

Forged Steel Valves



C-FVS



INDUSTRIAL VALVE MANUFACTURER is a Saudi owned and operated company which machine, assemble and test valves in the second industrial city in Al-Dammam. The company license the valves design and technology from OMB valves in Italy, with whom it has a strong industrial and commercial relationship since its founding: OMB valves group provide as well procurement and training supporting IVM to access the most reliable European suppliers of forgings and valve parts.



A licensed forged valve manufacturer in the Kingdom has acquired the speciality of one of the leading manufacturer of forged valves in the world. Industrial Valves Manufacturer has been manufacturing a growing range of forged steel gate, globe and check valves to API/ASME specifications. The licensor company OMB valves S.p.A. based in Bergamo specialises in large scale manufacturing of valves for the petro - chemical industry ranking second in the world for output. The Saudi operation by contrast, is a skilled flexible team with a capability to manufacture up to five thousand valves per month and provide a customization and quick delivery service.

INDUSTRIAL VALVES MANUFACTURER (LICENSOR OF OMB VALVES PRODUCTS)

Industrial Valves Manufacturer is a part of a network of worldwide valve supply through OMB, an Italian based group with 5 manufacturing plants, and its distribution partners. OMB manufactures valves in Italy, Singapore, UK and in Kingdom of Saudi Arabia, with a team of more than 200 engineers and valve specialists and 6 specialized plants. IVM products range starts from API602 gate, globe and check valves in any material, to cryogenic service, bellows sealed and specialized chemical service valves.

In kingdom of Saudi Arabia, IVM manufactures floating, trunnion and top entry ball valves up to 24" A complete set of catalogues can be requested in any of IVM sites or at IVM Agents and Distributors located in gulf countries and at over 10 locations.



What makes you choose a valve for your plant?
Quality, price, delivery, availability of product at distributors, approvals by end users, aftermarket service?
At IVM we try hard to give you the best in every area.

Material Sources And Traceability

IVM use forgings made in Italy only for all its products: we have an extensive investment in dies covering all size and pressure classes in every material from common carbon steels to the most exotic alloys. All our suppliers are ISO9000 certified.

Our valves are always supplied with the forging plant issued 3.1 certificate. We keep on our online database, searchable via our web site, all the certificates issued in the past 10 years.

Material & Valve Testing Facilities

Non-destructive examination by ultrasonics, magnetic particles and liquid penetrant can be held at our site. Chemical analysis by computer controlled direct reading emission spectrometer and ferrite content analyzer equipment are available.

All valves are hydraulically tested, seat leakage tested and functionally tested. In addition packing emission in accordance to the latest ISO requirement, helium gas, cryogenic, vacuum and other functional testing can be arranged in our laboratories.

ISO 15761 has been recently published as part of an international effort to standardize the products for the Petroleum and Natural Gas industries. At printing time the list of ISO standards in our industry can be summarized in the following table. We list as well the major API and ASME standards covering our industry to which we refer in some of our following pages.

DESIGN AND MANUFACTURING STANDARDS		
ISO	API/ASME	DESCRIPTION
ISO 5208:1993		Industrial valves – Pressure testing of valves
ISO 5209:1977		General purpose industrial valves – Marking
ISO 5752:1982		Metal valves for use in flanged pipe systems – Face-to-face and centre-to-face dimensions
ISO 5996:1984		Cast iron gate valves
ISO 6002:1992		Bolted bonnet steel gate valves
ISO 7121:1986		Flanged steel ball valves
ISO 7259:1988		Predominantly key-operated cast iron gate valves for underground use
ISO 10423:2003	API 6A	Specification for Wellhead and Christmas Tree Equipment
ISO 10434:2004	API 600	Bolted bonnet steel gate valves for the petroleum, petrochemical and aligned industries
ISO 10497:2004	API 607	Testing of valves - Fire type-testing requirements (Fire Test for Soft-Seated Quarter-Turn Valves)
ISO 10631:1994		Metallic butterfly valves for general purposes
ISO 12149:1999		Bolted bonnet steel globe valves for general-purpose applications
ISO 14313	API 6D	Specification for Pipeline Valves
ISO 15156	NACE MR0175	NACE MR0175, Petroleum and natural gas industries—Materials for use in H ₂ S-containing environments in oil and gas production
ISO 15761:2002	API 602 (including former BS5352)	Steel gate, globe and check valves for sizes DN 100 and smaller, for the petroleum and natural gas industries
ISO 15848-1:2006		Industrial valves — Measurement, test and qualification procedures for fugitive emission Part 1: Classification system and qualification procedures for type testing of valves
ISO 17292:2004		Metal ball valves for petroleum, petrochemical and aligned industries
	API 591	User Acceptance of Refinery Valves
	API 598	Valve Inspection and Testing
	API 600	Steel Gate Valves
	API 602	Compact Carbon Steel Gate Valves
	API 603	Cast, Corrosion Resistant Gate Valves
	API 608	Metal Ball Valves—Flanged, Threaded and Butt-Welding Ends (150&300)
	API 17D	Specification for Subsea Wellhead and Christmas Tree Equipment
	API 6FA	Specification for Fire Test for Valves
	API 622	Type Testing of Process Valve Packing for Fugitive Emissions
	ASME B16.34	Valves 2 Flanged, Threaded, and Buttwelded End
	ASME B16.10	Face-to-Face and End-to-End Dimensions of Valves
	ASME B16.5	Pipe Flanges and Flanged Fittings
	ASME B16.25	Buttwelded Ends
	ASME B16.11	Forged Fittings, Socket Welding and Threaded

SPECIAL DESIGN

On top of the complete range of valves covered by ISO15761/API602, we manufacture as well special gate, globe and check valves to meet specific requirements in various service and process conditions:

- Bellows Seal Valves
- Cryogenic and Low Temperature Valves
- High Temperature /High Pressure service valves
- Pressure Seal valves form 1/2" upwards
- Y pattern globe and check valves
- Alkylation Service
- Extended Bonnet/ Lantern Ring Vacuum service valves
- Chlorine Service valves
- Urea service valves
- Instrumentation – Needle valves
- Valves with Soft seat inserts
- Self Closing (Spring operated) Globe valves
- Angle Valves

SPECIAL SERVICE

ISO15761/API602 valves are designed for general use in Petroleum and Natural gas industries. In the event of special application valves design, material selection, manufacturing and inspection procedure may vary to address specific requirement of the process.

IVM publish a set of guidelines for Special service which are based on its experience and industry standard identifying the particular requirements for each activity.

SPECIAL SERVICE APPLICATIONS		
SERVICE	NOTE	OMB PROCEDURES
Bellows Seal	Bellows seal valves have been developed and tested according the EPA-API SV - 001 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 SV - 004 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 SV - 006 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 SV - 008 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 IVM reserves the right to make modifications or changes to its production.

MINIMUM FLOW PASSAGE WAY



CLASS 150-300-600-800

BS 5352 - API 602 ^{8TH} / ISO 15761					
	DN	NPS	BS 5352 (OBSOLETE)		API 602 ^{8TH} /ISO 1561
			STANDARD BORE	REDUCE BORE	MINIMUM DIAMETER
GATE	8	1/4	6	-	6
	10	3/8	9	6	6
	15	1/2	12	9	9
	20	3/4	18	12	12
	25	1	23	18	17
	32	1 1/4	30	23	23
	40	1 1/2	36	30	28
	50	2	46,5	26	36
GLOBE	8	1/4	6	-	6
	10	3/8	9	6	6
	15	1/2	12	9	9
	20	3/4	17,5	12	12
	25	1	22,5	17,5	17
	32	1 1/4	29,5	22,5	23
	40	1 1/2	35	29,5	28
	50	2	45,5	35	36
CHECK	8	1/4	6	-	6
	10	3/8	9	6	6
	15	1/2	12	9	9
	20	3/4	17,5	12	12
	25	1	22,5	17,5	17
	32	1 1/4	29,5	22,5	23
	40	1 1/2	35	29,5	28
	50	2	45,5	35	36

IVM MINIMUM PASSAGE WAY				
	DN	NPS	STANDARD PORT	FULL PORT
			API 602 8 th	BS 5352
			SW, NPT, FLANGED END, BUTT WELD END	
GATE	8	1/4	6	6
	10	3/8	6	9
	15	1/2	9	12
	20	3/4	12	18
	25	1	17	23
	32	1 1/4	23	30
	40	1 1/2	28	36
	50	2	36	46,5
GLOBE	8	1/4	6	N/A
	10	3/8	6	N/A
	15	1/2	9	N/A
	20	3/4	12	N/A
	25	1	17	N/A
	32	1 1/4	23	N/A
	40	1 1/2	28	N/A
	50	2	36	N/A
CHECK	8	1/4	6	N/A
	10	3/8	6	N/A
	15	1/2	9	N/A
	20	3/4	12	N/A
	25	1	17	N/A
	32	1 1/4	23	N/A
	40	1 1/2	28	N/A
	50	2	36	N/A

CLASS 900/1500

BS 5352 - API 602 ^{8TH} / ISO 15761					
	DN	NPS	BS 5352 (OBSOLETE)		API 602 ^{8TH} /ISO 1561
			STANDARD BORE	REDUCE BORE	MINIMUM DIAMETER
GATE	8	1/4	-	N/A	6
	10	3/8	-	N/A	6
	15	1/2	11,5	N/A	9
	20	3/4	15	N/A	12
	25	1	19,5	N/A	15
	32	1 1/4	28	N/A	22
	40	1 1/2	32	N/A	27
	50	2	40	N/A	34
GLOBE	8	1/4	-	N/A	5
	10	3/8	-	N/A	5
	15	1/2	11	N/A	8
	20	3/4	14,5	N/A	9
	25	1	19	N/A	14
	32	1 1/4	27	N/A	20
	40	1 1/2	31	N/A	25
	50	2	37,5	N/A	27
CHECK	8	1/4	-	N/A	5
	10	3/8	-	N/A	5
	15	1/2	11	N/A	8
	20	3/4	14,5	N/A	9
	25	1	19	N/A	14
	32	1 1/4	27	N/A	20
	40	1 1/2	31	N/A	25
	50	2	37,5	N/A	27

IVM MINIMUM PASSAGE WAY				
	DN	NPS	STANDARD PORT	FULL PORT
			API 602 8 th	BS 5352
			SW, NPT, FLANGED END (End to End IVM dimension)	FLANGED END, BUTTWELDED END (End to End IVM dimension as per ASME b16.10)
GATE	8	1/4	6	-
	10	3/8	6	-
	15	1/2	9	11,5
	20	3/4	12	15
	25	1	15	19,5
	32	1 1/4	22	28
	40	1 1/2	27	32
	50	2	34	40
GLOBE	8	1/4	5	-
	10	3/8	5	-
	15	1/2	8	11
	20	3/4	9	14,5
	25	1	14	19
	32	1 1/4	20	27
	40	1 1/2	25	31
	50	2	27	37,5
CHECK	8	1/4	5	-
	10	3/8	5	-
	15	1/2	8	11
	20	3/4	9	14,5
	25	1	14	19
	32	1 1/4	20	27
	40	1 1/2	25	31
	50	2	27	37,5

BODY AND BONNET MATERIALS

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

Material Group	Common Name	Nominal Type	UNS	Forging Spec. (ASTM)	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	TCS	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 cl2	A217-WC6	13CRMO44	1.7335	Up to 1100F (593C)
		2.1/4Cr-1Mo	K21590	A182-F22 cl3	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 91	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 Duplex F55	25Cr-7Ni-3.5Mo-N-Cu-W	S32760	A182 F55	CD3MWCuN			Service to 600F
	Super Austenitic 6Mo	20Cr-18Ni-6Mo	S31254	A182-F44	A351-CK3MCuN	1CrNiMoCuN20-18-7 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	2.4858N	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	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	

BOLTS MATERIALS

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.

IVM STANDARD TRIM DEFINITIONS						
API Trim No	Nominal Trim	IVM descr.	Steam	Disc/Wedge	Seat	Min Hardness (Brinell)
1	F6	F6	410 (13Cr)	F6 (13Cr)	410 (13Cr)	250
2	304	304	304 (18Cr-8Ni)	304 (18Cr-8Ni)	304 (18Cr-8Ni)	not specified
3	-	-	(25Cr-20Ni)	310 (25Cr-20Ni)	310 (25Cr-20Ni)	not specified
4	-	-	410 (13Cr)	F6 (13Cr)	F6 (13Cr)	750
5	Hardfaced	F6HF	410 (13Cr)	F6 + St Gr6 (CoCr Alloy)	410 + St Gr6 (CoCr Alloy)	350
5A	-	-	410 (13Cr)	F6+Hardf. NiCr Alloy	410+Hardf. NiCr Alloy	350
6	-	-	410 (13Cr)	F6 (13Cr)	Monel® (NiCu Alloy)	250/175
7	-	-	410 (13Cr)	F6 (13Cr)	F6 (13Cr)	250/750
8	F6 and Hardfaced	F6HFS	410 (13Cr)	F6 (13Cr)	410 + St Gr6 (CoCr Alloy)	250/350
8A	-	-	410 (13Cr)	F6 (13Cr)	410 Hardf. Nicr Alloy	250/350
9	Monel	Monel	Monel®(NiCu Alloy)	Monel®(NiCu Alloy)	Monel®(NiCu Alloy)	not specified
10	316	316	316 (18Cr-8Ni-Mo)	316 (18Cr-8Ni-Mo)	316 (18Cr-8Ni-Mo)	not specified
11	Monel and Hardfaced	MonelHFS	Monel®(NiCu Alloy)	Monel®(NiCu Alloy)	Monel®St Gr6	350
11A	-	-	Monel®(NiCu Alloy)	Monel®(NiCu Alloy)	Monel®Hardif. NiCrA	3350
12	316 and Hardfaced	316HFS	316 (18Cr-8Ni-Mo)	316 (18Cr-8Ni-Mo)	316 + St. Gr6	350
12A	-	-	316 (18Cr-8Ni-Mo)	316 (18Cr-8Ni-Mo)	316 Hardf. NiCr Alloy	350
13	Alloy 20	Alloy 20	Alloy 20 (19Cr-29Ni)	Alloy 20 (19Cr-29Ni)	Alloy 20 (19Cr-29Ni)	not specified
14	Alloy 20 and Hardfaced	Alloy 20HFS	Alloy 20 (19Cr-29Ni)	Alloy 20 (19Cr-29Ni)	Alloy 20 St Gr6	350
14A	-	-	Alloy 20 (19Cr-29Ni)	Alloy 20 (19Cr-29Ni)	Alloy 20 Hardf. NiCr Alloy	350
15	Hardfaced (304)	304-HF	304 (18Cr-8Ni)	304 + St Gr6	304 + St Gr6	350
16	Hardfaced (316)	316-HF	-	316 + St Gr6	316 + St Gr6	350
17	Hardfaced (347)	347-HF	-	347 + St Gr6	347 + St Gr6	350
18	Hardfaced Alloy 20 HF	Alloy 20 HF	Alloy 20 (19Cr-29Ni)	Alloy 20 + St Gr6	Alloy 20 + St Gr6	350
n/a	Alloy 625	Alloy 625	Alloy 625	Alloy 625	Alloy 625	-

IVM TRIM MATERIAL						
IVM	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®	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
17/4PH	UNS S17400	0Cr17Ni4Cu4Nb	ASTM A705 UNS S17400	ASTM A564 UNS S17400	X5CrNiCuNb17-4-4	1.4548
St. Gr6	UNS R30006	Co Cr-A	AMS 5894	Stellite(R) Gr6		

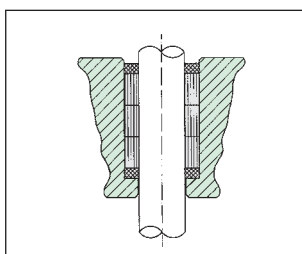
ASBESTOS-FREE PACKING is composed by a series of rings of pure graphite. The sets is closed with two rings, top and bottom, anti-extrusion, manufactured in braided graphite. Both internal and external rings are treated with corrosion inhibitor.

