel 300 series S.Steel	304 : 18Cr-8Ni	S30400	A182-F304	A351-CF8	DIN X5CrNi 18 9	1.4301	0.04% min. carbon for temp.>1000F(538C)
		304L : 18Cr-8Ni	S30403	A182-F304L	A351-CF3	X 2 CrNi 19 11	1.4306	Up to 800F(427C)
		304H :	S30409	A182-F304H		n/a	n/a	
		316 : 16Cr-12Ni-2Mo	S31600	A182-F316	A351-CF8M	DIN X5CrNiMo 18 10	1.4401	0.04% min. carbon for temp.>1000F(538C)
		316L : 16Cr-12Ni-2Mo	S31603	A182-F316L	A351-CF3M	X 5 CrNiMo 17 12 2	1.4404	Up to 800F(427C)
		316H :	S31609	A182-F316H		n/a	n/a	
		316Ti:	S31635	A182-F316Ti		X 6 CrNiMoTi 17 12 2	1.4571	
		321: 18Cr-10Ni-Ti	S32100	A182-F321		X 6 CrNiTi 18 10	1.4541	0.04% min. carbon (grade F321H) and heat treat at 2000F(1100C) for service temps.>1000F(538C)
		321H	S32109	A182-F321H		n/a	n/a	
		347: 18Cr-10Ni-Cb(Nb)	S34700	A182-F347	A351-CF8C	DIN 8556	1.4550	0.04% min. carbon (grade F347H) and heat treat at 2000F(1100C) for service temps.>1000F(538C)
	347H	S34709	A182-F347H		n/a	n/a		
	317L	S31703	A182-F317L	A351-CG3M	X2CrNiMo18-16-4	1.4438		
	Alloy 20	28Ni-19Cr-Cu-Mo	N08020	A182-F20	A351-CN7M	DIN 1.4500	2.4660	service to 600F(316C)
Duplex 2205	22Cr-5Ni-3Mo-N	S31803 S32205	A182-F51	A890-J92205	X2CrNiMoN22-5-3 DIN 10088-1 (95)	1.4462	service to 600F(316C) -The original S31803 UNS designation has been supplemented by S32205 which has higher minimum N, Cr, and Mo.	
Super Duplex 2507	25Cr-7Ni-4Mo-N	S32750	A182-F53	A351-CD4MCu A890 5A	X2CrNiMoN25-7-4 DIN 10088-1 (95)	1.4501	service to 600F(316C)	
Super Austenitic 6Mo	20Cr-18Ni-6Mo	S31254	A182-F44	A351-CK3MCuN	X1CrNiMoCuN20-18-7 DIN 10088-1 (95)	1.4547	service to 600F(316C)	
Nickel-Iron Alloy	Incoloy 800	33Ni-42Fe-21Cr	N08800	B564-N08800		X10NiCrAlTi32-20	1.4876	service to 1000F(538C)
	Incoloy 825	42Ni-21.5Cr-3Mo-2.3Cu	N08825	B564-N08825	A494-CU5MCuC	DIN 17744	2.4858	service to 600F(316C) for N02200, 1200F(648C) for N02201
Nickel	Nickel	99/95Ni	N02200	B160-N02200 (bar)	A494-CZ-100	NW2200	1.7740	
Nickel-Copper	Monel 400	67Ni-30Cu	N04400	B564-N04400	A494-M35-1	DIN 17730	2.4360	
	Monel 500		N05500	B564-N05500			2.4375	
Nickel-Alloy	904L		N08904	904L	n/a	Z2 NCDU 25-20	1.4539	
Nickel Superalloys	Inconel 600	72Ni-15Cr-8Fe	N06600	B564-N06600	A494-CY40	DIN 17742	2.4816	
	Inconel 625	60Ni-22Cr-9Mo-3.5Cb	N06625	B564-N06625*	A494-CW-6MC		2.4856	*Difficult to forge in close dye
	Hastelloy C-276	54Ni-15Cr-16Mo	N10276	B564-N10276*	A494-CW-2M	NiMo 16 Cr 15 W	2.4819	*Difficult to forge in close dye
Titanium	Titanium	98Ti	R50400	B381-Gr2	B367-C2	Ti 2	3.7035	

Note: these charts are for reference only. OMB recommends customer engineers to analyze service requirements and specify the materials they consider optimum. OMB cannot be held liable for any damage occurred due to the use of the tables.



The following tables suggest standard combination of body and bonnet materials and trim (stem, disc or wedge, seat) composition. Different combinations are available upon request.

TRIM STANDARD MATERIALS

OMB STANDARD TRIM DEFINITIONS

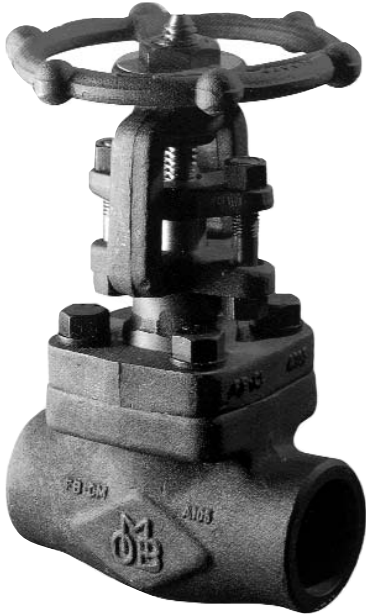
API Trim No	Nonimal Trim	OMB descr.	Stem	Disc/Wedge	Seat
1	F6	F6	410	F6	410
2	304	304	304	304	304
5	Hardfaced	F6HF	410	F6 + St Gr6	410 + St Gr6
8	F6 and Hardfaced	F6HFS	410	F6	410 + St Gr6
9	Monel	Monel	Monel	Monel	Monel
10	316	316	316	316	316
11	Monel and Hardfaced	MonelHFS	Monel	Monel	Monel
12	316 and Hardfaced	316HFS	316	316	316 + St. Gr6
13	Alloy 20	Alloy 20	Alloy 20	Alloy 20	Alloy 20
14	Alloy 20 and Hardfaced	Alloy 20HFS	Alloy 20	Alloy 20	Alloy 20
15	Hardfaced (304)	304-HF	304	304 + St Gr6	304 + St Gr6
16	Hardfaced (316)	316-HF	316 HF	316 + St Gr6	316 + St Gr6
17	Hardfaced (347)	347-HF	347 HF	347 + St Gr6	347 + St Gr6
18	Hardfaced (Alloy 20)	Alloy 20-HF	Alloy 20 HF	Alloy 20 + St Gr6	Alloy 20 + St Gr6
n/a	Alloy 625	Alloy 625	Alloy 625	Alloy 625	Alloy 625

OMB TRIM MATERIAL

OMB	UNS	TYPE	Grade (forged)	ASTM wrought	DIN	DIN W NO.
F6	UNS S41000	13Cr	ASTM A182 F6a	A276-410	DIN X12Cr13	1,4006
304	UNS S30400	18-8 Cr-Ni	ASTM A182 F304	A276-304	DIN X5CrNi 18 10	1,4301
316	UNS S31600	18-8 Cr-Ni (18-10-2)	ASTM A182 F316	A276-316	DIN X5CrNiMo 18 10	1,4401
321	UNS S32100	18 Cr-10 Ni-Ti	ASTM A182 F321	A276-321	DIN X6CrNiTi 18 10	1.4541
347	UNS S34700	18 Cr-10 Ni-Cb	ASTM A182 F347	A276-347	DIN X6CrNiNb18 10	1.4550
MONEL(R)	UNS N04400	67Ni-30Cu	ASTM B564-N04400	B164-N04400	DIN 17743	2.4360
ALLOY 20	UNS N08020	28Ni-19Cr-Cu-Mo	ASTM A182-F20	ASTM B473	DIN 14500	2.4660
ALLOY 625	UNS N06625	60Ni-22Cr-9Mo-3.5Cb	ASTM B564-N06625	ASTM B564-N06625	DIN 17361	2.4865
C276	UNS N10276	54Ni-15Cr-16Mo	ASTM B564-N10276	ASTM B574-N10276	DIN NiMo 16 Cr 15 W	2,4819
St. Gr6	UNS R30006	Co Cr-A	AMS 5894	Stellite(R) Gr6		

DESIGN AND MANUFACTURING STANDARDS

API 598	- Valve inspection and Test	BS 5352	- Specific for Cast and Forged Steel Wedge Gate, Globe, Check and Plug Valves, Screwed and Socket-Weld
ASME B 16.5	- Steel Pipe Flanges and Fittings	BS 6755	- Testing of valves
ASME B 16.10	- Face-to-Face and End-to-End Dimension of Ferrous Valves	NACE Standard	- Material Requirement - Sulfide Stress Cracking Resistant
ASME B 16.11	- Forged Steel Fittings, Socket-Welding and Threaded	MR 01.75	- Metallic Material for Oil Field Equipment
ASME B 16.34	- Steel Valves, Flanged and Buttwelded Ends	DIN 3202	- End to End dimensions of ferrous valves
MSS SP 25	- Standard Marking System for Valves, Fittings, Flanges and Unions		



Gate valves are bi-directional valves ideally suited for on-off duties. OMB produces various types both with parallel face gates or with wedge gates. These valves have a very low resistance to flow, which in the case of parallel gate valves approaches that of a straight pipe. They are used for duties with high pressure fluids due to the fact that upstream pressure helps the sealing between gate and seat. OMB takes great care to study finish of seating surfaces to guarantee their minimum wear under high pressures. Gate valves are supplied in various models to cover the most different and delicate services. The main characteristics of each type are described on pages 13 to 19.

Figure # is identified in each table as:

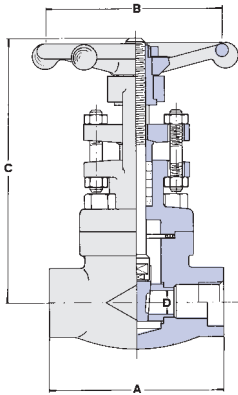
REGULAR PORT	810	-
FULL PORT	610	1/4
		mm

CLASS	CONNECTION	PORT	STANDARD	SCREW & YOKE	ENDS	SERVICE	PAGE	OMB FIG.
800	Bolted bonnet	Regular	API602-BS5352	Outside	Threaded and Socket Weld Ends	-	13	810
800	Bolted bonnet	Full	API602-BS5352	Outside	Threaded and Socket Weld Ends	-	13	610
800	Welded Bonnet	Regular	API602-BS5352	Outside	Threaded and Socket Weld Ends	-	13	L810
800	Welded Bonnet	Full	API602-BS5352	Outside	Threaded and Socket Weld Ends	-	13	L610
800	Bolted bonnet	Regular	API602	Inside	Threaded and Socket Weld Ends	-	13	800
800	Bolted bonnet	Full	API602	Inside	Threaded and Socket Weld Ends	-	13	600
800	Welded Bonnet	Regular	API602	Inside	Threaded and Socket Weld Ends	-	13	L800
800	Welded Bonnet	Full	API602	Inside	Threaded and Socket Weld Ends	-	13	L600
1500	Bolted bonnet	Regular	API602-BS5352	Outside	Threaded and Socket Weld Ends	-	14	R910
1500	Bolted bonnet	Full	API602-BS5352	Outside	Threaded and Socket Weld Ends	-	14	910
1500	Welded Bonnet	Regular	API602-BS5352	Outside	Threaded and Socket Weld Ends	-	14	LR910
1500	Welded Bonnet	Full	API602-BS5352	Outside	Threaded and Socket Weld Ends	-	14	L910
1500	Ring Joint BB	Full	BS5352	Outside	Threaded and Socket Weld Ends	-	14	RJ910
1500	Ring Joint BB	Full	BS5352	Outside	Butt Weld B16.10	-	14	BW9-RJ910
2500	Ring Joint BB	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	-	15	RJ2510
2500	Ring Joint BB	Full	ANSI B16.34	Outside	Butt Weld and Clamp Ends	-	15	BW25-RJ2510
2500	Welded Bonnet	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	-	15	L2510
2500	Welded Bonnet	Full	ANSI B16.34	Outside	Butt Weld and Clamp Ends	-	15	BW25-L2510
800	Welded Bonnet	Regular	API602	Outside	Extended Body - Male Threaded	-	16	MLA-810
800	Welded Bonnet	Regular	API602	Outside	Extended Body - Male Socket	-	16	MLB-810
800	Welded Bonnet	Regular	API602	Outside	Extended Body - BW	-	16	MLC-810
800	Bolted bonnet	Regular	API602	Outside	Extended Body - Male Threaded	-	16	MA-810
800	Bolted bonnet	Regular	API602	Outside	Extended Body - Male Socket	-	16	MB-810
800	Bolted bonnet	Regular	API602	Outside	Extended Body - BW	-	16	MC-810
800	Welded Bonnet	Regular	API602	Outside	Extended Body - Reinforced - BW	-	16	MLW-810
800	Welded Bonnet	Regular	API602	Outside	Extended Body - Reinforced - Male SW	-	16	MLD-810
800	Bolted bonnet	Regular	API602	Outside	Extended Body - Reinforced - BW	-	16	MW-810
800	Bolted bonnet	Regular	API602	Outside	Extended Body - Reinforced - Male SW	-	16	MD-810
1500	Welded Bonnet	Regular	API602	Outside	Extended Body - Male Threaded	-	16	MLA-R910
1500	Welded Bonnet	Regular	API602	Outside	Extended Body - Male Socket	-	16	MLB-R910
1500	Welded Bonnet	Regular	API602	Outside	Extended Body - BW	-	16	MLC-R910
1500	Bolted bonnet	Regular	API602	Outside	Extended Body - Male Threaded	-	16	MA-R910
1500	Bolted bonnet	Regular	API602	Outside	Extended Body - Male Socket	-	16	MB-R910
1500	Bolted bonnet	Regular	API602	Outside	Extended Body - BW	-	16	MC-R910
1500	Welded Bonnet	Regular	API602	Outside	Extended Body - Reinforced - BW	-	16	MLW-R910
1500	Welded Bonnet	Regular	API602	Outside	Extended Body - Reinforced - Male SW	-	16	MLD-R910
1500	Bolted bonnet	Regular	API602	Outside	Extended Body - Reinforced - BW	-	16	MW-R910
1500	Bolted bonnet	Regular	API602	Outside	Extended Body - Reinforced - Male SW	-	16	MD-R910
150	Bolted bonnet	Regular	API602-BS5352	Outside	Integral Flanged to ASME B16.5	-	17	F1-810
300	Bolted bonnet	Regular	API602-BS5352	Outside	Integral Flanged to ASME B16.5	-	17	F3-810
600	Bolted bonnet	Regular	API602-BS5352	Outside	Integral Flanged to ASME B16.5	-	17	F6-810
150	Bolted bonnet	Full	BS5352	Outside	Integral Flanged to ASME B16.5	-	17	F1-610
300	Bolted bonnet	Full	BS5352	Outside	Integral Flanged to ASME B16.5	-	17	F3-610
600	Bolted bonnet	Full	BS5352	Outside	Integral Flanged to ASME B16.5	-	17	F6-610
1500	Ring Joint BB	Full	BS5352	Outside	Integral Flanged to ASME B16.5	-	17	F9-RJ910
2500	Ring Joint BB	Full	BS5352	Outside	Integral Flanged to ASME B16.5	-	17	F25-RJ2510
800	Bolted bonnet	Regular	API602-BS5352	Outside	Threaded and Socket Weld Ends	Sour Service	18	SS810
800	Welded Bonnet	Regular	API602-BS5352	Outside	Threaded and Socket Weld Ends	Alkilation	18	AS-L810
800	Welded Bonnet	Regular	API602-BS5352	Outside	Threaded and Socket Weld Ends	Vacuum	18	VS-L810
800	Bolted bonnet	Regular	API602-BS5352	Outside	Threaded and Socket Weld Ends	Chlorine	18	CS-810

Note Bellows Seal Valves please see C-BS Bellows Seal Valve Catalog
 Cryogenic Service please see C-CRYO Cryogenic Service Valve Catalog
 Pressure Seal Valves please see C-PS Pressure Seal Valve Catalog
 Thru Conduit Valves please see C-TC Pressure Thru Conduit Valves Catalog

JIS Valve Standards please see JIS Section on this catalog
 DIN Valve Standards please see DIN Section on this catalog



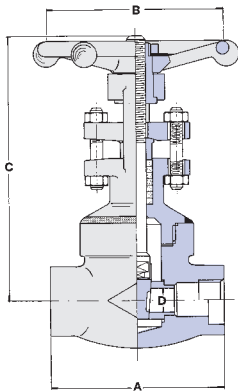


RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 800

BOLTED BONNET - REGULAR AND FULL PORT - API 602 - BS 5352 Outside Screw & Yoke - Threaded and Socket Weld Ends

REGULAR PORT	810	-	1/2	3/4	1	1.1/4	1.1/2	2	-						
FULL PORT	610	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2						
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.		
End to End	A	80	3.14	80	3.14	90	3.54	110	4.33	127	5.00	127	5.00	210	8.26
Handwheel	B	80	3.14	80	3.14	80	3.14	110	4.33	110	4.33	130	5.11	130	5.11
Center to Top Open	C	148	5.86	148	5.86	163	6.41	178	7.00	210	8.26	243	9.56	262	10.3
Dia. of Port	D	8	0.31	9.6	0.38	14	0.55	18	0.70	24	0.94	30	1.18	37	1.45
Approx. Weight	Kg / Lb	1.6	3.5	1.6	3.5	2.2	4.8	3.5	7.7	5	11	6.5	14.3	9	19.8

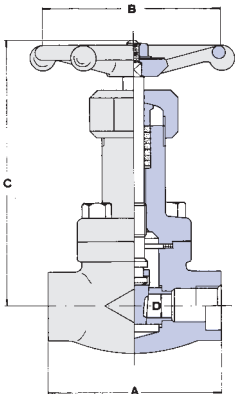


RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 800

WELDED BONNET - REGULAR AND FULL PORT - API 602 - BS 5352 Outside Screw & Yoke - Threaded and Socket Weld Ends

REGULAR PORT	L810	-	1/2	3/4	1	1.1/4	1.1/2	2	-						
FULL PORT	L610	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2						
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.		
End to End	A	80	3.14	80	3.14	90	3.54	110	4.33	127	5.00	127	5.00	210	8.26
Handwheel	B	80	3.14	80	3.14	80	3.14	110	4.33	110	4.33	130	5.11	130	5.11
Center to Top Open	C	148	5.86	148	5.86	163	6.41	178	7.00	210	8.26	243	9.56	262	10.3
Dia. of Port	D	8	0.31	9.6	0.38	14	0.55	18	0.70	24	0.94	30	1.18	37	1.45
Approx. Weight	Kg / Lb	1.6	3.5	1.6	3.5	2.2	4.8	3.5	7.7	5	11	6.3	13.8	8	17.6

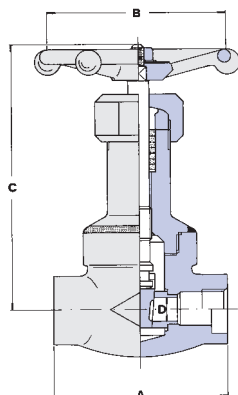


RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 800

BOLTED BONNET - REGULAR AND FULL PORT - API 602 Inside Screw & Yoke - Threaded and Socket Weld Ends

REGULAR PORT	800	-	1/2	3/4	1	1.1/4	1.1/2	2	-						
FULL PORT	600	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2						
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.		
End to End	A	80	3.14	80	3.14	90	3.54	110	4.33	127	5.00	127	5.00	210	8.26
Handwheel	B	80	3.14	80	3.14	80	3.14	110	4.33	110	4.33	130	5.11	130	5.11
Center to Top Open	C	148	5.86	148	5.86	175	6.88	212	8.34	235	9.25	287	11.3	327	12.9
Dia. of Port	D	8	0.31	9.6	0.38	14	0.55	18	0.70	24	0.94	30	1.18	37	1.45
Approx. Weight	Kg / Lb	1.5	3.3	1.5	3.3	2	4.4	3	6.6	5.1	11.2	6.7	14.7	9.5	20.9

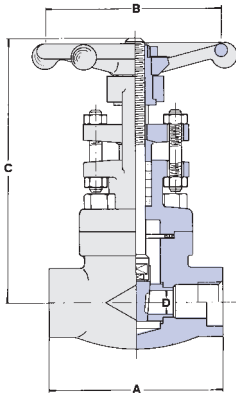


RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 800

WELDED BONNET - REGULAR AND FULL PORT - API 602 Inside Screw & Yoke - Threaded and Socket Weld Ends

REGULAR PORT	L800	-	1/2	3/4	1	1.1/4	1.1/2	2	-						
FULL PORT	L600	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2						
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.		
End to End	A	80	3.14	80	3.14	90	3.54	110	4.33	127	5.00	127	5.00	210	8.26
Handwheel	B	80	3.14	80	3.14	80	3.14	110	4.33	110	4.33	130	5.11	130	5.11
Center to Top Open	C	148	5.86	148	5.86	175	6.88	212	8.34	235	9.25	287	11.3	327	12.9
Dia. of Port	D	8	0.31	9.6	0.38	14	0.55	18	0.70	24	0.94	30	1.18	37	1.45
Approx. Weight	Kg / Lb	1.5	3.3	1.5	3.3	2	4.4	3	6.6	5.1	11.2	6.5	14.3	9	19.8

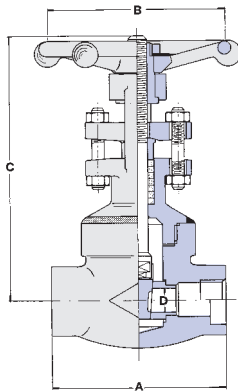


RATINGS: Carbon Steel - 3705 p.s.i. @ 100°F

CLASS 1500 BOLTED BONNET - REGULAR AND FULL PORT - API 602 - BS 5352

Outside Screw & Yoke - Threaded and Socket Weld Ends

REGULAR PORT	R910	-	1/2	3/4	1	1.1/4	1.1/2	2	-								
FULL PORT	910	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2								
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.		
End to End	A	90	3.54	90	3.54	110	4.33	127	5.00	127	5.00	210	8.26	210	8.26		
Handwheel	B	80	3.14	80	3.14	110	4.33	130	5.11	130	5.11	180	7.08	180	7.08		
Center to Top Open	C	145	5.70	160	6.29	175	6.89	210	8.26	240	9.45	260	10.2	355	13.9	360	14.1
Dia. of Port	D	8	0.31	9.6	0.38	14	0.55	18	0.70	24	0.94	30	1.18	37	1.45	40	1.57
Approx. Weight	Kg / Lb	2.2	4.8	2.2	4.8	3.8	8.3	5.5	12.1	6.8	14.9	9.5	20.9	22.5	49.5	22	48.4

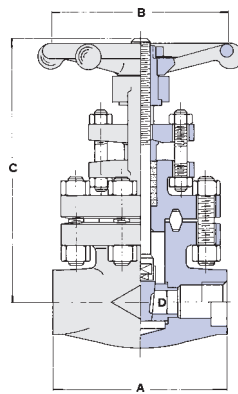


RATINGS: Carbon Steel - 3705 p.s.i. @ 100°F

CLASS 1500 WELDED BONNET - REGULAR AND FULL PORT - API 602 - BS 5352

Outside Screw & Yoke - Threaded and Socket Weld Ends

REGULAR PORT	LR910	-	1/2	3/4	1	1.1/4	1.1/2	2	-								
FULL PORT	L910	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2								
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.		
End to End	A	90	3.54	90	3.54	110	4.33	127	5.00	127	5.00	210	8.26	210	8.26		
Handwheel	B	80	3.14	80	3.14	110	4.33	130	5.11	130	5.11	180	7.08	180	7.08		
Center to Top Open	C	145	5.70	160	6.29	175	6.89	210	8.26	240	9.45	260	10.2	355	13.9	360	14.1
Dia. of Port	D	8	0.31	9.6	0.38	14	0.55	18	0.70	24	0.94	30	1.18	37	1.45	40	1.57
Approx. Weight	Kg / Lb	2.2	4.8	2.2	4.8	3.8	8.3	5.5	12.1	6.8	15	9	19.8	18.0	39.6	17.5	38.5



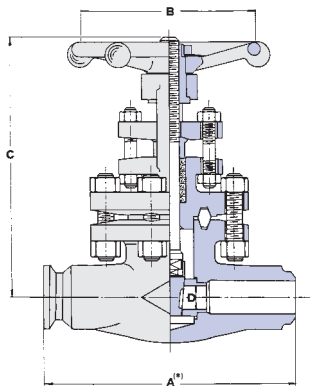
RATINGS: Carbon Steel - 3705 p.s.i. @ 100°F

CLASS 1500 ROUND BOLTED BONNET RJ - FULL PORT - BS 5352

Outside Screw & Yoke - Threaded and Socket Weld Ends

FULL PORT	RJ910	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2								
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.		
End to End	A	-	-	-	-	110	4.33	150	5.90	150	5.90	-	-	210	8.26	235	9.25
Handwheel	B	-	-	-	-	110	4.33	130	5.11	130	5.11	-	-	180	7.08	250	9.84
Center to Top Open	C	-	-	-	-	227	8.93	300	11.8	307	12	-	-	400	15.7	448	17.6
Dia. of Port	D	-	-	-	-	14	0.55	18	0.70	24	0.94	-	-	37	1.45	48	1.89
Approx. Weight	Kg / Lb	-	-	-	-	5	11.0	10	22.0	11.5	25.3	-	-	22	48.4	37	81.5

Ring-Joint gasket according to ASME B16.20 - API 6A. - Spiral wound gasket joint available on request.



RATINGS: Carbon Steel - 3705 p.s.i. @ 100°F

CLASS 1500 ROUND BOLTED BONNET RJ - FULL PORT - BS 5352

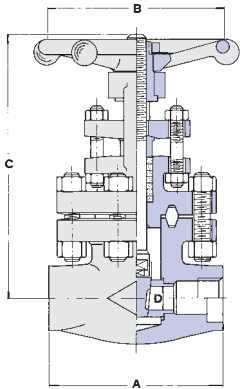
Outside Screw & Yoke - Butt Weld and Clamp Ends

FULL PORT	BW9-RJ910	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2								
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.		
End to End	A	-	-	-	-	216	8.50	229	9.01	254	10.0	-	-	305	12.0	368	14.5
Handwheel	B	-	-	-	-	110	4.33	130	5.11	130	5.11	-	-	180	7.08	300	11.8
Center to Top Open	C	-	-	-	-	260	10.2	300	11.8	300	11.8	-	-	390	15.3	420	16.5
Dia. of Port	D	-	-	-	-	14	0.55	18	0.70	24	0.94	-	-	37	1.45	48	1.89
Approx. Weight	Kg / Lb	-	-	-	-	9	19.8	12	26.4	13	28.6	-	-	26	57.2	44	96.9

Port dimensions can change depending on schedule.

(* End to end dimension according to ANSI B16.10.

Ring-Joint gasket according to ASME B16.20 - API 6A.



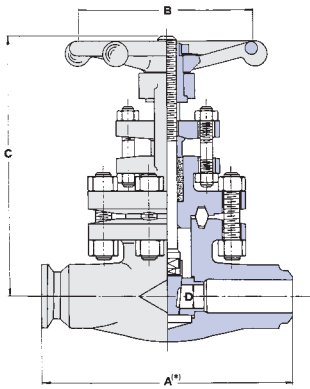
RATINGS: Carbon Steel - 6170 p.s.i. @ 100°F

CLASS 2500 ROUND BOLTED BONNET RJ - FULL PORT - B16.34

Outside Screw & Yoke - Threaded and Socket Weld Ends

FULL PORT	RJ2510	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	150	5.90	150	5.90	210	8.26	-	-	235	9.25	235	9.25
Handwheel	B	-	-	-	-	130	5.11	130	5.11	250	9.84	-	-	300	11.8	300	11.8
Center to Top Open	C	-	-	-	-	293	11.5	300	11.8	390	15.3	-	-	435	17.1	435	17.1
Dia. of Port	D	-	-	-	-	14	0.55	18	0.70	24	0.94	-	-	37	1.45	37	1.45
Approx. Weight	Kg / Lb	-	-	-	-	10	22.0	10.3	22.7	22.4	49.3	-	-	38	83.7	38	83.7

Ring-Joint gasket according to ASME B16.20 - API 6A.



