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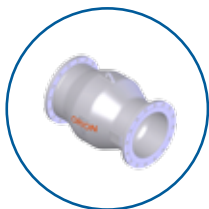
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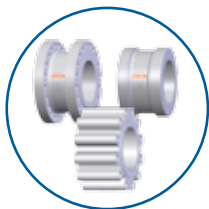


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Class ASME 600 (PN 100) • 900 (PN 150)

1500 (PN 250) • 2500 (PN 420)

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1500 (PN 250) • 2500 (PN 420)

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Class ASME 600 (PN 100) • 900 (PN 150)

1500 (PN 250) • 2500 (PN 420)

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Class ASME 600 (PN 100) • 900 (PN 150)

1500 (PN 250) • 2500 (PN 420)



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900 (PN 150) • 1500 (PN 250) • 2500 (PN 420)

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1500 (PN 250) • 2500 (PN 420)

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900 (PN 150) • 1500 (PN 250) • 2500 (PN 420)



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Class 150 • 300 • 600 • 900 • 1500 • 2500 (PN 420)

ORION STEEL VALVES Company Profile



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ORION STEEL VALVES

Steel Valves

The Company has a world market distribution network and sells its products both to engineering companies and to end users, manufacturing a complete line of steel gate, globe and check valves, as well as a variety of specialty valves such as Y-Pattern, Bellows Seal and valves for specialized services such as Alkylation, Cryogenic and Lethal service.

ORION PRESENTS ITS PRODUCT LINE OF STEEL VALVES INCORPORATING NEW AND REVISED DESIGNS, SPECIALLY ENGINEERED TO MEET THE EXACTING DEMANDS AND REQUIREMENTS OF THE PETROCHEMICAL INDUSTRY.

ORION products represent the best the market can offer both from the standpoint of quality of materials incorporated and standard of workmanship. All ORION valves are produced by employing the best raw material, carefully selected, correctly identified and analyzed.

The machining is carried out with the latest equipments according to the most up-to-date methods.

All ORION products are constantly tested and inspected to ensure that governing standards and tolerances are strictly complied with.

ORION valves are designed to the basic principle of hydrodynamics so that pressure drop and turbulence are reduced, thus allowing a smooth flow of fluids with the minimum of restriction.

The Company's equipment includes high volume transfer machines, bar machines, chucker, NC lathes, milling machines, drill machines, heat treatment equipment and a tool making/grinding shop.

These facilities are complemented through framework agreements with prime foundry suppliers, which guarantee the Company access to the most modern casting techniques and material treatment equipments.

ORION utilizes the latest edition of SOLIDWORKS CAD system and COSMOS FINITE ELEMENTS ANALYSIS engineering software for valve design purposes. The system allows the Company to export drawings and data-sheets to standard MS-Windows PC for an easy and accurate use by the various departments.

Throughout its history, ORION has built and maintained its premier industry position through superior product design, large and flexible production capacity, strong distribution and commitment to customer service.

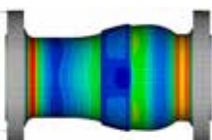
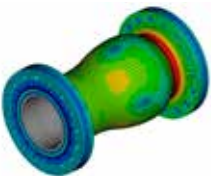
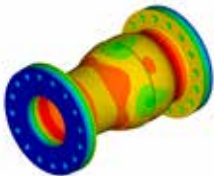
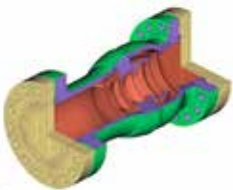
During the end of the 1990's, ORION management identified, and is actively pursuing, additional opportunities for improving the Company market share position by investing in high tech equipments and tools in order to satisfy the market demand for a top quality and reliable product.

ENGINEERED VALVES AND MAIN FLEXIBILITY TO SATISFY CUSTOMER

REQUIREMENTS ARE OUR STRENGTH

THE HIGHEST TECHNOLOGY LEVEL IN PRODUCT DEVELOPMENT MEETS A LONG EXPERIENCE IN VALVES INDUSTRY FOR ALL APPLICATIONS SUCH AS: LNG, REFINING, UPSTREAM, FLOW LINES, SEAWATER INJECTIONS

MODERN VALVE TEST LABORATORY IN HOUSE





ORION STEEL VALVES Company History

IN ORDER TO CORRECTLY ESTABLISH THE HISTORY AND THE HERITAGE OF THIS COMPANY, WE NEED TO GO BACK TO THE 1950-S. I HAVE DONE THAT, BY SEEKING THE HELD OF THOSE WHO HAVE LIVED WITH ORION OVER THE YEARS, AND HAVE WITNESSED THE VARIOUS CHANGE IN THE PEOPLE, EVENTS, SCENARIOS AND EMOTION THAT ARE AT THE VERY BASIS OF WHAT I CAN DEFINE, WITHOUT BEING ARCAIC, THE "ORION IMMORTALITY".

The sheer willingness to built, produce grow and constantly improve has always been the driving force behind ORION ever since its first days. It gives me great pleasure to share the past history of this Company and shall be honored to be part of its future, through hard work, dedication, improving quality, technologies and client satisfaction.

The FARINA family is involved in the management of several companies in oil, gas and energy industry, through the production of pipes, flanges, fittings and valves.

The birth of ORION also has its roots in a family enterprise; it was in fact thanks to two brothers from Trieste, operating in the naval industry (ship engines maintenance), that ORION started its activity back in 1950.

During these years Italy as a whole and Trieste in particular are struggling to recover from the post war traumas. Almost everything was imported at the time, and Italy was not exactly playing the leading role in the energy sector. Nevertheless the entrepreneurial spirit of the two brothers was the force behind "THE MIRACLE".

The opportunity that marked the turning points was when the modest machine started working with a refinery that at the time was buying valves from the U.S.A.



Thanks to the good relationship with the refinery the two brothers managed to get some drawings and normative for the construction of valves. By 1953 the Company set up the small machine shop includes on foundry and one forging unit. In 1958 ORION, for the first time, operates a complete cycle of valve production.

Along with the trend of those years, ORION developed a truly integrated activity, from raw material to finished goods: the total number of employees rises to 600.

At the beginning of the 1960's new partners joint the two brothers in their enterprise: amongst the most important ones was undoubtedly an American Company, already a worldwide known valve manufacturer.



At the beginning of the 1960's new partners joint the two brothers in their enterprise: amongst the most important ones was undoubtedly an American Company, already a worldwide known valve manufacturer.

It brought into ORION a significant step forward. ORION remains American until 1965, when an international crisis and the collapse of the market forced the American Company to leave the management.

It is at this point that a through re-structuring gets under way: the production process is rationalized through outsourcing and the once possible vertical integration with a complete production cycle is turned into a horizontal integration, whereby some important steps of the production cycle are committed to third party specialized companies.

The political and social impact of ORION in these years is as great as the economic one: we must consider that more than 400 families depend on ORION and it is not surprise that public regional and national companies such as assurance's one and local paper-mill became shareholders.

Eventually, however, it was once again a well known and respected family from Trieste that take over the management of ORION and successfully lead the Company until 1983.

Unfortunately, after the death of the owner in the same year, no valid succession within the family takes place, and ORION is saved by a group of foundries, which see an opportunity to re-create a wholly cycle, from raw to finished products.



In 1996 ORION is purchased by the FARINA Group.

We look forward, through a continuous effort, to a prosperous future, and ideally joint forces with all management, administration and particularly all employees, past and present for a common success.

Let me take the opportunity to thank all those who are dauly involved in the growth and constant improvement of the ORION name.