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 IVM maintains an extensive inventory of packing and gasket spares. To individualise the required one please refer to the information shown on IVM's data sheets (assembly drawings), indicating code and composition of the sets. A comprehensive updated list of packing and gasket for each design/figure is available online at www.ivm-ombsaudi.it.com

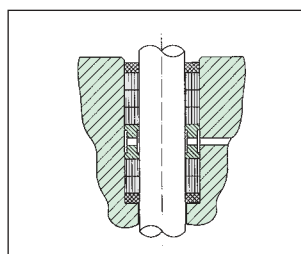
EMISSION CONTROL OPTIONS

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



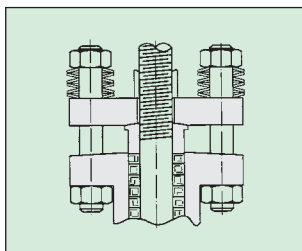
GRAPHITE PACKING

Tight control on stem and packing chamber walls finishing and material purity and density in the packing guarantee a leakproof 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.

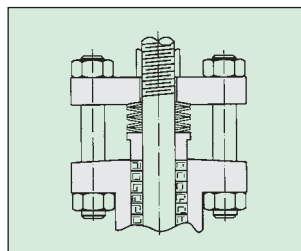


LIVE LOADING

BOLTS LOADED TYPE

(on request)

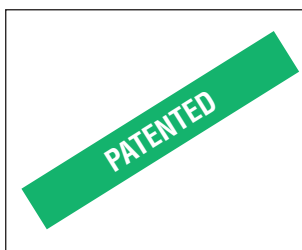
Two sets of Belleville springs keep gland flange pressure on packing for long periods of time without maintenance.



LIVE LOADING GLAND LOADED TYPE

(on request)

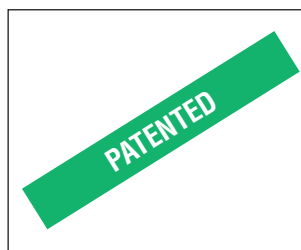
Sets of belleville springs keep gland pressure on packing for long periods of time without maintenance.



GARLOCK®

EVSP 9000 FVP

(on request) IVM offers this superior designed of OMB chevron-style graphite packing. ISA testing qualification for BP.



ARMA-SEAL 312 (TM)

(on request)

IVM valves qualified to ISO15848 testing using this special designed packing. Shell 77/312 qualification.

EMISSION CONTROL TESTING & QUALIFICATION

IVM 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.



API 622 TESTING

Valve temperature and pressure cycle with methane.



ISO 15848 TESTING

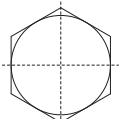
Emission test with Temperature and Pressure cycles combined. Detection by mass spectrometer in open ambient.

SUBSTITUTE BODY-TO-BONNET BOLTING MATERIALS

ASTM Bolting Material	EN 10269 Bolting Material Grade	ASTM Bolting Material	EN 10269 Bolting Material Grade
A193 B7 A 193 B16	42CrMo4 (1.7225) QT 40CrMoV4-6 (1.7711) - QT	A 193 B8M2, CL 2B A 193 B8M3, CL 2C	X5CrNiMo 17-12-2 (1.4401) - C700 X5CrNiMo 17-12-2 (1.4401) - C700
A 193 B8M, CL 2 A 194 2H	X5CrNiMo 17-12-2 (1.4401) C45E (1.1191) - QT	A 193 B8M, CL 1 A 193 B8MA, CL 1A	X5CrNiMo 17-12-2 (1.4401) - AT X5CrNiMo 17-12-2 (1.4401) - AT
A194 8M	X5CrNiMo 17-12-2 (1.4401) - AT	A 193 B8, CL 1 A193 B8A, CL 1A	X5CrNiMo 18-10 (1.4301) - AT X5CrNiMo 18-10 (1.4301) - AT
-	-	A 193, B8 CL 2 A 320, L7	X5CrNi 18-10 (1.4301) - C700 42CrMo4 (1.7225) - QT
-	-	A 194 GR 8 A194 GR 4	X5CrNi 18-10 (1.4301) - AT 42CrMo4 (1.7225) - QT
-	-	A 194 GR 7	42CrMo4 (1.7225) - QT

THERMAL EXPANSION OF BOLTS ON FORGED STEEL VALVES

In this table we will analyze the Thermal Expansion of bolting in B7 and B8 material used in Forged steel valves made according to ISO 15761/API 602. The following table gives the mechanical properties of the most common bolt materials used in the Forged Steel valves.

Identification Grnde Mark 	Specification	Material	Nominal Size Range (in.)	Linear Thermal Expansion Coefficient (°C-1)	Mechanical Properties		
					Proof Load (psi)	Yield Strength Min (psi)	Tensile Strength Min (psi)
B7	ASTM A193 type - Grade B7	4140, 4142, OR 4105	1/4 thru 2-1/2 Over 2-1/2 thru 4 Over 4 thru	12* 10 ⁻⁶	-- -- --	105,000 95,000 75,00	125,000 115,000 100,000
B16	ASTM A193 type - Grade B16	CrMoVa Alloy Steel	1/4 and larger	11* 10 ⁻⁶	--	105,000 95,000 85,000	125,000 115,000 100,000
B8	ASTM A193 Grade B8	AISI 304	1/4 thru 3/4 Over 3/4 to 1-1/2	11* 10 ⁻⁶	55,000 33,000	30,000	75,000
B8M	ASTM A193 Grade B8M	AISI 316	1/4 thru 2-1/2 Over 2-1/2 thru 4 Over 4 thru 7	11* 10 ⁻⁶	-- -- --	105,000 95,000 75,000	125,000 115,000 100,000

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	C	D
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	A	A
Milk	D	A	A	A	B
Molasses	B	A	A	A	A
Naptha	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.

ACCORDING TO API 302/8TH / ISO 15761

CLASS 800									
SERVICE TEMPER.	A105 ⁽¹⁾ A350-LF2 ⁽²⁾	A182 ⁽³⁾ F11	A182 ⁽³⁾ F22	A182 F5	A182 F9	A182 F304	A182 F316	A182 ⁽¹⁾ F304L	A182 F347H
°F	psi	psi	psi	psi	psi	psi	psi	psi	psi
-20 to 100	1975	2000	2000	2000	2000	1920	1920	1600	1920
200	1800	1900	2000	2000	2000	1600	1655	1350	1695
300	1750	1795	1940	1940	1940	1410	1495	1210	1570
400	1690	1755	1880	1880	1880	1255	1370	1100	1480
500	1595	1710	1775	1775	1775	1165	1275	1020	1380
600	1460	1615	1615	1615	1615	1105	1205	960	1310
650	1430	1570	1570	1570	1570	1090	1185	935	1280
700	1420	1515	1515	1515	1515	1075	1150	915	1250
750	1345	1420	1420	1420	1420	1060	1130	895	1230
800	1100	1355	1355	1325	1355	1050	1105	875	1215
850	715	1300	1300	1170	1300	1035	1080	860	1185
900	460	1200	1200	940	1200	1025	1050		1150
950	275	1005	1005	695	985	1000	1030		1030
1000	140	595	715	510	780	860	970		970
1050		365	530	375	505	825	960		960
1100		255	300	275	300	685	860		860
1150		140	275	185	200	520	735		735
1200		95	145	120	140	415	550		460
1250							485		330
1300							365		250
1350							275		180
1400							200		140
1450							155		110
1500							110		95

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.

CLASS 800							
SERVICE TEMPER.	A105 ⁽¹⁾ A350-LF2 ⁽³⁾	A182 ⁽³⁾ F11	A182 ⁽³⁾ F22	A182 F5	A182 F9	A182 F304	A182 F316
°C	bar	bar	bar	bar	bar	bar	bar
-29 to 38	136.2	137.9	137.9	137.9	137.9	132.4	132.4
93.5	124.1	131	131.7	137.9	137.9	110.3	114.1
149	120.7	123.8	124.5	133.8	133.8	97.2	103.1
204.5	116.6	121.0	119.3	129.7	129.7	86.5	94.5
260	110.0	117.9	117.6	122.4	122.4	80.3	87.9
315.5	100.7	113.4	113.4	113.4	113.4	76.2	83.1
343.5	98.6	108.3	108.3	108.3	108.3	75.2	81.7
371	97.9	104.5	104.5	104.5	104.5	74.1	79.3
399	92.7	97.9	97.9	97.9	97.9	73.1	77.9
426.5	75.9	93.4	93.4	91.4	93.4	72.4	76.2
454.5	49.3	89.7	89.7	80.7	89.7	71.4	74.5
482	31.7	82.8	82.8	64.8	82.8	70.7	72.4
510	19	69.3	69.3	47.9	67.9	69.0	71.0
538	9.7	41.0	49.3	35.2	53.8	59.3	66.9
565.5		25.2	36.6	25.9	34.8	56.9	66.2
593.5		17.6	20.7	19.0	20.7	47.2	59.3
621		9.7	19.0	12.8	13.8	35.9	50.7
649		6.6	10.0	8.3	9.6	28.6	37.9
676.5						20.3	33.4
704.5						15.0	25.2
732.5						11.4	19.0
760.5						9.0	13.8
788.5						6.6	10.7
815.5						4.5	7.6

ACCORDING TO ASME B16.34

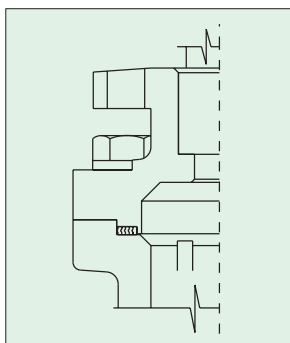
CARBON STEEL A105 ⁽¹⁾ & A350 LF2 ⁽²⁾					
SERVICE TEMPER.	A105	300	600	1500	2500
°F	psi	psi	psi	psi	psi
-20 to 100	285	740	1480	3705	6170
200	260	675	1350	3375	5625
300	230	655	1315	3280	5470
400	200	635	1270	3170	5280
500	170	600	1200	2995	4990
600	140	550	1095	2735	4560
650	125	535	1075	2680	4475
700	110	535	1065	2665	4440
750	95	505	1010	2520	4200
800	80	410	825	2060	3430
850	65	270	535	1340	2230
900	50	170	345	860	1430
950	35	105	205	515	860
1000	20	50	105	260	430
1050					
1100					

CARBON STEEL A105 ⁽¹⁾ & A350 LF2 ⁽²⁾				
SERVICE TEMPER.	PN 20	PN 50	PN 100	PN 250
°C	bar	bar	bar	bar
38	19.6	51.1	102.1	255.3
50	19.2	50.1	100.2	250.4
100	17.7	46.4	92.8	231.9
150	15.8	45.2	90.5	226.1
200	14.0	43.8	87.6	219.1
250	12.1	41.7	83.4	208.6
300	10.2	38.7	77.5	193.7
350	8.4	37.0	73.9	184.8
375	7.4	36.5	72.9	182.3
400	6.5	34.5	69.0	172.5
425	5.6	28.8	57.5	143.8
450	4.7	20.0	40.1	100.2
475	3.7	13.5	27.1	67.7
500	2.8	8.8	17.6	44.0
525	1.9	5.2	10.4	25.9
540	1.3	3.3	6.5	16.3

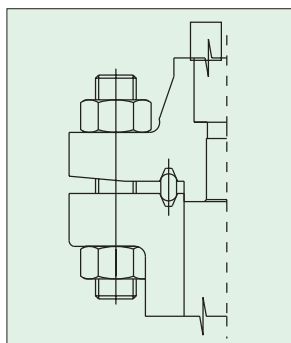
ISO 15848 PART I - FUGITIVE EMISSION TEST MATRIX

IVM valves completed the following test to qualify the complete product range with a major end user