RATINGS: Carbon Steel - 6170 p.s.i. @ 100°F

CLASS 2500 ROUND BOLTED BONNET RJ - FULL PORT - B16.34

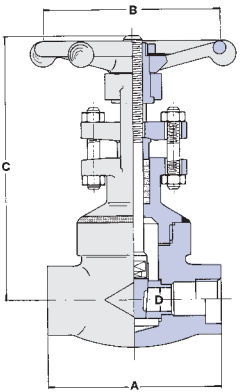
Outside Screw & Yoke - Butt Weld and Clamp Ends

FULL PORT	BW25-RJ2510	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	264	10.4	273	10.7	308	12.1	-	-	384	15.1	451	17.7
Handwheel	B	-	-	-	-	130	5.11	130	5.11	250	9.84	-	-	300	11.8	300	11.8
Center to Top Open	C	-	-	-	-	304	11.9	315	12.4	368	14.5	-	-	445	17.5	538	21.2
Dia. of Port	D	-	-	-	-	14	0.55	18	0.70	24	0.94	-	-	37	1.45	37	1.45
Approx. Weight	Kg / Lb	-	-	-	-	15	33.0	17	37.4	33	72.6	-	-	51	112.3	75	165.1

Port dimensions can change depending on schedule.

Ring-Joint gasket according to ASME B16.20 - API 6A.

(*) End to end dimension according to ANSI B16.10.



RATINGS: Carbon Steel - 6170 p.s.i. @ 100°F

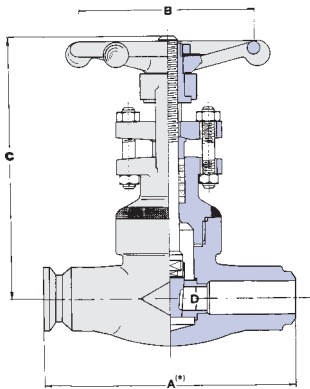
CLASS 2500 WELDED BONNET - FULL PORT - B16.34

Outside Screw & Yoke - Threaded and Socket Weld Ends

FULL PORT	L2510	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	127	5.00	127	5.00	127	5.00	-	-	235	9.25	235	9.25
Handwheel	B	-	-	-	-	130	5.11	130	5.11	130	5.11	-	-	300	11.8	300	11.8
Center to Top Open	C	-	-	-	-	214	8.42	239	9.40	253	9.96	-	-	425	16.7	430	16.9
Dia. of Port	D	-	-	-	-	14	0.55	18	0.70	24	0.94	-	-	37	1.45	37	1.45
Approx. Weight	Kg / Lb	-	-	-	-	5.8	12.7	7	15.4	10	22.0	-	-	26	57.3	25.5	56.2

CLASS 2500 WELDED BONNET - FULL PORT - B16.34

Outside Screw & Yoke - Butt Weld and Clamp Ends

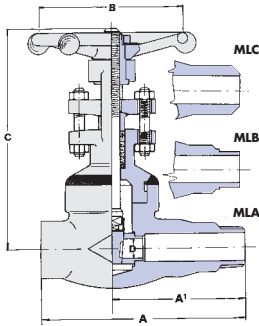


RATINGS: Carbon Steel - 6170 p.s.i. @ 100°F

FULL PORT	BW25-L2510	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	264	10.4	273	10.7	308	12.1	-	-	384	15.1	451	17.7
Handwheel	B	-	-	-	-	130	5.11	130	5.11	250	9.84	-	-	300	11.8	300	11.8
Center to Top Open	C	-	-	-	-	304	11.9	315	12.4	368	14.5	-	-	445	17.5	538	21.2
Dia. of Port	D	-	-	-	-	14	0.55	18	0.70	24	0.94	-	-	37	1.45	37	1.45
Approx. Weight	Kg / Lb	-	-	-	-	13	28.6	14	30.8	27	59.4	-	-	41	90.3	62	136.5

Port dimensions can change depending on schedule.

(*) End to end dimension according to ANSI B16.10.

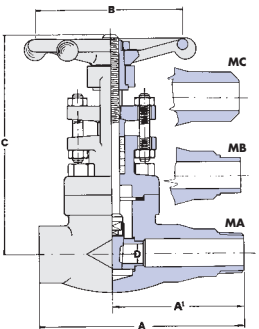


RATINGS: Carbon Steel
 Class 800 - 1975 p.s.i. @ 100°F
 Class 1500 - 3705 p.s.i. @ 100°F

CLASS 800-1500

TAKE-OFF VALVE - WELDED BONNET - REGULAR PORT - API 602
 Outside Screw & Yoke - Threaded, Socket Weld and BW Ends

REGULAR PORT	Class 800	MLA-810	-	1/2	3/4	1	-	1.1/2	2	-								
	Class 1500	MLA-R910	-	-	1/2	3/4	1	-	1.1/2	2								
			mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.				
End to End	A	-	-	148	5.82	153	6.02	182	7.16	216	8.50	216	8.50	264	10.4	264	10.4	
Center to Male End	A1	-	-	108	4.25	108	4.25	127	5.00	152	6.00	152	6.00	200	7.87	189	7.44	
Handwheel	B	-	-	80	3.14	80	3.14	110	4.33	110	4.33	130	5.11	130	5.11	180	7.08	
Center to Top Open	C	-	-	148	5.82	163	6.41	178	7.00	210	8.26	243	9.56	262	10.3	355	13.9	
Dia. of Port	Class 800	D	-	-	9.6	0.38	14	0.55	18	0.70	-	-	30	1.18	37	1.45	-	
	Class 1500	D	-	-	-	-	9.6	0.38	14	0.55	18	0.70	-	-	30	1.18	37	1.45
Approx. Weight	Class 800	Kg / Lb	-	-	2.1	4.6	2.8	6.2	4.4	9.7	-	-	8.1	17.8	10.5	23.2	-	-
	Class 1500	Kg / Lb	-	-	-	-	3.1	6.8	4.8	10.6	7.5	16.5	-	-	11.5	25.3	21.1	46.5

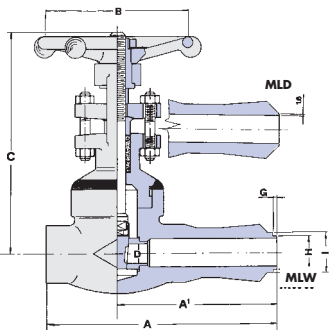


RATINGS: Carbon Steel
 Class 800 - 1975 p.s.i. @ 100°F
 Class 1500 - 3705 p.s.i. @ 100°F

CLASS 800-1500

TAKE-OFF VALVE - BOLTED BONNET - REGULAR PORT - API 602
 Outside Screw & Yoke - Threaded, Socket Weld and BW Ends

REGULAR PORT	Class 800	MA-810	-	1/2	3/4	1	-	1.1/2	2	-								
	Class 1500	MA-R910	-	-	1/2	3/4	1	-	1.1/2	2								
			mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.				
End to End	A	-	-	148	5.82	153	6.02	182	7.16	216	8.50	216	8.50	264	10.4	264	10.4	
Center to Male End	A1	-	-	108	4.25	108	4.25	127	5.00	152	6.00	152	6.00	200	7.87	189	7.44	
Handwheel	B	-	-	80	3.14	80	3.14	110	4.33	110	4.33	130	5.11	130	5.11	180	7.08	
Center to Top Open	C	-	-	148	5.82	163	6.41	178	7.00	210	8.26	243	9.56	262	10.3	355	13.9	
Dia. of Port	Class 800	D	-	-	9.6	0.38	14	0.55	18	0.70	-	-	30	1.18	37	1.45	-	
	Class 1500	D	-	-	-	-	9.6	0.38	14	0.55	18	0.70	-	-	30	1.18	37	1.45
Approx. Weight	Class 800	Kg / Lb	-	-	2.1	4.6	2.8	6.2	4.4	9.7	-	-	8.3	18.3	12	26.4	-	-
	Class 1500	Kg / Lb	-	-	-	-	3.1	6.8	4.8	10.6	7.5	16.5	-	-	12	26.4	22.1	48.7

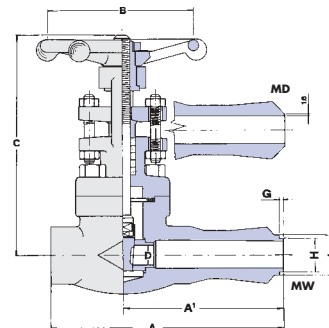


RATINGS: Carbon Steel
 Class 800 - 1975 p.s.i. @ 100°F
 Class 1500 - 3705 p.s.i. @ 100°F

CLASS 800-1500

REINFORCED EXTENDED BODY - WELDED BONNET - REGULAR PORT - API 602
 Outside Screw & Yoke - Threaded and Socket Weld Female End

REGULAR PORT	Class 800	MLW-810	-	1/2	3/4	1	-	1.1/2	2	-								
	Class 1500	MLW-R910	-	-	1/2	3/4	1	-	1.1/2	2								
			mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.				
End to End	A	-	-	196	7.71	220	8.66	244	9.60	265	10.4	265	10.4	270	10.6	270	10.6	
Center to Male End	A1	-	-	156	6.14	175	6.88	189	7.44	201	7.91	201	7.91	206	8.11	165	6.50	
Handwheel	B	-	-	80	3.14	80	3.14	110	4.33	110	4.33	130	5.11	130	5.11	180	7.08	
Center to Top Open	C	-	-	148	5.82	163	6.41	178	7.00	210	8.26	243	9.56	262	10.3	355	13.9	
Dia. of Port	Class 800	D	-	-	9.6	0.38	14	0.55	18	0.70	-	-	30	1.18	37	1.45	-	
	Class 1500	D	-	-	-	-	9.6	0.38	14	0.55	18	0.70	-	-	30	1.18	37	1.45
Approx. Weight	Class 800	Kg / Lb	-	-	3	6.6	3.2	7.0	5	11.0	-	-	9.3	20.5	12.5	27.5	-	-
	Class 1500	Kg / Lb	-	-	-	-	3.5	7.7	5.4	11.9	8.1	17.8	-	-	13	28.6	23.1	50.9



RATINGS: Carbon Steel
 Class 800 - 1975 p.s.i. @ 100°F
 Class 1500 - 3705 p.s.i. @ 100°F

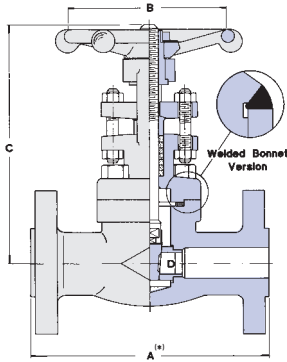
CLASS 800-1500

REINFORCED EXTENDED BODY - BOLTED BONNET - REGULAR PORT - API 602
 Outside Screw & Yoke - Threaded and Socket Weld Female End

REGULAR PORT	Class 800	MW-810	-	1/2	3/4	1	-	1.1/2	2	-								
	Class 1500	MW-R910	-	-	1/2	3/4	1	-	1.1/2	2								
			mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.				
End to End	A	-	-	196	7.71	220	8.66	244	9.60	265	10.4	265	10.4	270	10.6	270	10.6	
Center to Male End	A1	-	-	156	6.14	175	6.88	189	7.44	201	7.91	201	7.91	206	8.11	165	6.50	
Handwheel	B	-	-	80	3.14	80	3.14	110	4.33	110	4.33	130	5.11	130	5.11	180	7.08	
Center to Top Open	C	-	-	148	5.82	163	6.41	178	7.00	210	8.26	243	9.56	262	10.3	355	13.9	
Dia. of Port	Class 800	D	-	-	9.6	0.38	14	0.55	18	0.70	-	-	30	1.18	37	1.45	-	
	Class 1500	D	-	-	-	-	9.6	0.38	14	0.55	18	0.70	-	-	30	1.18	37	1.45
Approx. Weight	Class 800	Kg / Lb	-	-	3	6.6	3.2	7.0	5	11.0	-	-	9.5	20.9	12.5	27.5	-	-
	Class 1500	Kg / Lb	-	-	-	-	3.5	7.7	5.4	11.9	8.1	17.8	-	-	13.5	29.7	24.1	53.0

Reinforced - Lip - Class 800 & 1500	SIZE	-	1/2	3/4	1	-	1.1/2	2	-								
	H	-	-	18	0.70	23	0.91	28	1.10	-	-	44	1.73	50	1.97	-	-
	I	-	-	20.5	0.80	25.5	1.00	30.5	1.20	-	-	47	1.85	53	2.08	-	-
	G	-	-	4	0.15	4.5	0.17	5	0.19	-	-	7	0.25	8	0.31	-	-
Run size	Min.	-	-	1	1.1/2	2	3	4	5	6	7	8	9	10	11	12	13





RATINGS: Carbon Steel
 Class 150 - 285 p.s.i. @ 100°F
 Class 300 - 740 p.s.i. @ 100°F
 Class 600 - 1480 p.s.i. @ 100°F

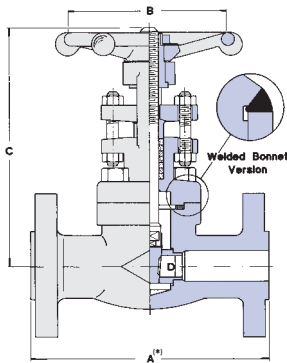
CLASS 150-300-600

BOLTED BONNET - REGULAR PORT - API 602 BS 5352
 Outside Screw & Yoke - Integral Flanged Ends according to ASME B16.5

REGULAR PORT		1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
Class 150 F1-810	A	-	-	-	-	108	4.25	118	4.64	127	5.00	-	-	165	6.49	178	7.00
Class 300 F3-810	A	-	-	-	-	140	5.51	153	6.02	165	6.49	-	-	191	7.51	216	8.50
Class 600 F6-810	A	-	-	-	-	165	6.49	191	7.51	216	8.50	-	-	241	9.48	292	11.5
Handwheel	B	-	-	-	-	80	3.14	80	3.14	110	4.33	-	-	130	5.11	130	5.11
Center to Top Open	Class 150/300	C		-		170	6.69	195	7.67	203	7.99	-	-	243	9.56	262	10.3
	Class 600	C		-		148	5.82	163	6.41	178	7.00	-	-	243	9.56	262	10.3
Dia. of Port	D	-	-	-	-	9.6	0.38	14	0.55	18	0.70	-	-	30	1.18	37	1.45
Approx. Weight	Class 150	Kg / Lb		-		3.4	7.5	3.8	8.3	5.7	12.5	-	-	9.7	21.4	13.2	29.1
	Class 300	Kg / Lb		-		3.9	8.6	5	11.0	6.2	13.6	-	-	12	26.4	16.5	36.3
	Class 600	Kg / Lb		-		4	8.8	5.2	11.4	7.5	16.5	-	-	15	33.0	20.5	45.1

End to End dimensions according to ASME B16.10

(*) End to end dimension according to ANSI B16.10.



RATINGS: Carbon Steel
 Class 150 - 285 p.s.i. @ 100°F
 Class 300 - 740 p.s.i. @ 100°F
 Class 600 - 1480 p.s.i. @ 100°F

CLASS 150-300-600

ROUND BOLTED BONNET - FULL PORT - BS 5352
 Outside Screw & Yoke - Integral Flanged Ends according to ASME B16.5

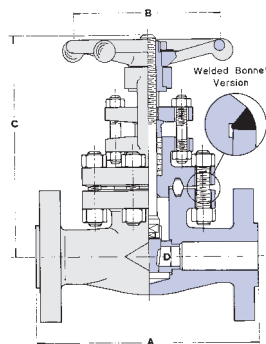
REGULAR PORT		1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
Class 150 F1-610	A	-	-	-	-	108	4.25	118	4.64	127	5.00	-	-	165	6.49	178	7.00
Class 300 F3-610	A	-	-	-	-	140	5.51	153	6.02	165	6.49	-	-	191	7.51	216	8.50
Class 600 F6-RJ610	A	-	-	-	-	165	6.49	191	7.51	216	8.50	-	-	241	9.48	292	11.5
Handwheel	B	-	-	-	-	110	4.33	110	4.33	130	5.11	-	-	250	9.84	250	9.84
Center to Top Open	Class 150/300	C		-		170	6.69	195	7.67	210	8.26	-	-	262	10.3	327	12.8
	Class 600	C		-		244	9.60	268	10.5	310	12.2	-	-	391	15.4	430	16.9
Dia. of Port	D	-	-	-	-	14	0.55	18	0.70	24	0.94	-	-	37	1.45	48	1.89
Approx. Weight	Class 150	Kg / Lb		-		3.6	7.9	4.8	10.5	6.5	14.3	-	-	12	26.4	18	39.6
	Class 300	Kg / Lb		-		4.1	9.0	5.5	12.1	7.0	15.4	-	-	13	28.6	19	41.8
	Class 600	Kg / Lb		-		6	13.2	11	24.2	13	28.6	-	-	27	59.4	30	66.0

End to End dimensions according to ASME B16.10

Spiral wound gasket joint for #150 - #300

Ring-Joint gasket according to ASME B 16.20 - API 6A

(*) End to end dimension according to ANSI B16.10.



RATINGS: Carbon Steel
 Class 1500 - 3705 p.s.i. @ 100°F

CLASS 1500

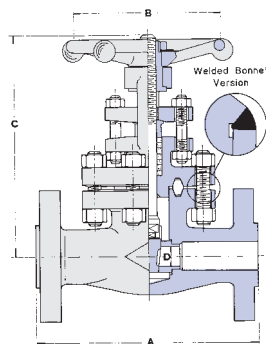
ROUND BOLTED BONNET RJ - FULL PORT - BS 5352
 Outside Screw & Yoke - Integral Flanged Ends according to ASME B 16.5

FULL PORT	F9-RJ910	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	216	8.50	229	9.01	254	10.0	-	-	305	12.0	368	14.5
Handwheel	B	-	-	-	-	110	4.33	130	5.11	130	5.11	-	-	250	9.84	300	11.8
Center to Top Open	C	-	-	-	-	260	10.2	300	11.8	300	11.8	-	-	390	15.3	420	16.5
Dia. of Port	D	-	-	-	-	14	0.55	18	0.70	24	0.94	-	-	37	1.45	48	1.89
Approx. Weight	Kg / Lb	-	-	-	-	11	24.2	16	35.2	19	41.8	-	-	35	77.1	59	130.0

End to End dimensions according to ASME B16.10

Spiral wound gasket joint available on request

Ring-Joint gasket according to ASME B 16.20 - API 6A



RATINGS: Carbon Steel
 Class 2500 - 6170 p.s.i. @ 100°F

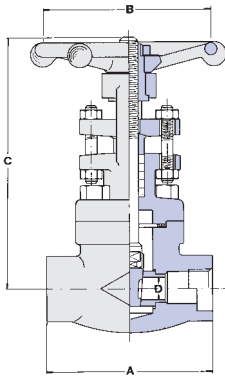
CLASS 2500

ROUND BOLTED BONNET RJ - FULL PORT - B16.34
 Outside Screw & Yoke - Integral Flanged Ends according to ASME B 16.5

FULL PORT	F25-RJ2510	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	264	10.4	273	10.7	308	12.1	-	-	384	15.1	451	17.7
Handwheel	B	-	-	-	-	130	5.11	130	5.11	250	9.84	-	-	300	11.8	300	11.8
Center to Top Open	C	-	-	-	-	304	11.9	315	12.4	368	14.5	-	-	445	17.5	538	22.2
Dia. of Port	D	-	-	-	-	14	0.55	18	0.70	24	0.94	-	-	37	1.45	37	1.45
Approx. Weight	Kg / Lb	-	-	-	-	19	41.8	21	46.2	40	88.1	-	-	62	136.5	92	202.6

End to End dimensions according to ASME B16.10

Ring-Joint gasket according to ASME B 16.20 - API 6A



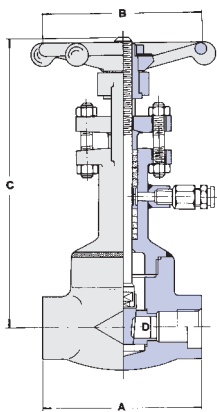
BOLTED BONNET
Outside Screw and Yoke
Solid Wedge

Sour Service

NACE STANDARD MR-01-75

CLASS 800 API 602 - BS 5352 Regular Port Full Port on request SS-810 Dimensions on page 13	RATINGS	MATERIAL		
		Body/Bonnet	Trim	Bolting
CLASS 1500 API 602 - BS 5352 Regular Port SS-R910 Dimensions on page 14	1975 psi @ 100°F Other ratings page 38	Carbon Steel	type 410 HFS	B7M
	3705 psi @ 100°F Other ratings page 38		type 316	

Welded Bonnet type on request



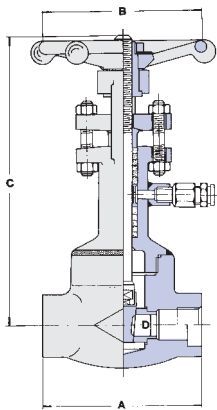
WELDED BONNET
Outside Screw and Yoke
Double Packing
Lantern Ring
Grease Injector
Solid Wedge

Alkylation Service

VALVES CONTAIN TEFLON
Max. temp. 450°F - 250°C

CLASS 800 API 602 - BS 5352 Regular Port Full Port on request AS-L810 For dimensions see OMB data sheets	RATINGS	MATERIAL		
		Body/Bonnet	Trim	Bolting
	1975 psi @ 100°F Other ratings page 38	Carbon Steel	Monel Teflon	B7

Bolted Bonnet type on request

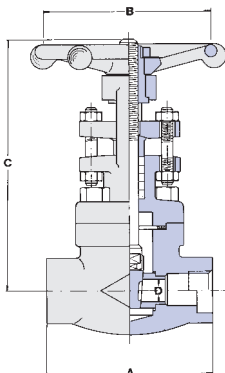


WELDED BONNET
Outside Screw and Yoke
Double Packing
Lantern Ring
Grease Injector
Solid Wedge

Vacuum Service - Extended Bonnet

CLASS 800 API 602 - BS 5352 Regular Port Full Port on request VS-L810 For dimensions see OMB data sheets	RATINGS	MATERIAL		
		Body/Bonnet	Trim	Bolting
	1975 psi @ 100°F Other ratings page 38	Carbon Steel	13% Cr	B7

Bolted Bonnet type on request

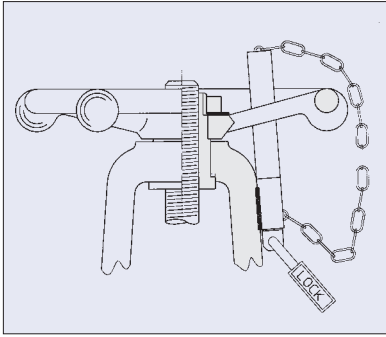


BOLTED BONNET
Outside Screw and Yoke
Solid Wedge

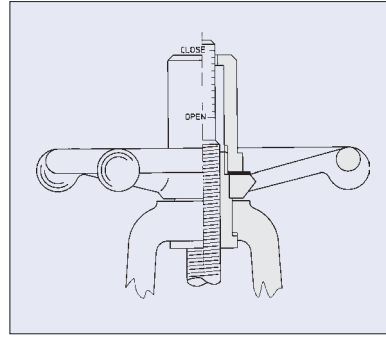
Chlorine Service

CLASS 800 API 602 - BS 5352 Regular Port Full Port on request CS-810 Dimensions on page 13	RATINGS	MATERIAL		
		Body/Bonnet	Trim	Bolting
	1975 psi @ 100°F Other ratings page 38	Carbon Steel	Hastelloy "C" seats Monel stem and disc	B7

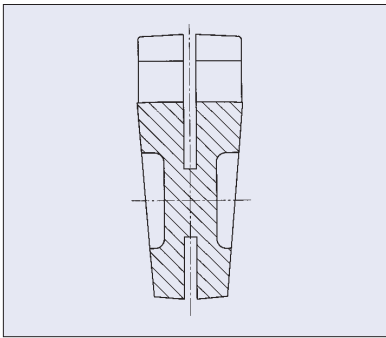
Welded Bonnet type on request



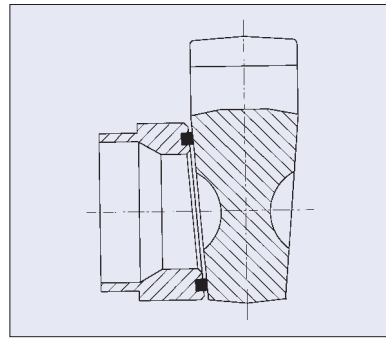
LOCKING DEVICE



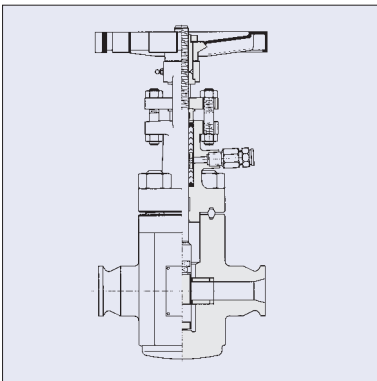
POSITION INDICATOR



FLEXIBLE WEDGE



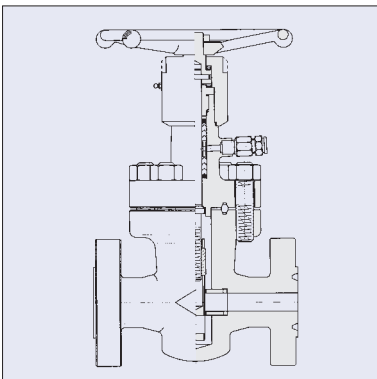
PTFE INSERT ON SEAT



THROUGH CONDUIT API 6D

API 6D	CLASS	MATERIALS
Design	600	Carbon Steel
Outside Screw and York	900/1500 2500	Low Temp. Carbon Steel / Alloys Stainless Steel Alloys

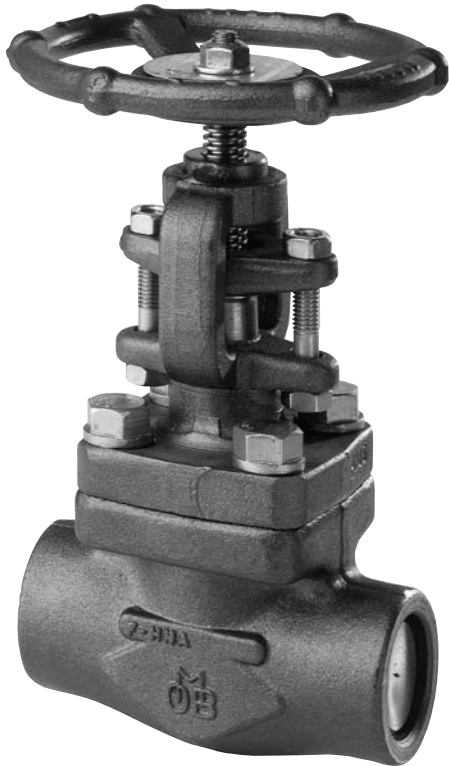
Please refer to OMB **Thought Conduit Catalog C-TC02**



THROUGH CONDUIT API 6A

API 6A	CLASS	MATERIALS
Design	3000	Carbon Steel
Inside Screw and York	5000 10000	Low Temp. Carbon Steel / Alloys Stainless Steel Alloys

Please refer to OMB **Thought Conduit Catalog C-TC02**



Globe valve are closing-down valves in which the closure member is moved squarely on and off the seat. In this way the opening of the port is directly proportional to the travel of the disc. This proportional relationship is ideally suited for duties requiring regulation of flow rate. To have a further precision in regulation the disc element can be available in the parabolic, needle, vee-port types. Furthermore the short travel of the disc between the open and closed position makes these valves ideally suited for on-off duties when they must be opened and closed frequently. Globe valves are uni-directional valves and are installed so that fluid pressure is under the disc. They are supplied in various models to cover the different services. Among these valves the Eco-L-Valve® combines the characteristics of total safety against leakages to the easy substitution of the most delicate components such as the bellows. The main characteristics of each type are described on pages 25 to 35.