LUCA FARINA
CEO

ORION STEEL VALVES
Location: **TRIESTE**



TRIESTE
CENTER OF EUROPE



YEAR	CUSTOMER	PROJECT	DESTINATION
2015	TRANSCANADA PIPELINES	GRAND RAPIDS PIPELINE PROJECT	CANADA
2014	AIR LIQUIDE THROUGH SOFINTER S.P.A. DIV. MACCHI	NATGASOLINE METHANOL PROJECT	USA
	NEXEN ENERGY ULC	LONG LAKE - NEXEN OIL SANDS STANDARD WELLPAD PROJECT	CANADA
	TRANSCANADA KEYSTONE PIPELINE, LP	HOUSTON TANK TERMINAL	USA
2013	IOWA FERTILIZER COMPANY (IFCO) THROUGH TECNIMONT	AMMONIA & PROCESS OSBL PROJECT	USA
	SHELL PIPELINE COMPANY LP / MUSTANG	HO-HO REVERSAL, PHASE 3	
	SPARTAN CONTROLS LTD	HOUSTON TANK TERMINAL HIGH PRESSURE DELIVERY SYSTEM	
	TRANS MOUNTAIN PIPELINE L.P. THROUGH KINDER MORGAN	EDMONTON TERMINAL EXPANSION	CANADA
2012	EXXONMOBIL CANADA / WORLEYPARSONS CANADA	HEBRON TOPSIDES PROJECT	USA
	SHELL PIPELINE COMPANY LP	HO-HO REVERSAL, PHASE 2	
2011	TRANSCANADA THROUGH UPSIDE ENGINEERING	KEYSTONE OIL PIPELINE PROJECT - HARDISTY WEST INTERCONNECT	CANADA
	TRANSCANADA KEYSTONE PIPELINES LIMITED PARTNERSHIP	KEYSTONE OIL PIPELINE PROJECT- NEDERLAND DELIVERY STATION, TX, USA	USA
2010	ENBRIDGE PIPELINES (ATHABASCA) INC.	WOODLAND PIPELINE PROJECT - CANADA	CANADA
	TRANSCANADA KEYSTONE PIPELINES LIMITED PARTNERSHIP	KEYSTONE OIL PIPELINE PROJECT - CUSHING DELIVERY STATION, OK, USA	USA
2009	DEVON ENERGY CORPORATION	JACKFISH PROJECT	CANADA
	TRANSCANADA	KEYSTONE XL OIL PIPELINE PROJECT	CANADA / USA
2008	TRANSCANADA PIPELINE LTD. THROUGH SNC LAVALIN / BECHTEL	KEYSTONE OIL PIPELINE PROJECT	
2007	SNC LAVALIN INC.	TERASEN PIPELINE CPX1 FACILITIES EXPANSION PROJECT	CANADA
2006	CRANE SUPPLY	TERASEN PIPELINE PROJECT	
2005	CHEVRON TEXACO THROUGH BONNEY FORGE	CLEANERS FUELS REFINERY PROJECT	USA
	TECHNIP / CANADIAN NATURAL'S	2213 HORIZON OIL SANDS PROJECT - PRIMARY UPGRADING	CANADA



ORION STEEL VALVES

Reference List

OF RECENT JOBS

YEAR	CUSTOMER	PROJECT	DESTINATION
2015	PETROPERU' THROUGH TECNICAS REUNIDAS	TALARA REFINERY MODERNIZATION PROJECT	PERU'
2014	PEMEX (PETROLEOS MEXICANOS)	LOW COMPRESSION PLATFORM LITORAL-A	MEXICO
	TOTAL E&P BOLIVIE	INCAHUASI AND AQUIO FIELD DEVELOPMENT	BOLIVIA
2013	BERGESEN WORLDWIDE LMTD	FPSO YÜUM K'AK'NÁAB	MEXICO
	BRAZILIAN DEEPWATER FLOATING TERMINALS INC. / SHELL	FPSO ESPIRITO SANTO TAMBÁ BV - BC10 FIELD	BRASIL
	CONSÓRCIO TECHNIP – TECHINT P-76 / PETROBRAS	CESSÃO ONEROSA AREA DEVELOPMENT	VENEZUELA
	PDVSA	PDVSA PROJECT	
	PETROBRAS / COMPERJ THROUGH SOFINTER SPA div. MACCHI	RIO DE JANEIRO PETROCHEMICAL COMPLEX	BRASIL
	PETROBRAS THROUGH SOFINTER SPA DIV. MACCHI	UNIDADE FERTILIZANTES NITROGENADOS III	
2012	BRASKEM IDESA SAPI THRU TECHNIP ITALY	ETILENO XXI PROJECT	MEXICO
	PDVSA	RPLC DEEP CONVERSION PROJECT	VENEZUELA
	PETROBRAS - ABASTECIMENTO	RAFINARIA DO NORDESTE - ABREU E LIMA - RNEST	BRASIL
	PETROBRAS NETHERLANDS B.V. / ENG. SINGLE BUOY MOORINGS INC.	FPSO CIDADE DE ILHABELA	
	OLEODUCTO BICENTENARIO DE COLOMBIA S.A.S. / ECOPETROL	COVENAS TERMINAL EXPANSION PROJECT	COLOMBIA
	UTE PERNAIBA GERAÇÃO DE ENERGIA S.A. THRU INITEC ENERGIA	MPX UTE PERNAIBA GAS PLANT - PHASE 4	BRAZIL
	YACIMIENTOS PETROLÍFEROS FISCALES BOLIVIANOS	PLANTA DE SEPARACION DE LIQUIDOS POR TURBO EXPANSION DE GRAN CHACO	BOLIVIA
2011	CARRIBEAN NITROGEN COMPANY LTD	CNC AMMONIA PLANT - CNC STABILIZATION AND UPGRADE	TRINIDAD AND TOBAGO
	PEMEX (PETROLEOS MEXICANOS)	TUZANDEPETL PROJECT	MEXICO
	REPSOL BOLIVIA THROUGH TECNICAS REUNIDAS	PLANTA MARGARITA PROJECT - NUEVA PLANTA DE GAS CENTRAL PROCESSING FACILITIES	BOLIVIA
2009	PACIFIC RUBIALES ENERGY/ OLEODUCTO DE LOS LLANOS ORIENTALES S.A. / ECOPETROL	OLEODUCTO DE LOS LLANOS ORIENTALES	COLOMBIA
	PETROBRAS	REGAP - GABRIEL PASSOS REFINERY BETIM	BRASIL
2008	PETROQUIMICA DE VENEZUELA S.A. THROUGH PROMAN / FERROSTAAL	MORÒN AMMONIA PLANT	VENEZUELA
2007	PROMAN GMBH	METHANOL HOLDING LTD - AUM COMPLEX (MHTL) - AMMONIA AND UREA PLANT (2040 MTPD)	TRINIDAD AND TOBAGO
2006	SUPEROCTANOS C.A. THROUGH SNAMPROGETTI	MTBE CONVERSION INTO ISOCTANE	VENEZUELA
2005	PETROBRAS THROUGH KANFA (NORWAY)	PIRANEMA FIELD OFFSHORE PROJECT (FPSO)	BRASIL
	TECHNIP ITALY	LOW SULFUR DIESEL PRODUCTION	CHILE
2003	JV ABB LUMMUS / SNAMPROGETTI	RIO POLIMEROS	BRASIL
	KVAERNER PROCESS SYSTEM AS (PETROBRAS BRASIL)	ALBACORA LESTE - SULPHATE REMOVAL PROJECT	
	TOYO ENGINEERING CORP: JAPAN / PETROBRAS S.A. (CLIENT: REFAP S.A.)	REFAP SECOND EXPANSION PROJECT	
1997	EXXON QUIMICA LTDA	SUNFLOWER PROJECT – BRASIL	BRASIL
1996	PDVSA-BARIVEN	VARIOUS PROJECTS	VENEZUELA
	PDVSA-CORPOVEN	VARIOUS PROJECTS	
	PDVSA-LAGOVEN	VARIOUS PROJECTS	
1995	SNAMPROGETTI	PEMEX HIDALGO REFINERY	MEXICO



YEAR	CUSTOMER	PROJECT	DESTINATION
2015	VERSALIS S.P.A. THROUGH SAIPEM S.P.A.	NUOVO IMPIANTO EP(D)M-GP27	ITALY
	STATOIL PETROLEUM AS	ÅSGARD B	NORWAY
		GULLFAKS A	
		KOLLSNES	
		KRISTIN	
		MONGSTAD	
		NORNE	
		HEIDRUN	
		VESLEFRIKK	
		SNORRE A	
		KVITEBJORN	
		TROLL	
		MONGSTAD	
		KARSTO	
		TJELDBERGODDEN	
		SNØHVIT MELKØYA	
		STATFJORD C PROJECTS	
	PREMIER OIL UK LMTD THROUGH BW OFFSHORE LTD	CATCHER FPSO PROJECT	U.K.
		NORTH SEA	
2014	ENEL GREEN POWER S.P.A. - DIVISIONE ENERGIE RINNOVABILI	PRODUZIONE GEOTERMICA - LARDERELLO	ITALY
	MARATHON OIL NORGE AS	FPSO ALVHEIM	NORWAY
	NORSKE SHELL	ORMEN LANGE PROJECT	
	SAIPEM SPA / ENI SPA EXPLORATION & PRODUCTION DIVISION	AQUILA PHASE 2	ITALY
	SAIPEM SPA - NORWEGIAN BRANCH	SCARABEO 5	NORWAY
	TALISMAN SINOPEC ENERGY (UK) LTD	FLYNDRE CAWDOR OVER CLYDE EPCC	U.K.
	TOTAL E&P NORGE AS	MARTIN LINGE TOPSIDES EPSCC PROJECT	NORWAY
	TOTAL OLEFINS ANTWERP NV THROUGH KINETICS TECHNOLOGY SPA	REFINERY OFF GAS (ROG) PROJECT KE156	BELGIUM
2013	CONOCOPHILLIPS	ALDER TOPSIDES PROJECT	U.K.
	ENI EXPLORATION & PRODUCTION	POTENZIAMENTO SVILIPPO VAL D'AGRI OTTIMIZZAZIONE UPGRADING WATER INJECTION	ITALY
	GDF SUEZ E&P UK LTD. THROUGH MRC TRANSMARK LTD	CYGNUS DEVELOPMENT PROJECT	U.K.
	JSC "LATVIJAS GĀZE" THROUGH SIA "ALGS RIGA"	INČUKALNS UNDERGROUND GAS STORAGE FACILITY	LATVIA
	MAERSK OLIE OG GAS AS THROUGH MARINE TECHNIC	HALFDAN BHBD FACILITIES	DENMARK
	MARATHON PETROLEUM COMPANY	ALVHEIM PROJECT	NORWAY
	SHELL UK LTD	EPC LIVING QUARTER CLIPPER PROJECT	U.K.
	SOCIETÀ ITALIANA PER L'OLEODOTTO TRANSALPINO S.P.A.	RELOCATION OF LINES AT PIAZZALE DOGANA	ITALY
	STATOIL / AIBEL AS	KOLLSNES PROJECT	NORWAY
		STATFJORD C PROJECT	
	STATOIL / APPLY SORCO AS	GULLFAKS SUBSEA COMPRESSION TOPSIDE AND PLATFORM	
	STATOIL AS THROUGH AIBEL AS	SFB - SYSTEMOPPGAVER MEKANISM - STATFJORD FIELD	
	STATOIL AS THROUGH REINERTSEN AS	GRANE GAS COOLER PROJECT	
	STATOIL / FMC	HEIDRUN FSU FISCAL METERING SYSTEM	
	STATOIL THROUGH AKER SOLUTIONS	GINA KROG TIE-IN TO SLEIPNER EPIC	
	STATOIL THROUGH DRESSER RAND AS	MARINER PROJECT	