	Design	Temp. Range	TEST PROTOCOL NUMBER		
			150-600	1500	2500
Gate Valves ISO 15761/ API602, Wedge Type, Metal Seated, Rising Stem valves, Cryogenic	ext bonnet	-196 to 300c	1	2	3
Gate Valves ISO 15761/ API602, Wedge Type, Metal Seated, Rising Stem valves	std	-50 to 400C	4	5	6
Gate Valves ISO 15761/ API602, Wedge Type, Metal Seated, Rising Stem valves, High Temp	std	0 -650C	7	8	9
Globe Valves ISO 15761/ API602 (BS5352), Flanged, Plug/ball type, Cryogenic	straight ext bonnet	-196 to 300c	10	11	12
Globe Valves ISO 15761/ API602 (BS5352), Flanged, Plug/ball type	straight	-50 to 400C	13	14	15
Globe Valves ISO 15761/ API602 (BS5352), Flanged, Plug/ball type, High Temp	straight	0 -650C	16	17	18
Globe Valves ISO 15761/ API602 (BS5352), Flanged, Plug/ball type	Y pattern	-50 to 400C	19	20	21
Globe Valves ISO 15761/ API602 (BS5352), Flanged, Plug/ball type, High Temp	Y pattern	0 -650C	22	23	24
Check Valves ISO 15761/ API602 (BS5352), Piston Type, Bolted cover, cryogenic	straight	-196 to 300c	25	26	27
Check Valves ISO 15761/ API602 (BS5352), Piston Type, Bolted cover	straight	-50 to 400C	28	29	30
Check Valves ISO 15761/ API602 (BS5352), Piston Type, Welded cover, high temperature	straight	0 -650C	31	30	33



Gasket Joint

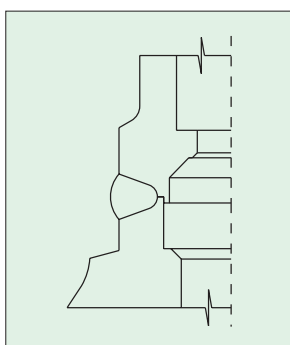


Ring Joint

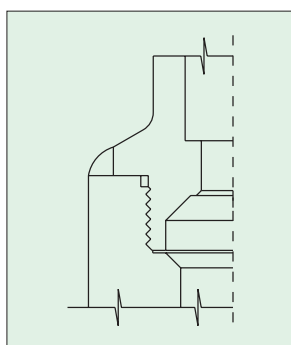
BODY-BONNET CONNECTIONS: BOLTED BONNET

Join IVM standard construction of body-bonnet connection is bolted, with a spiral wound gasket to seal the connection.

On request we offer as well Ring Joint connection. Ring Joint is standard feature on class 2500 bolted bonnet, on request on all other pressure class.



Full Penetration Weld "WP"



Screwed and Seal Weld "L"

BODY-BONNET CONNECTIONS: WELDED BONNET

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

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



INTEGRAL FLANGED ENDS

All IVM valves with flanges are provided with flanged integral with the body forgings.

We do not weld on flanges in any class or materials so you can have a complete guarantee of integrity, mechanical strength and material compatibility.

All our flanged (and butt weld) valves have dimension in accordance to ASME B16.5 (ends) and ASME B16.10 (end to end). Valves to DIN and JIS standards as well are made with integral flanged forgings.

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 system 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	-	-	0.9	2.3
1/8	-	4.3	-	1.4	-	-	1.1	3.5
1/2	5.5	11.6	1.5	3.6	1	1	2.1	4.8
3/4	12	26.6	3.8	6.6	2.8	2.8	5.8	7.8
1	27	54.6	6.8	10.9	6	6	7	11.2
1 1/4	55	79.8	11	14	9.5	9.5	9.2	18.0
1 1/2	80	87	14.3	24.3	11	11	15.4	37.8
2	105	108	25	39.7	18	18	32	69.2



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

p = 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.

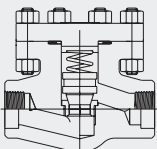
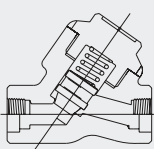
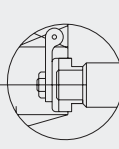
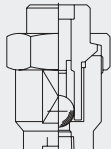
CONVERSION TABLE TO METRIC K_v

Flow Coefficient	C_v	K_v
C_v	1	0.865
K_v	1.156	1

To measure the properly value of C_v there is 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.

CHECK VALVES CRACKING PRESSURE

VALVE	PISTON TYPE		Y PATTERN PISTON TYPE		BALL TYPE		SWING	VERTICAL BALL
	Non Spring Loaded	Spring Loaded	Non Spring Loaded	Spring Loaded	Non Spring Loaded	Spring Loaded	Non Spring Loaded	Spring Loaded
NPS	840	840 Spring	Y640	Y640 Spring	850	850 Spring	860	UV850
1/2" - 15	0.4 Bar	0.5 Bar	0.4 Bar	0.5 Bar	0.3 Bar	0.4 Bar	0.03 Bar	0.4 Bar
3/4 - 20	0.4 Bar	0.5 Bar	0.4 Bar	0.5 Bar	0.3 Bar	0.4 Bar	0.03 Bar	0.4 Bar
1" - 25	0.4 Bar	0.5 Bar	0.4 Bar	0.5 Bar	0.3 Bar	0.4 Bar	0.03 Bar	0.4 Bar
1 1/2" - 40	0.4 Bar	0.5 Bar	0.4 Bar	0.5 Bar	0.3 Bar	0.4 Bar	0.04 Bar	0.4 Bar
2" - 50	0.5 Bar	0.6 Bar	0.5 Bar	0.5 Bar	0.4 Bar	0.5 Bar	0.05 Bar	0.5 Bar
Type Scheme								

Disclaimer. All above data have been calculated experimentally on production lost based on a standard combination of materials tested with air. Data may vary with fluid of higher or with spring/parts in special steel grades. In case of specific need we suggest you contact OMB center at the Bergamo plants.



NAMEPLATE

Each valve is identified by proper marking on the name plate according to MSS SP25 and ISO15761 specifications.

Nameplate contains information regarding valve type, body-bonnet material, seat-wedge and stem composition, class and diameter.

On the nameplate the relevant mark is incorporated.

Each valve when tested is stamped on the nameplate with the QC operator code for reference.

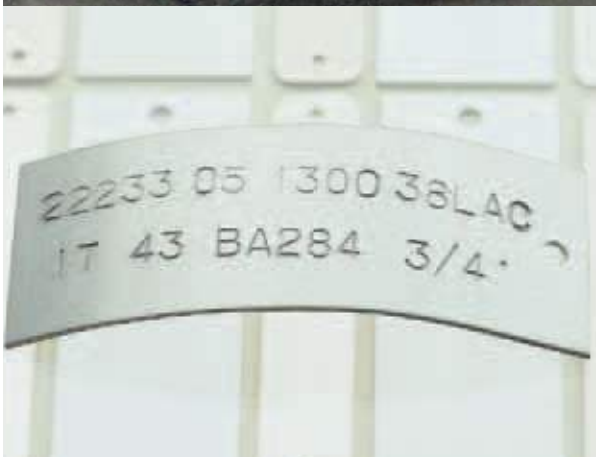


BODY MARKING

Material designation and heat codes are forged on both body and bonnet.

Bodies are marked with the OMB logo, pressure class designation, nominal size (using NPS number) and an arrow on check and globe valves (unidirectional).

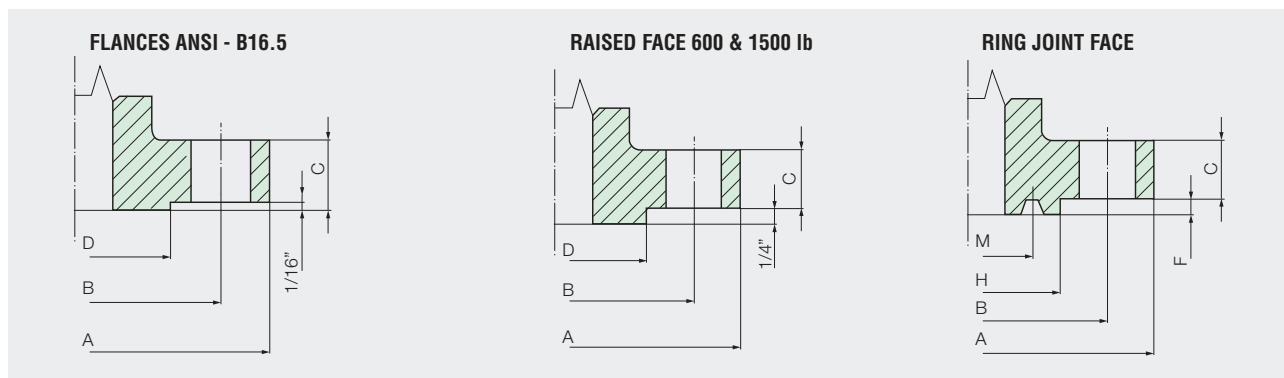
Upon customer request further marking can be applied.



ADDITIONAL TAGS

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

FLANGED ASME - B16.5



CLASS	SIZE	A		C		D		B		BOLT HOLED			RING JOINT FACING						RING N.
										N	SIZE		H	M	F				
150	1/2	3.50	89.0	0.44	11.5	1.38	34.9	2.38	60.5	4	0.62	16.0	-	-	-	-	-	-	-
	3/4	3.88	98.5	0.50	13.0	1.69	42.9	2.75	70.0	4	0.62	16.0	-	-	-	-	-	-	-
	1	4.25	108.0	0.56	14.5	2.00	50.8	3.12	79.5	4	0.62	16.0	2.50	63.5	1.875	47.62	0.250	6.4	R 15
	1 1/4	4.62	117.5	0.62	16.0	2.50	63.5	3.50	89.0	4	0.62	16.0	2.88	73.0	2.250	57.15	0.250	6.4	R 17
	1 1/2	5.00	127.0	0.69	18.0	2.88	73.0	3.88	98.5	4	0.62	16.0	3.25	82.5	2.562	65.07	0.250	6.4	R 19
	2	6.00	152.5	0.75	19.5	3.62	92.1	4.75	120.5	4	0.75	19.0	4.00	101.5	3.250	82.55	0.250	6.4	R 22
300	1/2	3.75	95.5	0.56	14.5	1.38	34.9	2.62	66.5	4	0.62	16.0	2.00	50.8	1.344	34.14	0.219	5.6	R 11
	3/4	4.62	117.5	0.62	16.0	1.69	42.9	3.25	82.5	4	0.75	19.0	2.50	63.5	1.688	42.88	0.250	6.4	R 13
	1	4.88	124.0	0.69	18.0	2.00	50.8	3.50	89.0	4	0.75	19.0	2.75	69.9	2.000	50.80	0.250	6.4	R 16
	1 1/4	5.25	133.5	0.75	19.5	2.50	63.5	3.88	98.5	4	0.75	19.0	3.12	79.2	2.375	60.32	0.250	6.4	R 18
	1 1/2	6.12	156	0.81	21.0	2.88	73.0	4.50	114.5	4	0.88	22.0	3.56	90.44	2.688	68.28	0.250	6.4	R 20
	2	6.50	165.5	0.88	22.5	3.62	92.1	5.00	127.0	8	0.75	19.0	4.25	108.0	3.250	82.55	0.312	7.9	R 23
600	1/2	3.75	95.5	0.56	14.5	1.38	34.9	2.62	66.5	4	0.62	16.0	2.00	50.5	1.344	34.14	0.219	5.6	R 11
	3/4	4.62	117.5	0.62	16.0	1.69	42.9	3.25	82.5	4	0.75	9.0	2.50	63.5	1.688	42.88	0.250	6.4	R 13
	1	4.88	124.0	0.69	18.0	2.00	50.8	3.50	89.0	4	0.75	19.0	2.75	69.9	2.000	50.80	0.250	6.4	R 16
	1 1/4	5.25	133.5	0.81	21.0	2.50	63.5	3.88	98.5	4	0.75	19.0	3.12	79.4	2.375	60.32	0.250	6.4	R 18
	1 1/2	6.12	156.0	0.88	22.5	2.88	73.0	4.50	114.5	4	0.88	22.0	3.56	90.5	2.688	68.25	0.250	6.4	R 20
	2	6.50	165.5	1.00	25.5	3.62	92.1	5.00	127.0	8	0.75	19.0	4.25	108.0	3.250	82.55	0.312	7.9	R 23
1500	1/2	4.75	121.0	0.88	22.5	1.38	34.9	3.25	82.5	4	0.88	22.0	2.38	60.3	1.562	39.67	0.250	6.4	R 12
	3/4	5.12	130.5	1.00	25.5	1.69	42.9	3.50	89.0	4	0.88	22.0	2.62	66.7	1.750	44.45	0.250	6.4	R 14
	1	5.88	149.5	1.12	29.0	2.00	50.8	4.00	101.5	4	1.00	25.5	2.81	71.4	2.000	50.80	0.250	6.4	R 16
	1 1/4	6.25	159.0	1.12	29.0	2.50	63.5	4.38	111.0	4	1.00	25.5	3.19	81.0	2.375	60.32	0.250	6.4	R 18
	1 1/2	7.00	178.0	1.25	32.0	2.88	73.0	4.88	124.0	4	1.12	28.5	3.62	92.1	2.688	68.28	0.250	6.4	R 20
	2	8.50	216.0	1.50	38.5	3.62	92.1	6.50	165.0	8	1.00	25.5	4.88	123.8	3.750	95.25	0.312	7.9	R 24
2500	1/2	5.23	133.5	1.20	30.5	1.38	34.9	3.50	89.0	4	0.88	22.0	2.55	65.1	1.688	42.88	0.250	6.4	R 13
	3/4	5.51	140.0	1.25	32.0	1.69	42.9	3.74	95.0	4	0.88	22.0	2.87	73.0	2.000	50.80	0.250	6.4	R 16
	1	6.25	159.0	1.37	35.0	2.00	50.8	4.24	108.0	4	1.00	25.5	3.24	82.5	2.375	60.32	0.250	6.4	R 18
	1 1/4	7.24	184.5	1.51	38.5	2.50	63.5	5.12	130.0	4	1.12	28.5	3.99	101.5	2.844	72.24	0.312	7.9	R 21
	1 1/2	7.99	203.5	1.75	44.5	2.88	73.0	5.74	146.0	4	1.25	31.5	4.50	114.3	3.250	82.55	0.312	7.9	R 23
	2	9.25	235.0	2.00	51.0	3.62	92.1	6.74	171.5	8	1.12	28.5	5.25	133.3	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 (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (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)	(0.19)	(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)	(0.217)	(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)