Figure # is identified in each table as:

REGULAR PORT	830	-
FULL PORT	630	1/4
		m^m

CLASS	CONNECTION	PORT	STANDARD	SCREW & YOKE	ENDS	SERVICE	PAGE	OMB FIG.
800	Bolted bonnet	Regular	BS5352	Outside	Threaded and Socket Weld Ends	-	21	830
800	Bolted bonnet	Full	BS5352	Outside	Threaded and Socket Weld Ends	-	21	630
800	Welded Bonnet	Regular	BS5352	Outside	Threaded and Socket Weld Ends	-	21	L830
800	Welded Bonnet	Full	BS5352	Outside	Threaded and Socket Weld Ends	-	21	L630
800	Welded Bonnet	Regular	BS5352	inside	Threaded and Socket Weld Ends	-	21	L820
800	Welded Bonnet	Full	BS5352	inside	Threaded and Socket Weld Ends	-	21	L620
1500	Bolted bonnet	Regular	BS5352	Outside	Threaded and Socket Weld Ends	-	21	R930
1500	Bolted bonnet	Full	BS5352	Outside	Threaded and Socket Weld Ends	-	21	930
1500	Welded Bonnet	Regular	BS5352	Outside	Threaded and Socket Weld Ends	-	22	LR930
1500	Welded Bonnet	Full	BS5352	Outside	Threaded and Socket Weld Ends	-	22	L930
1500	Ring Joint BB	Full	BS5352	Outside	Threaded and Socket Weld Ends	-	22	RJ930
2500	Ring Joint BB	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	-	22	RJ2530
2500	Welded Bonnet	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	-	22	L2530
4500	Welded Bonnet	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	-	23	RJ4530
4500	Welded Bonnet	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	-	23	L4530
4500	Welded Bonnet	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	-	23	RJ-4530-CL
4500	Welded Bonnet	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	-	23	L4530-CL
800	Welded Bonnet	Full	BS5352	Outside	Threaded and Socket Weld Ends	-	24	Y630
1500	Welded Bonnet	Full	BS5352	Outside	Threaded and Socket Weld Ends	-	24	Y930
2500	Welded Bonnet	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	-	24	Y2530
4500	Welded Bonnet	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	-	24	Y4530
150	Welded Bonnet	Full	BS5352	Outside	Flanged	-	25	1-Y630
300	Welded Bonnet	Full	BS5352	Outside	Flanged	-	25	3-Y630
600	Welded Bonnet	Full	BS5352	Outside	Flanged	-	25	6-Y630
150	Bolted bonnet	Regular	BS5352	Outside	Flanged	-	25	F1-830
300	Bolted bonnet	Regular	BS5352	Outside	Flanged	-	25	F3-830
600	Bolted bonnet	Regular	BS5352	Outside	Flanged	-	25	F6-830
150	Bolted bonnet	Full	BS5352	Outside	Flanged	-	25	F1-630
300	Bolted bonnet	Full	BS5352	Outside	Flanged	-	25	F3-RJ-630
600	Bolted bonnet	Full	BS5352	Outside	Flanged	-	25	F6-RJ-630
1500	Ring Joint BB	Full	BS5352	Outside	Flanged	-	25	F9-RJ930
2500	Ring Joint BB	Full	BS5352	Outside	Flanged	-	25	F25-RJ2530
800	Bolted bonnet	Regular	BS5352	Outside	Threaded and Socket Weld Ends	Sour Service	26	SS830
800	Welded Bonnet	Regular	BS5352	Outside	Threaded and Socket Weld Ends	Alkilation	26	AS-L830
800	Welded Bonnet	Regular	BS5352	Outside	Threaded and Socket Weld Ends	Vacuum	26	VS-L830
800	Bolted bonnet	Regular	BS5352	Outside	Threaded and Socket Weld Ends	Chlorine	26	CS-830

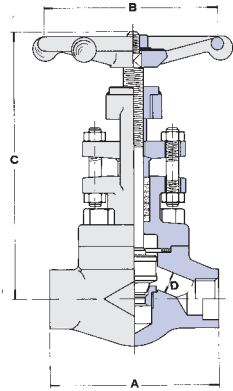
Note Bellows Seal Valves please see C-BS Bellows Seal Valve Catalog
 Cryogenic Service Valves please see C-CRYO Cryogenic Service Valve Catalog
 Pressure Seal Valves please see C-PS Pressure Seal Valve Catalog
 Thru Conduit Valves please see C-TC Pressure Thru Conduit Valves Catalog
 Y Pattern Valves please see C-HTHP High Pressure - High Temperature Valves

Eco-L-Valves
 OMB introduced an innovative solution to the Fugitive Emission issue: Eco-L-Valves Special patented Short Pattern Bellows Seal valves, with dimension equal to standard non-bellows valves and able to meet the severe service conditions of standard bellows seal with a lower dimensional height and reduced cost impact.

JIS Valve Standards please see JIS Section on this catalog
 DIN Valve Standards please see DIN Section on this catalog

ECO-L-VALVES please see C-BS Bellows Seal Valve Catalog





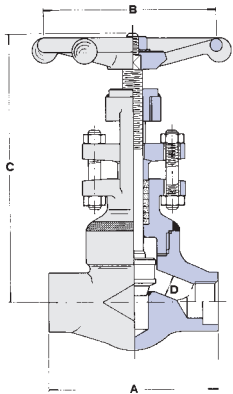
RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 800

BOLTED BONNET - REGULAR AND FULL PORT - BS 5352

Outside Screw & Yoke - Threaded and Socket Weld Ends

REGULAR PORT	830	-	1/2	3/4	1	1.1/4	1.1/2	2	-								
FULL PORT	630	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2								
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.				
End to End	A	80	3.14	80	3.14	90	3.54	110	4.33	127	5.00	155	6.10	170	6.69	210	8.26
Handwheel	B	80	3.14	80	3.14	80	3.14	110	4.33	130	5.11	130	5.11	180	7.08	180	7.08
Center to Top Open	C	148	5.82	148	5.82	165	6.49	180	7.08	213	8.38	248	9.76	257	10.1	370	14.5
Dia. of Port	D	7	0.28	9	0.35	13	0.51	17.5	0.69	22.5	0.89	29.5	1.16	35	1.37	45.5	1.79
Approx. Weight	Kg / Lb	1.7	3.7	1.7	3.7	2.3	5.0	3.6	7.9	5.5	12.1	7.5	16.5	11.6	25.5	22.0	48.5



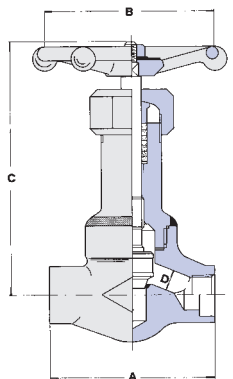
RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 800

WELDED BONNET - REGULAR AND FULL PORT - BS 5352

Outside Screw & Yoke - Threaded and Socket Weld Ends

REGULAR PORT	L830	-	1/2	3/4	1	1.1/4	1.1/2	2	-								
FULL PORT	L630	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2								
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.				
End to End	A	80	3.14	80	3.14	90	3.54	110	4.33	127	5.00	155	6.10	170	6.69	210	8.26
Handwheel	B	80	3.14	80	3.14	80	3.14	110	4.33	130	5.11	130	5.11	180	7.08	180	7.08
Center to Top Open	C	148	5.82	148	5.82	165	6.49	180	7.08	213	8.38	248	9.76	257	10.1	370	14.5
Dia. of Port	D	7	0.28	9	0.35	13	0.51	17.5	0.69	22.5	0.89	29.5	1.16	35	1.37	45.5	1.79
Approx. Weight	Kg / Lb	1.7	3.7	1.7	3.7	2.3	5.0	3.6	7.9	5.5	12.1	7.3	16	10.5	23.1	17.5	38.5



RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

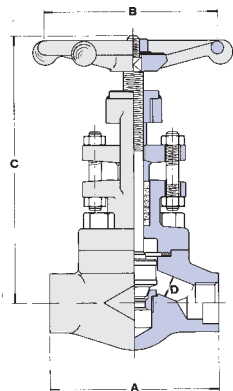
CLASS 800

WELDED BONNET - REGULAR AND FULL PORT - BS 5352

Inside Screw - Threaded and Socket Weld Ends

REGULAR PORT	L820	-	1/2	3/4	1	1.1/4	1.1/2	2	-								
FULL PORT	L620	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2								
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.				
End to End	A	80	3.14	80	3.14	90	3.54	110	4.33	127	5.00	155	6.10	170	6.69	210	8.26
Handwheel	B	80	3.14	80	3.14	80	3.14	110	4.33	130	5.11	130	5.11	180	7.08	180	7.08
Center to Top Open	C	148	5.82	148	5.82	175	6.88	212	8.34	235	9.25	287	11.3	327	12.9	380	15.0
Dia. of Port	D	7	0.28	9	0.35	13	0.51	17.5	0.69	22.5	0.89	29.5	1.16	35	1.37	45.5	1.79
Approx. Weight	Kg / Lb	1.5	3.3	1.5	3.3	2.0	4.4	3.7	8.1	5.5	12.1	7.3	16	10.5	23.1	17.5	38.5

Bolted Bonnet Type on request



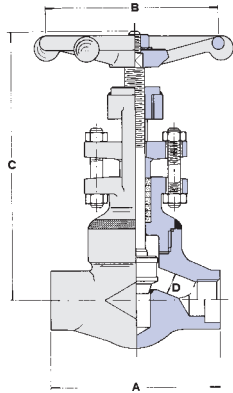
RATINGS: Carbon Steel - 3705 p.s.i. @ 100°F

CLASS 1500

BOLTED BONNET - REGULAR AND FULL PORT - BS 5352

Outside Screw & Yoke - Threaded and Socket Weld Ends

REGULAR PORT	R930	-	1/2	3/4	1	1.1/4	1.1/2	2	-								
FULL PORT	930	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2								
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.				
End to End	A	90	3.54	90	3.54	110	4.33	127	5.00	155	6.10	170	6.69	210	8.26	210	8.26
Handwheel	B	80	3.14	80	3.14	110	4.33	130	5.11	130	5.11	180	7.08	180	7.08	180	7.08
Center to Top Open	C	160	6.29	160	6.29	175	6.88	210	8.26	244	9.60	250	9.84	370	14.5	375	14.7
Dia. of Port	D	7	0.28	9	0.35	13	0.51	17	0.67	21	0.83	28	1.10	33	1.30	37.5	1.48
Approx. Weight	Kg / Lb	2.2	4.8	2.2	4.8	3.9	8.5	6	13.2	8	17.6	12	26.4	23.5	51.7	23	50.6

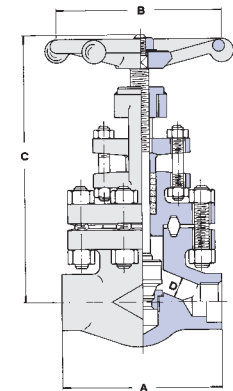


RATINGS: Carbon Steel - 3705 p.s.i. @ 100°F

CLASS 1500 WELDED BONNET - REGULAR AND FULL PORT - BS 5352

Outside Screw & Yoke - Threaded and Socket Weld Ends

REGULAR PORT	LR930	-	1/2	3/4	1	1.1/4	1.1/2	2	-								
FULL PORT	L930	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2								
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.				
End to End	A	90	3.54	90	3.54	110	4.33	127	5.00	155	6.10	170	6.69	210	8.26	210	8.26
Handwheel	B	80	3.14	80	3.14	110	4.33	130	5.11	130	5.11	180	7.08	180	7.08	180	7.08
Center to Top Open	C	160	6.29	160	6.29	175	6.88	210	8.26	244	9.60	250	9.84	370	14.5	375	14.7
Dia. of Port	D	7	0.28	9	0.35	13	0.51	17	0.67	21	0.83	28	1.10	33	1.30	37.5	1.48
Approx. Weight	Kg / Lb	2.2	4.8	2.2	4.8	3.9	8.5	6	13.2	8	17.6	12	26.4	19	41.8	18.5	40.7



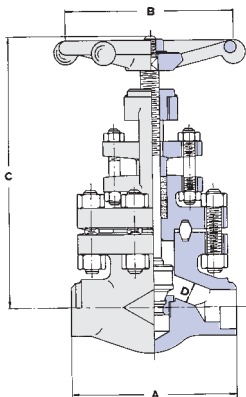
RATINGS: Carbon Steel - 3705 p.s.i. @ 100°F

CLASS 1500 ROUND BOLTED BONNET - FULL PORT - BS 5352

Outside Screw & Yoke - Threaded and Socket Weld Ends

FULL PORT	RJ930	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2								
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.				
End to End	A	-	-	-	-	110	4.33	150	5.90	150	5.90	-	-	210	8.26	235	9.25
Handwheel	B	-	-	-	-	110	4.33	130	5.11	130	5.11	-	-	180	7.08	250	9.84
Center to Top Open	C	-	-	-	-	235	9.25	265	10.4	310	12.2	-	-	370	14.5	435	17.1
Dia. of Port	D	-	-	-	-	13	0.51	17	0.67	21	0.83	-	-	33	1.30	37.5	1.48
Approx. Weight	Kg / Lb	-	-	-	-	5.1	11.2	11	24.2	12.1	26.6	-	-	22	48.4	37	81.5

Ring-Joint gasket according to ASME B16.20 - API 6A. - Spiral wound gasket joint available on request.



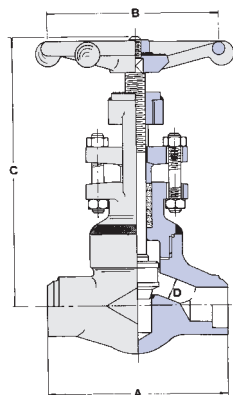
RATINGS: Carbon Steel - 6170 p.s.i. @ 100°F

CLASS 2500 ROUND BOLTED BONNET RJ - FULL PORT - B16.34

Outside Screw & Yoke - Socket and Butt Weld Ends

FULL PORT	RJ2530	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2								
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.				
End to End	A	-	-	-	-	150	5.90	150	5.90	210	8.26	-	-	235	9.25	235	9.25
Handwheel	B	-	-	-	-	130	5.11	130	5.11	250	9.84	-	-	300	11.8	300	11.8
Center to Top Open	C	-	-	-	-	265	10.4	265	10.4	360	14.1	-	-	430	16.9	435	17.1
Dia. of Port	D	-	-	-	-	13	0.51	17	0.67	21	0.83	-	-	33	1.30	35	1.37
Approx. Weight	Kg / Lb	-	-	-	-	11	24.2	11.3	24.8	22.4	49.3	-	-	38	83.7	38	83.7

Ring-Joint gasket according to ASME B16.20 - API 6A.

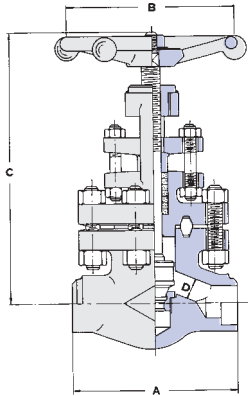


RATINGS: Carbon Steel - 6170 p.s.i. @ 100°F

CLASS 2500 WELDED BONNET - FULL PORT - B16.34

Outside Screw & Yoke - Socket and Butt Weld Ends

FULL PORT	L2530	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2								
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.				
End to End	A	-	-	-	-	127	5.00	155	6.10	170	6.69	-	-	235	9.25	235	9.25
Handwheel	B	-	-	-	-	130	5.11	130	5.11	130	5.11	-	-	300	11.8	300	11.8
Center to Top Open	C	-	-	-	-	237	9.33	242	9.52	256	10.1	-	-	430	16.9	435	17.1
Dia. of Port	D	-	-	-	-	13	0.51	17	0.67	21	0.83	-	-	33	1.30	35	1.37
Approx. Weight	Kg / Lb	-	-	-	-	6.5	14.3	8.5	18.7	12.5	27.5	-	-	26	57.2	25.5	56.1



RATINGS: Carbon Steel - 11110 p.s.i. @ 100°F

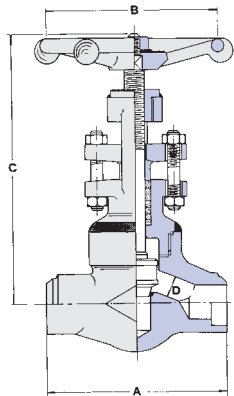
CLASS 4500 ROUND BOLTED BONNET RJ - FULL PORT - B16.34

Outside Screw & Yoke - Socket and Butt Weld Ends

FULL PORT	RJ4530	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	210	8.26	210	8.26	235	9.25	-	-	235	9.25	-	-
Handwheel	B	-	-	-	-	250	9.84	250	9.84	300	11.8	-	-	300	11.8	-	-
Center to Top Open	C	-	-	-	-	345	13.5	350	13.7	420	16.5	-	-	430	16.9	-	-
Dia. of Port	D	-	-	-	-	9	0.35	11	0.43	14	0.55	-	-	28	1.10	-	-
Approx. Weight	Kg / Lb	-	-	-	-	23	50.6	23	50.6	38.5	84.8	-	-	38.5	84.8	-	-

2" on request

Ring-Joint gasket according to ASME B16.20 - API 6A.



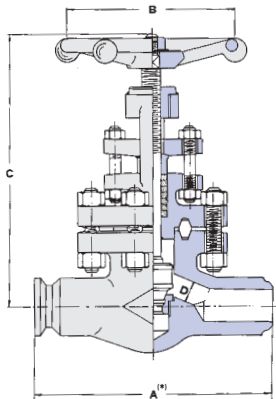
RATINGS: Carbon Steel - 11110 p.s.i. @ 100°F

CLASS 4500 WELDED BONNET - FULL PORT - B16.34

Outside Screw & Yoke - Socket and Butt Weld Ends

FULL PORT	L4530	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	155	6.10	170	6.69	210	8.26	-	-	235	9.25	-	-
Handwheel	B	-	-	-	-	180	7.08	250	9.84	250	9.84	-	-	300	11.8	-	-
Center to Top Open	C	-	-	-	-	240	9.44	250	11.2	350	13.7	-	-	410	16.1	-	-
Dia. of Port	D	-	-	-	-	11	0.43	11	0.43	14	0.55	-	-	28	1.10	-	-
Approx. Weight	Kg / Lb	-	-	-	-	9	19.8	13	28.6	24.5	53.9	-	-	28	61.7	-	-

2" on request



RATINGS: Carbon Steel - 11110 p.s.i. @ 100°F

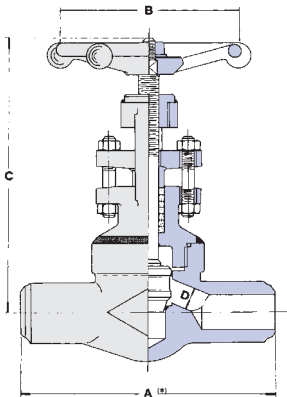
CLASS 4500 ROUND BOLTED BONNET RJ - FULL PORT - B16.34

Outside Screw & Yoke - Clamp and Butt Weld Ends

FULL PORT	RJ4530-BW	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	260	10.2	300	11.8	370	14.5	-	-	370	14.5	-	-
Handwheel	B	-	-	-	-	180	7.08	250	9.84	300	11.8	-	-	300	11.8	-	-
Center to Top Open	C	-	-	-	-	280	11.0	360	14.1	456	17.9	-	-	466	18.3	-	-
Dia. of Port	D	-	-	-	-	11	0.43	11	0.43	14	0.55	-	-	28	1.10	-	-
Approx. Weight	Kg / Lb	-	-	-	-	18	39.6	34	74.9	50	110.1	-	-	50	110.1	-	-

2" on request

(*) End to end dimension according to ANSI B16.10.



RATINGS: Carbon Steel - 11110 p.s.i. @ 100°F

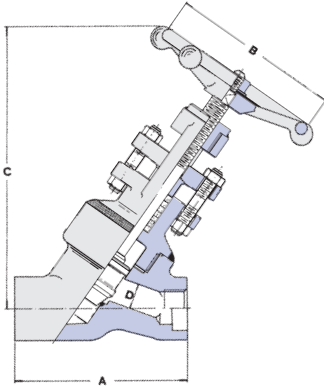
CLASS 4500 WELDED BONNET - FULL PORT - B16.34

Outside Screw & Yoke - Clamp and Butt Weld Ends

FULL PORT	L4530-BW	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	260	10.2	300	11.8	370	14.5	-	-	370	14.5	-	-
Handwheel	B	-	-	-	-	180	7.08	250	9.84	300	11.8	-	-	300	11.8	-	-
Center to Top Open	C	-	-	-	-	280	11.0	360	14.1	456	17.9	-	-	466	18.3	-	-
Dia. of Port	D	-	-	-	-	11	0.43	11	0.43	14	0.55	-	-	28	1.10	-	-
Approx. Weight	Kg / Lb	-	-	-	-	17	37.4	32	70.5	46	101.3	-	-	46	101.3	-	-

2" on request

(*) End to end dimension according to ANSI B16.10.



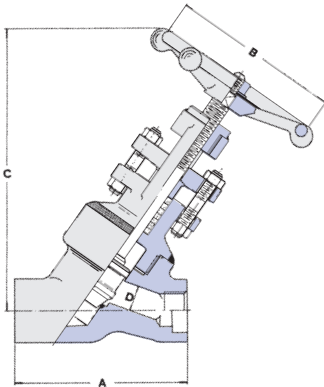
RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 800

WELDED BONNET - FULL PORT - BS 5352

Outside Screw & Yoke - Threaded and Socket Weld Ends

FULL PORT	Y630	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	90	3.54	90	3.54	90	3.54	90	3.54	127	5.00	127	5.00	155	6.10	180	7.08
Handwheel	B	80	3.14	80	3.14	80	3.14	110	4.33	130	5.11	130	5.11	180	7.08	180	7.08
Center to Top Open	C	155	6.10	155	6.10	155	6.10	175	6.88	220	8.66	240	9.44	280	11.02	350	13.78
Dia. of Port	D	7	0.27	9	0.35	13	0.51	17.5	0.68	22.5	0.88	29.5	1.16	35	1.37	45.5	1.79
Approx. Weight	Kg / Lb	1.5	3.3	1.5	3.3	1.5	3.3	2	4.4	4.2	9.2	5	11	9	19.8	13	28.6



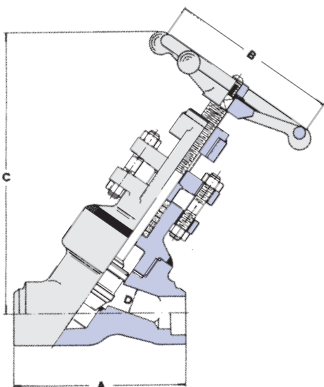
RATINGS: Carbon Steel
Class 1500 - 3705 p.s.i. @ 100°F
*Class 1700 - 4198 p.s.i. @ 100°F

CLASS 1500-1700

WELDED BONNET - FULL PORT - BS 5352

Outside Screw & Yoke - Threaded and Socket Weld Ends

FULL PORT	Y930	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	90	3.54	90	3.54	90	3.54	127	5.00	127	5.00	155	6.10	155	6.10	180	7.08
Handwheel	B	110	4.33	110	4.33	110	4.33	130	5.11	130	5.11	180	7.08	180	7.08	180	7.08
Center to Top Open	C	180	7.08	180	7.08	170	7.08	240	9.44	250	9.84	280	11.02	380	14.96	420	16.53
Dia. of Port	D	7	0.27	9	0.35	11	0.43	15	0.59	19.5	0.76	27.5	1.08	31.5	1.24	39	1.53
Approx. Weight	Kg / Lb	2	4.4	2	4.4	2	4.4	4.2	9.2	5.2	11.4	9	20.9	10.5	23.1	13.5	29.8



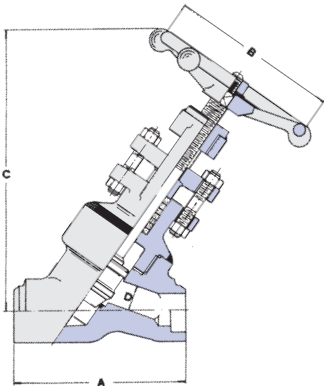
RATINGS: Carbon Steel
Class 2500 - 6170 p.s.i. @ 100°F
*Class 2700 - 6664 p.s.i. @ 100°F

CLASS 2500-2700

WELDED BONNET - FULL PORT - B16.34

Outside Screw & Yoke - Socket and Butt Weld Ends

FULL PORT	Y2530	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	127	5.00	127	5.00	127	5.00	127	5.00	155	6.10	155	6.10	180	7.08	225	8.86
Handwheel	B	130	5.11	130	5.11	130	5.11	130	5.11	180	7.08	180	7.08	180	7.08	300	11.8
Center to Top Open	C	280	11.02	280	11.02	280	11.02	280	11.02	360	14.1	370	14.56	420	16.53	540	21.2
Dia. of Port	D	7	0.27	9	0.35	11	0.43	15	0.59	19.5	0.76	27.5	1.08	31.5	1.24	39	1.53
Approx. Weight	Kg / Lb	4.5	9.9	4.5	9.9	4.5	9.9	7.1	15.6	7.6	16.7	9.8	21.5	17.1	37.8	36	79.5



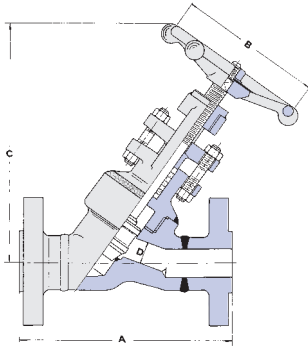
RATINGS: Carbon Steel - 11110 p.s.i. @ 100°F

CLASS 4500

WELDED BONNET - FULL PORT - B16.34

Outside Screw & Yoke - Socket and Butt Weld Ends

FULL PORT	Y4530	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	155	6.10	155	6.10	155	6.10	155	6.10	155	6.10	-	-	225	8.86	225	8.86
Handwheel	B	180	7.08	180	7.08	180	7.08	180	7.08	180	7.08	-	-	400	15.75	400	15.75
Center to Top Open	C	350	13.77	350	13.77	350	13.77	350	13.77	380	14.96	-	-	453	17.83	453	17.83
Dia. of Port	D	7	0.27	9	0.35	11	0.43	11	0.43	15	0.59	-	-	26	1.02	28	1.10
Approx. Weight	Kg / Lb	9.6	21.1	9.6	21.1	9.6	21.1	9.4	20.7	10.5	23.1	-	-	34	75.0	36	79.5



RATINGS: Carbon Steel
 Class 150 - 285 p.s.i. @ 100°F
 Class 300 - 740 p.s.i. @ 100°F
 Class 600 - 1480 p.s.i. @ 100°F

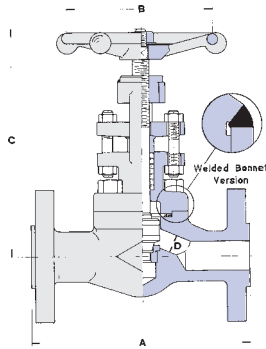
CLASS 150-300-600

WELDED BONNET - FULL PORT - BS 5352

Outside Screw & Yoke - Flanged Ends according to ASME B16.5

FULL PORT		1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
Class 150	1-Y630	A	-	-	-	108	4.25	118	4.64	127	5.00	-	-	165	6.49	203	7.99
Class 300	3-Y630	A	-	-	-	153	6.02	178	7.00	203	7.99	-	-	229	9.01	267	10.5
Class 600	6-Y630	A	-	-	-	165	6.49	191	7.51	216	8.50	-	-	241	9.48	292	11.5
Handwheel	B	-	-	-	-	80	3.14	80	3.14	130	5.11	-	-	180	7.08	180	7.08
Center to Top Open	C	-	-	-	-	155	6.10	175	6.88	220	8.66	-	-	280	11.0	350	13.78
Dia. of Port	D	-	-	-	-	13	0.51	17.5	0.68	22.5	0.88	-	-	35	1.37	45.5	1.79
Approx. Weight	Class 150	Kg / Lb	-	-	-	3.2	7.04	4	8.8	7.2	15.8	-	-	14.9	32.8	19	41.8
	Class 300	Kg / Lb	-	-	-	4.2	9.25	5.7	12.5	10.7	23.5	-	-	16.4	36.1	21	46.2
	Class 600	Kg / Lb	-	-	-	4.7	10.3	6	13.2	11.7	25.7	-	-	17.4	38.3	23	50.6