YEAR	CUSTOMER	PROJECT	DESTINATION
2013	STATOIL PETROLEUM AS THROUGH AKER SOLUTIONS	SNORRE A PLATFORM	NORWAY
	STATOIL PETROLEUM AS	GULLFAKS, HEIDRUN, VESLEFRIKK, ASGARD, SLEIPNER	
	STATOIL PETROLEUM AS	ASGARD, SLEIPNER, NORNE	
	STATOIL / SAAS	ÅSGARD PROJECTS	
	STATOIL / SAAS	POLARBASE - SNOHVIT MELKOYA + GULLFAKS 0050C	
	STATOIL THROUGH KANFA ARAGO	AASTA HANSTEEN TOPSIDE EPC PROJECT	
	SMOE PTE LTD / DET NORSKE	IVAR AASEN FIELD DEVELOPMENT PROJECT	
	SOCIETÀ ITALIANA PER L'OLEODOTTO TRANSALPINO S.P.A.	RELOCATION OF LINES AT PIAZZALE DOGANA	ITALY
	TOTAL ANTWERPEN REFINERY N.V. THROUGH FOSTER WHEELERS S.P.A.	HDS4 REVAMP PROJECT	BELGIUM
	TOTAL - FINA ANTWERP OLEFINS N.V.	FAO APOLLO PROJECT 2012	
	TOTAL RAFFINADERIJ ANTWERPEN NV	OPTARA PROJECT	
2012	DONG E&P A/S	HEJRE DEVELOPMENT PROJECT	DENMARK
	ENEL GREEN POWER S.P.A. - DIVISIONE ENERGIE RINNOVABILI PRODUZIONE GEOTERMICA	FRAME AGREEMENT FOR GATE CLADDED VALVES	ITALY
	ITHACA ENERGY, UK THRU PETROFAC	GREATER STELLA AREA (GSA) DEVELOPMENT UK CNS-FPF1 REFURBISHMENT	UNITED KINGDOM
	LUKOIL NEFTOCHIM BOURGAS AD THRU TECHNIP ITALY	HEAVY RESIDUE PROCESS COMPLEX FIRST PHASE	BULGARIA
	SIEMENS OIL & GAS OFFSHORE AS / AKER SOLUTIONS	EDVARD GRIEG EPC TOPSIDE PROJECT	NORWAY
	STATOIL PETROLEUM AS	TJELDBERGODDEN METANOL PLANT - DUAL PLATE CHECK WAFER PACKAGE	
	STATOIL PETROLEUM AS	GJEF PIGGING WATER INJECTION AT HEIDRUN	
		TJELDBERGODDEN METHANOL PLANT	
		NORNE TOPSIDES PROJECT	
	STOGIT SPA / SNAM RETE GAS THROUGH SAIPEM SPA	CAMPO DI STOCCAGGIO GAS BORDOLANO (CR)	ITALY
2011	ENAGAS	GASODUCTO YELA-VILLAR DE ARNEDO	SPAIN
	ENEL GREEN POWER S.P.A.	PRODUZIONE GEOTERMICA - LARDERELLO	ITALY
	ENI NORGE AS / STATOIL PETROLEUM AS THROUGH HYUNDAI HEAVY INDUSTRIES CO., LTD.	GOLIAT FPSO PROJECT	NORWAY
	TOTAL NORMANDY REFINERY THROUGH TECHNIP FRANCE	DHC & SMR DEBOTTLENECK PROJECT	FRANCE
	TOTAL NORMANDY REFINERY THROUGH TECNIMONT SPA	D11 UNIT - H101 FURNACE REVAMP	
2010	ENAGAS	GASODUCTO YELA-VILLAR DE ARNEDO	SPAIN
	ENEL GREEN POWER S.P.A.	PRODUZIONE GEOTERMICA - LARDERELLO	ITALY
	E.ON RUHRGAS UK E&P LIMITED & SEVAN MARINE AS	HUNTINGTON FIELD DEVELOPMENT	NORTH SEA NORWAY
	RAFFINERIA DI MILAZZO (RAM) / LINDE	P-1409 NUOVA UNITÀ PRODUZIONE IDROGENO HMU3 - MILAZZO (ME)	ITALY
	SHELL NEDERLAND	SHELL NEDERLAND RAFFINADERIJ B.V. - INTEGRATED HDS-6 PROJECT	THE NETHERLANDS
2009	CORINTH REFINERIES S.A. THROUGH MOTOR OIL HELLAS	CORINTH REFINERIES PROJECT	GREECE
	ENAGAS	ALMACENAMIENTO ENAGAS YELA - SPAIN	SPAIN
	ENI	IMPIANTO VACUUM RAFFINERIA ENI SAN NAZZARO DE BURGONDI	ITALY
	ENI S.P.A.	STABILIMENTO DI SARROCH - CAGLIARI	
	ENI SPA EXPLORATION & PRODUCTION DIVISION	AQUILA PHASE 2	
	GATE LNG TERMINAL B.V. / TS LNG B.V. (JV TECHINT S.P.A. AND SENER INGENIERIA Y SISTEMAS A.A.)	LNG RECEIVING TERMINAL, MAASVLAKTE ROTTERDAM	THE NETHERLANDS
	GRUPA LOTOS S.A. / TECHNIP ITALY	PROJ. 2328 - BUTANE DEASPHALTING SDA/ROSE PROJECT	POLAND



YEAR	CUSTOMER	PROJECT	DESTINATION
2009	MAERSK OLIE OG GAS AS	HALFDAN B,HBD FACILITIES	DENMARK
	MURCO PETROLEUM / M.K.KELLOGG	MURCO MEX2010 - MILFORD HAVEN	UNITED KINGDOM (GALLES)
	RAFFINERIA ISAB IMPIANTI SUD DI PRIOLO GARGALLO (SR)	PROGETTO REVAMPING UNITÀ 400	ITALY
	THESSALONIKI REFINERY	CRUDE OIL STORAGE TANKS PROJECT	GREECE
2008	FLUOR S.A. - ENAGAS	TERMINAL DE REGASIFICATION DE GNL DE GIJON	SPAIN
	NESTE OIL OYI THROUGH TECHNIP ITALY	2308 - ROTTERDAM NEXBTL PLANT PROJECT - CAST VALVES	THE NETHERLANDS
	SOCIETA' ITALIANA PER L'OLEODOTTO TRANSALPINO (S.I.O.T.)	PARCO SERBATOI III - PIGGABILITY PROJECT	ITALY
	TECHNIP ITALY	PROJ. 2299 - GDANSK REFINERY RESIDUE UPGRADING PROJECT (GRUPA LOTOS S.A.)	POLAND
	TECNICAS REUNIDAS	PROJECT 4008 - 5° TANQUE DE GNL FB-251 PLANTA DE CARTAGENA - ENAGAS	SPAIN
2007	KANFA AS	OLOWI PROJECT - PROJECT NO.KA40036 FRED OLSEN FPSO CNR INTERNATIONAL	NORWAY
		PROJECT SSP300 SHELLY FIELD - KA40045 CLIENT SEVAN MARINE	
	TECHNIP ITALY	PROJ. 2277 - HDS VII PLANT - PKN ORLEN SA - POLAND	POLAND
2006	AKER KVAERNER	AKER H-6E DRILLING RIG PROJECT	NORWAY
	KANFA AS	PROJECT TOPSIDE FOR CHESTNUT	
2005	BERGESEN PEMEX	BERGESEN PEMEX KU-MALOOP-ZAAP PROJECT	NORWAY
	EDISON - STF	CENTRALE TERMoeLETTICA A CICLO COMBINATO DI SIMERI CRICHI	ITALY
	MARATHON PETROLEUM COMPANY - VETCO	ALVHEIM PROJECT	NORWAY
	NESTE ENGINEERING OY	NATURAL GAS PROJECT SPECIFICATION FOR VALVES	FINLAND
2004	ENI POWER ITALY	307710 PROGETTO MANTOVA	ITALY
	EXXON MOBIL	SAGE TERMINAL EXPANSION ATLANTIC CROMARTY PROJECT ST. FERGUS	NORTH SEA
	FOSTER WHEELER ITALIANA	ERG RAFFINERIE MEDITERRANEE S.R.L. COMPLETAMENTO CTE UNITÀ 2000A / 1-BD-0215A	ITALY
	LINDE IMPIANTI ITALIA	ETYLEN PLANT (REVAMP) AT RAFNES/NORWAY-NORETYL	NORWAY
	SNAMPROGETTI	C/O ENI SPA-DIV.REFINING & MARKETING-RAFFINERIA DI SAN NAZZARO DE BURGONDI (PV)	ITALY
	STATOIL - NORWAY	KÅRSTO PLANT - NORWAY	NORWAY
	TECHNIP COFLEXIP (FOR MOTOR OIL HELLAS)	2141 REFINERY EXPANSION 2005 - SPECS MOTOR OIL (HELLAS) CORINTH REFINERY	GREECE
	TECNOIL SUISSE – ANSALDO	ENIPOWER PROJECTS FOR SITES BRINDISI FERRARA MANTOVA RAVENNA	ITALY
2003	LINDE ITALIA IMPIANTI (FOR STATOIL)	KOLLSNES PROJECT	NORWAY
	TECHNIP ITALY	FCC-REGENERATOR FLUE GAS CLEANING	ITALY
1999	STONE & WEBSTER	KGXX EXPANSION – BP CHEMICALS	G. BRITAIN