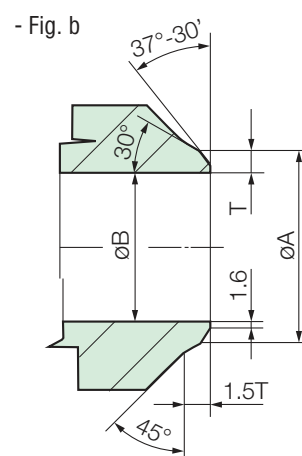
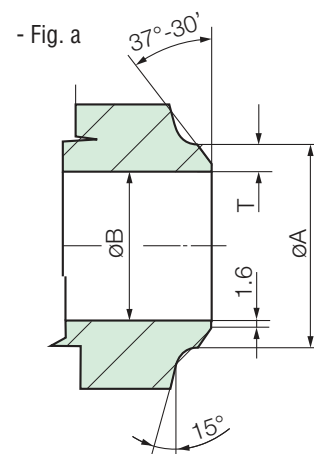
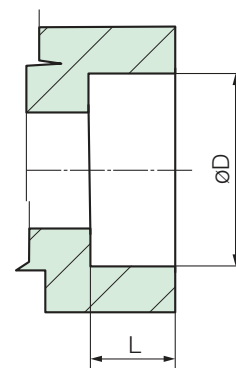


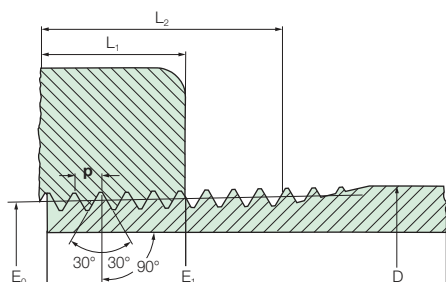
Fig. a $\leq 2"$ | Fig. b $> 2"$ | $A = B - 2T$

SOCKET WELD API 602/ISO 1576

SIZE	ØD		L (min)	
	mm	inch	mm	inch
1/4"	14.20	0.557	9.53	0.38
3/8"	17.60	0.690	9.53	0.38
1/2"	21.80	0.855	9.53	0.38
3/4"	27.20	1.065	12.70	0.5
1"	33.90	1.330	12.70	0.5
1.1/4"	42.70	1.675	12.70	0.5
1.1/2"	48.80	1.915	12.70	0.5
2"	61.20	2.406	15.88	0.62

L (IVM)	
mm	inch
11.1	0.44
11.1	0.44
12.7	0.5
4.5	0.57
16.0	0.63
17.5	0.69
19.0	0.75
22.0	0.86



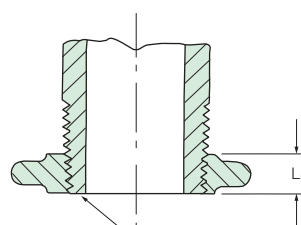


$$E_0 = D - (0.050D + 1.1)p$$

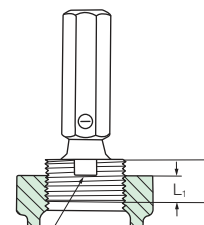
$$* E_1 = E_0 + 0.0625 L_1$$

$$L_2 = (0.80D + 6.8)p$$

p = Pitch
Depth of thread = $0.80p$
Total Taper $3/4$ -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

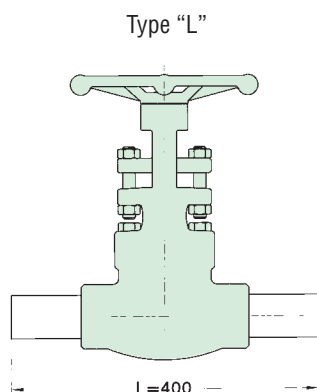
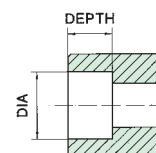
NOMINAL PIPE SIZE	D Outside diameter of pipe	Number of threads per inch	p Pitch of thread	E_0 Pitch diameter at end of external thread	E_1 ■ Pitch diameter at end of external	E_1 ● Normal engagement by and between external and internal threads	E_1 ◆ Length of effective external thread	Height of thread
1/16	0.3125	27	0.03704	0.27118	0.8118	0.160	0.2611	0,02963
1/8	0.405	27	0.3704	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	.82234	0.420	0.7235	0,06957
2	2.375	11.5	0.08696	2.2692	2.29627	0.436	0.7565	0,06957

■ Also pitch diameter at gauging notch.

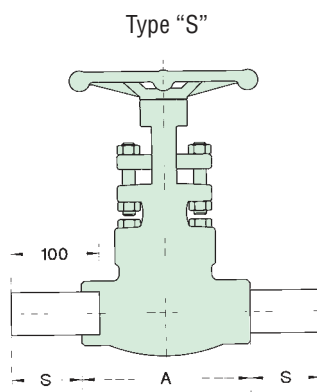
◆ Also length of plug gauge.

● 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... E_1 approx. = $D - (0.05D + 0.827)p$.



Long Pattern Total length 400 mm.



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

VALVES WITH NIPPLES LENGTHS

NOMINAL PIPE SIZE		SOCKET BORE DIA.		SOCKET DEPTH		S	
NPT	DN	mm	in	mm	in	mm	in
1/4	8	14.2	0.557	11.1	0.437	89	3.503
3/8	10	17.6	0.690	11.1	0.437	89	3.503
1/2	15	21.8	0.855	12.7	0.500	88	3.464
3/4	20	27.2	1.065	14.5	0.570	86	3.385
1	25	33.9	1.330	16	0.629	85	3.346
1 1/4	32	42.57	1.675	17.5	0.688	83	3.267
1 1/2	40	48.8	1.915	19	0.748	82	3.228
2	50	61.2	2.406	22	0.866	79	3.110

PHOSPHATIZING OF CS VALVES

All IVM carbon and alloy steel bodies and bonnet 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.

PICKLING OF SS VALVES

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

RUST PREVENTION AND SHIPPING

All valves are shipped in wooden crates seaworthy with end protection cups in plastic and a rust prevention fluid applied in the valves internal parts. In case of special applications valves can be prepared for transportation in accordance to customer specifications.

SPARE PARTS

IVM supply on request spare parts in the form of kits inclusive of packing and gaskets. Valves need to be identified with the data provided on the Nameplate (model type, material and size as a minimum). IVM policy is to maintain for at least 10 years parts in stock for every design even discontinued.

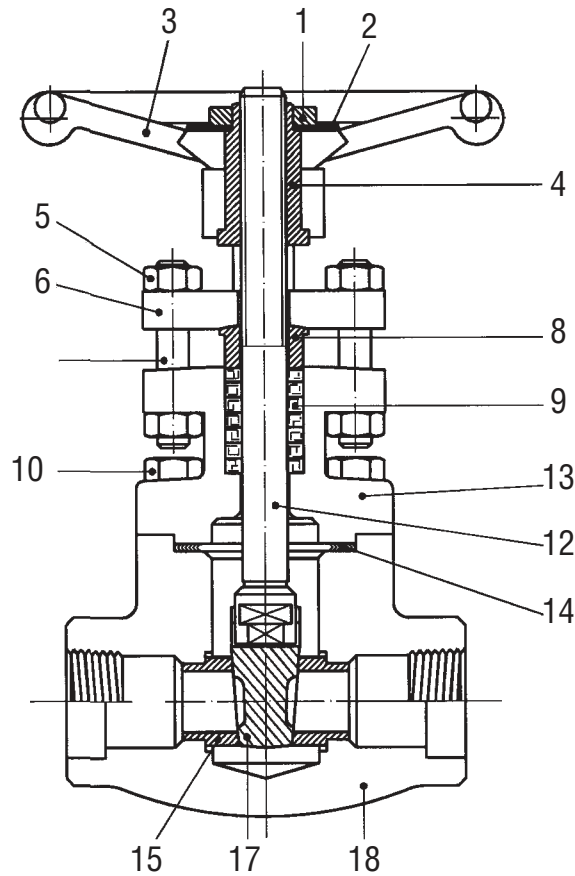
INSTALLATION, OPERATION AND MAINTENANCE MANUALS



Copy available on request



GATE



1	WHEELNUT	Austentic ductile iron, 13Cr steel, or copper alloy having a melting point above 955°
2	NAMEPLATE	A corrosion resistant metal
3	HANDWHEEL	Malleable iron, carbon steel, or ductile iron
4	YOKE NUT	Carbon steel or similar material composition as the bonnet
5	GLAND NUT	Bolting materials of a type 300 or type 400 series stainless steel. Also, material at least equal to either ASTM A307-Grade B or EN 10269-C35E (1.1181) may be used for yoke bolting
6	GLAND FLANGE	Steel
7	GLAND STUD	-
8	GLAND	Material with a melting point above 955° C
9	PACKING	Non-asbestos material suitable for steam and petroleum fluids over a temperature range of - 29°C to 540°C and containing a corrosion inhibitor
10	BOLTS	Unless other materials are agreed between the purchaser and manufacturer the bolting material shall be according with annex F
12	STEM	-
13	BONNET	A forging or casting material as selected from ASME B 16.34, group 1 and Group 2
14	GASKET	See 5.5.3
15	SEAT	As in Table 11, except that when weld deposited facings are used, the base material shall have a corrosion resistance equal to or greater than that of the body material
17	WEDGE	Steel or base material compatible with the pressure/temperature rating and least equal in corrosion resistance as the body material
18	BODY	A forging or casting material as selected from ASME B 16.34, group 1 and Group 2



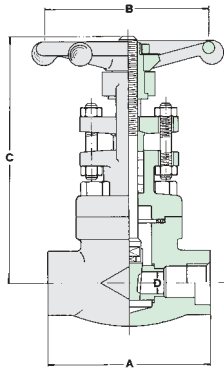
Gate valves are bi-directional valves ideally suited for on-off duties. IVM produces various types both with parallel face gates or with wedge gates.

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. IVM 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 25 to 29.

	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



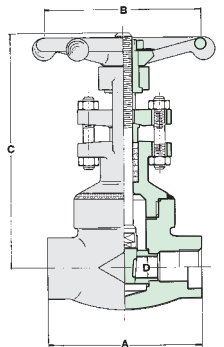


RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 800 BOLTED BONNET - STANDARD PORT TO API602/ISO 15761 - FULL PORT TO BS 5352

Outside Screw & Yoke - Threaded and Socket Weld Ends

SANDART 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.	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	127	5.00	150	5.90
Handwheel	B	80	3.14	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	5.86	148	5.86	163	6.41	178	7.00	210	8.26	243	9.56	262	10.3	365	14.3
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	48	1.89
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	21.5	47.3

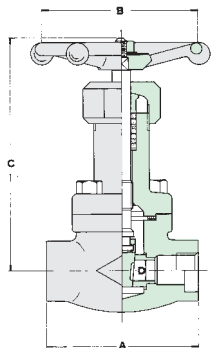


RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 800 WELDED BONNET STANDARD PORT TO API602/ISO 15761 - FULL PORT TO BS 5352

Outside Screw & Yoke - Threaded and Socket Weld Ends

SANDART 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.	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	127	5.00	150	5.90
Handwheel	B	80	3.14	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	5.86	148	5.86	163	6.41	178	7.00	210	8.26	243	9.56	262	10.3	365	14.3
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	48	1.89
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	17	37.4

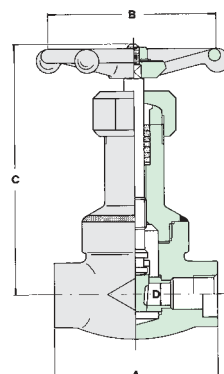


RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 800 BOLTED BONNET - STANDARD PORT TO API602/ISO 15761 - FULL PORT TO BS 5352

Inside Screw & Yoke - Threaded and Socket Weld Ends

STANDARD 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.	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	127	5.00	150	5.90
Handwheel	B	80	3.14	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	5.86	148	5.86	175	6.88	212	8.34	235	9.25	287	11.3	327	12.9	380	15.0
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	48	1.89
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	17	37.4

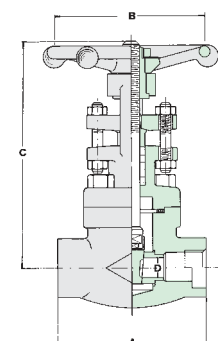


RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 800 WELDED BONNET STANDARD PORT TO API602/ISO 15761 - FULL PORT TO BS 5352

Inside Screw & Yoke - Threaded and Socket Weld Ends

STANDARD 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.	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	127	5.00	150	5.90
Handwheel	B	80	3.14	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	5.86	148	5.86	175	6.88	212	8.34	235	9.25	287	11.3	327	12.9	380	15.0
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	48	1.90
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	17	37.4

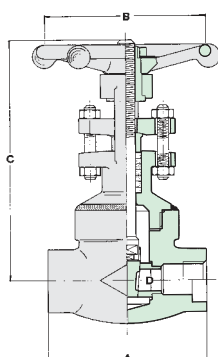


RATINGS: Carbon Steel - 3705 p.s.i. @ 100°F

CLASS 1500 BOLTED BONNET - STANDARD PORT TO API602/ISO 15761 - FULL PORT TO BS 5352

Outside Screw & Yoke - Threaded and Socket Weld Ends

STANDARD 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.
End to End	A	90	3.54	90	3.54	110	4.33	127	5.00
Handwheel	B	80	3.14	80	3.14	110	4.33	130	5.11
Center to Top Open	C	145	5.70	160	6.29	175	6.89	210	8.26
Dia of Port	D	8	0.31	9.6	0.38	14	0.55	18	0.70
Approx. Weight	Kg/Lb	2.2	4.8	2.2	4.8	3.8	8.3	5.5	12.1

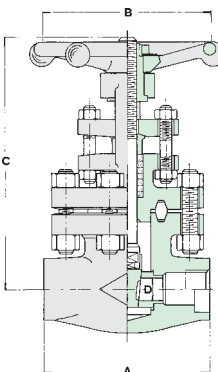


RATINGS: Carbon Steel - 3705 p.s.i. @ 100°F

CLASS 1500 WELDED BONNET STANDARD PORT TO API602/ISO 15761 - FULL PORT TO BS 5352

Outside Screw & Yoke - Threaded and Socket Weld Ends

STANDARD 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.
End to End	A	90	3.54	90	3.54	110	4.33	127	5.00
Handwheel	B	80	3.14	80	3.14	110	4.33	130	5.11
Center to Top Open	C	145	5.70	160	6.29	175	6.89	210	8.26
Dia of Port	D	8	0.31	9.6	0.38	14	0.55	18	0.70
Approx. Weight	Kg/Lb	2.2	4.8	2.2	4.8	3.8	8.3	5.5	12.1



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

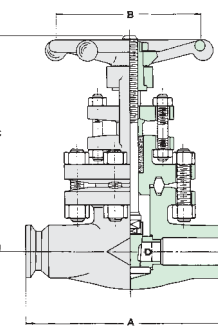
CLASS 1500 ROUND BOLTED BONNET RJ - FULL PORT TO BS 5352

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.	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	488	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

Spiral wound gasket joint available on request.