End to End dimensions according to ASME B16.10



RATINGS: Carbon Steel
 Class 150 - 285 p.s.i. @ 100°F
 Class 300 - 740 p.s.i. @ 100°F
 Class 600 - 1480 p.s.i. @ 100°F

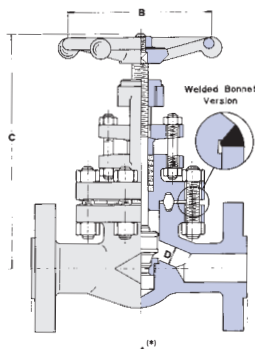
CLASS 150-300-600

BOLTED BONNET - REGULAR PORT - BS 5352

Outside Screw & Yoke - Integral Flanged Ends according to ASME B16.5

REGULAR PORT		1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
Class 150	F1-830	A	-	-	-	108	4.25	118	4.64	127	5.00	-	-	165	6.49	203	7.99
Class 300	F3-830	A	-	-	-	153	6.02	178	7.00	203	7.99	-	-	229	9.01	267	10.5
Class 600	F6-830	A	-	-	-	165	6.49	191	7.51	216	8.50	-	-	241	9.48	292	11.5
Handwheel	B	-	-	-	-	80	3.14	80	3.14	110	4.33	-	-	130	5.11	180	7.08
Center to Top Open	Class 300-600	C	-	-	-	148	5.82	165	6.49	180	7.08	-	-	248	9.76	257	10.1
	Class 150	C	-	-	-	170	6.69	197	7.75	205	8.07	-	-	248	9.76	257	10.1
Dia. of Port	D	-	-	-	-	9	0.35	13	0.51	17.5	0.69	-	-	29.5	1.16	35	1.37
Approx. Weight	Class 150	Kg / Lb	-	-	-	3.4	7.5	4	8.8	5.7	12.5	-	-	10	22.0	17.0	37.4
	Class 300	Kg / Lb	-	-	-	4	8.8	5	11.0	7.3	16.1	-	-	14	30.8	20.5	45.1
	Class 600	Kg / Lb	-	-	-	4.5	9.9	5.5	12.1	7.6	16.7	-	-	15	33.0	21	46.2

End to End dimensions according to ASME B16.10



RATINGS: Carbon Steel
 Class 150 - 285 p.s.i. @ 100°F
 Class 300 - 740 p.s.i. @ 100°F
 Class 600 - 1480 p.s.i. @ 100°F

CLASS 150-300-600

BOLTED BONNET - FULL PORT - BS 5352

Outside Screw & Yoke - Integral Flanged Ends according to ASME B16.5

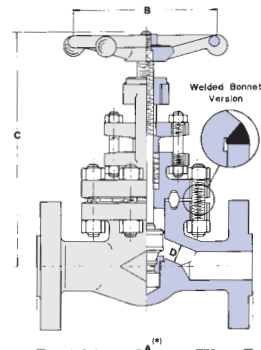
REGULAR PORT		1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
Class 150	F1-630	A	-	-	-	108	4.25	118	4.64	127	5.00	-	-	165	6.49	203	7.99
Class 300	F3-RJ630	A	-	-	-	153	6.02	178	7.00	203	7.99	-	-	229	9.01	267	10.5
Class 600	F6-RJ630	A	-	-	-	165	6.49	191	7.51	216	8.50	-	-	241	9.48	292	11.5
Handwheel	B	-	-	-	-	110	4.33	110	4.33	130	5.11	-	-	250	9.84	250	9.84
Center to Top Open	Class 300-600	C	-	-	-	245	9.64	273	10.7	295	11.6	-	-	410	16.1	440	17.3
	Class 150	C	-	-	-	170	6.69	200	7.87	250	9.84	-	-	285	11.2	320	12.6
Dia. of Port	D	-	-	-	-	13	0.51	17.5	0.69	22.5	0.89	-	-	35	1.37	45.5	1.79
Approx. Weight	Class 150	Kg / Lb	-	-	-	4.2	9.2	5.5	12.1	7.5	16.5	-	-	13.5	29.7	21	46.2
	Class 300	Kg / Lb	-	-	-	5.8	12.8	10.8	23.8	12.8	28.2	-	-	26.5	58.4	29	63.9
	Class 600	Kg / Lb	-	-	-	6	13.2	10	22.0	14.5	32.0	-	-	27	59.4	30	66.0

End to End dimensions according to ASME B16.10

Spiral wound gasket joint for #150

Ring-Joint gasket according to ANSI B16.10 - API 6A

(*) End to end dimension BW on request Fig. N. BW 1-630 / BW 3-630 / BW 6-630



RATINGS: Carbon Steel
 Class 1500 - 3705 p.s.i. @ 100°F
 Class 2500 - 6170 p.s.i. @ 100°F

CLASS 1500-2500

ROUND BOLTED BONNET RJ - FULL PORT - BS 5352 - B16.34

Outside Screw & Yoke - Integral Flanged Ends according to ANSI B16.5

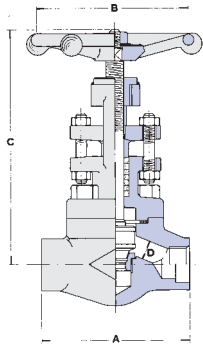
FULL PORT		1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
Class 1500	F9-RJ930	A	-	-	-	216	8.50	229	9.01	254	10.0	-	-	305	12.0	368	14.5
Class 2500	F25-RJ2530	A	-	-	-	264	10.4	273	10.7	308	12.1	-	-	384	15.1	451	17.7
Handwheel	Class 1500	B	-	-	-	110	4.33	130	5.11	130	5.11	-	-	250	9.84	300	11.8
	Class 2500	B	-	-	-	130	5.11	130	5.11	250	9.84	-	-	300	11.8	300	11.8
Center to Top Open	Class 1500	C	-	-	-	260	10.2	300	11.8	300	11.8	-	-	390	15.3	420	16.5
	Class 2500	C	-	-	-	332	13.0	332	13.0	370	14.5	-	-	435	17.1	570	22.4
Dia. of Port	Class 1500	D	-	-	-	13	0.51	17	0.67	21	0.83	-	-	33	1.30	37.5	1.48
	Class 2500	D	-	-	-	11	0.43	17	0.67	21	0.83	-	-	33	1.30	37.5	1.48
Approx. Weight	Class 1500	Kg / Lb	-	-	-	11	24.2	16	35.2	19.5	42.9	-	-	34	74.8	61	134.3
	Class 2500	Kg / Lb	-	-	-	19.5	42.9	21.5	47.3	42	92.5	-	-	65	143.2	95	209.2

End to End dimensions according to ASME B16.10

For class 1500 spiral wound gasket joint available on request

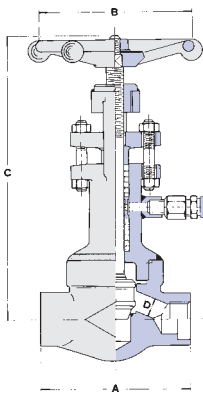
Ring-Joint gasket according to ASME B16.20 - API 6A

(*) End to end dimension BW on request Fig. N. BW 9-RJ930 / BW 25-RJ2530



BOLTED BONNET

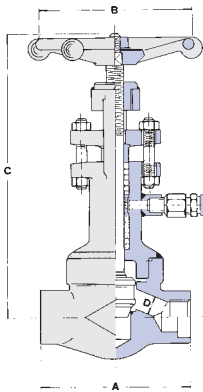
Outside Screw and Yoke



WELDED BONNET

Outside Screw and Yoke

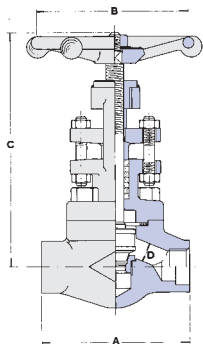
Double Packing
Lantern Ring
Grease Injector
Loose Solid Disc



WELDED BONNET

Outside Screw and Yoke

Double Packing
Lantern Ring
Grease Injector
Loose Solid Disc



BOLTED BONNET

Outside Screw and Yoke

Loose Solid Disc
or Loose Teflon
Inserted Disc

Sour Service

NACE STANDARD MR-01-75

CLASS 800 BS 5352 Regular Port Full Port on request	RATINGS	MATERIAL		
		Body/Bonnet	Trim	Bolting
SS-830 Dimensions on page 21	1975 psi @ 100°F Other ratings page 38	Carbon Steel	type 410 HFS type 316	B7M
CLASS 1500 BS 5352 Regular Port SS-R930 Dimensions on page 21	3705 psi @ 100°F Other ratings page 38			

Welded Bonnet type on request

Alkylation Service

VALVES CONTAIN TEFLON
Max. temp. 450°F - 250°C

CLASS 800 BS 5352 Regular Port Full Port on request	RATINGS	MATERIAL		
		Body/Bonnet	Trim	Bolting
AS-L830 For dimensions see OMB data sheets	1975 psi @ 100°F Other ratings page 38	Carbon Steel	Monel	B7
			Monel	
			Teflon inserted disc	

Bolted Bonnet type on request

Vacuum Service - Extended Bonnet

CLASS 800 BS 5352 Regular Port Full Port on request	RATINGS	MATERIAL		
		Body/Bonnet	Trim	Bolting
VS-L830 For dimensions see OMB data sheets	1975 psi @ 100°F Other ratings page 38	Carbon Steel	13% Cr	B7

Bolted Bonnet type on request

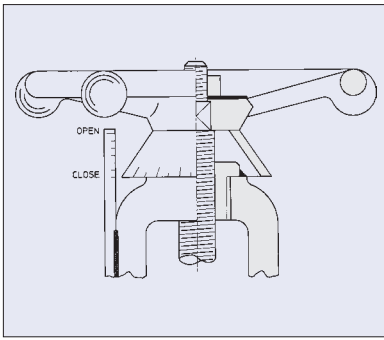
Chlorine Service

VALVES CONTAIN TEFLON
Max. temp. 450°F - 250°C

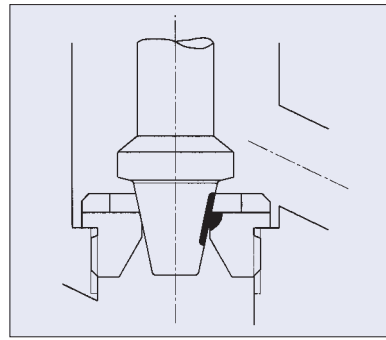
CLASS 800 BS 5352 Regular Port Full Port on request	RATINGS	MATERIAL		
		Body/Bonnet	Trim	Bolting
CS-830 Dimensions on page 21	1975 psi @ 100°F Other ratings page 38	Carbon Steel	Hastelloy "C" seats Monel stem and disc	B7
			Hastelloy "C" seats Monel stem and Teflon inserted disc	

Welded Bonnet type on request

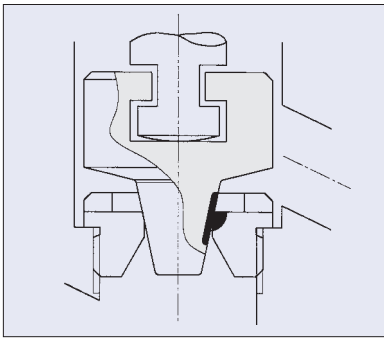




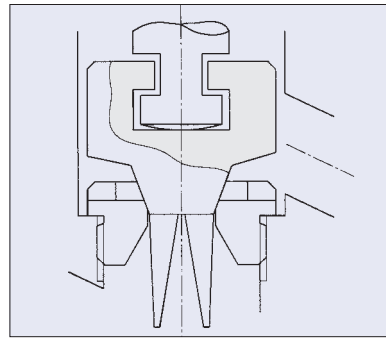
POSITION INDICATOR



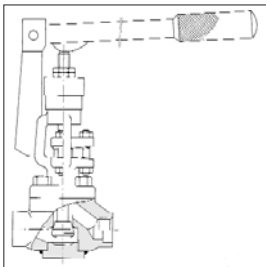
NEEDLE POINT RENEWABLE OR INTEGRAL SEAT



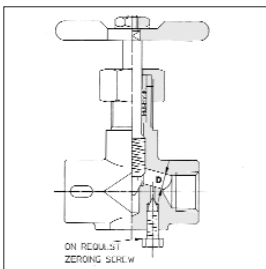
LOOSE DISC NEEDLE POINT RENEWABLE OR INTEGRAL SEAT



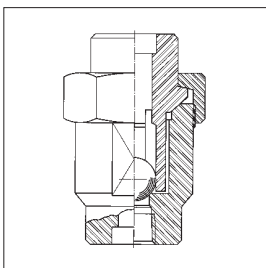
LOOSE "V" PORT DISC RENEWABLE OR INTEGRAL SEAT



BOLTED BONNET
Outside Screw & Yoke
Spring operated



THREADED BONNET
Forged Steel Construction



THREADED BONNET
Forged Steel Construction

SELF CLOSING - LEVER OPERATED

Figure	CLASS	MATERIALS
SC-830	800	Carbon Steel
SC-R930	1500	Alloy Steels
Flanged and BW ends available		Stainless Steel Alloys

Please contact OMB offices for dimensional data

INSTRUMENTATION VALVE

Figure	CLASS	MATERIALS
3001	3000	Carbon Steel
6001	6000	Stainless Steel

Please contact OMB offices for dimensional data

VERTICAL CHECK

Figure	CLASS	MATERIALS
UV650	800	Carbon Steel
UV950	1500	Stainless Steels Exotics and Alloys

Please contact OMB offices for dimensional data



Check valves are uni-directional valves which automatically open with forward flow and close against reverse flow. They are supplied to meet a wide variety of applications with the closing element in the piston, ball or swing type. Piston check valves are normally supplied by OMB with the addition of a spring which allows both the vertical and horizontal installation.

Great care is given by OMB employees in the design and in manufacturing to prevent noisy operation and unsatisfactory wear of closure components.

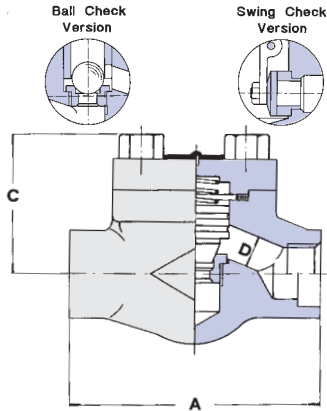
The full range of OMB production is reported on pages 37 to 42.

Figure # is identified in each table as:

REGULAR PORT	PISTON	840	-
	BALL	850	
	SWING	860	
FULL PORT	PISTON	640	1/A
	BALL	650	
	SWING	660	

CLASS	DESIGN	CONNECTION	PORT	STANDARD	SCREW & YOKE	ENDS	PAGE	OMB FIG.
800	Piston	Bolting bonnet	Regular	BS5352	Outside	Threaded and Socket Weld Ends	29	840
800	Piston	Bolting bonnet	Full	BS5352	Outside	Threaded and Socket Weld Ends	29	640
800	Ball	Bolting bonnet	Regular	BS5352	Outside	Threaded and Socket Weld Ends	29	850
800	Ball	Bolting bonnet	Full	BS5352	Outside	Threaded and Socket Weld Ends	29	650
800	Swing	Bolting bonnet	Regular	BS5352	Outside	Threaded and Socket Weld Ends	29	860
800	Swing	Bolting bonnet	Full	BS5352	Outside	Threaded and Socket Weld Ends	29	660
800	Piston	Welded Bonnet	Regular	BS5352	Outside	Threaded and Socket Weld Ends	29	L840
800	Piston	Welded Bonnet	Full	BS5352	Outside	Threaded and Socket Weld Ends	29	L640
800	Ball	Welded Bonnet	Regular	BS5352	Outside	Threaded and Socket Weld Ends	29	L850
800	Ball	Welded Bonnet	Full	BS5352	Outside	Threaded and Socket Weld Ends	29	L650
1500	Piston	Bolting bonnet	Regular	BS5352	Outside	Threaded and Socket Weld Ends	29	R940
1500	Piston	Bolting bonnet	Full	BS5352	Outside	Threaded and Socket Weld Ends	29	940
1500	Ball	Bolting bonnet	Regular	BS5352	Outside	Threaded and Socket Weld Ends	29	R950
1500	Ball	Bolting bonnet	Full	BS5352	Outside	Threaded and Socket Weld Ends	29	950
1500	Swing	Bolting bonnet	Regular	BS5352	Outside	Threaded and Socket Weld Ends	29	R960
1500	Piston	Welded Bonnet	Regular	BS5352	Outside	Threaded and Socket Weld Ends	29	LR940
1500	Piston	Welded Bonnet	Full	BS5352	Outside	Threaded and Socket Weld Ends	29	L940
1500	Ball	Welded Bonnet	Regular	BS5352	Outside	Threaded and Socket Weld Ends	29	LR950
1500	Ball	Welded Bonnet	Full	BS5352	Outside	Threaded and Socket Weld Ends	29	L950
1500	Swing	Bolting bonnet	Full	BS5352	Outside	Threaded and Socket Weld Ends	30	960
1500	Piston	Ring Joint BB	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	30	RJ940
1500	Ball	Ring Joint BB	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	30	RJ950
1500	Swing	Ring Joint BB	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	30	RJ960
2500	Piston	Ring Joint BB	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	30	RJ2540
2500	Ball	Ring Joint BB	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	30	RJ2550
2500	Piston	Welded Bonnet	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	30	L2540
2500	Ball	Welded Bonnet	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	30	L2550
4500	Piston	Ring Joint BB	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	30	RJ4540
4500	Ball	Ring Joint BB	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	30	RJ4550
800	Piston Y Pattern	Welded Bonnet	Full	BS5352	Outside	Threaded and Socket Weld Ends	31	Y640
1500	Piston Y Pattern	Welded Bonnet	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	31	Y940
2500	Piston Y Pattern	Welded Bonnet	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	31	Y2540
4500	Piston	Welded Bonnet	Full	ANSI B16.34	Outside	Threaded and Socket Weld Ends	31	Y4540
150	Piston	Bolting bonnet	Regular	BS5352	Outside	Flanged	32	F1-840
150	Ball	Bolting bonnet	Regular	BS5352	Outside	Flanged	32	F1-850
300	Piston	Bolting bonnet	Regular	BS5352	Outside	Flanged	32	F3-840
300	Ball	Bolting bonnet	Regular	BS5352	Outside	Flanged	32	F3-850
600	Piston	Bolting bonnet	Regular	BS5352	Outside	Flanged	32	F6-840
150	Swing	Bolting bonnet	Regular	BS5352	Outside	Flanged	32	F1-860
300	Swing	Bolting bonnet	Regular	BS5352	Outside	Flanged	32	F3-860
600	Swing	Bolting bonnet	Regular	BS5352	Outside	Flanged	32	F6-860
600	Ball	Bolting bonnet	Regular	BS5352	Outside	Flanged	32	F6-850
150	Piston	Bolting bonnet	Full	BS5352	Outside	Flanged	32	F1-640
150	Ball	Bolting bonnet	Full	BS5352	Outside	Flanged	32	F1-650
300	Piston	Bolting bonnet	Full	BS5352	Outside	Flanged	32	F3-640
300	Ball	Bolting bonnet	Full	BS5352	Outside	Flanged	32	F3-650
600	Piston	Bolting bonnet	Full	BS5352	Outside	Flanged	32	F6-640
600	Ball	Bolting bonnet	Full	BS5352	Outside	Flanged	32	F6-650
150	Swing	Bolting bonnet	Full	BS5352	Outside	Flanged	32	F1-660
300	Swing	Ring Joint BB	Full	BS5352	Outside	Flanged	32	F3-RJ-660
600	Swing	Ring Joint BB	Full	BS5352	Outside	Flanged	32	F6-RJ-660
1500	Piston	Ring Joint BB	Full	BS5352	Outside	Flanged	33	F9-RJ-940
1500	Ball	Ring Joint BB	Full	BS5352	Outside	Flanged	33	F9-RJ-950
1500	Swing	Ring Joint BB	Full	BS5352	Outside	Flanged	33	F9-RJ-960
2500	Piston	Ring Joint BB	Full	ANSI B16.34	Outside	Flanged	33	F25-RJ-2540
2500	Ball	Ring Joint BB	Full	ANSI B16.34	Outside	Flanged	33	F25-RJ-2550
2500	Swing	Ring Joint BB	Full	ANSI B16.34	Outside	Flanged	33	F25-RJ-2560
1500	Piston Y Pattern	Welded Bonnet	Full	BS5352	Outside	Flanged	33	9-Y940
2500	Piston Y Pattern	Welded Bonnet	Full	ANSI B16.34	Outside	Flanged	33	25-Y2540





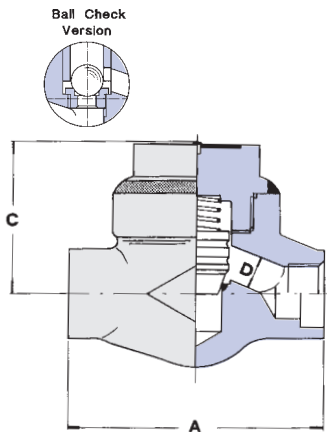
RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 800

PISTON, BALL AND SWING TYPE - REGULAR AND FULL PORT - BS 5352

Bolted Cover - Threaded and Socket Weld Ends

REGULAR PORT		PISTON 840 BALL 850 SWING 860	-	1/2	3/4	1	1.1/4	1.1/2	2	-		
FULL PORT		PISTON 640 BALL 650 SWING 660	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2		
End to End	PISTON - BALL	A	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.
	SWING	A	80 3.14	80 3.14	90 3.54	110 4.33	127 5.00	155 6.10	170 6.69	210 8.26	210 8.26	
Center to Top		C	53 2.08	53 2.08	60 2.36	73 2.87	80 3.14	98 3.85	118 4.64	150 5.90	150 5.90	
Dia. of Port	PISTON - BALL	D	7 0.28	9 0.35	13 0.51	17.5 0.69	22.5 0.88	29.5 1.16	35 1.38	45.5 1.79	45.5 1.79	
	SWING	D	8 0.31	9.6 0.38	14 0.55	18 0.70	24 0.94	30 1.18	37 1.45	48 1.89	48 1.89	
Approx. Weight	PISTON - BALL	Kg / Lb	1.3 2.8	1.3 2.8	1.4 3.0	2.4 5.2	4.0 8.8	7.4 16.2	8 17.6	18 39.6	18 39.6	
	SWING	Kg / Lb	1.3 2.8	1.3 2.8	1.4 3.0	2.4 5.2	4.0 8.8	5.5 12.1	6.5 14.3	17.5 38.5	17.5 38.5	



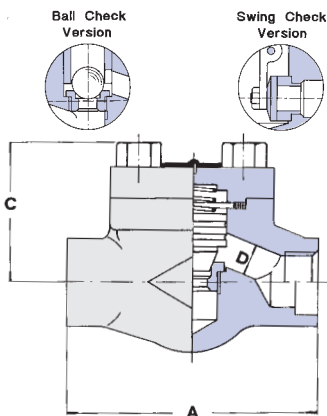
RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 800

PISTON AND BALL TYPE - REGULAR AND FULL PORT - BS 5352

Welded Cover - Threaded and Socket Weld Ends

REGULAR PORT		PISTON L840 BALL L850	-	1/2	3/4	1	1.1/4	1.1/2	2	-	
FULL PORT		PISTON L640 BALL L650	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2	
End to End	A	A	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.
	A	A	80 3.14	80 3.14	90 3.54	110 4.33	127 5.00	155 6.10	170 6.69	210 8.26	210 8.26
Center to Top		C	53 2.08	53 2.08	60 2.36	73 2.87	80 3.14	98 3.85	110 4.33	150 5.90	150 5.90
Dia. of Port		D	7 0.28	9 0.35	13 0.51	17.5 0.69	22.5 0.88	29.5 1.16	35 1.37	45.5 1.79	45.5 1.79
Approx. Weight		Kg / Lb	1.3 2.8	1.3 2.8	1.4 3.0	2.4 5.2	4.0 8.8	7.4 16.3	8 17.6	17 37.4	17 37.4



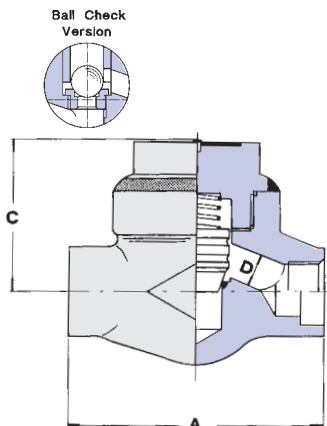
RATINGS: Carbon Steel - 3705 p.s.i. @ 100°F

CLASS 1500

PISTON, BALL AND SWING TYPE - REGULAR AND FULL PORT - BS 5352

Bolted Cover - Threaded and Socket Weld Ends

REGULAR PORT		PISTON R940 BALL R950 SWING R960	-	1/2	3/4	1	1.1/4	1.1/2	2	-	
FULL PORT		PISTON 940 BALL 950 SWING 960	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2	
End to End	PISTON - BALL	A	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.
	SWING	A	90 3.54	90 3.54	110 4.33	127 5.00	155 6.10	170 6.69	210 8.26	210 8.26	
Center to Top		C	60 2.36	60 2.36	73 2.87	80 3.14	98 3.85	118 4.64	150 5.90	150 5.90	
Dia. of Port	PISTON - BALL	D	7 0.28	9 0.35	13 0.51	17.5 0.69	21 0.83	28 1.10	33 1.30	37.5 1.48	
	SWING	D	8 0.31	9.6 0.38	14 0.55	18 0.70	24 0.94	30 1.18	37 1.45	40 1.57	
Approx. Weight	PISTON - BALL	Kg / Lb	1.5 3.3	1.5 3.3	2.8 6.1	4.6 10.1	7.4 16.2	9 19.8	19.5 43.1	19 41.8	
	SWING	Kg / Lb	1.6 3.5	1.5 3.3	2.4 5.2	4 8.8	6 13.2	9.5 20.9	19 41.8	18.5 40.7	



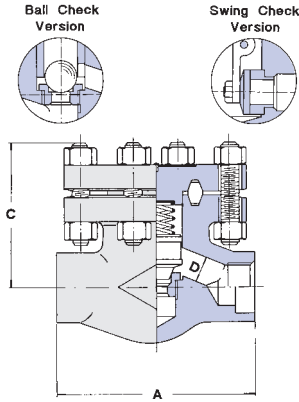
RATINGS: Carbon Steel - 3705 p.s.i. @ 100°F

CLASS 1500

PISTON AND BALL TYPE - REGULAR AND FULL PORT - BS 5352

Welded Cover - Threaded and Socket Weld Ends

REGULAR PORT		PISTON LR940 BALL LR950	-	1/2	3/4	1	1.1/4	1.1/2	2	-
FULL PORT		PISTON L940 BALL L950	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2
End to End	A	A	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.
	A	A	90 3.54	90 3.54	110 4.33	127 5.00	155 6.10	170 6.69	210 8.26	210 8.26
Center to Top		C	60 2.36	60 2.36	73 2.87	80 3.14	98 3.85	110 4.33	150 5.90	150 5.90
Dia. of Port		D	7 0.28	9 0.35	13 0.51	17 0.67	21 0.83	28 1.10	33 1.30	37.5 1.47
Approx. Weight		Kg / Lb	1.5 3.3	1.5 3.3	2.8 6.1	4.6 10.1	7.4 16.3	9 19.8	15 33.0	14.5 31.9