YEAR	CUSTOMER	PROJECT	DESTINATION
2014	JSC YAMAL LNG THROUGH TECHNIP FRANCE	YAMAL LNG PROJECT	RUSSIA
	LUKOIL OIL COMPANY THROUGH TECNICAS REUNIDAS	VGO DEEP CONVERSION COMPLEX (1st Stage)	
	RN-TUAPSINSKY NPZ	UNIT 3000 – INTEGRATED HYDRTOCRACKING AND HYDROTREATING UNIT / NEFTECHIMPROEKT	
	SAKHALIN ENERGY INVESTMENT COMPANY LTD	LUN-A CRI WELL LA-519 HOOKUP	
	TATNEFT-TANECO	TATNEFT-TANECO PROJECT	
2013	LUKOIL TRADE HOUSE, CJSC	KORCHAGIN OFFSHORE ICE-RESISTANT STATIONARY PLATFORM (MISP)	
2012	AMMONI, REPUBLIC OF TATARSTAN (ENGINEERING: MITSUBISHI HEAVY INDUSTRIES, LTD)	TAF PROJECT	
2011	SAKHALIN ENERGY INVESTMENT COMPANY	SAKHALIN II PHASE II PROJECT FACILITIES DESIGN	
2004	OMS / AMEC	SAKHALIN ISLAND OFFSHORE PLANT	
	SAKHALIN ENERGY INVESTMENT COMPANY, LTD	SAKHALIN PROJECT	
	SAMSUNG	SAKHALIN II PROJECT	
2000	FERROSTAAL PIPING SUPPLY FOR LUKOIL	PERMMNEFTEORGINTES PROJECT	



YEAR	CUSTOMER	PROJECT	DESTINATION
2014	SONATRACH ACTIVATE AMONT THROUGH PETROFAC	ALRAR INLET SEPARATION AND BOOSTING FACILITIES	ALGERIA
	TULLOW GHANA LIMITED / MODEC	TEN DEVELOPMENT PROJECT: FPSO PACKAGE	GHANA
2013	NIGERIAN NATIONAL PETROLEUM CORPORATION	-	NIGERIA
	NMPP ALLIANCE	TRANSNET LIMITED PROJECT	SOUTH AFRICA
	TULLOW GHANA LIMITED / MODEC	TEN DEVELOPMENT PROJECT: FPSO PACKAGE	GHANA
2012	CAIRO ELECTRICITY PRODUCTION COMPANY	GIZA NORTH 1500 MW COMBINED CYCLE POWER PROJECT	EGYPT
2011	SONATRACH THROUGH SAIPEM S.A.	HASSI MESSAOUD ET SEPARATION D'HUITES LDHP ZCINA	ALGERY
2010	ABB SPA / SARPI / PETROJET	EL MERK PROJECT OFFSITES FACILITIES (LOTS 3&4)	ALGERY
	NAFTEC SPA / HYUNDAI ENGINEERING CO.,LTD HANWHA ENGINEERING & COSTRUCTION	ARZEW REFINERY REHABILITATION AND ADAPTION PROJECT	
	SONATRACH THROUGH SAIPEM S.P.A.	SONATRACH GNL-3Z PROJECT, ARZEW ALGERIA - CRYOGENIC	
2009	BP ANGOLA / MODEC	BP ANGOLA FPSO DEVELOPMENT	ANGOLA
	GROUPEMENT BERKINE SONATRACH-ANADARKO	GAS DISTRIBUTION SYSTEM ENHANCEMENTS	ALGERY
	MELLITAH OIL & GAS BV THROUGH MUSTANG ENG.	BOURI GRM PROJECT	LIBYA
	MIDOR – MIDDLE EAST OIL REFINERY	2364 - HYDROCRACKER REHABILITATION PROJECT	EGYPT
	MITSUBISHI THROUGH SOFINTER MACCHI	ALGERIA ARZEW FERTILIZER	ALGERY
	SONATRACH THROUGH SAIPEM SA	LPG HASSI MESSAOUD	
	TOTAL EXPLORATION & PRODUCTION	TOTAL ANGOLA E&P PROJECT	ANGOLA
2008	BELAYIM PETROLEUM COMPANY (PETROBEL) THROUGH BRED A ENERGIA S.P.A.	TUNA GAS GATHERING PROJECT - TEMSAH PLANT - SUBSEA CHECK VALVES	EGYPT
	TOTAL EXPLORATION & PRODUCTION	TOTAL CONGO E&P PROJECT	CONGO
2007	MEDGAZ S.A.	ONSHORE FACILITIES EPIC PROJECT BSCE	ALGERY
2005	BENTINI	SONATRACH/TRC - REALISATION DES STATION DE POMPAGE SP2(BISKRA) ET SP3(M'SILA) DE L'OLEODUC OB1-HAOUZ EL HAMRA A BEJAIA	
2004	HYUNDAI HEAVY INDUSTRIES	WESTERN LIBYA GAS PROJECT (AGIP GAS) SABRATH PLATFORM	LIBIA
	SONATRACH – BP	INAMENAS ALGERIE PROJECT	ALGERY
2003	BECHTEL LIMITED	BRITISH GAS - TUNISIA MISKAR PROJECT	TUNISIA
	JGC CORPORATION	WESTERN LIBYA GAS PROJECT - WAFA PLANTS	LIBYA
2002	JGC CORPORATION – GROVE DRESSER	OURHOUD PROJECT	ALGERIA
1996	CEYLON PETROLEUM	COLOMBO REFINERY	CEYLON
	METRAGAS-INITEC	MAROC POWER PLANT	MAROC
	METRAGAZ	GAZODUC MAGHREB EUROPE	TUNISIA
1995	ENNPI	ASSIUT REFINERY	EGYPT
	NOELL LGA	MALTA OILTANKING	MALTA
	SNAMPROGETTI	BOURI FIELD	ALGERIA
1994	SIFCA	EGPC ALEXANDRIA	EGYPT
	SUEZ OIL	GPP 133/94 PROJECT	