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

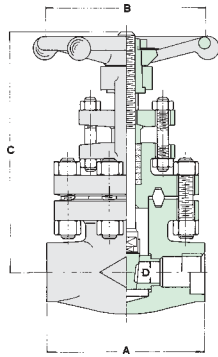


RATINGS: Carbon Steel - 3705 p.s.i. @ 100°F

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

Outside Screw & Yoke - Butt Welded 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.	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



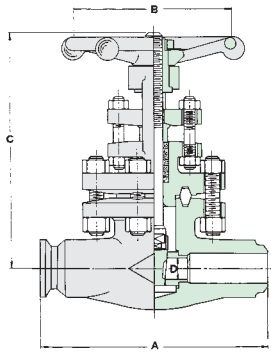
RATINGS: Carbon Steel - 6170 p.s.i. @ 100°F

CLASS 2500 ROUND BOLTED BONNET RJ - FULL PORT - ASME 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

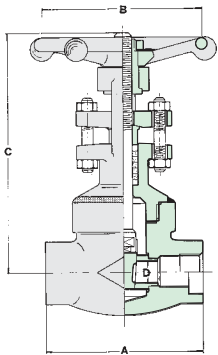
CLASS 2500 ROUND BOLTED BONNET RJ - FULL PORT - ASME B16.34

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 dimension 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 WELDED BONNET - FULL PORT - ASME B16.34

Outside Screw & Yoke - Threaded and Socket Weld Ends

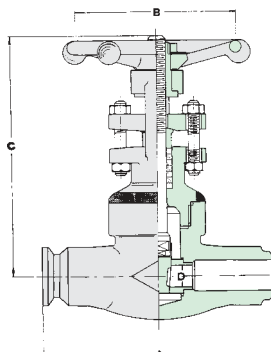
FULL PORT	L2510	1/4		3/8		1/2		3/4		1		1 1/4		1 1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	264	10.4	273	10.7	308	12.1	-	-	384	15.1	451	17.7
Handwheel	B	-	-	-	-	130	5.11	130	5.11	250	9.84	-	-	300	11.8	300	11.8
Center to Top Open	C	-	-	-	-	214	8.42	239	9.40	253	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 - ASME B16.34

Outside Screw & Yoke - Butt Weld and Clamp Ends

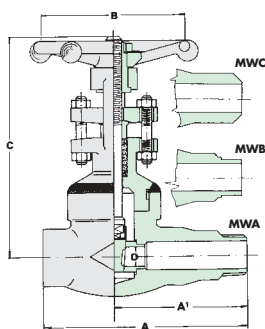
FULL PORT	BW25-L2510	1/4		3/8		1/2		3/4		1		1 1/4		1 1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	264	10.4	273	10.7	308	12.1	-	-	384	15.1	451	17.7
Handwheel	B	-	-	-	-	130	5.11	130	5.11	250	9.84	-	-	300	11.8	300	11.8
Center to Top Open	C	-	-	-	-	304	11.9	315	12.4	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 dimension can change depending on schedule.
(*) End to end dimension according to ANSI B16.10



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

GATE VALVES

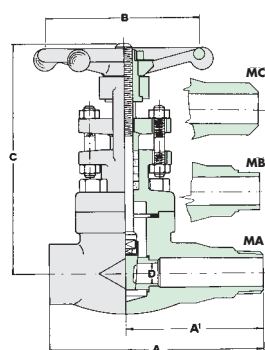


RATINGS: Carbon Steel
Class 800 - 1975 p.s.i. @ 100°F
Class 1500 - 3705 p.s.i. @ 100°F

CLASS 800-1500 TAKE-OFF VALVE - WELDED BONNET - STANDARD PORT TO API602/ISO15761

Outside Screw & Yoke - Threaded, Socket Weld and BW Ends

STANDARD 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.	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		A ₁	-	-	108	4.25	108	4.25	127	5.00	152	6.00	152	6.00	200	7.87	210	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	23.5	21.1	46.5

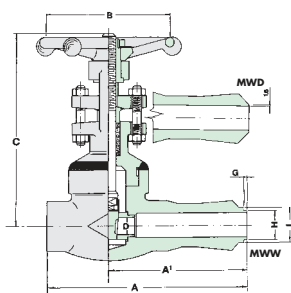


RATINGS: Carbon Steel
Class 800 - 1975 p.s.i. @ 100°F
Class 1500 - 3705 p.s.i. @ 100°F

CLASS 800-1500 TAKE-OFF VALVE - BOLTED BONNET - STANDARD PORT TO API602/ISO15761

Outside Screw & Yoke - Threaded, Socket Weld and BW Ends

STANDARD 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.	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		A ₁	-	-	108	4.25	108	4.25	127	5.00	152	6.00	152	6.00	200	7.87	210	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

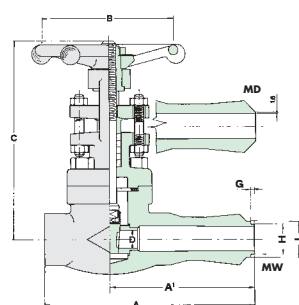


RATINGS: Carbon Steel
Class 800 - 1975 p.s.i. @ 100°F
Class 1500 - 3705 p.s.i. @ 100°F

CLASS 800-1500 REINFORCED EXTENDED BODY - WELDED BONNET - STANDARD PORT API602/ISO15761

Outside Screw & Yoke - Threaded and Socket Weld Female Ends

STANDARD 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.	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		A ₁	-	-	156	6.14	175	6.88	189	7.44	201	7.91	201	7.91	206	8.11	220	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



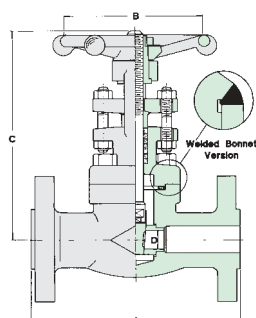
RATINGS: Carbon Steel
Class 800 - 1975 p.s.i. @ 100°F
Class 1500 - 3705 p.s.i. @ 100°F

CLASS 800-1500 REINFORCED EXTENDED BODY - BOLTED BONNET - STANDARD PORT API602/ISO15761

Outside Screw & Yoke - Threaded and Socket Weld Female Ends

STANDARD 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.	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		A ₁	-	-	156	6.14	175	6.88	189	7.44	201	7.91	201	7.91	206	8.11	220	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		-	



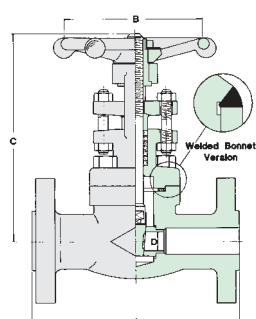
RATINGS: Carbon Steel
Class 150 - 285 p.s.i. @ 100°F
Class 300 - 740 p.s.i. @ 100°F
Class 600 - 1480 p.s.i. @ 100°F

CLASS 150-300-600 BOLTED BONNET - STANDARD PORT TO API602/ISO15761

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

STANDARD 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	117	4.64	127	5.00	-	-	165	6.49	178	7.00
Class 300	F3-810	A	-	-	-	140	5.51	152	6.02	165	6.49	-	-	190	7.51	216	8.50
Class 600	F6-810	A	-	-	-	165	6.49	190	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 dimension according to ANSI 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

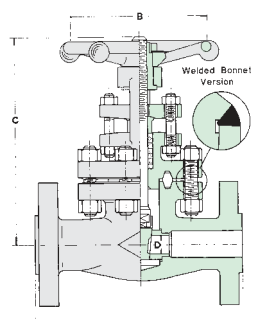
CLASS 800-1500 BOLTED BONNET - STANDARD PORT TO API602/ISO15761

Outside Screw & Yoke - Integral Flanged End 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	F1-610	A	-	-	-	108	4.25	117	4.64	127	5.00	-	-	165	6.49	178	7.00
Class 300	F3-610	A	-	-	-	140	5.51	152	6.02	165	6.49	-	-	190	7.51	216	8.50
Class 600	F6-RJ610	A	-	-	-	165	6.49	190	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	29.6	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 dimension according to ANSI B16.10
Spiral wound gasket joint for #150-#300
#150-#300 square bolted bonnet #600 round bolted bonnet

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

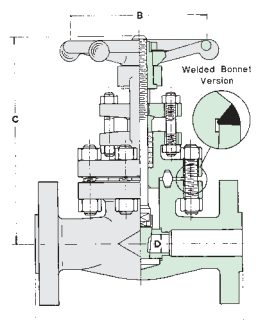
CLASS 1500 ROUND BOLTED BONNET RJ - FULL PORT BS 5352

Outside Screw & Yoke - Integral Flanged End 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.
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 dimension according to ANSI B16.10
Spiral wound gasket joint available on request

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



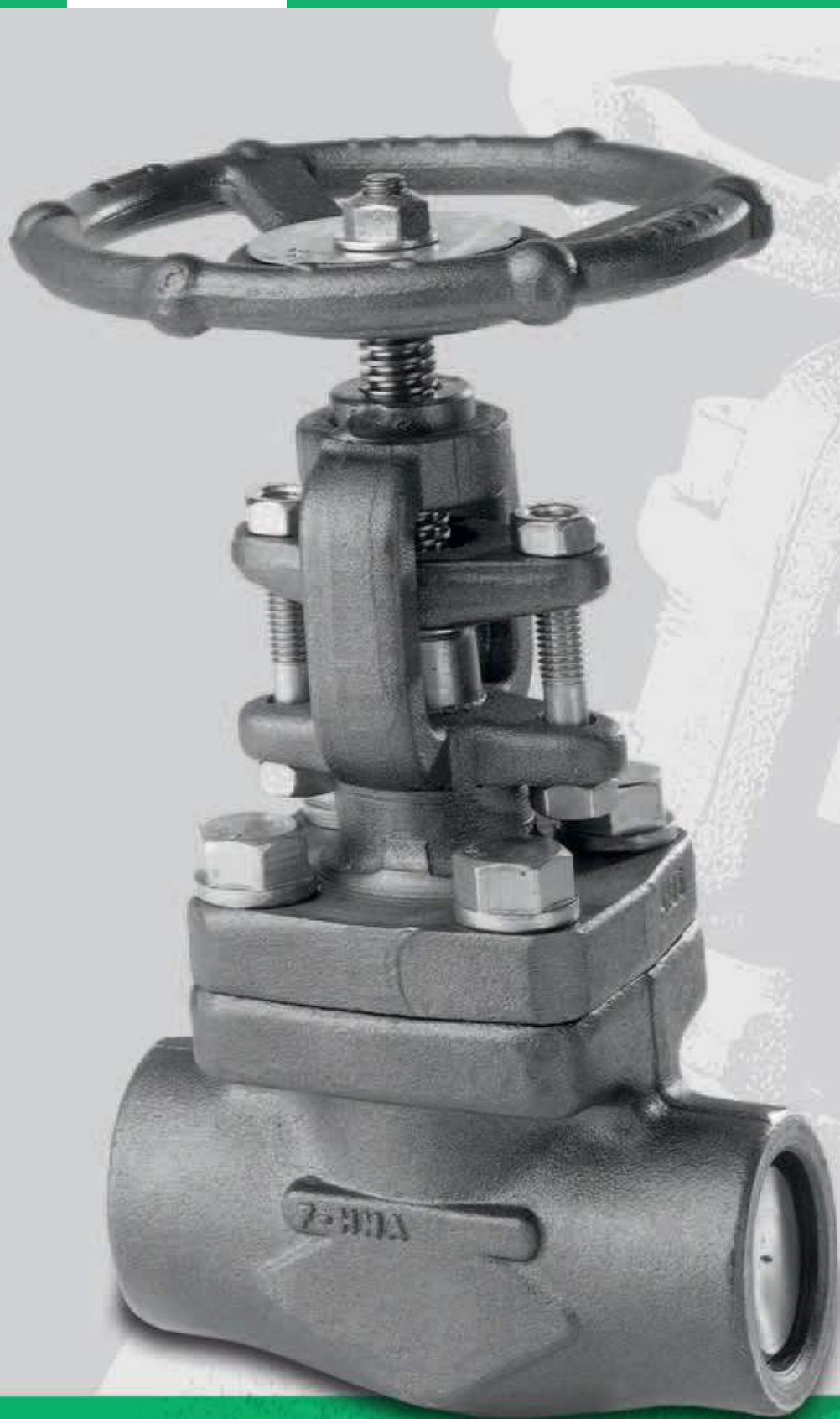
RATINGS: Carbon Steel
Class 150 - 285 p.s.i. @ 100°F
Class 300 - 740 p.s.i. @ 100°F
Class 600 - 1480 p.s.i. @ 100°F