RATINGS: Carbon Steel - 3705 p.s.i. @ 100°F

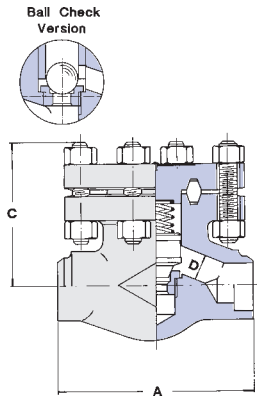
CLASS 1500 PISTON, BALL AND SWING TYPE - FULL PORT - BS 5352

Round Bolted Cover - Threaded and Socket Weld Ends

FULL PORT	PISTON BALL SWING	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	110	4.33	150	5.90	150	5.90	-	-	210	8.26	235	9.25
Center to Top	C	-	-	-	-	100	3.93	130	5.11	145	5.70	-	-	160	6.29	195	7.67
Dia. of Port	PISTON - BALL	D	-	-	-	13	0.51	17	0.67	21	0.83	-	-	33	1.30	37.5	1.48
	SWING	D	-	-	-	14	0.55	18	0.70	24	0.94	-	-	37	1.45	48	1.89
Approx. Weight	PISTON - BALL	Kg / Lb	-	-	-	4	8.8	7.5	16.5	9	19.8	-	-	18.5	40.7	30	66
	SWING	Kg / Lb	-	-	-	3.8	8.37	7	15.4	8.5	18.7	-	-	17.5	38.5	29	63.8

Spiral wound gasket joint available on request

Ring-Joint gasket according to ASME B16.20 - API 6A



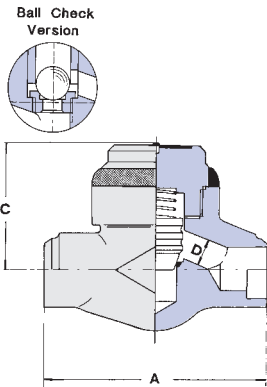
RATINGS: Carbon Steel - 6170 p.s.i. @ 100°F

CLASS 2500 PISTON AND BALL TYPE - FULL PORT - B16.34

Round Bolted Cover - Socket and Butt Weld Ends

FULL PORT	PISTON BALL	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	150	5.90	150	5.90	210	8.26	-	-	235	9.25	235	9.25
Center to Top	C	-	-	-	-	130	5.11	130	5.11	160	6.29	-	-	195	7.67	195	7.67
Dia. of Port	D	-	-	-	-	13	0.51	17	0.67	21	0.83	-	-	33	1.30	35	1.37
Approx. Weight	Kg / Lb	-	-	-	-	7	15.4	6.8	14.9	17.5	38.5	-	-	29	63.8	29	63.8

Ring-Joint gasket according to ASME B16.20 - API 6A

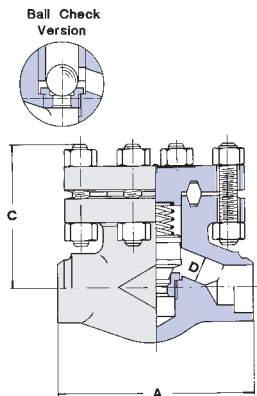


RATINGS: Carbon Steel - 6170 p.s.i. @ 100°F

CLASS 2500 PISTON AND BALL TYPE - FULL PORT - B16.34

Welded Cover - Socket and Butt Weld Ends

FULL PORT	PISTON BALL	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	127	5.00	155	6.10	170	6.69	-	-	235	9.25	235	9.25
Center to Top	C	-	-	-	-	80	3.14	98	3.85	110	4.33	-	-	170	6.69	170	6.69
Dia. of Port	D	-	-	-	-	13	0.51	17	0.67	21	0.83	-	-	33	1.30	35	1.37
Approx. Weight	Kg / Lb	-	-	-	-	5	11.0	8	17.6	10	22.0	-	-	21.5	47.3	21.3	46.9



RATINGS: Carbon Steel - 11110 p.s.i. @ 100°F

CLASS 4500 PISTON AND BALL TYPE - FULL PORT - B16.34

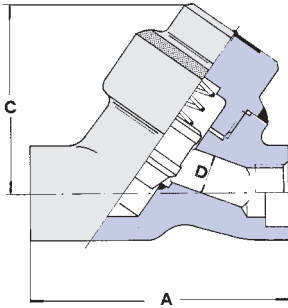
Round Bolted Cover - Socket and Butt Weld Ends

FULL PORT	PISTON BALL	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	210	8.26	210	8.26	235	9.25	-	-	235	9.25	-	-
Center to Top	C	-	-	-	-	160	6.29	160	6.29	195	7.67	-	-	195	7.67	-	-
Dia. of Port	D	-	-	-	-	9	0.35	11	0.43	14	0.55	-	-	28	1.10	-	-
Approx. Weight	Kg / Lb	-	-	-	-	18	39.6	18	39.6	29.5	65.0	-	-	29.5	65.0	-	-

Ring-Joint gasket according to ASME B16.20 - API 6A

CLASS 800

PISTON TYPE - FULL PORT - BS 5352
Welded Cover - Threaded and Socket Weld Ends

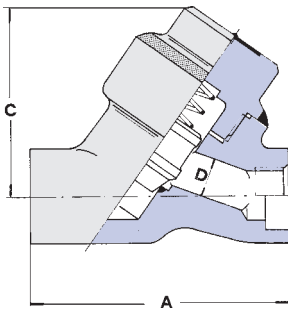


FULL PORT	Y640	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	90	3.54	90	3.54	90	3.54	90	3.54	127	5.00	127	5.00	155	6.10	180	7.08
Center to Top	C	65	2.55	65	2.55	65	2.55	65	2.55	80	3.14	95	3.74	115	4.52	135	5.31
Dia. of Port	D	7	0.27	9	0.35	13	0.51	17.5	0.68	22.5	0.88	29.5	1.16	35	1.37	45.5	1.79
Approx. Weight	Kg / Lb	1.2	2.6	1.2	2.6	1.2	2.6	1.2	2.6	3	6.6	3.3	7.2	5.8	12.7	7	15.4

RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 1500-1700

WELDED BONNET - FULL PORT - BS 5352
Welded Cover - Threaded and Socket Weld Ends

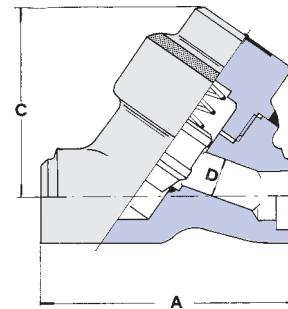


FULL PORT	Y940 Y940*	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	90	3.54	90	3.54	90	3.54	127	5.00	127	5.00	155	6.10	155	6.10	180	7.08
Center to Top	C	70	2.75	70	2.75	70	2.75	100	3.93	100	3.93	120	4.72	120	4.72	140	5.51
Dia. of Port	D	7	0.27	9	0.35	11	0.43	15	0.59	19.5	0.76	27.5	1.08	31.5	1.24	39	1.53
Approx. Weight	Kg / Lb	1.5	3.3	1.5	3.3	1.5	3.3	3.2	7.0	3.2	7.0	6	13.2	6.2	13.6	9.5	20.9

RATINGS: Carbon Steel
Class 1500 - 3705 p.s.i. @ 100°F
*Class 1700 - 4198 p.s.i. @ 100°F

CLASS 2500-2700

WELDED BONNET - FULL PORT - B16.34
Welded Cover - Socket and Butt Weld Ends

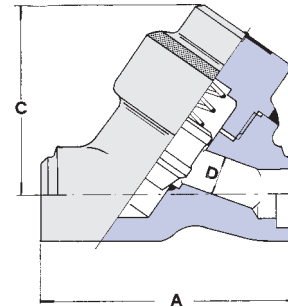


FULL PORT	Y2540 Y2540*	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	127	5.00	127	5.00	127	5.00	127	5.00	155	6.10	155	6.10	180	7.08	225	8.86
Center to Top	C	115	4.52	115	4.52	115	4.52	120	4.72	150	5.90	150	5.90	160	6.30	170	6.70
Dia. of Port	D	7	0.27	9	0.35	11	0.43	15	0.59	19.5	0.76	27.5	1.08	31.5	1.24	39	1.53
Approx. Weight	Kg / Lb	3.2	7.0	3.2	7.0	3.5	7.7	3.5	7.7	6.2	13.7	5.6	12.3	10.4	22.9	14	30.8

RATINGS: Carbon Steel
Class 2500 - 6170 p.s.i. @ 100°F
*Class 2700 - 6664 p.s.i. @ 100°F

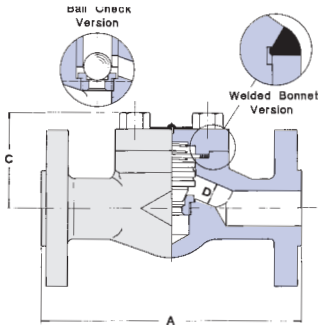
CLASS 4500

PISTON TYPE - FULL PORT - B16.34
Welded Cover - Socket and Butt Weld Ends



FULL PORT	Y4540	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	155	6.10	155	6.10	155	6.10	155	6.10	155	6.10	-	-	225	8.86	225	8.86
Center to Top	C	120	4.72	120	4.72	120	4.72	120	4.72	145	5.70	-	-	160	6.30	160	6.30
Dia. of Port	D	7	0.27	9	0.35	11	0.43	11	0.43	15	0.59	-	-	26	1.02	28	1.10
Approx. Weight	Kg / Lb	8.7	19.1	8.7	19.1	8.7	19.1	8.0	17.6	7.6	16.7	-	-	16.5	36.3	16	35.2

RATINGS: Carbon Steel - 11110 p.s.i. @ 100°F



RATINGS: Carbon Steel
 Class 150 - 285 p.s.i. @ 100°F
 Class 300 - 740 p.s.i. @ 100°F
 Class 600 - 1480 p.s.i. @ 100°F

CLASS 150-300-600 PISTON AND BALL TYPE - REGULAR PORT - BS 5352

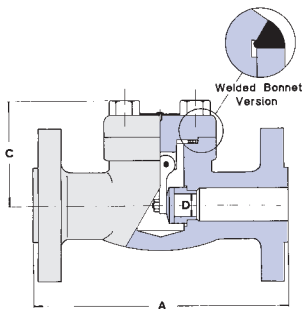
Bolted Cover - Integral Flanged Ends according to ASME B16.5

REGULAR PORT			1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
			mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
Class 150	PISTON BALL F1-840 F1-850	A	-	-	-	-	108	4.25	118	4.64	127	5.00	-	-	165	6.49	203	7.99
Class 300	PISTON BALL F3-840 F3-850	A	-	-	-	-	153	6.02	178	7.00	203	7.99	-	-	229	9.01	267	10.5
Class 600	PISTON BALL F6-840 F6-850	A	-	-	-	-	165	6.49	191	7.51	216	8.50	-	-	241	9.48	292	11.5
Center to Top Open	Class 150	C	-	-	-	-	75	2.95	92	3.62	98	3.85	-	-	98	3.85	110	4.33
	Class 300-600	C	-	-	-	-	53	2.08	60	2.36	73	2.87	-	-	98	3.85	110	4.33
Dia. of Port		D	-	-	-	-	9	0.35	13	0.51	17.5	0.69	-	-	29.5	1.16	35	1.37
Approx. Weight	Class 150	Kg/Lb	-	-	-	-	2.9	6.4	3.2	7.0	4.3	9.5	-	-	6.5	14.3	14.5	31.9
	Class 300	Kg/Lb	-	-	-	-	3.6	7.9	4.2	9.2	6	13.2	-	-	12	26.4	16	35.2
	Class 600	Kg/Lb	-	-	-	-	4.1	9.0	4.7	10.4	6.3	13.8	-	-	13	28.6	17	37.4

End to End dimensions according to ASME B16.10

CLASS 150-300-600 SWING TYPE - REGULAR PORT - BS 5352

Round Bolted Cover - Integral Flanged Ends according to ASME B16.5



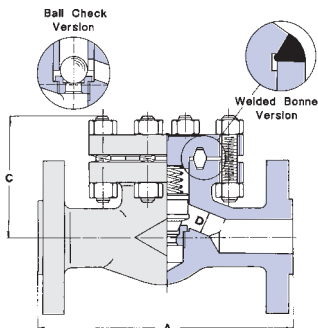
RATINGS: Carbon Steel
 Class 150 - 285 p.s.i. @ 100°F
 Class 300 - 740 p.s.i. @ 100°F
 Class 600 - 1480 p.s.i. @ 100°F

FULL PORT			1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
			mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
Class 150	F1-860	A	-	-	-	-	108	4.25	118	4.64	127	5.00	-	-	165	6.49	203	7.99
Class 300	F3-860	A	-	-	-	-	153	6.02	178	7.00	216	8.50	-	-	241	9.48	267	10.5
Class 600	F6-860	A	-	-	-	-	165	6.49	191	7.51	216	8.50	-	-	241	9.48	292	11.5
Center to Top Open	Class 150	C	-	-	-	-	75	2.95	92	3.62	98	3.85	-	-	98	3.85	110	4.33
	Class 300-600	C	-	-	-	-	53	2.08	60	2.36	73	2.87	-	-	98	3.85	110	4.33
Dia. of Port		D	-	-	-	-	9.6	0.38	14	0.55	18	0.70	-	-	30	1.18	37	1.45
Approx. Weight	Class 150	Kg/Lb	-	-	-	-	2.9	6.4	3.2	7.0	4.3	9.5	-	-	6.5	14.3	14.5	31.9
	Class 300	Kg/Lb	-	-	-	-	3.6	7.9	4.2	9.2	6.1	13.4	-	-	13	28.6	16	35.2
	Class 600	Kg/Lb	-	-	-	-	4.1	9.0	4.7	10.4	6.3	13.8	-	-	13	28.6	17	37.4

End to End dimensions according to ASME B16.10

CLASS 150-300-600 PISTON AND BALL TYPE - REGULAR PORT - BS 5352

Bolted Cover - Integral Flanged Ends according to ASME B16.5



RATINGS: Carbon Steel
 Class 150 - 285 p.s.i. @ 100°F
 Class 300 - 740 p.s.i. @ 100°F
 Class 600 - 1480 p.s.i. @ 100°F

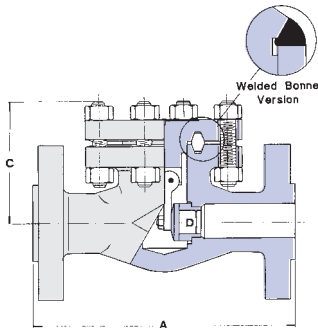
REGULAR PORT			1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
			mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
Class 150	PISTON BALL F1-640 F1-650	A	-	-	-	-	108	4.25	118	4.64	127	5.00	-	-	165	6.49	203	7.99
Class 300	PISTON BALL F3-RJ640 F3-RJ650	A	-	-	-	-	153	6.02	178	7.00	203	7.99	-	-	229	9.01	267	10.5
Class 600	PISTON BALL F6-RJ640 F6-RJ650	A	-	-	-	-	165	6.49	191	7.51	216	8.50	-	-	241	9.48	292	11.5
Center to Top Open	Class 150	C	-	-	-	-	75	2.95	100	3.93	110	4.33	-	-	120	4.72	147	5.78
	Class 300-600	C	-	-	-	-	115	4.52	130	5.11	140	5.51	-	-	170	6.69	195	7.67
Dia. of Port		D	-	-	-	-	13	0.51	17.5	0.69	22.5	0.89	-	-	35	1.37	45.5	1.79
Approx. Weight	Class 150	Kg/Lb	-	-	-	-	3.2	7.0	3.5	7.7	4.6	10.1	-	-	7.0	15.4	16	35.2
	Class 300	Kg/Lb	-	-	-	-	4.6	10.1	6.1	13.4	9.1	20.0	-	-	16	35.2	21	46.2
	Class 600	Kg/Lb	-	-	-	-	4.8	10.5	6.3	13.8	9.3	20.5	-	-	16.5	36.3	22	48.4

End to End dimensions according to ASME B16.10
 Spiral wound gasket joint and for #150

Ring-Joint gasket according to ASME B16.20 - API 6A

CLASS 150-300-600 SWING TYPE - REGULAR PORT - BS 5352

Bolted Cover - Integral Flanged Ends according to ASME B16.5



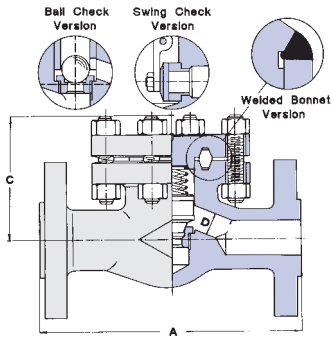
RATINGS: Carbon Steel
 Class 150 - 285 p.s.i. @ 100°F
 Class 300 - 740 p.s.i. @ 100°F
 Class 600 - 1480 p.s.i. @ 100°F

REGULAR PORT			1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
			mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
Class 150	F1-660	A	-	-	-	-	108	4.25	118	4.64	127	5.00	-	-	165	6.49	203	7.99
Class 300	F3-RJ660	A	-	-	-	-	153	6.02	178	7.00	216	8.50	-	-	241	9.48	267	10.5
Class 600	F6-RJ660	A	-	-	-	-	165	6.49	191	7.51	216	8.50	-	-	241	9.48	292	11.5
Center to Top Open	Class 150	C	-	-	-	-	75	2.95	100	3.93	110	4.33	-	-	120	4.72	147	5.78
	Class 300-600	C	-	-	-	-	115	4.52	130	5.11	140	5.51	-	-	170	6.69	195	7.67
Dia. of Port		D	-	-	-	-	14	0.55	18	0.70	24	0.94	-	-	37	1.45	48	1.89
Approx. Weight	Class 150	Kg/Lb	-	-	-	-	3.1	6.8	3.4	7.5	4.5	9.9	-	-	6.8	14.9	15.7	34.5
	Class 300	Kg/Lb	-	-	-	-	4.6	10.1	6.1	13.4	9.3	20.5	-	-	16.5	36.3	21	46.2
	Class 600	Kg/Lb	-	-	-	-	4.8	10.5	6.3	13.8	9.3	20.5	-	-	16.5	36.3	22	48.4

End to End dimensions according to ASME B16.10
 Spiral wound gasket joint for #150

Ring-Joint gasket according to ASME B16.20 - API 6A





RATINGS: Carbon Steel - 3075 p.s.i. @ 100°F

CLASS 1500

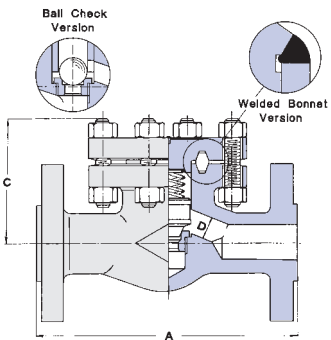
PISTON, BALL AND SWING TYPE - FULL PORT - BS 5352

Round Bolted Cover - Integral Flanged Ends according to ASME B16.5

FULL PORT	PISTON F9-RJ940 BALL F9-RJ950 SWING F9-RJ960	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	216	8.50	229	9.01	254	10.0	-	-	305	12.0	368	14.5
Center to Top	C	-	-	-	-	130	5.11	140	5.51	155	6.10	-	-	170	6.69	195	7.67
Dia. of Port	PISTON - BALL	D	-	-	-	13	0.51	17	0.67	21	0.83	-	-	33	1.30	37.5	1.48
	SWING	D	-	-	-	14	0.55	18	0.70	24	0.94	-	-	37	1.45	48	1.89
Approx. Weight	PISTON - BALL	Kg / Lb	-	-	-	8	17.6	14	30.8	17	37.5	-	-	28	61.6	37	81.4
	SWING	Kg / Lb	-	-	-	7.8	17.1	13.8	30.4	16.5	36.3	-	-	27	59.5	35	77.1

End to End dimensions according to ASME B16.10
Spiral wound gasket joint available on request

Ring-Joint gasket according to ASME B16.20 - API 6A



RATINGS: Carbon Steel - 6170 p.s.i. @ 100°F

CLASS 2500

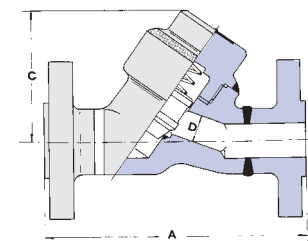
PISTON AND BALL TYPE - FULL PORT - B16.34

Round Bolted Cover - Integral Flanged Ends according to ASME B16.5

FULL PORT	PISTON F25-RJ2540 BALL F25-RJ2550	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	264	10.4	273	10.7	308	12.1	-	-	384	15.1	451	17.7
Center to Top	C	-	-	-	-	155	6.10	155	6.10	170	6.69	-	-	245	9.64	260	10.23
Dia. of Port	D	-	-	-	-	11	0.43	17	0.67	21	0.83	-	-	33	1.30	37.5	1.48
Approx. Weight	Kg / Lb	-	-	-	-	17	37.5	21	46.2	28	61.6	-	-	58	127.7	85	187.2

End to End dimensions according to ASME B16.10

Ring-Joint gasket according to ASME B16.20 - API 6A



RATINGS: Carbon Steel - 3705 p.s.i. @ 100°F

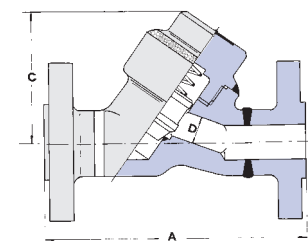
CLASS 1500

PISTON TYPE - FULL PORT - BS 5352

Welded Cover - Flanged Ends according to ASME B16.5

FULL PORT	9-Y940	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	216	8.50	229	9.01	254	10.0	-	-	305	12.0	368	14.5
Center to Top	C	-	-	-	-	70	2.75	100	3.93	100	3.93	-	-	120	4.72	140	5.51
Dia. of Port	D	-	-	-	-	11	0.43	15	0.59	19.5	0.76	-	-	31.5	1.24	39	1.53
Approx. Weight	Kg / Lb	-	-	-	-	7.4	16.3	9.5	21.0	10.6	23.3	-	-	18.2	40.0	33.5	73.8

End to End dimensions according to ASME B16.10



RATINGS: Carbon Steel - 6170 p.s.i. @ 100°F

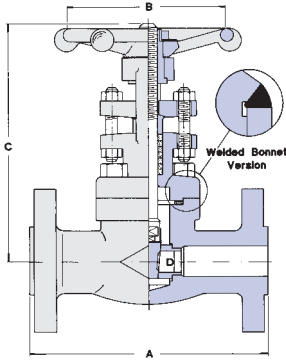
CLASS 2500

PISTON TYPE - FULL PORT - B16.34

Welded Cover - Flanged Ends according to ASME B16.5

FULL PORT	25-Y2540	1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	264	10.4	273	10.7	308	12.1	-	-	384	15.1	451	17.7
Center to Top	C	-	-	-	-	115	4.52	120	4.72	150	5.90	-	-	165	6.49	180	7.08
Dia. of Port	D	-	-	-	-	11	0.43	15	0.59	19.5	0.76	-	-	31.5	1.24	39	1.53
Approx. Weight	Kg / Lb	-	-	-	-	12	26.4	14.2	31.3	20.2	44.5	-	-	37.4	82.3	65.6	144.5

End to End dimensions according to ASME B16.10



RATINGS: Carbon Steel
 Class 10K - 14 bar @ 29°F
 Class 20K - 34 bar @ 29°F
 Class 40K - 68 bar @ 29°F

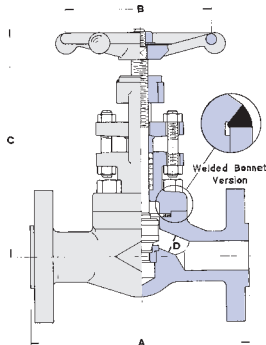
CLASS 10K-20K-40K

GATE VALVES - BOLTED BONNET- REGULAR PORT

Outside Screw & Yoke - Integral Flanged Ends according to JIS B2238

REGULAR PORT		1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
Class 10K	F10K-810	A	-	-	-	108	4.25	117	4.64	127	5.00	-	-	165	6.49	178	7.00
Class 20K	F20K-810	A	-	-	-	140	5.51	152	5.98	165	6.49	-	-	190	7.48	216	8.50
Class 40K	F40K-810	A	-	-	-	165	6.49	190	7.48	216	8.50	-	-	241	9.48	292	11.5
Handwheel		B	-	-	-	80	3.14	80	3.14	110	4.33	-	-	130	5.11	130	5.11
Center to Top Open	Class 10K-20K	C	-	-	-	170	6.69	195	7.67	203	7.99	-	-	243	9.56	262	10.3
	Class 40K	C	-	-	-	148	5.82	163	6.41	178	7.00	-	-	243	9.56	262	10.3
Dia. of Port		D	-	-	-	9.6	0.38	14	0.55	18	0.70	-	-	30	1.18	37	1.45
Approx. Weight	Class 10K	Kg/Lb	-	-	-	3.4	7.5	3.8	8.3	5.7	12.5	-	-	9.7	21.4	13.2	29.1
	Class 20K	Kg/Lb	-	-	-	3.9	8.6	5	11.0	6.2	13.6	-	-	12	26.4	16.5	36.3
	Class 40K	Kg/Lb	-	-	-	4	8.8	5.2	11.4	7.5	16.5	-	-	15	33.0	20.5	45.1

End to End dimensions according to JIS B2002



RATINGS: Carbon Steel
 Class 10K - 14 bar @ 29°F
 Class 20K - 34 bar @ 29°F
 Class 40K - 68 bar @ 29°F

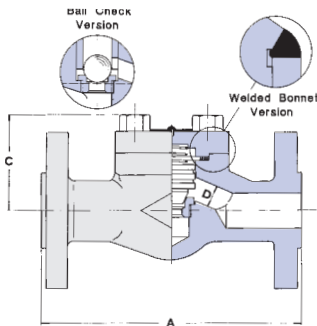
CLASS 10K-20K-40K

GATE VALVES - BOLTED BONNET- REGULAR PORT

Outside Screw & Yoke - Integral Flanged Ends according to JIS B2238

REGULAR PORT		1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
Class 10K	F10K-830	A	-	-	-	108	4.25	117	4.60	127	5.00	-	-	165	6.49	203	7.99
Class 20K	F20K-830	A	-	-	-	152	5.98	178	7.00	203	7.99	-	-	229	9.01	267	10.5
Class 40K	F40K-830	A	-	-	-	165	6.49	190	7.48	216	8.50	-	-	241	9.48	292	11.5
Handwheel		B	-	-	-	80	3.14	80	3.14	110	4.33	-	-	130	5.11	180	7.08
Center to Top Open	Class 20K-40K	C	-	-	-	148	5.82	165	6.49	180	7.08	-	-	248	9.76	257	10.1
	Class 10K	C	-	-	-	170	6.69	197	7.75	205	8.07	-	-	248	9.76	257	10.1
Dia. of Port		D	-	-	-	9	0.35	13	0.51	17.5	0.69	-	-	29.5	1.16	35	1.37
Approx. Weight	Class 10K	Kg/Lb	-	-	-	3.4	7.5	4	8.8	5.7	12.5	-	-	10	22.0	17.0	37.4
	Class 20K	Kg/Lb	-	-	-	4	8.8	5	11.0	7.3	16.1	-	-	14	30.8	20.5	45.1
	Class 40K	Kg/Lb	-	-	-	4.5	9.9	5.5	12.1	7.6	16.7	-	-	15	33.0	21	46.2

End to End dimensions according to JIS B2002



RATINGS: Carbon Steel
 Class 10K - 14 bar @ 29°F
 Class 20K - 34 bar @ 29°F
 Class 40K - 68 bar @ 29°F