YEAR	CUSTOMER	PROJECT	DESTINATION
2015	YEMEN LNG COMPANY LTD	OIL&GAS PRODUCTION	YEMEN
	ADCO THROUGH CONSORTIUM GS E&C & DODSAL RUMAITHA	SHANAYEL FACILITIES - PHASE III	U.A.E.
	KUWAIT OIL COMPANY (KOC) THROUGH SANCO	REPLACEMENT OF DUAL TANK AT GC-04 AND DRY TANK AT GC-21	KUWAIT
	BP EXPLORATION (EPSILON) LIMITED THROUGH PETROFAC CENTRAL PROCESSING FACILITY(CPF)	KHAZZAN PROJECT	OMAN
	ADCO	ADCO AGREEMENT	U.A.E.
2014	ADCO	BAB FAR NORTH CO2 INJECTION PROJECT / ADCO AGREEMENT SAHIL AND SHAH FULL FIELD DEVELOPMENT PROJECT	U.A.E.
	ADCO / GALFAR ENGINEERING	EPC FOR NEW WAG WELLS & CONVERSION OF EXISTING GAS INJECTORS WELLS TO WAG WELLS AT SAHIL	
	ADCO THROUGH PETROFAC	EPC FOR ASAB FFD PROJECT	
	ADMA-OPCO THROUGH HYUNDAI ENGINEERING & COSTRUCTION	SATAH AL RAZBOOT (SARB) FIELD DEVELOPMENT PROJECT	
	ADMA-OPCO THROUGH MCDERMOTT MIDDLE EAST	D6221 ADMA OPCO - 4GI, WP3A AND 3 BARREN TOWERS PROJECT	
	ADMA-OPCO THROUGH NPCC	ZAKUM OIL LINES REPLACEMENT PROJECT (PHASE-1)	
	ADMA-OPCO THROUGH NPCC/TECHNIP	UMM LULU FULL PHASE II FIELD DEVELOPMENT PROJECT	
	AL-JULIAH TRADING & CONTRACTING CO. W.L.L. FOR KOC	CENTRAL SEAWATER INJECTION PLANT NK REBUILDING OF DAMAGED FACILITIES AT GC-15 AND BS-130	KUWAIT
	CHIYODA ALMANA ENGINEERING LLC / RASGAS COMPANY LIMITED	FLOW ASSURANCE PROJECT (FAP) RGX2 SOURWATER DEGASSERS (U-87A) MODIFICATION PROJECT	QATAR
	IBN SINA NATIONAL METHANOL COMPANY / DRAGADOS INDUSTRIAL & INTECSA INDUSTRIAL	IBN SINA POLYOXYMETHYLENE PROJECT	SAUDI ARABIA
	KGOC (KUWAIT GULF OIL COMPANY) & AGOC (ARAMCO GULF OPERATIONS COMPANY) THROUGH TECHNIP	KGOC GAS AND CONDENSATE EXPORT SYSTEM	
	LUKOIL OIL COMPANY / TOYO ENGINEERING THROUGH EMERSON	WEST QURNA FIELD 2ND PHASE PROJECT	IRAQ
	MASDAR / ADNOC THRU DOSDAL	ESI CARBON CAPTURE AND STORAGE (CCS) PROJECT	U.A.E.
	PETROFAC / ADCO	BAB HABSHAN-1 DEVELOPMENT PROJECT (PHASE-1)	OMAN
	PETROLEUM DEVELOPMENT OMAN LLC / WORLEY PARSONS OMAN	AMAL STEAM SURFACE FACILITIES PROJECT – phase 1A	OMAN
	QATARGAS OPERATING COMPANY LIMITED	QG2 FLARE REDUCTION PROJECT EARLY MECHANICAL TIE-INS	QATAR
	QATAR SHELL GTL LIMITED / QATAR KENTZ WLL THROUGH MRC	FGP GRVE IMPROVEMENT PROJECT	
	RASGAS COMPANY LIMITED THROUGH CHIYODA ALMANA ENGINEERING	FLOW ASSURANCE PROJECT (FAP)	SAUDI ARABIA
	SAIPEM S.P.A. / SAFCO (SAUDI ARABIAN FERTILIZER COMPANY)	SAFCO V - UREA STAND ALONE PROJECT	
	SAIPEM SPA / SAUDI ARAMCO	ARABIAH & HASBAH OFFSHORE AND ONSHORE FACILITIES	
	SAUDI ARAMCO	DAYLIGHTING PHASE III PIPELINE PROJECT	
	SAUDI ARAMCO THROUGH HANWHA ENGINEERING & CONSTRUCTION	JAZAN REFINERY AND TERMINAL PROJECT	
	SAUDI ARAMCO THROUGH McDERMOTT MIDDLE EAST INC.	ARABIAH & HASBAH OFFSHORE AND ONSHORE FACILITIES	
	SAUDI ARAMCO THROUGH McDERMOTT MIDDLE EAST INC.	ARAMCO NORTH DOME PROJECT	
	SAUDI ARAMCO THROUGH SKEC	JAZAN REFINERY AND TERMINAL PROJECT	
	SAUDI BASIC INDUSTRIES CORPORATION (SABIC - JUBAIL)	UNITED FURNACE-9 PROJECT	
	SAUDI BINLADIN GROUP THROUGH EUSEBI IMPIANTI	KING ABDULAZIZ INTERNATIONAL AIRPORT DEVELOPMENT PROJECT PHASE-1	
	ZADCO (ZAKUM DEVELOPMENT COMPANY) THROUGH ABB SPA	EPC FOR POWER UPGRADE AT ZIRCU	U.A.E.



YEAR	CUSTOMER	PROJECT	DESTINATION
2013	ABU DHABI POLIMERS COMPANY LIMITED (BOROUGE)	BOROUGE PETROCHEMICALS JVP-EU-003	U.A.E.
	ADMA-OPCO THROUGH CCC	100 MBD DAS FACILITIES UPGRADE PROJECT SCOPE B (COMMON UTILITIES) EPC PHASE	
	ADCO / MATRIX CONSTRUCTION	EPC FOR BATCH 1 PLANT MODIFICATIONS AT BU HASA	
	ADCO THROUGH NPCC	QUSAHWIRA FULL FIELD DEVELOPMENT 1.8 MMBOPD PJ	
	AL-JULIAH TRADING & CONTRACTING CO. W.L.L. FOR KOC	INSTALLATION OF FLOWLINES & ASSOCIATED WORKS IN NORTH KUWAIT AREA	KUWAIT
	AL-KHAFJI JOINT OPERATIONS (KJO) THROUGH JGC GULF INTERNATIONAL	KJO WATER TREATMENT FACILITIES PHASE-3	SAUDI ARABIA
	DOLPHIN ENERGY LIMITED	EXPORT GAS COMPRESSION FACILITY UPDATE	QATAR
	DOLPHIN ENERGY THROUGH SOFINTER SPA div. MACCHI	EGC EXPANSION PROJECT	
	GASCO (ABU DHABI GAS INDUSTRIES LTD.)	HABSHAN ACID GAS FLARE RECOVERY PROJECT	U.A.E.
	HANWHA ENGINEERING & CONSTRUCTION / SAUDI ARAMCO	JAZAN REFINERY AND TERMINAL PROJECT	SAUDI ARABIA
	HYUNDAI ENG & COSTRUCTION CO.,LTD / ADMA OPCO	SATAH AL RAZBOOT (SARB) FIELD DEVELOPMENT PROJECT	U.A.E.
	KUWAIT OIL COMPANY THROUGH SAIPEM	NEW BOOSTER STATION BS171	KUWAIT
	JGC CORPORATION /SAUDI ARAMCO	MANIFA PROJECT (CENTRAL)	SAUDI ARABIA
	JOINT OPERATIONS SAUDI ARABIAN CHEVRON INC. / KUWAIT GULF OIL OIL COMPANY (K.S.C) THROUGH CONSOLIDATED CONTRACTORS COMPANY (Kuwait) W.L.L.	CONSTRUCTION OF TWO EOCENE TANKS AND TWO CHEMICAL STORAGE TANKS AT MGC PROJECT	KUWAIT
	J. RAY MCDERMOTT /SAUDI ARAMCO	SAFANIYA FIELD PROJECT	SAUDI ARABIA
	Mc DERMOTT MIDDLEA EAST INC / ADMA-OPCO	D6221 ADMA OPCO - 4GI, WP3A AND 3 BARREN TOWERS PROJECT	U.A.E.
	NPCC / ADMA-OPCO	UMM LULU FULL FIELD DEVELOPMENT PROJECT	
	NPCC / ADMA-OPCO	ZAKUM OIL LINES REPLACEMENT PROJECT (PHASE-1)	
	PDO (PETROLEUM DEVELOPMENT OMAN LCC) / WOOD GROUP THROUGH CCC	NRPS AP FLARE GAS RECOVERY PROJECT	OMAN
	PETROFAC / ADCO	EPC FOR ASAB FFD PROJECT	U.A.E.
	PETROFAC / ADCO	EXPANSION OF BAB GAS COMPRESSION PROJECT (EBGCP), PHASE 2	
	PETROFAC / J. RAY MCDERMOTT FOR SAUDI ARAMCO	KARAN OFFSHORE PLATFORMS AND SUBSEA PIPELINES PROJECT	SAUDI ARABIA
	QATARGAS OPERATING COMPANY LIMITED	EPCM SERVICES FOR MECHANICAL TIE-INS TRAIN 6 & 7	QATAR
	RASGAS COMPANY LMTD THROUGH CHIYODA ALMANA	SALES GAS BACK-OP:TRAIN -7 TIE-IN (RGCP-530) (RFS-114)	
	SABIC / PETROKEMYA THROUGH TECNICAS REUNIDAS	PETROKEMYA ABS PROJECT	SAUDI ARABIA
	SAUDI ARAMCO	UPGRADE JET FUEL SHIPPING FACILITIES AT NORTH JEDDAH BULK PLANT	
	SAUDI ARAMCO SAMSUNG SAUDI ARABIA	CO2 CAPTURE & INJECTION PROJECT	
	SAUDI ARAMCO THROUGH DAELIM INDUSTRIAL CO., LTD	YANBU EXPORT REFINERY PROJECT GASOLINE PACKAGE (EPC-3)	
	SAUDI ARAMCO THROUGH SAMSUNG ENGINEERING CO.,LTD	LUBEREF YANBU REFINERY EXPANSION PROJECT	
	SAUDI ARAMCO THROUGH ENPPI	YANBU EXPORT REFINERY TANK FARM (SP-1) PROJECT	
	SAUDI ARAMCO THROUGH SAIPEM S.P.A.	ARABIYAH & HASBAH OFFSHORE AND ONSHORE FACILITIES	
	SAUDI ARAMCO THROUGH DAELIM INDUSTRIA	RABIGH II PETROCHEMICAL PROJECT PETROCHEMICAL-1 PACKAGE (CP1)	
	SAUDI ARAMCO THROUGH McDERMOTT MIDDLE EAST	UPGRADE OF CRUDE GATHERING FACILITIES - SAFANIYA PHASE 2 PROJECT - SUBSEA CHECK VALVES	
	SAUDI ARAMCO THROUGH PETROFAC	RABIGH II PETROCHEMICAL PROJECT (U02 & U03 PACKAGES)	
	SAUDI ARAMCO THROUGH SAMSUNG ENGINEERING	LUBEREF YANBU REFINERY EXPANSION PROJECT	