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

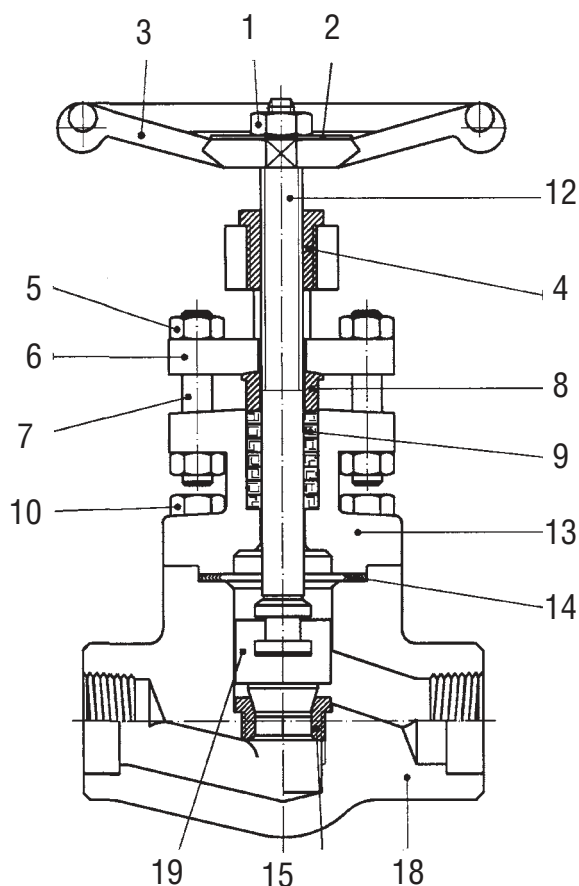
Outside Screw & Yoke - Integral Flanged End according to ASME B16.5

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.
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	-	-	-	19	41.8	21	46.2	40	88.1	-	-	62	136.5	92	202.6

End to end dimension according to ANSI B16.10



GLOBE



1	WHEELNUT	Austenitic ductile iron, 13Cr steel, or copper alloy having a melting point above 955°
2	NAMEPLATE	A corrosion resistant metal
3	HANDWHEEL	Malleable iron, carbon steel, or ductile iron
4	YOKE NUT	Carbon steel or similar material composition as the bonnet
5	GLAND NUT	Bolting materials of a type 300 or type 400 series stainless steel. Also, material at least equal to either ASTM A307-Grade B or EN 10269-C35E (1.1181) may be used for yoke bolting
6	GLAND FLANGE	Steel
7	GLAND STUD	-
8	GLAND	Material with a melting point above 955° C
9	PACKING	Non-asbestos material suitable for steam and petroleum fluids over a temperature range of -29°C to 540°C and containing a corrosion inhibitor
10	BOLTS	Unless other materials are agreed between the purchaser and manufacturer the bolting material shall be according with annex F
12	STEM	-
13	BONNET	A forging or casting material as selected from ASME B 16.34, group 1 and Group 2
14	GASKET	See 5.5.3
15	SEAT	As in Table 11, except that when weld deposited facings are used, the base material shall have a corrosion resistance equal to or greater than that of the body material
18	BODY	A forging or casting material as selected from ASME B 16.34, group 1 and Group 2
19	DISC	Steel or base material compatible with the pressure/temperature rating and least equal in corrosion resistance as the body material



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.

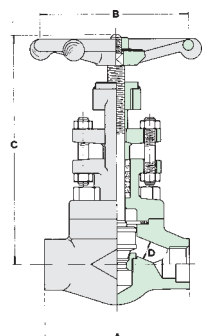
This proportional relationship is ideally suited for duties requiring regulation of flow rate. To have a further precision in regulation the disc element can be available in the parabolic, needle, v-port types. Furthermore the short travel of the disc between the open and closed position makes these 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 33 to 37.

	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	410	410	304	410	304	316
Body	A105	A105	LF2	F11	F304	F316



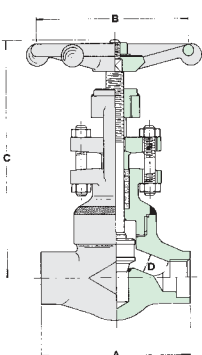


RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 800 BOLTED BONNET - STANDARD PORT TO API602/ISO 15761 - FULL PORT TO BS 5352

Outside Screw & Yoke - Threaded and Socket Weld Ends

STANDARD 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.	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	23	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

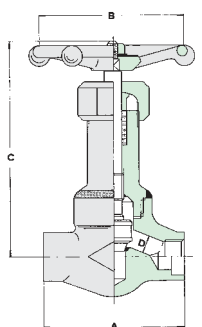


RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 800 WELDED BONNET - STANDARD PORT TO API602/ISO 15761 - FULL PORT TO BS 5352

Outside Screw & Yoke - Threaded and Socket Weld Ends

STANDARD 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.	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	23	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

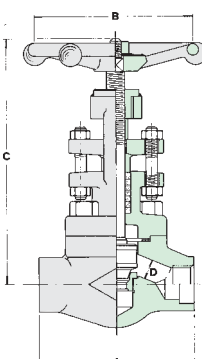


RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 800 WELDED BONNET - STANDARD PORT TO API602/ISO 15761 - FULL PORT TO BS 5352

Inside Screw - Threaded and Socket Weld Ends

STANDARD PORT	L820	-		1/2		3/4		1		1 ^{1/4}		1 ^{1/2}		2		-	
FULL PORT	620	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	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	130	5.11	180	7.08
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	380	15.0
Dia of Port	D	7	0.28	9	0.35	13	0.51	17.5	0.69	23	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

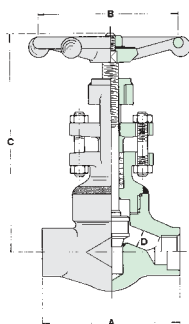


RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 1500 WELDED BONNET STANDARD PORT TO API602/ISO 15761 - FULL PORT TO BS 5352

Outside Screw & Yoke - Threaded and Socket Weld Ends

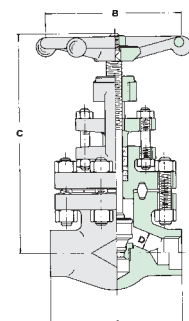
STANDARD PORT	R930	-		1/2		3/4		1		1 ^{1/4}		1 ^{1/2}		2		-	
FULL PORT	930	1/4		3/8		1/2		3/4		1		1 ^{1/4}		1 ^{1/2}		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	90	3.54	90	3.54	110	4.33	127	5.00	155	6.10	170	6.69	210	8.26	210	8.26
Handwheel	B	80	3.14	80	3.14	110	4.33	130	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



CLASS 1500 WELDED BONNET STANDARD PORT TO API602/ISO 15761 - FULL PORT TO BS 5352

Outside Screw & Yoke - Threaded and Socket Weld Ends

STANDARD 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.
End to End	A	90	3.54	90	3.54	110	4.33	127	5.00
Handwheel	B	80	3.14	80	3.14	110	4.33	130	5.11
Center to Top Open	C	160	6.29	160	6.29	175	6.88	210	8.26
Dia of Port	D	7	0.28	9	0.35	13	0.51	17	0.67
Approx. Weight	Kg/Lb	2.2	4.8	2.2	4.8	3.9	8.5	6	13.2

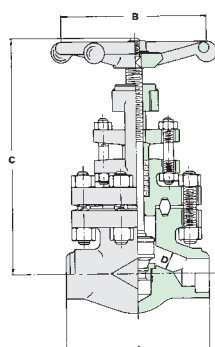


RATINGS: Carbon Steel - 3705 p.s.i. @ 100°F

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.
End to End	A	-	-	-	-	110	4.33	150	5.90
Handwheel	B	-	-	-	-	110	4.33	130	5.11
Center to Top Open	C	-	-	-	-	235	9.25	265	10.4
Dia of Port	D	-	-	-	-	13	0.51	17	0.67
Approx. Weight	Kg/Lb	-	-	-	-	5.1	11.2	11	24.2



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

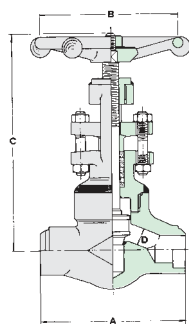
CLASS 2500 ROUND BOLTED BONNET RJ - FULL PORT - ASME B16.34

Outside Screw & Yoke - Socket and Butt Weld Ends

FULL PORT	RJ250	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
		mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	150	5.90	150	5.90
Handwheel	B	-	-	-	-	130	5.11	130	5.11
Center to Top Open	C	-	-	-	-	265	10.4	254	10.4
Dia of Port	D	-	-	-	-	13	0.51	17	0.67
Approx. Weight	Kg/Lb	-	-	-	-	11	24.2	11.3	24.8

Spiral wound gasket joint available on request.

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

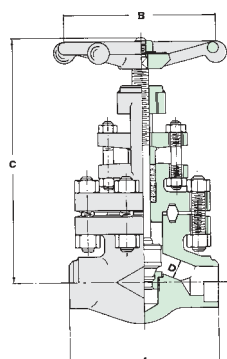


RATINGS: Carbon Steel - 3705 p.s.i. @ 100°F

CLASS 2500 WELDED BONNET RJ - FULL PORT - ASME 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.
End to End	A	-	-	-	-	127	5.00	155	6.10
Handwheel	B	-	-	-	-	130	5.11	130	5.11
Center to Top Open	C	-	-	-	-	237	9.33	242	9.52
Dia of Port	D	-	-	-	-	13	0.51	17	0.67
Approx. Weight	Kg/Lb	-	-	-	-	6.5	14.3	8.5	18.7



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

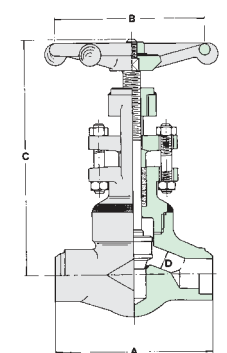
CLASS 4500 ROUND BOLTED BONNET RJ - FULL PORT - ASME B16.34

Outside Screw & Yoke - Socket and Butt Weld Ends

FULL PORT	RJ4530	-		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.



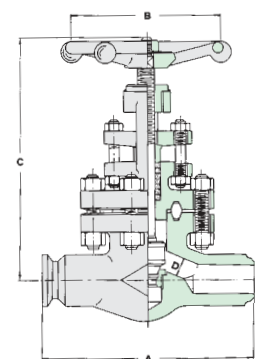
RATINGS: Carbon Steel - 11110 p.s.i. @ 100°F

CLASS 4500 WELDED BONNET - FULL PORT - ASME 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

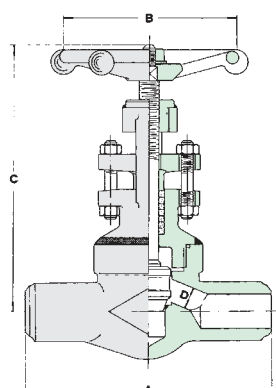
CLASS 4500 ROUND BOLTED BONNET RJ - FULL PORT - ASME B16.34

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 - ASME B16.34

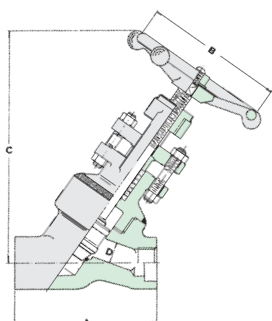
Outside Screw & Yoke - Clamp and Butt Weld Ends

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

Y-PATTERN GLOBE VALVES

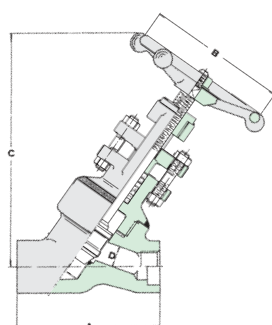


RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 800 WELDED BONNET - FULL PORT BS 5352

Outside Screw & Yoke - Threaded and Socket Weld Ends

FULL PORT	Y630	-	1/2	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	100 4.33	110 4.33	110 4.33	142 5.59	142 5.59	170 6.69	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	23 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

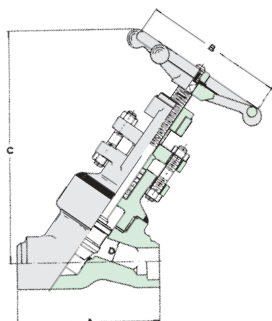


RATINGS: Carbon Steel
Class 1500 - 3705 p.s.i. @ 100°F
Class* 1700 - 4198 p.s.i. @ 100°F

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	110 4.33	110 4.33	110 4.33	142 5.59	142 5.59	170 6.69	170 6.69	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

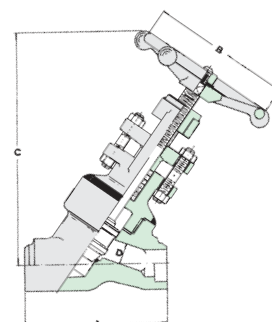


RATINGS: Carbon Steel
Class 2500 - 6170 p.s.i. @ 100°F
Class* 2700 - 6664 p.s.i. @ 100°F

CLASS 2500-2700 WELDED BONNET - FULL PORT - ASME 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	142 5.59	142 5.59	142 5.59	142 5.59	170 6.69	170 6.69	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

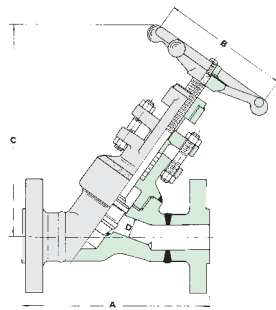


RATINGS: Carbon Steel
Class 2500 - 6170 p.s.i. @ 100°F
Class* 2700 - 6664 p.s.i. @ 100°F

CLASS 4500 WELDED BONNET - FULL PORT - ASME 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	170 6.69	170 6.69	170 6.69	170 6.69	170 6.69	- -	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	350 13.77	- -	435 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 1.01
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