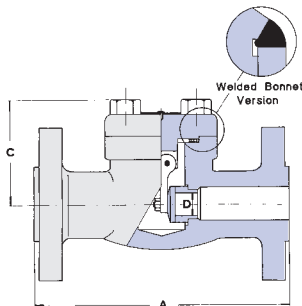
CLASS 10K-20K-40K

PISTON AND BALL VALVES - BOLTED COVER - REGULAR PORT

Integral Flanged Ends according to JIS B2238

REGULAR PORT		1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
Class 10K	PISTON BALL F10K-840 BALL F10K-850	A	-	-	-	108	4.25	117	4.60	127	5.00	-	-	165	6.49	203	7.99
Class 20K	PISTON BALL F20K-840 BALL F20K-850	A	-	-	-	152	5.98	178	7.00	203	7.99	-	-	229	9.01	267	10.5
Class 40K	PISTON BALL F40K-840 BALL F40K-850	A	-	-	-	165	6.49	190	7.48	216	8.50	-	-	241	9.48	292	11.5
Center to Top Open	Class 10K	C	-	-	-	75	2.95	92	3.62	98	3.85	-	-	98	3.85	110	4.33
	Class 20K-40K	C	-	-	-	53	2.08	60	2.36	73	2.87	-	-	98	3.85	110	4.33
Dia. of Port		D	-	-	-	9	0.35	13	0.51	17.5	0.69	-	-	29.5	1.16	35	1.37
Approx. Weight	Class 10K	Kg/Lb	-	-	-	2.9	6.4	3.2	7.0	4.3	9.5	-	-	6.5	14.3	14.5	31.9
	Class 20K	Kg/Lb	-	-	-	3.6	7.9	4.2	9.2	6	13.2	-	-	12	26.4	16	35.2
	Class 40K	Kg/Lb	-	-	-	4.1	9.0	4.7	10.4	6.3	13.8	-	-	13	28.6	17	37.4

End to End dimensions according to JIS B2002



RATINGS: Carbon Steel
 Class 10K - 14 bar @ 29°F
 Class 20K - 34 bar @ 29°F
 Class 40K - 68 bar @ 29°F

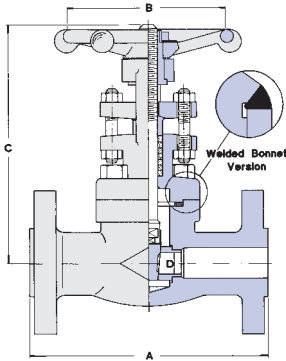
CLASS 10K-20K-40K

SWING VALVES - BOLTED COVER - REGULAR PORT

Integral Flanged Ends according to JIS B2238

REGULAR PORT		1/4		3/8		1/2		3/4		1		1.1/4		1.1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
Class 10K	F10K-860	A	-	-	-	108	4.25	117	4.60	127	5.00	-	-	165	6.49	203	7.99
Class 20K	F20K-860	A	-	-	-	153	6.02	178	7.00	203	7.99	-	-	229	9.01	267	10.5
Class 40K	F40K-860	A	-	-	-	165	6.49	190	7.48	216	8.50	-	-	241	9.48	292	11.5
Center to Top Open	Class 10K	C	-	-	-	75	2.95	92	3.62	98	3.85	-	-	98	3.85	110	4.33
	Class 20K-40K	C	-	-	-	53	2.08	60	2.36	73	2.87	-	-	98	3.85	110	4.33
Dia. of Port		D	-	-	-	9.6	0.38	14	0.55	18	0.70	-	-	30	1.18	37	1.45
Approx. Weight	Class 10K	Kg/Lb	-	-	-	2.9	6.4	3.2	7.0	4.3	9.5	-	-	6.5	14.3	14.5	31.9
	Class 20K	Kg/Lb	-	-	-	3.6	7.9	4.2	9.2	6.1	13.4	-	-	13	28.6	16	35.2
	Class 40K	Kg/Lb	-	-	-	4.1	9.0	4.7	10.4	6.3	13.8	-	-	13	28.6	17	37.4

End to End dimensions according to JIS B2002



RATINGS: Carbon Steel
DIN PIN - 25-40 - 40 bar @ 29°C
DIN PIN - 63-100 - 100 bar @ 29°C

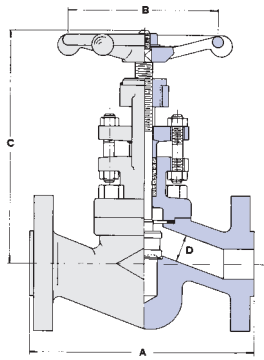
DIN PN25/40/63/100 GATE VALVES - BOLTED BONNET - FULL PORT

Outside Screw & Yoke - Integral Flanged Ends according to DIN 2634/2635/2636/2637

FULL PORT	PN25	F4U-610 F10U-610	-		DIN 15		DIN 20		DIN 25		DIN 32		DIN 40		DIN 50	
	PN100		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	PN 25-40	A	-	-	130	5.11	150	5.90	160	6.30	-	-	240	9.44	250	9.84
	PN 63-100	A	-	-	140	5.51	150	5.90	160	6.30	-	-	240	9.44	250	9.84
Handwheel		B	-	-	80	3.14	110	4.33	110	4.33	-	-	130	5.11	180	7.08
Center to Top Open		C	-	-	152	5.98	182	7.16	214	8.42	-	-	270	10.6	333	13.1
Dia of Port		D	-	-	14	0.55	18	0.70	24	0.94	-	-	37	1.45	47	1.85
Approx.	PN 25-40	Kg / Lb	-	-	4.4	9.7	6.5	14.3	7.9	17.4	-	-	13	28.6	24.5	53.9
Weight	PN 63-100	Kg / Lb	-	-	5	11.0	7.4	16.3	9.4	20.7	-	-	15	33.0	27	59.4

End to End dimensions according to DIN 3202

PN 63 and PN 100 Welded Flanged



RATINGS: Carbon Steel
DIN PIN - 25-40 - 40 bar @ 29°C
DIN PIN - 63-100 - 100 bar @ 29°C

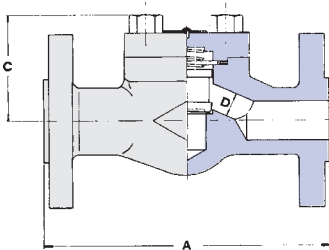
DIN PN25/40/63/100 GLOBE VALVES - BOLTED BONNET - FULL PORT

Outside Screw & Yoke - Integral Flanged Ends according to DIN 2634/2635/2636/2637

FULL PORT	PN25	F4U-630 F10U-630	-		DIN 15		DIN 20		DIN 25		DIN 32		DIN 40		DIN 50	
	PN100		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	PN 25-40	A	-	-	130	5.11	150	5.90	160	6.30	-	-	200	7.87	230	9.05
	PN 63-100	A	-	-	210	8.26	230	9.05	230	9.05	-	-	260	10.2	300	11.8
Handwheel		B	-	-	80	3.14	110	4.33	110	4.33	-	-	130	5.11	180	7.08
Center to Top Open		C	-	-	180	7.08	185	7.28	215	8.46	-	-	260	10.2	230	9.0
Dia of Port		D	-	-	15	0.59	19	0.75	24	0.95	-	-	38	1.49	50	1.96
Approx.	PN 25-40	Kg / Lb	-	-	5	11.0	6.5	14.3	8.5	18.7	-	-	14	30.8	24.5	53.9
Weight	PN 63-100	Kg / Lb	-	-	6.5	14.3	8.0	17.6	10	22.0	-	-	16.5	36.3	30	66.0

End to End dimensions according to DIN 3202

PN 63 and PN 100 Welded Flanged



RATINGS: Carbon Steel
DIN PIN - 25-40 - 40 bar @ 29°C
DIN PIN - 63-100 - 100 bar @ 29°C

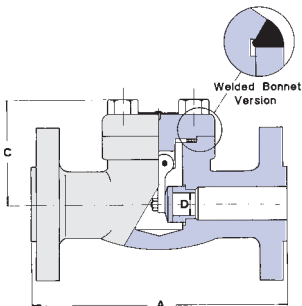
DIN PN25/40/63/100 PISTON CHECK - BOLTED COVER - FULL PORT

Integral Flanged Ends according to DIN 2634/2635/2636/2637

FULL PORT	PN25	F4U-640 F10U-640	-		DIN 15		DIN 20		DIN 25		DIN 32		DIN 40		DIN 50	
	PN100		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	PN 25-40	A	-	-	130	5.11	150	5.90	160	6.30	-	-	200	7.87	230	9.05
	PN 63-100	A	-	-	210	8.26	230	9.05	230	9.05	-	-	260	10.2	300	11.8
Center to Top Open		C	-	-	85	3.34	90	3.54	95	3.74	-	-	135	5.31	120	4.72
Dia of Port		D	-	-	15	0.59	19	0.75	24	0.95	-	-	38	1.49	50	1.96
Approx.	PN 25-40	Kg / Lb	-	-	3.5	7.7	4.0	8.8	6.0	13.2	-	-	11	24.2	16	35.2
Weight	PN 63-100	Kg / Lb	-	-	5	11.0	5.5	12.1	7.5	16.5	-	-	13.5	29.7	21.5	47.3

End to End dimensions according to DIN 3202

PN 63 and PN 100 Welded Flanged



RATINGS: Carbon Steel
DIN PIN - 25-40 - 40 bar @ 29°C
DIN PIN - 63-100 - 100 bar @ 29°C

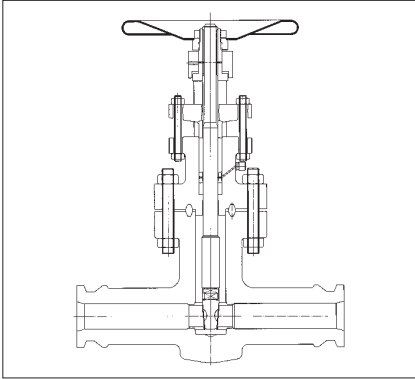
DIN PN25/40/63/100 PISTON CHECK - BOLTED COVER - FULL PORT

Integral Flanged Ends according to DIN 2634/2635/2636/2637

FULL PORT	PN25	F4U-640 F10U-640	-		DIN 15		DIN 20		DIN 25		DIN 32		DIN 40		DIN 50	
	PN100		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	PN 25-40	A	-	-	130	5.11	150	5.90	160	6.30	-	-	200	7.87	230	9.05
	PN 63-100	A	-	-	210	8.26	230	9.05	230	9.05	-	-	260	10.2	300	11.8
Center to Top Open		C	-	-	85	3.34	90	3.54	95	3.74	-	-	135	5.31	120	4.72
Dia of Port		D	-	-	14	0.55	18	0.70	24	0.94	-	-	37	1.45	47	1.85
Approx.	PN 25-40	Kg / Lb	-	-	3.2	7.0	3.5	7.7	5.5	12.1	-	-	10.5	23.1	15	33.0
Weight	PN 63-100	Kg / Lb	-	-	4.7	10.3	5	11.0	7	15.4	-	-	13	28.6	20.5	45.1

End to End dimensions according to DIN 3202

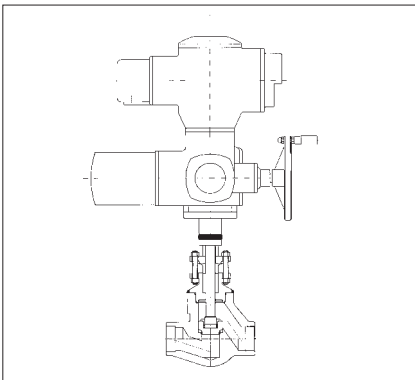
PN 63 and PN 100 Welded Flanged



GATE - GLOBE AND CHECK VALVES WITH CLAMPS

FIGURE	CLASSES	MATERIALS
CLxxx	1500	Carbon Steel
	2500	Stainless and Alloy
	4500	Exotic Materials

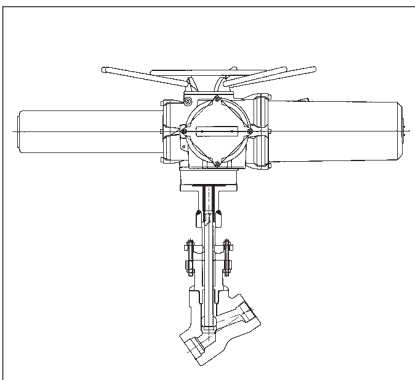
Please contact OMB offices for dimensional data



ELECTRIC ACTUATOR

FIGURE	CLASSES	MATERIALS
EA-xxx	150	Carbon Steel
	to	Stainless and Alloy
	2500	Exotic Materials

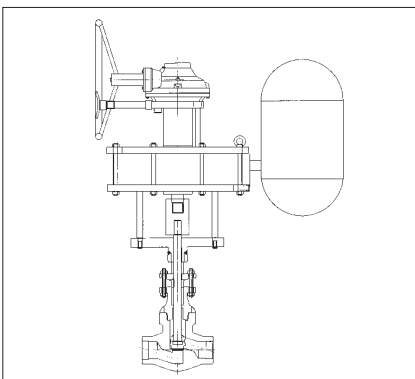
Please contact OMB offices for dimensional data



ELECTRIC ACTUATOR

FIGURE	CLASSES	MATERIALS
EA-xxx	1500	Carbon Steel
	to	Stainless and Alloy
	2500	Exotic Materials

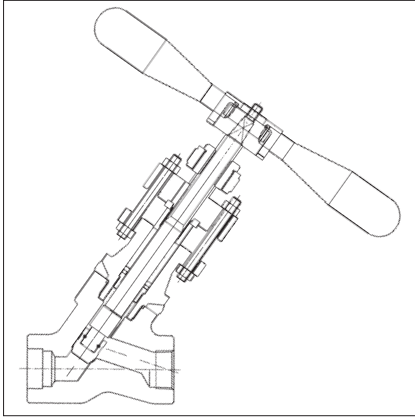
Please contact OMB offices for dimensional data



PNEUMATIC ACTUATOR

FIGURE	CLASSES	MATERIALS
PA-xxx	150	Carbon Steel
	to	Stainless and Alloy
	2500	Exotic Materials

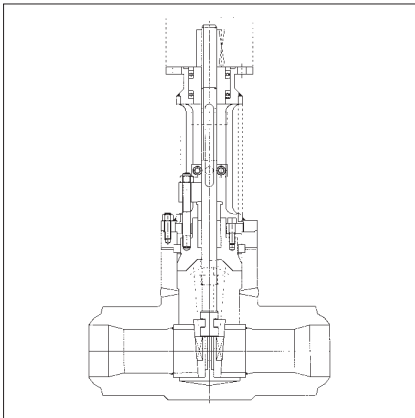
Please contact OMB offices for dimensional data



GLOBE - Y PATTERN LOOSE BACKSEAT

FIGURE	DIAM	CLASSES	MATERIALS
	1/2"	1670	Carbon Steel
	to	2700	Alloy Steel
	4"	4500	Special Alloys

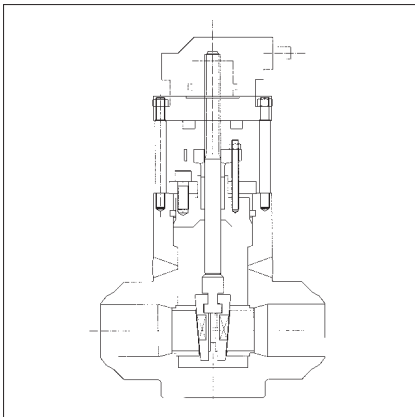
See OMB C-YV-1 catalog
Please contact OMB offices for dimensional data



FORGED PRESSURE SEAL GATE, GLOBE AND CHECK

FIGURE	DIAM	CLASSES	MATERIALS
PS-xx	2"	150	Carbon Steel
	to	to	Alloy Steel
	8"	6500	Special Alloys

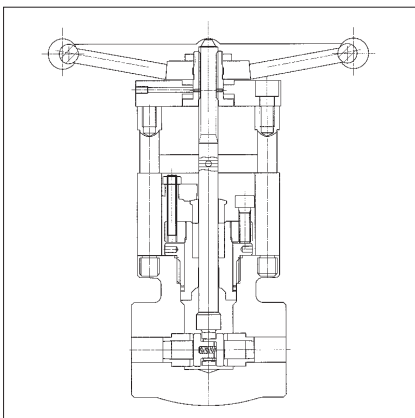
See OMB C-PS-2 catalog
Please contact OMB offices for dimensional data



FORGED PRESSURE SEAL GATE, GLOBE AND CHECK

FIGURE	DIAM	CLASSES	MATERIALS
PS-xx	2"	1500	Carbon Steel
	to	to	Alloy Steel
	6"	2500	Special Alloys

See OMB C-PS-2 catalog
Please contact OMB offices for dimensional data



PARALLEL SLIDE PRESSURE SEAL GATE VALVES

FIGURE	DIAM	CLASSES	MATERIALS
PS-PL-xx	1/2"	1500	Carbon Steel
	to	to	Alloy Steel
	2"	2500	Special Alloys

Please contact OMB offices for dimensional data

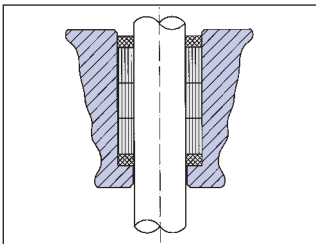
Asbestos-free packing is composed by a series of rings of pure graphite. The sets is closed with two rings, top and bottom, anti-extrusion, manufactured in braided graphite. Both internal and external rings are treaded with corrosion inhibitor.

Asbestos-free gaskets used on bolted bonnet valves are of the spiral-wound type in Stainless Steel 316 and pure graphite. On class 1500 valves, ring-joint gaskets in accordance with ANSI B16.20 - API 6A can be used.

Spare Parts: OMB maintains an extensive inventory of packing and gaskets spares. To individuate the require one please refer to the information shown on OMB's data sheets (assembly drawings), indicating code and composition of the sets.

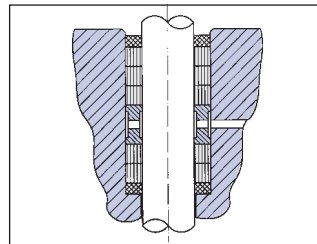
A comprehensive updated list of packing and gaskte for each design/figure is available online at www.ombvalves.com

OMB offers a wide range of solutions to control fugitive emissions in **packed valves**.



GRAFITE PACKING

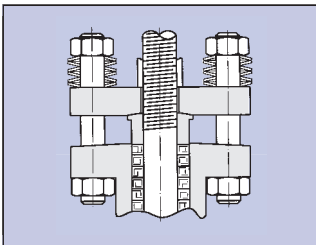
Tight control on stem and packing chamber walls finishing and material purity and density in the packing guarantee a leak-proof sealing to EPA requisitions.



LANTERN PACKING

(on request)

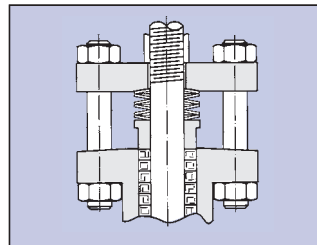
The lantern ring solution provide a way to verify the packing operation and a grease injector option to increase packing seal.



LIVE LOADING BOLTS LOADED TYPE

(on request)

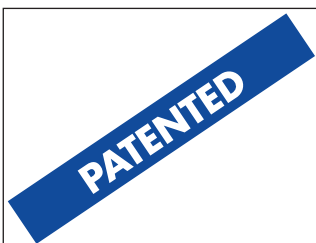
Two sets of Belleville springs keep gland flange pressure on packing for long periods of time without maintenance.



LIVE LOADING GLAND LOADED TYPE

(on request)

Sets of belleville springs keep gland pressure on packing for long periods of time without maintenance.

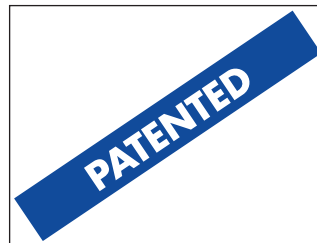


GARLOCK® EVSP 9000

(on request)

OMB offers this superior designed chevron-style graphite packing.

ISA testing qualification for BP.



ARMA-SEAL 312™

(on request)

OMB valves qualified to ISO15848 testing using this special designed packing.

Shell 77/312 qualification.

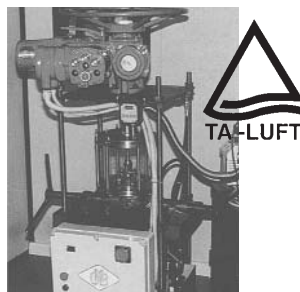
EMISSION CONTROL TESTING & QUALIFICATION

OMB has been involved in extensive testing of various packing solutions which lead to major improvements in the standard design and qualification by the main relevant specifications.



ISO TESTING

Valve cycle tester using a mass spectrometer in sniffer mode to measure helium leakage from the valve gland.



TA-LUFT TESTING

Valve cycle tester with vacuum collection tank directly connected to the mass spectrometer



ISO 15848 TESTING

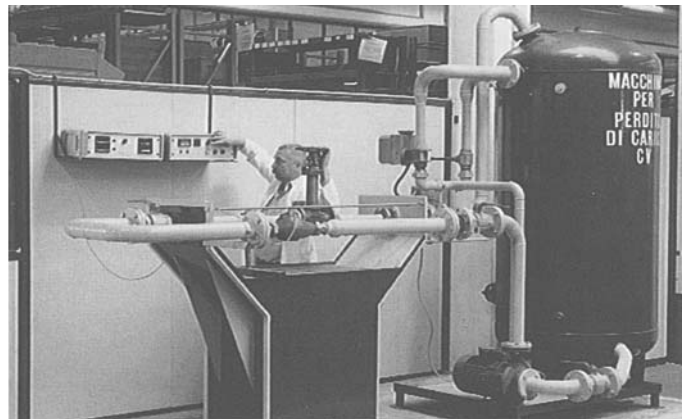
Emission test with Temperature and Pressure cycles combined. Detection by mass spectrometer in open ambient.

FLOW COEFFICIENT C_v

The C_v 's a valve property and is defined as follows: "The Flow Coefficient C_v states the flow capacity of a valve in U.S. gallons per minute of water at a standard temperature of 60°F (15,6° C) that will flow through the valve with a pressure loss of one pound per square inch at a specific opening position". For the metric sistem the analog value is K_v where measure unit are Bar, Kg and meters. The C_v show the quality and accuracy of a valve in terms of pressure loss, the highest values of C_v indicate the highest quality of a valve.

The values shown

VALVE SIZE	GATE		GLOBE			PISTON		
	Regular Port	Full Port	Regular Port	Full Port	Y-Pattern	Regular Port	Full Port	Y-Pattern
1/4	-	2.5	-	1.1	2.9	-	0.9	2.3
3/8	-	4.3	-	1.4	3.8	-	1.1	3.5
1/2	5.5	11.6	1.5	3.6	4.5	1	2.1	4.8
3/4	12	26.6	3.8	6.6	10.1	2.8	5.8	7.8
1	27	54.6	6.8	10.9	16.0	6	7	11.2
1 1/4	55	79.8	11	14	23.1	9.5	9.2	18.0
1 1/2	80	87	14.3	24.3	47.1	11	15.4	37.8
2	105.0	108	25	39.7	80.2	18	32	69.2



To measure the properly value of C_v there in not a standard method. OMB R & D team has used two different methods: 1-Using C_v definition, through the means of a specifically built test rig, it has been obtained 1Bar of pressure loss and the flow has been verified with specific equipment. Calculation is possible to convert the measure to C_v . 2-In the same machine the flow has been changed and different measure of pressure loss has been obtained: a table has been defined and an average value per each valve has been calculated.

FLOW-RATE

$$Q = C_v \sqrt{\frac{\Delta p}{S}}$$

PRESSURE DROP

$$\Delta p = S \left(\frac{Q}{C_v} \right)^2$$

For liquids other than water

Δp = Pressure drop (p.s.i.).

Q = Liquid flow in gallons per minute (GPM).

S = Specific gravity of liquid relative to water (60°F).

C_v = Valves flow coefficient.

CONVERSION TABLE TO METRIC STD

Flow Coefficient	C_v	K_v
C_v	1	0,865
K_v	1.156	1

MANUAL REQUEST

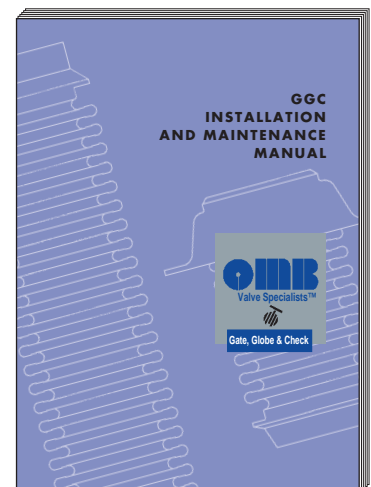
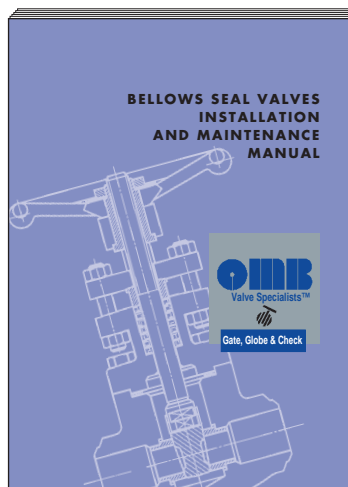
(send a copy of this page with your request to +39.035.942638)

OMBG GGC

Intall and Maintenance

OMBG Bellows Seal Valve

Intall and Maintenance



According to API 602 7th edition

CLASS 800

SERVICE TEMPER.	A105 ⁽¹⁾ A350-LF2 ⁽²⁾	A182 ⁽³⁾ F11	A182 ⁽³⁾ F22	A182 F5	A182 F9	A182 F304	A182 F316	A182 F304L	A182 F347H	SERVICE TEMPER.	A105 ⁽¹⁾ A350-LF2 ⁽²⁾	A182 ⁽³⁾ F11	A182 ⁽³⁾ F22	A182 F5	A182 F9	A182 F304	A182 F316	A182 F304L	A182 F347H
°F	psi	psi	psi	psi	psi	psi	psi	psi	psi	°C	bar	bar	bar	bar	bar	bar	bar	bar	bar
-20 to 100	1975	2000	2000	2000	2000	1920	1920	1600	1920	-29 to 38	136.2	137.9	137.9	137.9	137.9	132.4	132.4	110.3	132.4
200	1800	1900	1910	2000	2000	1600	1655	1350	1695	93.5	124.1	131.0	131.7	137.9	137.9	110.3	114.1	93.1	116.9
300	1750	1795	1805	1940	1940	1410	1495	1210	1570	149	120.7	123.8	124.5	133.8	133.8	97.2	103.1	83.4	108.3
400	1690	1755	1730	1880	1880	1255	1370	1100	1480	204.5	116.6	121.0	119.3	129.7	129.7	86.5	94.5	75.9	102.1
500	1595	1710	1705	1775	1775	1165	1275	1020	1380	260	110.0	117.9	117.6	122.4	122.4	80.3	87.9	70.3	95.2
600	1460	1615	1615	1615	1615	1105	1205	960	1310	315.5	100.7	113.4	113.4	113.4	113.4	76.2	83.1	66.2	90.3
650	1430	1570	1570	1570	1570	1090	1185	935	1280	343.5	98.6	108.3	108.3	108.3	108.3	75.2	81.7	64.5	88.3
700	1420	1515	1515	1515	1515	1075	1150	915	1250	371	97.9	104.5	104.5	104.5	104.5	74.1	79.3	63.1	86.2
750	1345	1420	1420	1420	1420	1060	1130	895	1230	399	92.7	97.9	97.9	97.9	97.9	73.1	77.9	61.7	84.8
800	1100	1355	1355	1325	1355	1050	1105	875	1215	426.5	75.9	93.4	93.4	91.4	93.4	72.4	76.2	60.3	83.8
850	715	1300	1300	1170	1300	1035	1080	860	1185	454.5	49.3	89.7	89.7	80.7	89.7	71.4	74.5	59.3	81.7
900	460	1200	1200	940	1200	1025	1050		1150	482	31.7	82.8	82.8	64.8	82.8	70.7	72.4		79.3
950	275	1005	1005	695	985	1000	1030		1030	510	19	69.3	69.3	47.9	67.9	69.0	71.0		71.0
1000	140	595	715	510	780	860	970		970	538	9.7	41.0	49.3	35.2	53.8	59.3	66.9		66.9
1050		365	530	375	505	825	960		960	565.5		25.2	36.6	25.9	34.8	56.9	66.2		66.2
1100		255	300	275	300	685	860		860	593.5		17.6	20.7	19.0	20.7	47.2	59.3		59.3
1150		140	275	185	200	520	735		735	621		9.7	19.0	12.8	13.8	35.9	50.7		50.7
1200		95	145	120	140	415	550		460	649		6.6	10.0	8.3	9.6	28.6	37.9		31.7
1250						295	485		330	676.5						20.3	33.4		22.8
1300						218	365		250	704.5						15.0	25.2		17.2
1350						165	275		180	732.5						11.4	19.0		12.4
1400						130	200		140	760.5						9.0	13.8		9.6
1450						95	155		110	788.5						6.6	10.7		7.6
1500						65	110		95	815.5						4.5	7.6		6.6

Notes: (1) Permissible, but not recommended for prolonged use above 800°F.
 (2) Not to be used over 650°F.
 (3) Permissible, but not recommended for prolonged use above 1050°F.