YEAR	CUSTOMER	PROJECT	DESTINATION
2013	SAUDI ARAMCO THROUGH TECHINT	YANBU EXPORT REFINERY PROJECT - SOLIDS HANDLING	SAUDI ARABIA
	SAUDI ARAMCO THROUGH SAIPEM	ARABIAH & HASBAH OFFSHORE AND ONSHORE FACILITIES	
	ZADCO THROUGH NPCC	ZIRKU FACILITIES PKG-1B- OILY WATER TREATMENT & DISPOSAL PROJECT	U.A.E.
	ZADCO (ZAKUM DEVELOPMENT COMPANY) THROUGH NPCC-TECHNIP CONSORTIUM	UPPER ZAKUM 750K PROJECT	
2012	ABU DHABI GAS DEVELOPMENT COMPANY LIMITED	SHAH GAS DEVELOPMENT	U.A.E.
	ADCO	NEB PHASE 1 ADDITIONAL INJECTION WELL TIE-INS	
	ADCO THRU ALSA ENGINEERING & CONSTRUCTION	EPC FOR OPTICAL NETWORK AT BAB FIELD	
	ADCO THRU NPCC	QUSAHWIRA FULL FIELD DEVELOPMENT 1.8 MMBOPD PROJECT	
	AL-KHAFJI JOINT OPERATIONS (KJO)	HOUT (KRL) OFFSHORE GAS FACILITIES	SAUDI ARABIA
	AL-KHAFJI JOINT OPERATIONS (KJO) THROUGH JGC GULF INTERNATIONAL CO.,LTD	CONSTRUCTION OF WATER TREATMENT FACILITIES - PHASE 3 (WTF-3)	
	AL-KHAFJI JOINT OPERATIONS (KJO) THROUGH TECNICAS REUNIDAS	GAS & NGL EXPORT FACILITIES	
	GASCO (ABU DHABI GAS INDUSTRIES LTD.)	MIRFA - RUWAIS NITROGEN PIPELINE PROJECT	U.A.E.
		ABBR PROJECT - BAB MODIFICATIONS	
	KOC THRU GS E&C CORPORATION	WARA PRESSURE MAINTENANCE PROJECT	KUWAIT
	MARAFIQ (POWER AND WATER UTILITY COMPANY FOR YANBU & JUBAIL) THROUGH HANWHA ENGINEERING & COSTRUCTION (KR)	MARAFIQ STG 5&6 FUEL SUPPLY PROJECT	SAUDI ARABIA
	NATIONAL IRANIAN OIL COMPANY (NIOC) / PARS OIL AND GAS COMPANY (POGS)	SOUTH PARS GAS FIELD DEVELOPMENT PHASE 12	IRAN
	PETROLEUM DEVELOPMENT OMAN LLC (PDO)	AMAL STEAM SURFACE FACILITIES PROJECT PHASE 1B	OMAN
	QATAR SHELL GTL LIMITED	PEARL GTL PROJECT	QATAR
	RASGAS COMPANY LIMITED	BARZAN ONSHORE PROJECT	
		RASGAS ONSHORE EXPANSION PROJECT PHASE 2	
		BARZAN ONSHORE PROJECT	
	SAFCO (SAUDI ARABIAN FERTILIZER COMPANY)	SAFCO V - UREA STAND ALONE PROJECT	SAUDI ARABIA
	SAUDI ARAMCO THROUGH DAELIM INDUSTRIAL CO., LTD	YANBU EXPORT REFINERY PROJECT - GASOLINE PACKAGE (EPC-3)	
	SAUDI ARAMCO THROUGH SAMSUNG ENGINEERING CO.,LTD	SHAYBAH #4 INCREASE GAS HANDLING PROJECT	
	SAUDI ARAMCO THROUGH SAMSUNG ENGINEERING	WASIT#2 GAS PLANT - COGENERATION & STEAM GENERATION PROJECT	
	SAUDI ARAMCO THROUGH SAMSUNG ENGINEERING CO. LTD	SHAYBAH #1 INLET & GAS TREATMENT PROJECT	
	SAUDI ARAMCO THRU SAMSUNG ENGINEERING CO. LTD	SHAYBAH #1 INLET & GAS TREATMENT PROJECT	
	SAUDI ARAMCO THROUGH SK ENGINEERING & CONSTRUCTION CO. LTD	WASIT INLET & GAS PROCESSING PROJECT (WGC) - PACKAGE #1	
		WASIT SRU & UTILITIES PROJECT (WUC) - PACKAGE #3	
		WASIT NGL FRACTIONATION PROJECT (WFC) - PACKAGE #4	
	SAUDI ARAMCO THRU MCDERMOTT MIDDLE EAST INC	KARAN OFFSHORE PLATFORMS AND SUBSEA PIPELINES PROJECT	
	SAUDI ARAMCO THRU SAUDI ARCHIRODON LTD.	YANBU EXPORT REFINERY PROJECT	
	ZADCO (ZAKUM DEVELOPMENT COMPANY)	ZADCO OFFSHORE & ONSHORE FACILITIES	U.A.E.



YEAR	CUSTOMER	PROJECT	DESTINATION
2011	ABU DHABI COMPANY FOR ONSHORE OPERATIONS (ADCO)	ADCO PRICE AGREEMENT	U.A.E.
	ADCO THROUGH NPCC – NATIONAL PETROLEUM CONSTRUCTION COMPANY	BAB THAMAMA G & HABSHAN 2 1.8 MMBOPD PHASE-1 DEVELOPMENT PROJECT	
	DOLPHIN ENERGY LIMITED	DOLPHIN PROJECT	
	ILAM PETROCHEMICAL COMPANY (ILPC) THROUGH CANTEP INC.	OLEFIN PLANT ILAM PETROCHEMICAL COMPLEX	IRAN
	KUWAIT OIL COMPANY THROUGH SAIPEM S.P.A.	NEW BOOSTER STATION BS-171 AT WEST KUWAIT - KOC	KUWAIT
	PETROLEUM DEVELOPMENT OMAN LLC (PDO) THROUGH RIYAM ENGINEERING & SERVICES L.L.C.	AMAL STEAM SURFACE FACILITIES PROJECT PHASE 1B	OMAN
	QATARGAS OPERATING COMPANY LIMITED	QATARGAS 3 & 4 ONSHORE PROJECT	QATAR
	QATARGAS OPERATING COMPANY LIMITED THROUGH CHIYODA ALMANA	QATARGAS HELIUM (II) PROJECT	
	RASGAS COMPANY LIMITED THROUGH CHIYODA ALMANA	HELIUM 2 HEXU AND UTILITIES	
	REPUBLIC OF IRAQ MINISTRY OF OIL - STATE COMPANY FOR OIL PROJECTS (SCOP) THROUGH APS ENGINEERING COMPANY ROMA	NEW PUMP STATION OF LIGHT PRODUCTS PIPELINE (SHUAIBA-KARKH)	IRAQ
	SAUDI ARAMCO THROUGH JRM	D5854 - UPGRADE CRUDE GATHERING FACILITIES - SAFANIYA PHASE I	SAUDI ARABIA
	SAUDI ARAMCO THROUGH SAMSUNG ENGINEERING & ANSALDO CALDAIE S.P.A.	WASIT GAS PLANT - COGENERATION & STEAM GENERATION PROJECT	
	SAUDI ARAMCO THROUGH SAMSUNG ENGINEERING CO.,LTD	SHAYBAH INCREASED GAS HANDLING CAPACITY PROJECT (SHAYBAH IGHC)	
	SAUDI ARAMCO THROUGH SK ENGINEERING & CONSTRUCTION CO., LTD AND TECNICAS REUNIDAS	YANBU EXPORT REFINERY PROJECT, EPC-2 PACKAGE	
	SATORP THROUGH CONSORTIUM OF CHIYODA CORPORATION/ SAMSUNG ENGINEERING (CYSE)	JUBAIL EXPORT REFINERY PROJECT (PACKAGE 4 - COKER)	
	SATORP THROUGH M.R. AL-KHATHLAN EST.	JUBAIL EXPORT REFINERY AUXILIARY UTILITIES PROJECT (PACKAGE 5C)	
2010	ABU DHABI CO. (ADCO) / CONSOLIDATED CONTRACTING ENGINEERING & PROCUREMENT	SAHIL & SHAH FULL FIELD DEVELOPMENT PROJECT	U.A.E.
	ABU DHABI CO. (ADCO) / TR ABU DHABI	EPC FOR SAHIL & SHAH FULL FIELD DEVELOPMENT PROJECT	
	ADCO THROUGH NPCC – NATIONAL PETROLEUM CONSTRUCTION COMPANY	BAB THAMAMA G & HABSHAN 2 1.8 MMBOPD PHASE-1 DEVELOPMENT PROJECT	
	EL SEIF ENGINEERING CONTRACTING COMPANY	CRUDE OIL PIPELINE & METERING STATION FOR RIYAD	SAUDI ARABIA
	IRANIAN GAS ENGINEERING & DEVELOPMENT CO.(I.G.E.D.C.) / IRAN ITOK COMPANY (IET)	POLKALEH-DEHAGH GAS COMPRESSOR STATIONS	IRAN
	KUWAIT OIL COMPANY THROUGH SAIPEM S.P.A.	NEW BOOSTER STATION BS-171 AT WEST KUWAIT - KOC	KUWAIT
	PETROFAC / GS ENG. JV – (MACCHI)	RUWAI 4° NGL TRAIN - GASCO	U.A.E.
	SAIPEM S.P.A. - SOFINTER S.P.A. DIV. MACCHI	IMPIANTO SAIPEM / QAFCO VI MESAIEED	QATAR
	SAUDI ARAMCO - SAIPEM S.P.A.	P31840 - MANIFA CORE HYDROCARBON FACILITIES AT MANIFA CENTRAL PROCESSING FACILITIES	SAUDI ARABIA
	SAUDI ARAMCO / TECNICAS REUNIDAS	MANIFA CO-GENERATION & MAIN SUBSTATIONS PROJECT 7420	
	SAUDI ARAMCO THROUGH SUEDEHROHRBAU SAUDI ARABIA LTD	REFINED PRODUCTS PIPELINE RTDB-2 & DR-2 (IK) PROJECT-ARAMCO	
	SATORP THROUGH DAELIM INDUSTRIAL CO.	JUBAIL EXPORT REFINERY PROJECT (PACKAGE 2B)	
	SATORP THROUGH SK ENGINEERING & CONSTRUCTION	JUBAIL EXPORT REFINERY PROJECT (PACKAGE 5B)	
	SATORP THROUGH TECHNIP ITALY	2365-JUBAIL EXPORT REFINERY PROJECT-SAUDI ARAMCO TOTAL (PACKAGE 2A)	
	SAUDI ARAMCO	UTHMANIYAH WATER INJECTION PLANT #4	