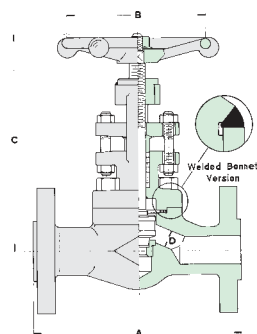
RATINGS: Carbon Steel
Class 150 - 285 p.s.i. @ 100°F
Class 300 - 740 p.s.i. @ 100°F
Class 600 - 1480 p.s.i. @ 100°F

CLASS 150-300-600 WELDED BONNET - FULL PORT - ISO15761 BS 5352

Outside Screw & Yoke - Flanged End 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	117	4.64	127	5.00	-	-	165	6.49	203	7.99
Class 300	3-Y630	A	-	-	-	152	6.02	178	7.00	203	7.99	-	-	299	9.01	267	10.5
Class 600	6-Y630	A	-	-	-	165	6.49	190	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	7.4	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 dimension according to ANSI B16.10



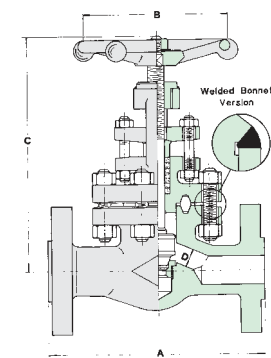
RATINGS: Carbon Steel
Class 150 - 285 p.s.i. @ 100°F
Class 300 - 740 p.s.i. @ 100°F
Class 600 - 1480 p.s.i. @ 100°F

CLASS 150-300-600 BOLTED BONNET - STANDARD PORT TO API602/ISO15761

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

STANDARD 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	117	4.64	127	5.00	-	-	165	6.49	178	7.00
Class 300	F3-830	A	-	-	-	152	6.02	178	7.00	203	7.99	-	-	229	9.01	267	10.5
Class 600	F6-830	A	-	-	-	165	6.49	190	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 150/300	C	-	-	-	148	5.82	165	6.49	180	7.08	-	-	248	9.76	257	10.1
	Class 600	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 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 BOLTED BONNET - STANDARD PORT - BS 5352

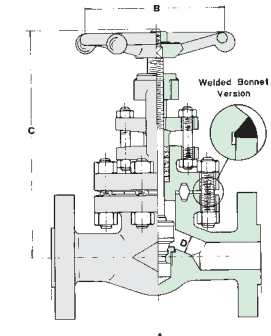
Outside Screw & Yoke - Integral Flanged End according to ASME B16.5

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	F1-630	A	-	-	-	108	4.25	117	4.64	127	5.00	-	-	165	6.49	203	7.99
Class 300	F3-630	A	-	-	-	152	6.02	178	7.00	203	7.99	-	-	229	9.01	267	10.5
Class 600	F6-RJ630	A	-	-	-	165	6.49	190	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	-	-	-	246	9.64	273	10.7	295	11.6	-	-	410	16.1	440	17.3
	Class 150	C	-	-	-	170	6.69	197	7.75	205	8.07	-	-	285	11.02	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 dimension according to ANSI B16.10

Spiral wound gasket joint for #150

Ring-Joint gasket according to ASME B16.20 - API 6A.
(*End to end dimension BW on request Fig. N. BW 1-630/BW 6-630)



RATINGS: Carbon Steel
Class 1500 - 285 p.s.i. @ 100°F
Class 3000 - 740 p.s.i. @ 100°F
Class 6000 - 1480 p.s.i. @ 100°F

CLASS 1500-2500 ROUND BOLTED BONNET RJ - FULL PORT - BS 5352 - ASME B16.34

Outside Screw & Yoke - Integral Flanged End 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 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

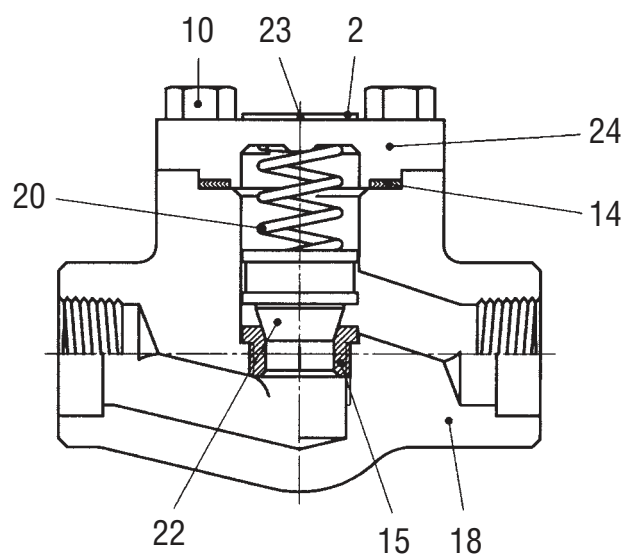
End to end dimension according to ANSI B16.10

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)



CHECK



2	NAMEPLATE	A corrosion resistant metal
10	BOLTS	Unless other materials are agreed between the purchaser and manufacturer the bolting material shall be according with annex F
14	GASKET	See 5.5.3
15	SEAT	As in Table 11, except that when weld deposited facings are used, the base material shall have a corrosion resistance equal to or greater than that of the body material
18	BODY	A forging or casting material as selected from ASME B 16.34, group 1 and Group 2
20	SPRING	-
22	PISTON	Steel or base material compatible with the pressure/temperature rating and least equal in corrosion resistance as the body material
23	RIVET	-
24	CAP	A forging or casting material as selected from ASME B 16.34, group 1 and Group 2



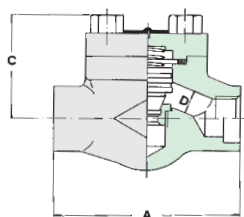
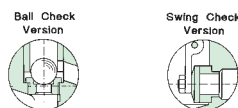
Check valves are uni-directional valves which automatically open with forward flow and close against reverse flow. They are supplied to meet a wide variety of applications with the closing element in the piston, ball or swing type. Piston check valves are normally supplied by IVM with the addition of a spring which allows both the vertical and horizontal installation. Great care is given by IVM employees in the design and in manufacturing to prevent noisy operation and unsatisfactory wear of closure components. The full range of IVM production is reported on pages 41 to 45.

	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



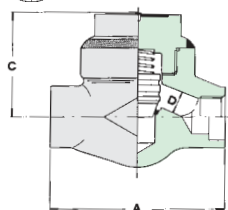
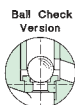
CLASS 800 PISTON, BALL AND SWING TYPE - STANDARD PORT TO API602/ISO 15761 - FULL PORT TO BS 5352

Bolted Cover - Threaded and Socket Weld Ends



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

STANDARD 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	
				mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	Piston -	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
	Ball Swing			80	3.14	80	3.14	90	3.54	110	4.33	127	5.00	127	5.00	127	5.00	210	8.26
Center to Top Open		C	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
Dia of Port	Piston -	D	D	7	0.28	9	0.35	13	0.51	17.5	0.69	23	0.88	29.5	1.16	35	1.38	45.5	1.79
	Ball Swing			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
Approx. Weight	Piston -	Kg/Lb	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
	Ball Swing			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

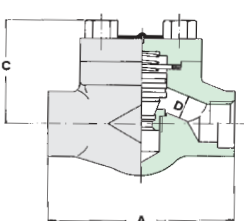
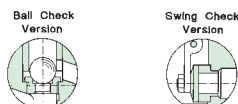


RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 800 PISTON AND BALL TYPE - STANDARD PORT TO API602/ISO 15761 - FULL PORT TO BS 5352

Welded Cover - Threaded and Socket Weld Ends

STANDARD 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	
				mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End		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
Center to Top Open		C	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
Dia of Port		D	D	7	0.28	9	0.35	13	0.51	17.5	0.69	23	0.88	29.5	1.16	35	1.38	45.5	1.79
Approx. Weight		Kg/Lb	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	17	37.4

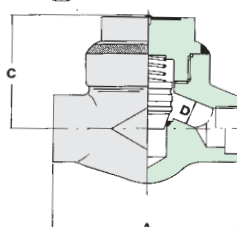
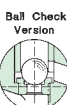


RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 1500 PISTON, BALL AND SWING TYPE - STANDARD PORT TO API602/ISO 15761 - FULL PORT TO BS 5352

Bolted Cover - Threaded and Socket Weld Ends

STANDARD 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	
				mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	Piston -	A	A	90	3.54	90	3.54	110	4.33	127	5.00	155	6.10	170	6.99	210	8.26	210	8.26
	Ball Swing			90	3.54	90	3.54	110	4.33	127	5.00	127	5.00	127	5.00	210	8.26	210	2.26
Center to Top Open		C	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 -	D	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
	Ball Swing			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 -	Kg/Lb	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	49.9	19	41.8
	Ball Swing			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

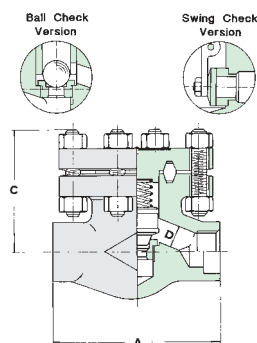


RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 1500 PISTON AND BALL TYPE - STANDARD PORT TO API602/ISO 15761 - FULL PORT TO BS 5352

Welded Cover - Threaded and Socket Weld Ends

STANDARD 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	
				mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End		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 Open		C	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	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	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

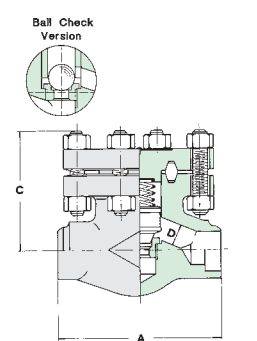
CLASS 1500 PISTON, BALL AND SWING TYPE - FULL PORT TO BS 5352

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 Open	C	-	-	-	-	100	3.93	130	5.11	145	5.70	-	-	160	6.29	195	7.67
Dia of Port	Piston -	D	-	-	-	13	0.51	17	0.67	21	0.83	-	-	33	1.30	37.5	1.48
	Ball Swing	D	-	-	-	14	0.55	18	0.70	24	0.94	-	-	37	1.45	48	1.89
Approx. Weight	Piston -	Kg/Lb	-	-	-	4	8.8	7.5	16.5	9	19.8	-	-	18.5	40.7	30	66
	Ball Swing	Kg/Lb	-	-	-	3.8	8.87	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.



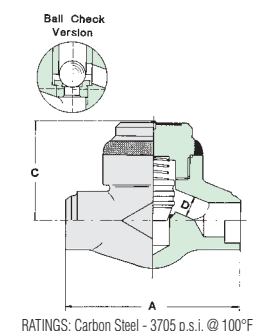
RATINGS: Carbon Steel - 3705 p.s.i. @ 100°F

CLASS 2500 PISTON AND BALL TYPE - FULL PORT - ASME 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 Open	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	36.8	29	63.8

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



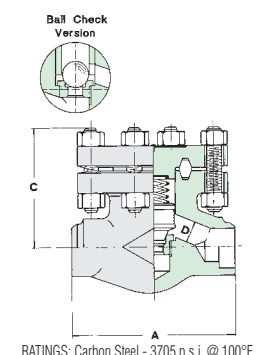
RATINGS: Carbon Steel - 3705 p.s.i. @ 100°F

CLASS 2500 PISTON AND BALL TYPE - FULL PORT - ASME 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 Open	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

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

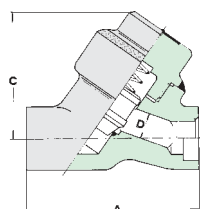


RATINGS: Carbon Steel - 3705 p.s.i. @ 100°F

CLASS 4500 PISTON AND BALL TYPE - FULL PORT - ASME 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 Open	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	-	-

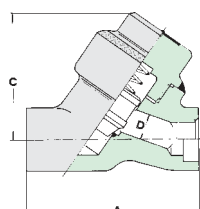


RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

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	110	4.33	110	4.33	110	4.33	110	4.33	142	5.59	142	5.59	170	6.69	180	7.08
Center to Top Open	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	3.9	3	6.6	3.3	7.2	5.8	12.7	7	15.4

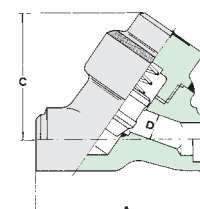


RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

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	110	4.33	110	4.33	110	4.33	142	5.59	142	5.59	170	6.69	170	6.69	180	7.08
Center to Top Open	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

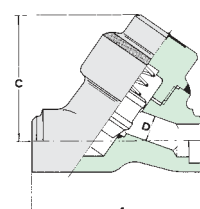


RATINGS: Carbon Steel - 1975 p.s.i. @ 100°F

CLASS 2500-2700 WELDED BONNET - FULL PORT - ASME 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	142	5.59	142	5.59	142	5.59	142	5.59	170	6.69	170	6.69	180	7.08	225	8.86
Center to Top Open	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 - 1975 p.s.i. @ 100°F

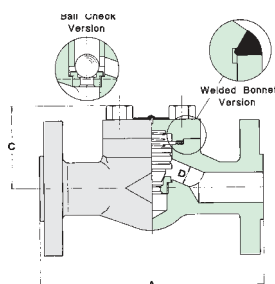
CLASS 4500 PISTON TYPE - FULL PORT - ASME B16.34

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	170	6.69	170	6.69	170	6.69	170	6.69	170	6.69	-	-	225	8.86	225	8.86
Center to Top Open	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

CLASS 150-300-600 PISTON AND BALL TYPE - STANDARD PORT TO API602/ISO 15761

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



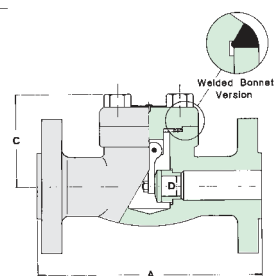
RATINGS: Carbon Steel
Class 150 - 285 p.s.i. @ 100°F
Class 300 - 740 p.s.i. @ 100°F
Class 600 - 1480 p.s.i. @ 100°F