According to ASME B16.34

CARBON STEEL A105⁽¹⁾ & A350 LF2⁽²⁾

SERVICE TEMPERATURE	150	300	600	1500	2500	SERVICE TEMPERATURE	PN 20	PN 50	PN 100	PN 250	PN 420
°F	psi	psi	psi	psi	psi	°C	bar	bar	bar	bar	bar
-20 to 100	285	740	1480	3705	6170	38	19.6	51.1	102.1	255.3	425.5
200	260	675	1350	3375	5625	50	19.2	50.1	100.2	250.4	417.3
300	230	655	1315	3280	5470	100	17.7	46.4	92.8	231.9	386.5
400	200	635	1270	3170	5280	150	15.8	45.2	90.5	226.1	376.9
500	170	600	1200	2995	4990	200	14.0	43.8	87.6	219.1	365.2
600	140	550	1095	2735	4560	250	12.1	41.7	83.4	208.6	347.7
650	125	535	1075	2685	4475	300	10.2	38.7	77.5	193.7	322.8
700	110	535	1065	2665	4440	350	8.4	37.0	73.9	184.8	308.0
750	95	505	1010	2520	4200	375	7.4	36.5	72.9	182.3	303.9
800	80	410	825	2060	3430	400	6.5	34.5	69.0	172.5	287.5
850	65	270	535	1340	2230	425	5.6	28.8	57.5	143.8	239.6
900	50	170	345	860	1430	450	4.7	20.0	40.1	100.2	166.9
950	35	105	205	515	860	475	3.7	13.5	27.1	67.7	112.9
1000	20	50	105	260	430	500	2.8	8.8	17.6	44.0	73.3
1050						525	1.9	5.2	10.4	25.9	43.2
1100						540	1.3	3.3	6.5	16.3	27.2

Notes: (1) Permissible, but not recommended for prolonged use above 800°F.
 (2) Not to be used over 650°F.





PRESSURE-TEMPERATURE RATINGS

IMPERIAL UNITS - psig / °F - from ASME B16.34

ASTM A105 - ASTM A350 LF2-ASTM A216 WCB • ASME B16.34 GROUP 1.1

°F	150#	300#	600#	800#	1500#	2500#	4500#
	(PN20)	(PN50)	(PN100)	(PN140)	(PN250)	(PN420)	(PN760)
-20	285	740	1480	1975	3705	6170	11110
100	285	740	1480	1975	3705	6170	11110
200	260	675	1350	1800	3375	5625	10120
300	230	655	1315	1750	3280	5470	9845
400	200	635	1270	1690	3170	5280	9505
500	170	600	1200	1595	2995	4990	8980
600	140	550	1095	1460	2735	4560	8210
650	125	535	1075	1430	2685	4475	8055
700	110	535	1065	1420	2665	4440	7990
750	95	505	1010	1345	2520	4200	7560
800	80	410	825	1100	2060	3430	6170

METRIC UNITS - °C / barg - values interpolated from ASME B16.34

ASTM A105 - ASTM A350 LF2-ASTM A216 WCB • ASME B16.34 GROUP 1.1

°C	150#	300#	600#	800#	1500#	2500#	4500#
	(PN20)	(PN50)	(PN100)	(PN140)	(PN250)	(PN420)	(PN760)
-29	19.7	51.0	102.1	136.2	255.5	425.5	766.2
0	19.7	51.0	102.1	136.2	255.5	425.5	766.2
50	19.3	50.0	100.1	133.6	250.5	417.2	751.2
100	17.7	46.4	92.8	123.7	232.0	386.6	695.7
150	15.8	45.1	90.6	120.6	226.1	377.0	678.5
200	14.0	43.9	87.8	116.9	219.2	365.2	657.4
250	12.1	41.8	83.6	111.1	208.7	347.6	625.7
300	10.2	38.9	77.5	103.3	193.6	322.8	581.1
350	8.4	36.9	74.0	98.5	184.8	308.0	554.4
375	7.4	36.6	72.9	97.2	182.4	303.9	546.9
400	6.5	34.6	69.1	92.1	172.5	287.5	517.5
427	5.5	28.3	56.9	75.9	142.1	236.6	425.5

Notes: 1MPa = 10 bar; 100 kPa = 1bar

IMPERIAL UNITS - psig / °F

ASTM A182 F11CL 2 - ASTM A217 WC6 • ASME B16.34 GROUP 1.9

°F	150#	300#	600#	800#	1500#	2500#	4500#
	(PN20)	(PN50)	(PN100)	(PN140)	(PN250)	(PN420)	(PN760)
-20	290	750	1500	2000	3750	6250	11250
100	290	750	1500	2000	3750	6250	11250
200	260	750	1500	2000	3750	6250	11250
300	230	720	1445	1925	3610	6015	10830
400	200	695	1385	1850	3465	5775	10400
500	170	665	1330	1775	3325	5540	9965
600	140	605	1210	1615	3025	5040	9070
650	125	590	1175	1570	2940	4905	8825
700	110	570	1135	1515	2840	4730	8515
750	95	530	1065	1420	2660	4430	7970
800	80	510	1015	1355	2540	4230	7610
850	65	485	975	1300	2435	4060	7305
900	50	450	900	1200	2245	3745	6740
950	35	320	640	850	1595	2655	4785
1000	20	215	430	575	1080	1800	3240
1050	20	145	290	385	720	1200	2160
1100	20	95	190	255	480	800	1440
1150	20	60	125	165	310	515	925
1200	15	40	75	100	190	315	565

METRIC UNITS - °C / barg

ASTM A182 F11 CL 2 - ASTM A217 WC6 • ASME B16.34 GROUP 1.9

°C	150#	300#	600#	800#	1500#	2500#	4500#
	(PN20)	(PN50)	(PN100)	(PN140)	(PN250)	(PN420)	(PN760)
-29	20.0	51.7	103.4	137.9	258.6	431.0	775.9
0	20.0	51.7	103.4	137.9	258.6	431.0	775.9
50	19.5	51.7	103.4	137.9	258.6	431.0	775.9
100	17.7	51.5	103.0	137.3	257.5	429.1	772.4
150	15.8	49.6	99.6	132.7	248.8	414.5	746.3
200	14.0	48.1	95.8	128.0	239.8	399.6	719.6
250	12.1	46.2	92.4	123.3	231.1	385.0	692.6
300	10.2	42.9	85.8	114.5	214.4	357.2	642.8
350	8.4	40.4	80.4	107.4	201.1	335.4	603.5
375	7.4	38.9	77.6	103.6	194.1	323.3	582.0
400	6.5	36.5	73.3	97.8	183.1	305.0	548.7
425	5.6	35.3	70.2	93.7	175.7	292.6	526.3
450	4.6	33.7	67.7	90.3	169.1	281.9	507.2
475	3.7	31.7	63.4	84.6	158.2	263.9	475.0
500	2.8	25.3	50.6	67.3	126.1	210.2	378.5
525	1.9	18.2	36.3	48.4	90.8	151.3	272.5
550	1.4	12.7	25.4	33.9	63.6	105.9	190.7
575	1.4	8.8	17.7	23.5	44.0	73.4	132.1
600	1.4	6.0	12.0	16.1	30.3	50.5	90.8
625	1.3	3.9	8.1	10.8	20.2	33.6	60.3
649	1.0	2.8	5.2	6.9	13.1	21.7	39.0

Notes: 1MPa = 10 bar; 100 kPa = 1bar



IMPERIAL UNITS - psig / °F

ASTM A182 F22 CL 3 - ASTM A217 WC9 • ASME B16.34 GROUP 1.10

°F	150#	300#	600#	800#	1500#	2500#	4500#
	(PN20)	(PN50)	(PN100)	(PN140)	(PN250)	(PN420)	(PN760)
-20	290	750	1500	2000	3750	6250	11250
100	290	750	1500	2000	3750	6250	11250
200	260	750	1500	2000	3750	6250	11250
300	230	730	1455	1940	3640	6070	10925
400	200	705	1410	1880	3530	5880	10585
500	170	665	1330	1775	3325	5540	9965
600	140	605	1210	1615	3025	5040	9070
650	125	590	1175	1570	2940	4905	8825
700	110	570	1135	1515	2840	4730	8515
750	95	530	1065	1420	2660	4430	7970
800	80	510	1015	1355	2540	4230	7610
850	65	485	975	1300	2435	4060	7305
900	50	450	900	1200	2245	3745	6740
950	35	375	755	1005	1885	3145	5665
1000	20	260	520	695	1305	2170	3910
1050	20	175	350	465	875	1455	2625
1100	20	110	220	295	550	915	1645
1150	20	70	135	180	345	570	1030
1200	20	40	80	110	205	345	615

METRIC UNITS - °C / barg

ASTM A182 F22 CL 3 - ASTM A217 WC9 • ASME B16.34 GROUP 1.10

°C	150#	300#	600#	800#	1500#	2500#	4500#
	(PN20)	(PN50)	(PN100)	(PN140)	(PN250)	(PN420)	(PN760)
-29	20.0	51.7	103.4	137.9	258.6	431.0	775.9
0	20.0	51.7	103.4	137.9	258.6	431.0	775.9
50	19.5	51.7	103.4	137.9	258.6	431.0	775.9
100	17.7	51.6	103.1	137.4	257.7	429.5	773.2
150	15.8	50.3	100.3	133.7	250.9	418.4	753.0
200	14.0	48.8	97.5	130.0	244.1	406.6	731.9
250	12.1	46.3	92.7	123.7	231.8	386.2	694.7
300	10.2	42.9	85.8	114.5	214.4	357.2	642.8
350	8.4	40.4	80.4	107.4	201.1	335.4	603.5
375	7.4	38.9	77.6	103.6	194.1	323.3	582.0
400	6.5	36.5	73.3	97.8	183.1	305.0	548.7
425	5.6	35.3	70.2	93.7	175.7	292.6	526.3
450	4.6	33.7	67.7	90.3	169.1	281.9	507.2
475	3.7	31.7	63.4	84.6	158.2	263.9	475.0
500	2.8	27.7	55.7	74.2	138.9	231.8	417.4
525	1.9	21.6	43.3	57.8	108.4	180.6	325.3
550	1.4	15.4	30.7	41.0	77.0	128.0	230.7
575	1.4	10.5	21.1	28.1	52.7	87.7	158.1
600	1.4	6.9	13.8	18.4	34.5	57.4	103.3
625	1.4	4.5	8.8	11.7	22.4	37.1	67.0
649	1.4	2.8	5.5	7.6	14.1	23.8	42.4

Notes: 1MPa = 10 bar; 100 kPa = 1bar

IMPERIAL UNITS - psig / °F

ASTM A182 F316 - ASTM A351 CF8M • ASME B16.34 GROUP 2.2

°F	150#	300#	600#	800#	1500#	2500#	PN420	4500#
	(PN20)	(PN50)	(PN100)	(PN140)	(PN250)	(PN420)	(BAR)	(PN760)
-20	275	720	1440	1920	3600	6000	413.8	10800
100	275	720	1440	1920	3600	6000	413.8	10800
200	235	620	1240	1655	3095	5160	355.9	9290
300	215	560	1120	1495	2795	4660	321.4	8390
400	195	515	1025	1370	2570	4280	295.2	7705
500	170	480	955	1275	2390	3980	274.5	7165
600	140	450	900	1205	2255	3760	259.3	6770
650	125	445	890	1185	2220	3700	255.2	6660
700	110	430	870	1160	2170	3620	249.7	6515
750	95	425	855	1140	2135	3560	245.5	6410
800	80	420	845	1125	2110	3520	242.8	6335
850	65	420	835	1115	2090	3480	240.0	6265
900	50	415	830	1105	2075	3460	238.6	6230
950	35	385	775	1030	1930	3220	222.1	5795
1000	20	350	700	935	1750	2915	201.0	5245
1050	20	345	685	915	1720	2865	197.6	5155
1100	20	305	610	815	1525	2545	175.5	4575
1150	20	235	475	630	1185	1970	135.9	3550
1200	20	185	370	495	925	1545	106.6	2775
1250	20	145	295	390	735	1230	84.8	2210
1300	20	115	235	310	585	970	66.9	1750
1350	20	95	190	255	480	800	55.2	1440
1400	20	75	150	200	380	630	43.4	1130
1450	20	60	115	155	290	485	33.4	875
1500	20	40	85	110	205	345	23.8	620

METRIC UNITS - °C / barg

ASTM A182 F316 - ASTM A351 CF8M • ASME B16.34 GROUP 2.2

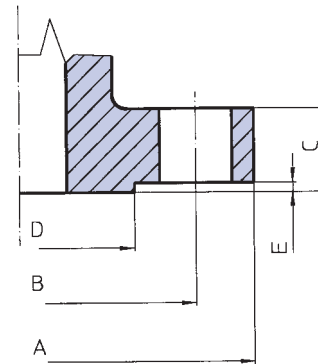
°C	150#	300#	600#	800#	1500#	2500#	4500#
	(PN20)	(PN50)	(PN100)	(PN140)	(PN250)	(PN420)	(PN760)
-29	19.0	49.7	99.3	132.4	248.2	413.8	744.8
0	19.0	49.7	99.3	132.4	248.3	413.8	744.8
38	19.0	49.7	99.3	132.4	248.3	413.8	744.8
50	18.4	48.1	96.3	128.4	240.6	401.0	721.9
100	16.0	42.3	84.5	112.8	211.0	351.7	633.2
150	14.8	38.6	77.1	102.9	192.4	320.9	577.7
200	13.6	35.8	71.2	95.2	178.5	297.3	535.2
250	12.0	33.5	66.8	89.1	167.1	278.3	501.0
300	10.2	31.6	63.1	84.5	158.1	263.6	474.5
350	8.4	30.4	61.0	81.3	152.3	253.8	456.9
375	7.4	29.6	59.9	79.8	149.3	249.1	448.3
400	6.5	29.3	58.9	78.6	147.2	245.4	441.9
425	5.6	29.0	58.3	77.6	145.6	242.9	437.2
450	4.6	29.0	57.7	77.0	144.4	240.4	432.8
475	3.7	28.7	57.3	76.4	143.4	239.0	430.3
500	2.8	27.3	54.8	72.9	136.7	228.0	410.5
525	1.9	25.2	50.7	67.5	126.4	210.7	379.2
550	1.4	24.0	47.8	63.9	119.8	199.5	359.0
575	1.4	22.9	45.5	60.8	114.0	190.1	341.9
600	1.4	19.9	39.8	53.1	99.5	166.0	298.6
625	1.4	15.7	31.7	42.1	79.2	131.8	237.3
650	1.4	12.6	25.3	33.8	63.3	105.7	189.8
675	1.4	10.2	20.7	27.3	51.5	86.1	154.8
700	1.4	8.3	16.9	22.3	42.0	69.8	125.8
725	1.4	6.9	13.9	18.6	35.0	58.2	104.9
750	1.4	5.7	11.3	15.2	28.7	47.7	85.6
775	1.4	4.6	9.0	12.1	22.9	38.0	68.4
800	1.4	3.5	7.0	9.3	17.4	29.2	52.6
816	1.4	2.8	5.9	7.6	14.1	23.8	42.8

Notes: 1MPa = 10 bar; 100 kPa = 1bar

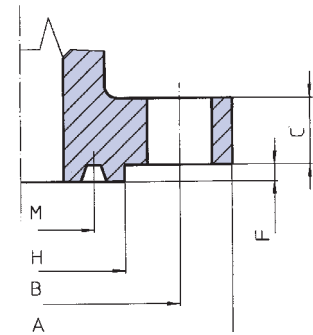
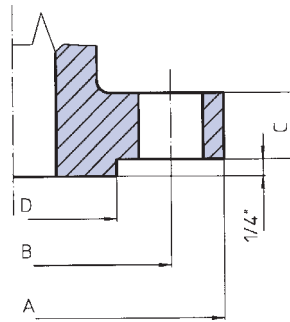
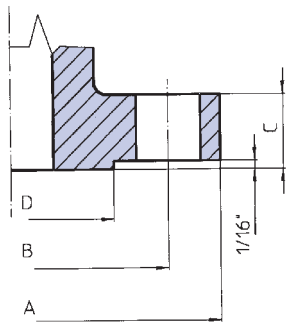


FLANGES DIN 2544-45-46

DN	PN	Size	A	B	C	D	E	Bolt holes	
								N	Ø
15	25/40	1/2	95	65	16	45	2	4	14
20		3/4	105	75	18	58	2	4	14
25		1	115	85	18	68	2	4	14
32		1.1/4	140	100	18	78	2	4	18
40		1.1/2	150	110	18	88	3	4	18
50		2	165	125	20	102	3	4	18
15	64	1/2	105	75	20	45	2	4	14
20		3/4	130	90	22	58	2	4	18
25		1	140	100	24	65	2	4	18
32		1.1/4	155	110	24	75	2	4	22
40		1.1/2	170	125	26	88	3	4	22
50		2	180	135	26	95	3	4	22



FLANGES ASME - B16.5



FLANGES ANSI - B16.5

RAISED FACE 600 & 1500 lb

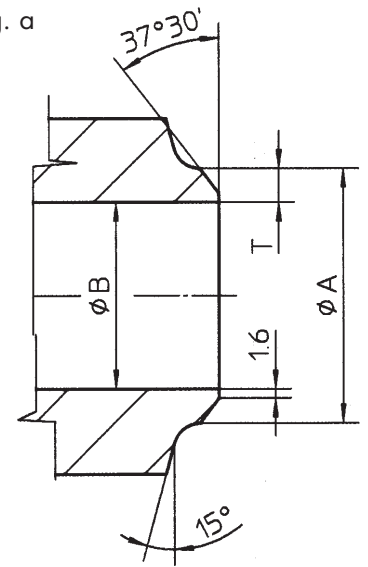
RING JOINT FACE

CLASS	Size	A	C	D	B	Bolt holes			Ring Joint Facing					Ring N.					
						N	Size	H	M	F									
150	1/2	3.50	89	0.44	11.5	1.38	34.9	2.38	60.3	4	0.62	16	-	-	-	-	-		
	3/4	3.88	98	0.50	13.0	1.69	42.9	2.75	69.8	4	0.62	16	-	-	-	-	-		
	1	4.25	108	0.56	14.5	2.00	50.8	3.12	79.4	4	0.62	16	2.50	63.5	1.875	47.62	0.250	6.3	R 15
	1.1/4	4.62	117	0.62	16.0	2.50	63.5	3.50	88.9	4	0.62	16	2.88	73.0	2.250	57.15	0.250	6.3	R 17
	1.1/2	5.00	127	0.69	17.5	2.88	73.0	3.88	98.4	4	0.62	16	3.25	82.5	2.562	65.07	0.250	6.3	R 19
	2	6.00	152	0.75	19.5	3.62	92.1	4.75	120.6	4	0.75	20	4.00	102.0	3.250	82.55	0.250	6.3	R 22
300	1/2	3.75	95	0.56	14.5	1.38	34.9	2.62	66.7	4	0.62	16	2.00	51.0	1.344	34.14	0.219	5.6	R 11
	3/4	4.62	117	0.62	16.0	1.69	42.9	3.25	82.5	4	0.75	20	2.50	63.5	1.688	42.88	0.250	6.3	R 13
	1	4.88	124	0.69	17.5	2.00	50.8	3.50	88.9	4	0.75	20	2.75	70.0	2.000	50.80	0.250	6.3	R 16
	1.1/4	5.25	133	0.75	19.5	2.50	63.5	3.88	98.4	4	0.75	20	3.12	79.5	2.375	60.32	0.250	6.3	R 18
	1.1/2	6.12	156	0.81	21.0	2.88	73.0	4.50	114.3	4	0.88	23	3.56	90.5	2.688	68.28	0.250	6.3	R 20
	2	6.50	165	0.88	22.5	3.62	92.1	5.00	127.0	8	0.75	20	4.25	108.0	3.250	82.55	0.312	7.9	R 23
600	1/2	3.75	95	0.56	14.5	1.38	34.9	2.62	66.7	4	0.62	16	2.00	51.0	1.344	34.14	0.219	5.6	R 11
	3/4	4.62	117	0.62	16.0	1.69	42.9	3.25	82.5	4	0.75	20	2.50	63.5	1.688	42.88	0.250	6.3	R 13
	1	4.88	124	0.69	17.5	2.00	50.8	3.50	88.9	4	0.75	20	2.75	70.0	2.000	50.80	0.250	6.3	R 16
	1.1/4	5.25	133	0.81	21.0	2.50	63.5	3.88	98.4	4	0.75	20	3.12	79.5	2.375	60.32	0.250	6.3	R 18
	1.1/2	6.12	156	0.88	22.5	2.88	73.0	4.50	114.3	4	0.88	23	3.56	90.5	2.688	68.28	0.250	6.3	R 20
	2	6.50	165	1.00	25.5	3.62	92.1	5.00	127.0	8	0.75	20	4.25	108.0	3.250	82.55	0.312	7.9	R 23
1500	1/2	4.75	121	0.88	22.5	1.38	34.9	3.25	82.5	4	0.88	23	2.38	60.5	1.562	39.67	0.250	6.3	R 12
	3/4	5.12	130	1.00	25.5	1.69	42.9	3.50	88.9	4	0.88	23	2.62	66.5	1.750	44.45	0.250	6.3	R 14
	1	5.88	149	1.12	29.0	2.00	50.8	4.00	101.6	4	1.00	26	2.81	71.5	2.000	50.80	0.250	6.3	R 16
	1.1/4	6.25	159	1.12	29.0	2.50	63.5	4.38	111.1	4	1.00	26	3.19	81.0	2.375	60.32	0.250	6.3	R 18
	1.1/2	7.00	178	1.25	32.0	2.88	73.0	4.88	123.8	4	1.12	29	3.62	92.0	2.688	68.28	0.250	6.3	R 20
	2	8.50	216	1.50	38.5	3.62	92.1	6.50	165.1	8	1.00	26	4.88	124.0	3.750	95.25	0.312	7.9	R 24
2500	1/2	5.23	133	1.20	30.5	1.38	34.9	3.50	88.9	4	0.88	23	2.55	65.0	1.688	42.88	0.250	6.3	R 13
	3/4	5.51	140	1.25	32.0	1.69	42.9	3.74	95.2	4	0.88	23	2.87	73.0	2.000	50.80	0.250	6.3	R 16
	1	6.25	159	1.37	35.0	2.00	50.8	4.24	107.9	4	1.00	26	3.24	82.5	2.374	60.32	0.250	6.3	R 18
	1.1/4	7.24	184	1.51	38.5	2.50	63.5	5.12	130.2	4	1.12	29	3.99	101.5	2.844	72.24	0.312	7.9	R 21
	1.1/2	7.99	203	1.75	44.5	2.88	73.0	5.74	146	4	1.25	32	4.50	114.5	3.250	82.55	0.312	7.9	R 23
	2	9.25	235	2.00	51.0	3.62	92.1	6.74	171.4	8	1.12	29	5.25	133.5	4.000	101.60	0.312	7.9	R 26

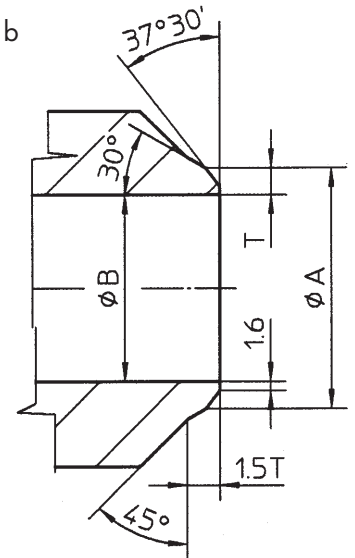
BUTT WELD - ASME B16.25

SIZE	SCHEDULE 40		SCHEDULE 80		SCHEDULE 160		SCHEDULE XXS	
	ØA	T	ØA	T	ØA	T	ØA	T
	mm	mm	mm	mm	mm	mm	mm	mm
	(In)	(In)	(In)	(In)	(In)	(In)	(In)	(In)
1/2"	21.3	2.77	21.3	3.73	21.3	4.78	21.3	7.47
	(0.840)	(0.190)	(0.840)	(0.147)	(0.840)	(0.188)	(0.840)	(0.294)
3/4"	26.7	2.87	26.7	3.91	26.7	5.56	26.7	7.82
	(1.050)	(0.113)	(1.050)	(0.154)	(1.050)	(0.219)	(1.050)	(0.308)
1"	33.4	3.38	33.4	4.55	33.4	6.35	33.4	9.09
	(1.315)	(0.133)	(1.315)	(0.179)	(1.315)	(0.250)	(1.315)	(0.358)
1.1/4"	42.2	3.55	42.2	4.85	42.2	6.35	42.2	9.70
	(1.660)	(0.140)	(1.660)	(0.191)	(1.660)	(0.250)	(1.660)	(0.382)
1.1/2"	48.3	3.68	48.3	5.08	48.3	7.14	48.3	10.15
	(1.900)	(0.145)	(1.900)	(0.200)	(1.900)	(0.281)	(1.900)	(0.400)
2"	60.3	3.91	60.3	5.54	60.3	8.74	60.3	11.07
	(2.375)	(0.154)	(2.375)	(0.218)	(2.375)	(0.344)	(2.375)	(0.436)
2.1/2"	73.0	5.15	73.0	7.01	73.0	9.53	73.0	14.02
	(2.875)	(0.203)	(2.875)	(0.276)	(2.875)	(0.375)	(2.875)	(0.552)
3"	88.9	5.48	88.9	7.62	88.9	11.13	88.9	15.24
	(3.500)	(0.216)	(3.500)	(0.300)	(3.500)	(0.438)	(3.500)	(0.600)
4"	114.3	6.02	114.3	8.56	114.3	13.49	114.3	17.12
	(4.500)	(0.237)	(4.500)	(0.337)	(4.500)	(0.531)	(4.500)	(0.674)

-Fig. a



-Fig. b



-Fig. a $\leq 2''$

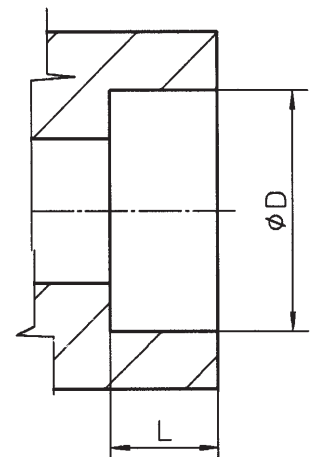
-Fig. b $> 2''$

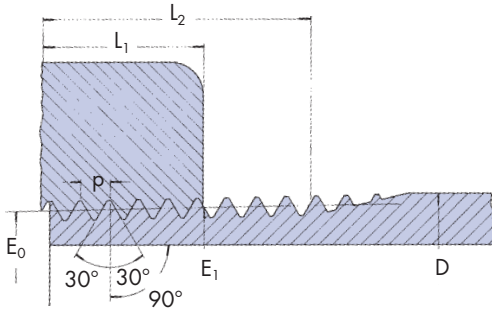
$$B = A - 2T$$

SOCKET WELD - ASME B16.11

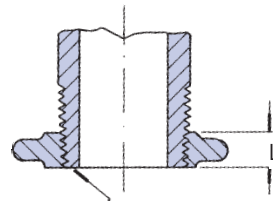
SIZE	ØD		L (min)		L (OMB)	
	Inch	mm	Inch	mm	Inch	mm
1/4"	0.555	14.10	0.38	9.53	0,44	11,1
3/8"	0.690	17.53	0.38	9.53	0,44	11,1
1/2"	0.855	21.72	0.38	9.53	0,5	12,7
3/4"	1.065	27.05	0.5	12.70	0,57	14,5
1"	1.330	33.78	0.5	12.70	0,63	16,0
1.1/4"	1.675	42.54	0.5	12.70	0,69	17,5
1.1/2"	1.915	48.64	0.5	12.70	0,75	19,0
2"	2.406	61.11	0.62	15.88	0,86	22,0

Socket wall thickness conform to ASME B16.34





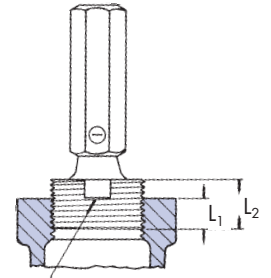
$E_0 = D - (0.050D + 1.1)p$ $p = \text{Pitch}$
 $E_1 = E_0 + 0.0625 L_1$ $\text{Depth of thread} = 0.80p$
 $L_2 = (0.80D = 6.8)p$ $\text{Total Taper } \frac{3}{4}\text{-inch per Foot}$



Flush by Hand

Tolerance on Product

One turn large or small from notch on plug gauge or face of ring gauge.