YEAR	CUSTOMER	PROJECT	DESTINATION
2010	SAUDI ARAMCO THROUGH GULF CONSOLIDATED CONTRACTORS	RTDB-1 PIPELINE CAPACITY PROJECT JOB 278 - RAS TANURA	SAUDI ARABIA
	SAUDI ARAMCO THROUGH JGC CORPORATION	MANIFA CPF UTILITIES PROJECT	
	SAUDI ARAMCO THROUGH PETROFAC	KARAN UTILITIES & CO-GENERATION PROJECT	
	SATORP THROUGH SK ENGINEERING & CONSTRUCTION-MACCHI	JUBAIL EXPORT REFINERY PROJECT	
	SATORP THROUGH TECHNIP ITALY-RMT	JUBAIL EXPORT REFINERY PROJECT (PACKAGE 5A)	
	SATORP THROUGH TECHNICAS REUNIDAS	JUBAIL EXPORT REFINERY PROJECT	
2009	ABU DHABI OIL REFINING COMPANY - TAKREER	GREEN DIESEL PROJECT	U.A.E.
	J.RAY MCDERMOTT MIDDLE EAST INC.	KARAN GAS FIELD DEVELOPMENT OFFSHORE PLATFORMS AND SUBSEA PIPELINES PROJECT - SAUDI ARAMCO	SAUDI ARABIA
	KUWAIT OIL COMPANY (KOC)	BUILDING NEW BOOSTER STATION BS 160 AT SOUTH EAST KUWAIT	KUWAIT
	MINISTRY OF OIL / SOUTH OIL COMPANY (S.O.C.)	CRUDE OIL PROCESS PLANTS PACKAGES FOR DEGASSING STATION - NAHAR BIN UMMAR	IRAQ
	MOUCHEL EXCELERATE ENERGY	MINA AL AHMADI SOUTH PIER GASPORT	KUWAIT
	PETROFAC	EPC FOR ASAB FULL FIELDS DEVELOPMENT PROJECT - FOR ABU DHABI CO. (ADCO) - ONSHORE OIL OPERATION	U.A.E.
	SAUDI ARAMCO	QASSIM CRUDE OIL PIPELINE PROJECT, JOB#502	SAUDI ARABIA
		INCREASE RTDB-1 PIPELINE CAPACITY RASTANURA PROJECT	
		HARMALIYAH GOSP1 PROJECT	
		RTDB-1 PIPELINE CAPACITY RASTANURA PROJECT	
	SAUDI ARAMCO THROUGH PETROFAC/SOFINTER	KARAN PROJECT C/O KHURSANIYAH	U.A.E.
	SUEDROHRBAU SAUDI ARABIA LTD.	MANIFA WATER SUPPLY SYSTEM & DOWNSTREAM PIPELINES (SAUDI ARAMCO)	
	TR ABU DHABI	EPC FOR SAHIL & SHAH FULL FIELD DEVELOPMENT PROJECT NO. 08500 FOR ABU DHABI CO. (ADCO) - ONSHORE OIL OPERATION	
2008	CONTRACTING AND TRADING CO. (C.A.T.)	MARAFIQ GAS PIPELINE (SAUDI ARAMCO)	SAUDI ARABIA
	ENI IRAN B.V. N.I.O.C. NATIONAL	DARQUAIN OIL FIELD PROJECT - SECOND STAGE OF DEVELOPMENT	IRAN
	J.RAY MCDERMOTT MIDDLE EAST INC.	D5749 ARAMCO MANIFA PROJECT	SAUDI ARABIA
	MAERSK OIL QATAR THROUGH MIKUNI (M) SDN. BHD.	BE PROCESS AND BG UTILITY PLATFORM - AL SHAHEEN DEVELOPMENT OFFSHORE PHASE 3	QATAR
	OMAN METHANOL COMPANY (OMC) THROUGH OMAN PROMAN CONTRACTING AND TRADING	MO3000 METHANOL PLANT - SOHAR	OMAN
	QATAR FERTILISER COMPANY S.A.Q. THROUGH SNAMPROGETTI / SOFINTER DIV. MACCHI	QAFCO 5 PROJECT	QATAR
	SUEDROHRBAU SAUDI ARABIA LTD.	PIPELINE LOOPS FOR SHY-1 EXPANSION PHASE-II (SAUDI ARAMCO)	SAUDI ARABIA