STANDARD 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 F1-840 BALL F1-850	A	-	-	-	108	4.25	117	4.64	127	5.00	-	-	165	6.49	203	7.99
Class 300	PISTON F3-840 BALL F3-850	A	-	-	-	152	6.02	178	7.00	203	7.99	-	-	229	9.01	267	10.5
Class 600	PISTON F6-840 BALL F6-850	A	-	-	-	165	6.49	190	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 dimension according to ASME B16.10

CLASS 150-300-600 SWING TYPE - STANDARD PORT TO API602/ISO 15761

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



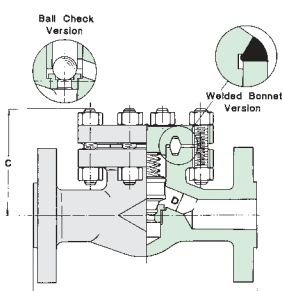
RATINGS: Carbon Steel
Class 150 - 285 p.s.i. @ 100°F
Class 300 - 740 p.s.i. @ 100°F
Class 600 - 1480 p.s.i. @ 100°F

STANDARD 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	117	4.64	127	5.00	-	-	165	6.49	203	7.99
Class 300	F3-860	A	-	-	-	152	6.02	178	7.00	216	8.50	-	-	241	9.48	292	11.5
Class 600	F6-860	A	-	-	-	165	6.49	190	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 dimension according to ASME B16.10

CLASS 150-300-600 PISTON AND BALL TYPE - FULL 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

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	PISTON F1-840 BALL F1-850	A	-	-	-	108	4.25	117	4.64	127	5.00	-	-	165	6.49	203	7.99
Class 300	PISTON F3-RJ640 BALL F3-RJ650	A	-	-	-	152	6.02	178	7.00	203	7.99	-	-	229	9.01	267	10.5
Class 600	PISTON F6-RJ840 BALL F6-RJ850	A	-	-	-	165	6.49	190	7.51	216	8.50	-	-	241	9.48	292	11.5
Center to Top Open	Class 150	C	-	-	-	75	2.95	100	3.93	100	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

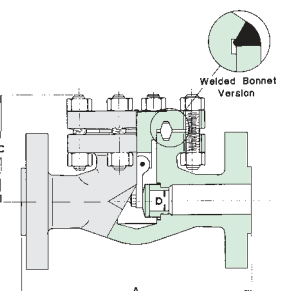
End to end dimension according to ANSI B16.10

Spiral wound gasket joint for #150

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

CLASS 150-300-600 SWING TYPE - FULL 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	F1-660	A	-	-	-	108	4.25	117	4.64	127	5.00	-	-	165	6.49	203	7.99
Class 300	F3-RJ660	A	-	-	-	152	6.02	178	7.00	216	8.50	-	-	241	9.48	292	11.5
Class 600	F6-RJ660	A	-	-	-	165	6.49	190	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 dimension according to ANSI B16.10

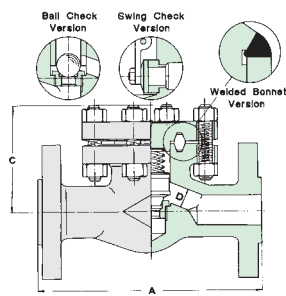
Spiral wound gasket joint for #150

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

CHECK VALVES

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

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

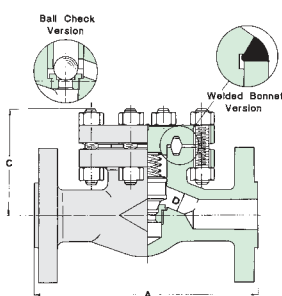


RATINGS: Carbon Steel - 3075 p.s.i. @ 100°F

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 Open	C	-	-	-	-	130	5,11	140	5,51	155	6,10	-	-	170	6,69	195	7,67
Dia of Port	Piston -	D	-	-	-	13	0,51	17	0,67	21	0,83	-	-	33	1,30	37,5	1,48
	Ball Swing	D	-	-	-	14	0,55	18	0,70	24	0,94	-	-	37	1,45	48	1,89
Approx. Weight	Piston -	Kg/Lb	-	-	-	8	17,6	14	30,8	17	37,5	-	-	28	61,6	37	81,4
	Ball Swing	Kg/Lb	-	-	-	7,8	17,1	13,8	30,4	16,5	36,3	-	-	27	59,5	35	77,1

End to end dimension according to ANSI 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

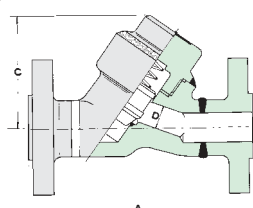
CLASS 2500 PISTON AND BALL TYPE - FULL PORT - ASME B16.34

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 Open	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 dimension according to ANSI B16.10

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



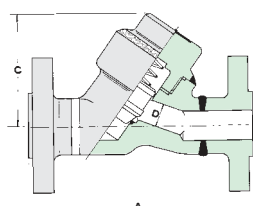
RATINGS: Carbon Steel - 3075 p.s.i. @ 100°F

CLASS 1500 PISTON TYPE - STANDARD PORT TO API602/ISO 15761

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	154	10,0	-	-	305	12,0	368	14,5
Center to Top Open	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 dimension according to ANSI B16.10



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

CLASS 2500 PISTON TYPE - FULL PORT - ASME B16.34

Welded Cover - Flanged Ends according to ASME B16.5

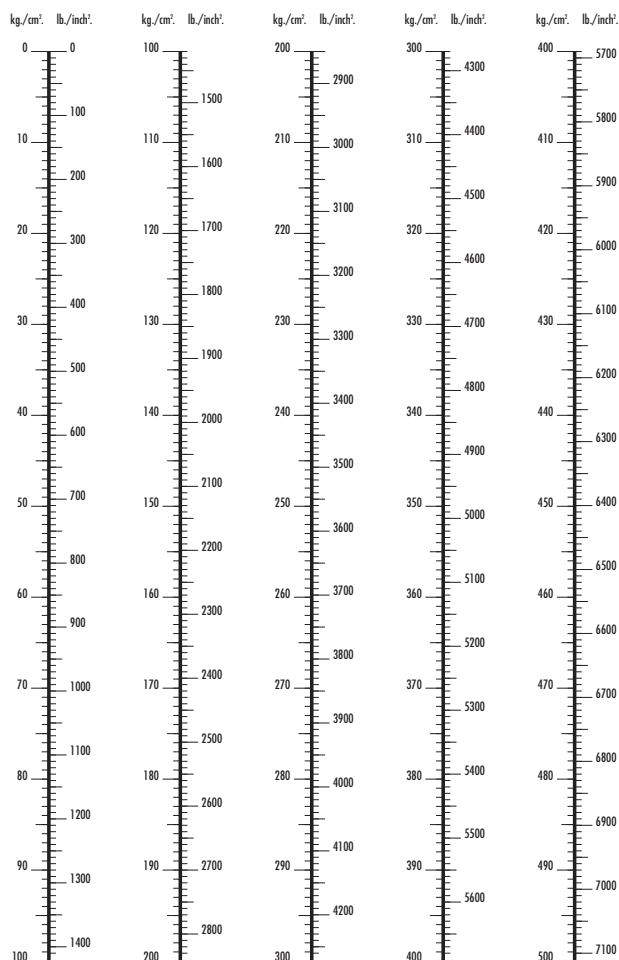
FULL PORT	25-Y2540	1/4		3/8		1/2		3/4		1		1 1/4		1 1/2		2	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
End to End	A	-	-	-	-	264	10,4	273	10,7	308	12,1	-	-	384	15,1	451	17,7
Center to Top Open	C	-	-	-	-	115	4,52	120	4,72	150	5,90	-	-	165	6,49	180	7,08
Dia of Port	D	-	-	-	-	11	0,43	15	0,59	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 dimension according to ANSI B16.10

PRESSURE

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

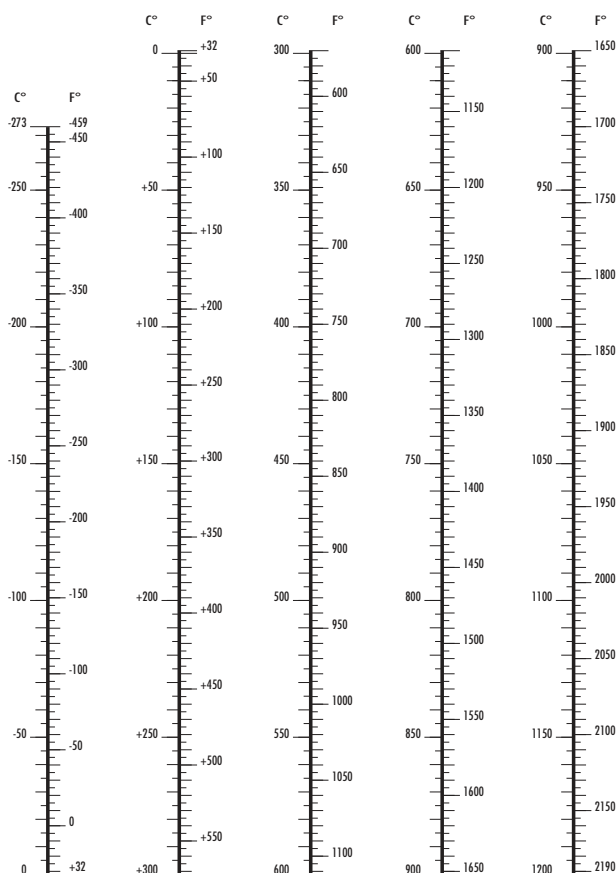
$$1 \text{ lb/inch}^2 = 0,07037 \text{ Kg/cm}^2$$



TEMPERATURE

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

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



FRACTION OF 1 INCH INTO DECIMAL AND MILLIMETERS

FRACTION	INCH.	MILLIM.
1/64	0.016	0.397
1/32	0.031	0.794
3/64	0.047	1.191
1/16	0.062	1.587
5/64	0.078	1.984
3/32	0.094	2.381
7/64	0.109	2.778
1/8	0.125	3.175
9/64	0.141	3.572
5/32	0.156	3.969
11/64	0.172	4.365
3/16	0.187	4.762
13/64	0.203	5.159
7/32	0.219	5.556
15/64	0.234	5.953
1/4	0.250	6.350

FRACTION	INCH.	MILLIM.
17/64	0.266	6.747
9/32	0.281	7.141
19/64	0.297	7.541
5/16	0.312	7.937
21/64	0.328	8.334
11/32	0.344	8.731
23/64	0.359	9.128
3/8	0.375	9.525
25/64	0.391	9.922
13/32	0.406	10.319
27/64	0.422	10.716
7/16	0.437	11.112
29/64	0.453	11.509
15/32	0.469	11.906
31/64	0.484	12.303
1/2	0.500	12.700

FRACTION	INCH.	MILLIM.
33/64	0.516	13.097
17/32	0.531	13.494
35/64	0.547	13.891
5/8	0.562	14.287
37/64	0.578	14.684
19/32	0.594	15.081
39/64	0.609	15.478
5/8	0.625	15.875
41/64	0.641	16.272
21/32	0.656	16.669
43/64	0.672	17.066
11/16	0.687	17.462
45/64	0.703	17.859
23/32	0.719	18.256
47/64	0.734	18.653
3/4	0.750	19.050

FRACTION	INCH.	MILLIM.
49/64	0.766	19.447
25/32	0.781	19.844
51/64	0.797	20.241
13/16	0.812	20.637
53/64	0.828	21.034
27/32	0.844	21.431
55/64	0.859	21.828
7/8	0.875	22.225
57/64	0.891	22.622
29/32	0.906	23.019
59/64	0.922	23.406
15/16	0.937	23.812
61/64	0.953	24.209
31/32	0.969	24.606
63/64	0.984	25.003
1	1.000	25.400

Suggested spares for IVM valves are packing and gaskets: We provide here below a list, inclusive of the bonnetcapscrew specification, which can be used to source spare parts for the most common valves. All other valves' spares can be requested directly at IVM.

DESC	CLASS	BASE FIGURE NO	NPS	PACKING CODE	GASKET CODE	BONNET CAPSCROW	GLAND STUD.
RB Gate	150-800#	810	0.50"	T2	40x30	M10X25	M8X42
RB Gate	150-800#	810	0.75"	T2	40x30	M10X25	M8X42
RB Gate	150-800#	810	1"	T4	48x38	M12X30	M8X48
RB Gate	150-800#	810	1.25"	T5	54x44	M12X35	M10X58
RB Gate	150-800#	810	1.50"	T6	66x54	M14X35	M10X60
RB Gate	150-800#	810	2"	T6	74x50	M16X40	M10X60

DESC	CLASS	BASE FIGURE NO	NPS	PACKING CODE	GASKET CODE	BONNET CAPSCROW	GLAND STUD.
RB Globe	150-800#	830	0.50"	T2	40x30	M10X25	M8X42
RB Globe	150-800#	830	0.75"	T3	40x30	M10X25	M8X42
RB Globe	150-800#	830	1"	T5	48x38	M12X30	M8X48
RB Globe	150-800#	830	1.25"	T25	54x44	M12X35	M10X58
RB Globe	150-800#	830	1.50"	T6	66x54	M14X35	M10X60
RB Globe	150-800#	830	2"	T27	74x50	M16X40	M10X60

DESC	CLASS	BASE FIGURE NO	NPS	PACKING CODE	GASKET CODE	BONNET CAPSCROW	GLAND STUD.
RB Check	150-800#	840, 850, 860	0.50"	-	40x30	M10X25	-
RB Check	150-800#	840, 850, 860	0.75"	-	40x30	M10X25	-
RB Check	150-800#	840, 850, 860	1"	-	48x38	M12X30	-
RB Check	150-800#	840, 850, 860	1.25"	-	54x44	M12X35	-
RB Check	150-800#	840, 850, 860	1.50"	-	66x54	M14X35	-
RB Check	150-800#	840, 850, 860	2"	-	74x50	M16X40	-

IVM Saudi

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Local Agent: >>