Notch flush with face of fitting. If chamfered, notch flush with bottom of chamfer.

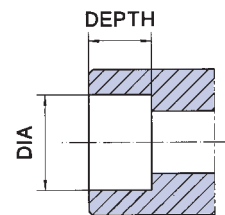
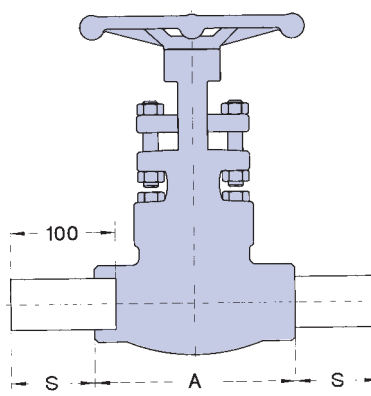
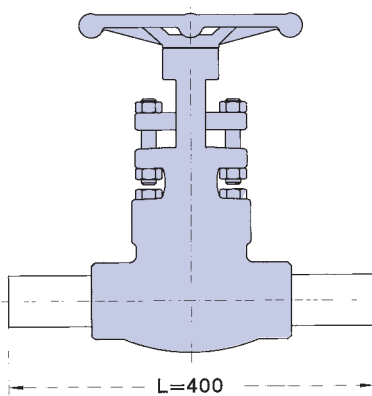
THREADS - ASME B1.20.1

Nominal pipe size	D Outside diameter of pipe	Number of threads per inch	p Pitch of thread	E ₀ Pitch diameter at end of external thread	E ₁ ■ Pitch diameter at end of external	L ₁ ● Normal engagement by and between external and internal threads	L ₂ ◆ Length of effective external thread	Height of thread
1/16	0.3125	27	0.03704	0.27118	0.28118	0.160	0.2611	0.02963
1/8	0.405	27	0.03704	0.36351	0.37360	0.1615	0.2639	0.02963
1/4	0.540	18	0.05556	0.47739	0.49163	0.2278	0.4018	0.04444
3/8	0.675	18	0.05556	0.61201	0.62701	0.240	0.4078	0.04444
1/2	0.840	14	0.07143	0.75843	0.77843	0.320	0.5337	0.05714
3/4	1.050	14	0.07143	0.96768	0.98887	0.339	0.5457	0.05714
1	1.315	11.5	0.08696	1.23863	1.23863	0.400	0.6828	0.06957
1 1/4	1.660	11.5	0.08696	1.55713	1.58338	0.420	0.7068	0.06957
1 1/2	1.900	11.5	0.08696	1.79609	1.82234	0.420	0.7235	0.06957
2	2.375	11.5	0.08696	2.26902	2.29627	0.436	0.7565	0.06957

- Also pitch diameter at gauging notch.
- ◆ Also length of plug gauge.
- Also length of ring gauge, and length from gauging notch to small end of plug gauge.
- * For the 1/8-27 and 1/4-18 sizes... E1 approx. = $D - (0.05D + 0.827)p$.

Type "L"

Type "S"



VALVES WITH NIPPLES LENGTHS

NOMINAL PIPE SIZE	SOCKET BORE DIA.	SOCKET DEPTH		S			
		NPT	DN	mm	in.	mm	in.
1/4	8	14.1	0.555	11.1	0.437	89	3.503
3/8	10	17.53	0.690	11.1	0.437	89	3.503
1/2	15	21.72	0.855	12.7	0.500	88	3.464
3/4	20	27.05	1.064	14.5	0.570	86	3.385
1	25	33.78	1.329	16	0.629	85	3.346
1 1/4	32	42.54	1.674	17.5	0.688	83	3.267
1 1/2	40	48.64	1.914	19	0.748	82	3.228
2	50	61.11	2.405	22	0.866	79	3.110

A = See relevant Product/Size/Class table within this catalogue
S = See table Socket Weld

Lont Pattern Total length 400 mm.

PRESSURE

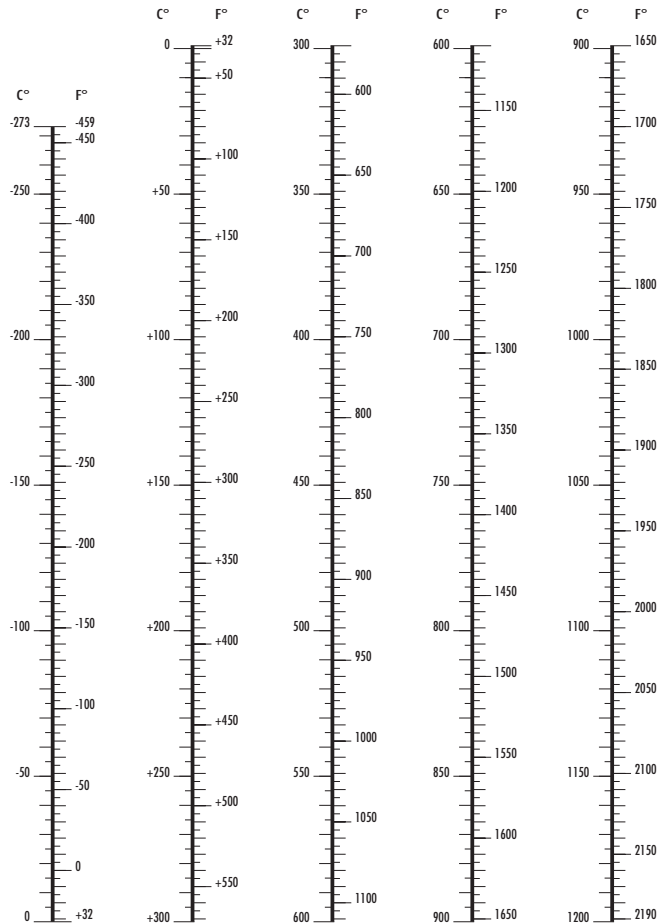
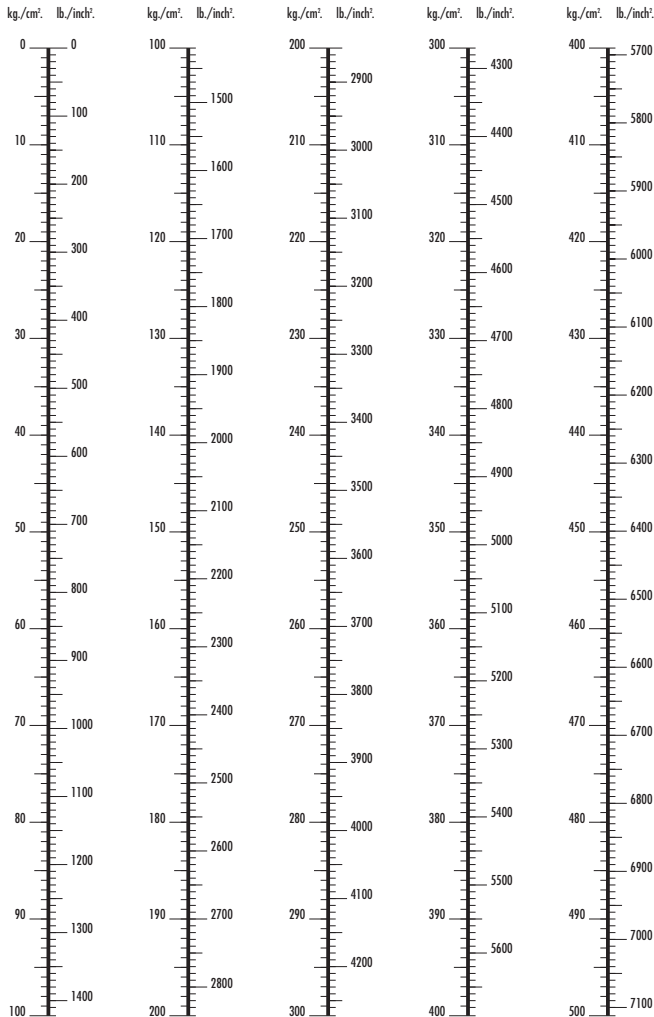
$$1 \text{ Kg/cm}^2 = 142233 \text{ lb/inch}^2$$

$$1 \text{ lb/inch}^2 = 0,07037 \text{ Kg/cm}^2$$

TEMPERATURE

$$^{\circ}\text{F} = 9/5 \text{ }^{\circ}\text{C} + 32$$

$$^{\circ}\text{C} = 5/9 (\text{ }^{\circ}\text{F} - 32)$$

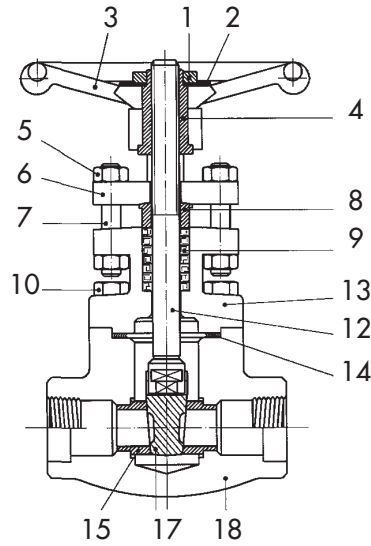


FRACTION OF 1 INCH INTO DECIMALS AND MILLIMETERS

Fract.	Inch.	Millim.	Fract.	Inch.	Millim.	Fract.	Inch.	Millim.	Fract.	Inch.	Millim.
1/64	0.016	0.397	17/64	0.266	6.747	33/64	0.516	13.097	49/64	0.766	19.447
1/32	0.031	0.794	9/32	0.281	7.141	17/32	0.531	13.494	25/32	0.781	19.844
3/64	0.047	1.191	19/64	0.297	7.541	35/64	0.547	13.891	51/64	0.797	20.241
1/16	0.062	1.587	5/16	0.312	7.937	5/8	0.562	14.287	13/16	0.812	20.637
5/64	0.078	1.984	21/64	0.328	8.334	37/64	0.578	14.684	53/64	0.828	21.034
3/32	0.094	2.381	11/32	0.344	8.731	19/32	0.594	15.081	27/32	0.844	21.431
7/64	0.109	2.778	23/64	0.359	9.128	39/64	0.609	15.478	55/64	0.859	21.828
1/8	0.125	3.175	3/8	0.375	9.525	5/8	0.625	15.875	7/8	0.875	22.225
9/64	0.141	3.572	25/64	0.391	9.922	41/64	0.641	16.272	57/64	0.891	22.622
5/32	0.156	3.969	13/32	0.406	10.319	21/32	0.656	16.669	29/32	0.906	23.019
11/64	0.172	4.365	27/64	0.422	10.716	43/64	0.672	17.066	59/64	0.922	23.406
3/16	0.187	4.762	7/16	0.437	11.112	11/16	0.687	17.462	15/16	0.937	23.812
13/64	0.203	5.159	29/64	0.453	11.509	45/64	0.703	17.859	61/64	0.953	24.209
7/32	0.219	5.556	15/32	0.469	11.906	23/32	0.719	18.256	31/32	0.969	24.606
15/64	0.234	5.953	31/64	0.484	12.303	47/64	0.734	18.653	63/64	0.984	25.003
1/4	0.250	6.350	1/2	0.500	12.700	3/4	0.750	19.050	1	1.000	25.400

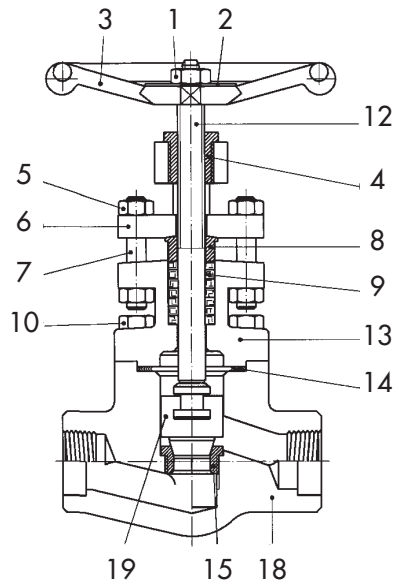


GATE VALVE



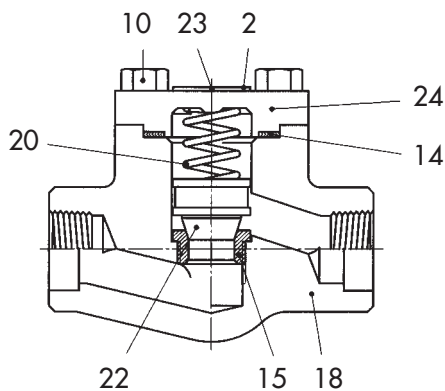
- 1 WHEELNUT
- 2 NAMEPLATE
- 3 HANDWHEEL
- 4 YOKE NUT
- 5 GLAND NUT
- 6 GLAND FLANGE
- 7 GLAND STUD
- 8 GLAND
- 9 PACKING
- 10 BOLTS
- 12 STEM
- 13 BONNET
- 14 GASKET
- 15 SEAT
- 17 WEDGE
- 18 BODY

GLOBE VALVE



- 1 WHEELNUT
- 2 NAMEPLATE
- 3 HANDWHEEL
- 4 YOKE NUT
- 5 GLAND NUT
- 6 GLAND FLANGE
- 7 GLAND STUD
- 8 GLAND
- 9 PACKING
- 10 BOLTS
- 12 STEM
- 13 BONNET
- 14 GASKET
- 15 SEAT
- 18 BODY
- 19 DISC

CHECK VALVE



- 2 NAMEPLATE
- 10 BOLTS
- 14 GASKET
- 15 SEAT
- 18 BODY
- 20 SPRING
- 22 PISTON
- 23 RIVET
- 24 CAP

GATE VALVE

	A105/F6	A105/F6HFS	LF2/304	F11/F6HFS	F304/304	F316/316
Wheelnut	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
Nameplate	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium
Handwheel	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
Yoke Nut	416	416	416	416	303	303
Gland Nut	2H	2H	GR8	GR8	GR8	GR8
Gland Flange	A105	A105	F6	F6	F304	F304
Gland Stud	410	410	B8	B8	B8	B8
Gland	316L	316L	316L	316L	316L	316L
Packing (*)	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite
Bolts	B7	B7	L7	B16	B8	B8
Stem	410	410	304	410	304	316
Bonnet	A105	A105	LF2	F11	F304	F316
Gasket	Sp. Wound	Sp. Wound	Sp. Wound	Sp. Wound	Sp. Wound	Sp. Wound
Seat	410	410HF	304	410HF	304	316
Wedge	F6	F6	F304	F6	F304	F316
Body	A105	A105	LF2	F11	F304	F316

GLOBE VALVE

	A105/F6	A105/F6HFS	LF2/304	F11/F6HFS	F304/304	F316/316
Wheelnut	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
Nameplate	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium
Handwheel	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
Yoke Nut	416	416	416	416	303	303
Gland Nut	2H	2H	GR8	GR8	GR8	GR8
Gland Flange	A105	A105	F6	F6	F304	F304
Gland Stud	410	410	B8	B8	B8	B8
Gland	316L	316L	316L	316L	316L	316L
Packing (*)	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite
Bolts	B7	B7	L7	B16	B8	B8
Stem	410	410	304	410	304	316
Bonnet	A105	A105	LF2	F11	F304	F316
Gasket	Sp. Wound	Sp. Wound	Sp. Wound	Sp. Wound	Sp. Wound	Sp. Wound
Seat	410	410HF	304	410HF	304	316
Disc	410	410	304	410	304	316
Body	A105	A105	LF2	F11	F304	F316

CHECK VALVE

	A105/F6	A105/F6HFS	LF2/304	F11/F6HFS	F304/304	F316/316
Nameplate	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium
Bolts	B7	B7	L7	B16	B8	B8
Gasket	Sp. Wound	Sp. Wound	Sp. Wound	Sp. Wound	Sp. Wound	Sp. Wound
Seat	410	410HF	304	410HF	304	316
Body	A105	A105	LF2	F11	F304	F316
Spring	Arm. Steel	Arm. Steel	Arm. Steel	Arm. Steel	Arm. Steel	Arm. Steel
Piston	410	410	304	410	304	316
Rivet	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
Cap	A105	A105	LF2	F11	F304	F316

(*) = Packing: Low Emission Packing Available on Request

CORROSIVE MEDIA	Carbon Steel	Stainless Steel 304	Stainless Steel 316	Inconel	Monel
Acetate Solvents, Crude	D	A	A	A	B
Acetate Solvents, Pure	C	A	A	A	A
Acetic Acid, 95%	D	B	A	A	A
Acetic Anhydride, Boiling	D	B	A	A	A
Acetone	B	A	A	A	A
Alcohols	B	A	A	A	A
Amines	B	A	A	A	A
Ammonia, Anhydrous	B	A	A	A	A
Ammonium Hydroxide, Hot	B	A	A	A	D
Ammonium Nitrate	B	A	A	A	C
Aniline Hydrochloride	D	D	C	B	B
Antimony Trichloride	D	D	C	B	B
Asphalt	B	A	A	A	A
Barium Chloride, 5%	C	A	A	A	A
Barium Hydroxide	C	A	A	A	A
Barium Nitrate	C	A	A	B	C
Benzene, Hot	B	A	A	A	A
Benzoic Acid	B	A	A	A	A
Blood	D	A	A	A	A
Bromine, Dry Gas	D	A	A	B	A
Bromine, Moist Gas	D	D	D	D	C
Buttermilk	D	A	A	A	A
Calcium Bisulfite, Hot	D	C	B	D	D
Calcium Chloride, Dilute	C	B	A	A	A
Calcium Hydroxide, 20%, Boiling	D	A	A	A	A
Calcium Hydrochloride, < 2%	C	C	B	B	C
Carbolic Acid, 90%	C	A	A	A	B
Carbon Dioxide, Dry	C	A	A	A	A
Carbon Disulphide	B	A	A	A	B
Chloroacetic Acid	D	D	C	B	B
Chloric Acid	D	D	C	C	C
Chlorinated Water, Sat.	D	D	C	C	C
Chlorine, Dry Gas	B	B	B	A	A
Chlorine, Moist Gas	D	D	C	D	C
Citric Acid, Dilute	D	A	A	A	A
Citric Acid, Hot, Conc.	D	C	B	B	B
Creosote, Hot	B	A	A	A	A
Cupric Chloride, 5%	D	D	C	D	D
Ethyl Chloride	A	A	A	A	A
Ethylene Glycol	A	A	A	A	A
Ferric Chloride < 1%	D	C	B	B	C
Ferric Nitrate, 5%	D	B	A	C	D
Ferric Sulfate, 5%	D	B	A	B	C
Ferrous Sulfate, 10%	C	A	A	B	A
Flourine, Dry Gas	C	C	B	A	A
Flourine, Moist Gas	D	D	D	B	A
Freon, Wet	C	C	C	B	A
Fuel Oil, 140°F	A	A	A	A	B

CORROSIVE MEDIA	Carbon Steel	Stainless Steel 304	Stainless Steel 316	Inconel	Monel
Furfural	B	B	B	B	B
Gasoline Sour	B	A	A	C	C
Gasoline Refined	A	A	A	B	A
Gelatine	D	B	A	A	A
Glucose	B	A	A	A	A
Glycerine	B	A	A	A	A
Hydrofluoric Acid, Boiling	D	D	D	D	B
Hydrofluosilicic Acid	D	D	C	B	A
Hydrogen Chloride, Dry	B	D	C	A	A
Hydrogen Chloride, Moist	D	D	D	D	C
Hydrogen Fluoride, Dry	C	D	C	A	A
Hydrogen Peroxide, Boiling	D	C	B	B	B
Hydrogen Sulfide, Dry	B	A	A	A	A
Hydrogen Sulfide, Moist	C	B	A	A	B
Iodine, Dry	D	D	B	A	A
Kerosene	A	A	A	A	A
Lactic Acid, 5%	D	B	A	A	B
Lactic Acid, 10%	D	B	A	A	B
Lactic Acid, Boiling, 5%	D	C	B	B	C
Lactic Acid, Boiling, 10%	D	D	B	B	C
Lead Acetate, Hot	D	A	A	B	B
Magnesium Chloride, Hot, 5%	D	C	B	A	A
Magnesium Hydroxide	B	A	A	A	A
Magnesium Sulfate	B	A	A	B	A
Magnesium Sulfate, Boiling	C	A	A	C	A
Mercury	B	A	A	A	B
Mercuric Chloride, < 2%	D	D	D	D	D
Mercuric Cyanide	D	B	B	B	D
Methyl Chloride, Dry	D	B	B	B	A
Milk	D	A	A	A	B
Molasses	B	A	A	A	A
Naphtha	B	A	A	A	A
Nickel Chloride	D	C	B	B	B
Nickel Sulfate, Boiling	D	C	C	B	A
Nitric Acid, 20%	D	A	A	B	D
Nitric Acid, Boiling, Conc.	D	D	D	D	D
Nitrous Acid	D	B	B	B	C
Nitrobenzene	D	B	A	B	B
Oils - Miner.	B	A	A	C	B
Oxalic Acid, Boiling, 10%	C	A	A	A	A
Oxalic Acid, Boiling, 50%	D	D	C	B	B
Oxygen	B	A	A	A	A
Picric Acid	C	A	A	D	D
Potassium Bromide	D	C	B	A	A
Potassium Carbonate	B	A	A	A	A
Potassium Chlorate	B	A	A	A	B
Potassium Chloride	D	A	A	A	A
Potassium Chloride, Hot	D	C	B	B	A

CORROSIVE MEDIA	Carbon Steel	Stainless Steel 304	Stainless Steel 316	Inconel	Monel
Potassium Cyanide	B	B	B	B	B
Potassium Sulfate, Dil.	B	A	A	A	A
Propane, Liquid & Gas	B	A	A	A	A
Pyrogalllic Acid	B	A	A	B	A
Rosin, Molten	D	A	A	A	A
Salicylic Acid	D	B	B	B	B
Silver Bromide	D	B	A	C	B
Silver Chloride	D	D	D	C	B
Silver Nitrate	D	A	A	A	C
Sodium Acetate	C	A	A	A	A
Sodium Bisulfate	D	B	B	B	A
Sodium Bromide, Dil.	D	B	B	B	A
Sodium Cyanide	B	B	B	B	A
Sodium Fluoride, 5%	D	B	A	B	A
Sodium Hydroxide, 50%	B	A	A	A	A
Sodium Hyposulfite	D	B	A	B	A
Sodium Nitrate	B	B	A	A	B
Sodium Perborate	C	A	A	A	B
Sodium Peroxide	C	A	A	A	B
Sodium Phosphate, Tribasic	C	A	A	A	A
Sodium Silicate	B	A	A	A	B
Sodium Thiosulfate	D	B	A	B	B
Stannous Chloride, Sat.	D	D	B	B	B
Steam, 212°F	A	A	A	A	A
Steam, 600°F	C	A	A	A	A
Sulfite Liquors	D	C	B	D	D
Sulfur Chloride	D	C	D	B	B
Sulfur Dioxide, Moist	D	B	A	D	D
Sulfuric Acid, Conc.	B	B	B	B	D
Sulfurous Acid, Sat.	D	B	B	D	D
Tannic Acid, 10%	D	A	A	B	A
Tar, Hot	B	A	A	A	B
Tartaric Acid, 120°F	D	B	A	A	A
Toluene	A	A	A	A	A
Trichlorethylene	B	A	A	A	A
Turpentine	B	A	A	A	A
Varnish, Hot	C	A	A	A	A
Vegetable Oils	B	A	A	A	B
Vinegar	D	A	A	A	A
Water, Acid Mine	D	A	A	A	C
Water, Boiler Feed	B	A	A	A	A
Water, Distilled	D	A	A	A	A
Water, Salt Sea	D	C	B	B	A
Whiskey, Boiling	D	A	A	A	C
Wine	D	A	A	A	C
Xylene, Boiling	D	A	A	A	A
Zinc Chloride, 5%	D	C	B	B	B
Zinc Sulfate, Boiling	D	A	A	B	A

- A** = Substantial resistance - Preferred material of construction.
- B** = Moderate resistance - Satisfactory for use under most conditions.
- C** = Questionable resistance - Use with caution.
- D** = Inadequate resistance - Not recommended.

OMB doesn't assume any responsibility from the use of a.m. data which are purely theoretical. The user must verify the best conditions of use.



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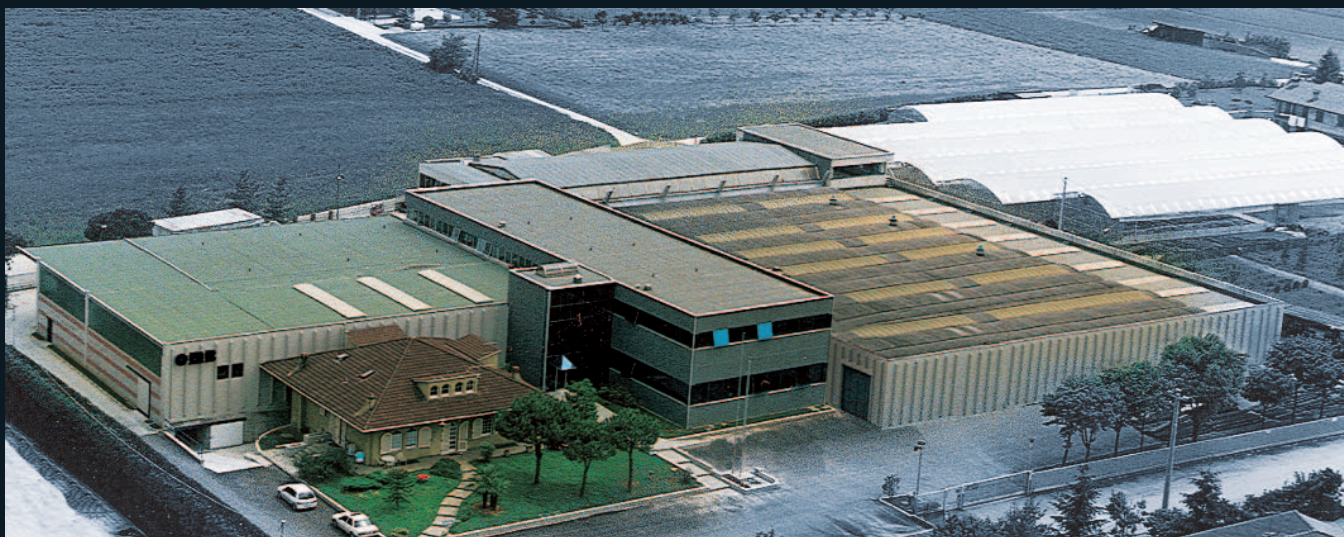
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