YEAR	CUSTOMER	PROJECT	DESTINATION
2007	ABU DHABI POLYMERS CO.LTD (BOROUGE) THROUGH LINDE AG.	RUWAI52 PROJECT	ABU DHABI - UAE
	BONATTI S.P.A	OPTIMIZE PRODUCTION IN MUBARRAZ AREA RABIGH PROJECT (SAUDI ARAMCO)	SAUDI ARABIA
	CONSORZIO OVERSEAS BECHTEL INC. / TECHNIP ITALY S.P.A	KHURSANIYAH GAS PLANT (KGP) PROJECT - SAUDI ARAMCO	
	ENPPI - ENGINEERING FOR THE PETROLEUM AND PROCESS INDUSTRIES ON BEHALF OF AL-KHAFJI JOINT OPERATIONS	SAUDI ARAMCO - PROCUREMENT SERVICES FOR EXPANSION OF HOUT CRUDE ONSHORE PRODUCTION FACILITIES PROJECT	
	EXXON MOBIL MIDDLE EAST GAS MARKETING LIMITED	AL KHALEEJ GAS PROJECT PHASE 2 (AKG-2)	QATAR
	INITEC PLANTAS INDUSTRIALES THROUGH VALVULAS Y CONTROL DE FLUIDOS S.A.	HAWIYAH GAS PLANT EXPANSION PROJECT (PNEUMATIC ON-OFF VALVES)	SAUDI ARABIA
		HAWIYAH GAS PLANT EXPANSION PROJECT (MOTOR OPERATED VALVES)	
	J & P INTERNATIONAL CONTRACTORS	SAUDI ARAMCO X-41- NUAYYIM ASL CRUDE INCREMENT FACILITIES	
	JV FOSTER WHEELER ENERGY LTD & HYUNDAI ENGINEERING & CONSTRUCTION CO.,LTD	KHURAI5 CENTRAL PROCESSING FACILITIES - GAS	QATAR
	JV TECHNIP / CHIYODA	QATARGAS 3&4 ONSHORE PROJECT - C.R.A. VALVES	
	QATAR SHELL GTL LIMITED	PEARL GTL PROJECT	
	SNAMPROGETTI	QURAYYAH SEAWATER PLANT - ARAMCO (ACTUATED GATE VALVES)	SAUDI ARABIA
		SAUDI ARAMCO KHURAI5 WATER INJECTION FACILITIES AND UTILITIES	
		SAUDI ARAMCO - SHAYBAH CENTRAL PROCESSING FACILITIES PROJECT NO.:017280	
2006	HYUNDAI	CRUDE EXPORT FACILITIES AT NTF, STF AND MAA	KUWAIT
	INITEC PLANTAS INDUSTRIALES THROUGH VALVULAS Y CONTROL DE FLUIDOS S.A.	HAWIYAH GAS PLANT EXPANSION PROJECT (CARBON STEEL & STAINLESS VALVES)	SAUDI ARABIA
	RAS LAFFAN LIQUEFIED NATURAL GAS COMPANY LIMITED (3)	RAS GAS ONSHORE EXPANSION PROJECT PHASE II (TRAIN 6&7) EPC9	QATAR
	SAUDI ARABIAN SAIPEM LIMITED	SAOC KHURAI5 & GHAWAR SEAWATER PLINES	SAUDI ARABIA
	SICON OIL & GAS SRL	EXPANSION OF KHAFJI CRUDE ONSHORE PRODUCTION FACILITIES	
	SNAMPROGETTI	ARAMCO OC BV KHURSANIYAH PRODUCING FACILITIES QURAYYAH SEAWATER PLANT - ARAMCO (MOTORIZED OPERATED LARGE SIZE GATE VALVES)	
2005	ADCO	ASAB WATER INJECTION PROJECT	U.A.E.
	EASTERN BECHTEL CO/ ABU DHABI GAS LIMITED LTD	OGD III ONSHORE GAS DEVELOPMENT	ABU DHABI - UAE
	INITEC/ TECNICAS REUNIDAS	JU'AYMAH GAS PLANT EXPANSION	SAUDI ARABIA
	J.G.C CORPORATION	DOLPHIN ONSHORE GAS PLANT	QATAR
	JV TECHNIP - CHIYODA	QATARGAS II DEVELOPMENT	
	M.S. AL SUWAIDI	ARAMCO PROJECT	SAUDI ARABIA
	PROMAN	MO 3000 METHANOL PLANT-SOHAR, SULTANATE OF OMAN	OMAN
	TECHINT ARGENTINA	GOSP III AL HARADH CRUDE INCREMENT	SAUDI ARABIA
	TECHNIP	KHARG ETYLENE PLANT	IRAN
	SUEDROHBAU	14521-SHY-1 EXPANSION PAHSE I	SAUDI ARABIA
	SNAMPROGETTI SOFINTER MACCHI	KHURSANYAH PROJECT - ARAMCO	



YEAR	CUSTOMER	PROJECT	DESTINATION
2004	C.B. & I. (U.S.A.)	SAUDI ARAMCO QATIF PROJECT GOSP-2	SAUDI ARABIA
	DAELIM ENGINEERING FOR KUWAIT OIL COMPANY	EFFLUENT WATER DEVELOPMENT PROJECT	KUWAIT
	ENELPOWER ITALY	RAS LAFFAN COMBINED CYCLE& DESALINATION FACILITY	QATAR
	JGC CORPORATION (SAUDI ARAMCO)	BERRI GAS COGENERATION PROJECT	SAUDI ARABIA
	JV SNAMPROGETTI - TECHNIP FRANCE	OMAN-INDIA FERTILIZER PROJECT	OMAN
	KVAERNER PROCESS SYSTEMS (STATOIL & BP)	SHAH DENIZ PROJECT	AZERBAIJAN
	MACCHI	DOLPHIN PROJECT	QATAR
	QATAR PETROLEUM / PETROFAC	QATAR RAG & FLARE MITIGATION PROJECT.	
	SUEDROHBAU	10935-HARAD AL CRUDE INCREMENT III PIPELINES (ARAMCO)	SAUDI ARABIA
	TECHNICA REUNIDAS	QATIF PROJECT (ARAMCO)	
	TECHNIP ABU DHABI	GASCO-HABSHAN CAPACITY ENHANCEMENT STEP 2B PROJECT	U.A.E.
	TECHNIP COFLEXIP (FRANCE) JAM PETROCHEMICAL CO.	OLEFIN 10° COMPLEX CRACKING PLANT	IRAN
	TECHNIP COFLEXIP / NPCC	ADCO NORTH EAST BAB PROJECT (NEB)	U.A.E.
	TECHNIP ITALY	RYADH REFINERY - DHT COMPLEX	SAUDI ARABIA
	TECHINT ARGENTINA	HARADH AL CRUDE INCREMENT III PROJECT (ARAMCO)	
	TOYO ENGINEERING	SOUTH PARS GAS FIELD PHASE 6,7 & 8 OHNSORE DEVELOPMENT	IRAN
2003	SNAMPROGETTI	309700 SAUDI ARAMCO QCBV QATIF GOSP-1 PROJECT	SAUDI ARABIA
	TECHNIP FRANCE	9TH OLEFIN PROJECT	IRAN
	TECHNIP ITALY (FOR SAUDI ARAMCO)	SAUDI ARAMCO QATIF GOSP-2 PROJECT	SAUDI ARABIA
		SAUDI ARAMCO SABIC PROJECT 2121 SABIC ACETIC ACID PROJECT	
2002	"SNAMPROGETTI-SAIPEM-MITSUBISHI CONSORTIUM"	"OMAN GAS COMPANY, 32" FAHUD – SOHAR GAS PIPELINE"	OMAN



YEAR	CUSTOMER	PROJECT	DESTINATION
2015	SHANDONG TIANYUAN NEW ENGERY TECHNOLOGY CO. LTD	SHANDONG TIANYUAN COAL HYDROGENATION PROJECT	CHINA
	CHINA PETROLEUM MATERIALS CORPORATION	MOHE DAQING CRUDE OIL PIPELINE PROJECT	
2014	AGIP KAZAKHSTAN NORTH CASPIAN OPERATING COMPANY	KASHAGAN FIELD DEVELOPMENT PROJECT - EXPERIMENTAL PROGRAMME	KHAZAKISTAN
	BAKU OIL REFINERY THROUGH ARCOTRANS LLP	BAKU OIL REFINERY THROUGH PROJECT	AZERBAIJAN
	BAKU OIL REFINERY THROUGH EDL ANLAGENBAU GESELLSCHAFT MBH		
	BEIJING PETROCHEMICAL ENGINEERING CO. LTD.	SHAANXI YANCHANG PETROLEUM GROUP) CO. LTD. LNG 200 THOUSAND TONS/YEAR	CHINA
	BP EXPLORATION (SHAH DENIZ) LTD / KBR	SHAH DENIZ STAGE 2 PROJECT	AZERBAIJAN
	BRUNEI SHELL PETROLEUM COMPANY	BRUNEI SHELL PROJECT	BRUNEI
	CHINA DAQING REFINING AND CHEMICAL COMPANY	MIXED DIESEL HYDROGENATION UNIT OF 1.7 MILLION TONS / YEAR OF DIESEL PRODUCT QUALITY UPGRADING	CHINA
	NGHI SON REFINERY AND PETROCHEMICAL THRU JGCS CONSORTIUM	NSRP COMPLEX PROJECT	VIETNAM
	ZHONGKE SYNTHETIC OIL ENGINEERING CO. LTD	SHANXI LUAN HIGH HYDROPHOBIC COAL CLEAN UTILIZATION OIL ELECTRIC INTEGRATED DEMONSTRATION PROJECT	CHINA
2013	BP EXPLORATION LTD / KBR	SHAH DENIZ STAGE 2 PROJECT	AZERBAIJAN
	JGCS CONSORTIUM (JGC CORP., CHIYODA CORP., GSEC, SKEC, TECHNIP FRANCE, TECHNIP GEOPRODUCTION (M) SDN. BHD.	NSRP COMPLEX PROJECT	VIETNAM
	PETROCHINA THROUGH HONG KONG NEW CENTURY CONTROL EQUIPMENT CO.LTD	NC-OIL FIELD(SU QIAO) UNDERGROUND GAS STORAGE	CHINA
	PETRONAS CARIGALI	TURKMENISTAN BLOCK 1 DEVELOPMENT PROJECT - ONSHORE GAS TERMINAL	TURKMENISTAN
	PETRONAS CARIGALI SDN BHD	MASA PIPELINE & FLEXIBLE RISER DECOMMISSIONING & PRESERVATION	MALAYSIA
	PETRONAS LNG 9 SDN BHD (PL9SB) THROUGH JGC CORPORATION	PETRONAS LNG TRAIN 9 PROJECT	
	SINOPEC THROUGH HONG KONG NEW CENTURY CONTROL EQUIPMENT CO.LTD	SINOPEC-S01	CHINA
2012	AGIP KAZAKHSTAN NORTH CASPIAN OPERATING COMPANY	KASHAGAN FIELD DEVELOPMENT PROJECT	KAZAKISTAN
	CARIGALI HESS OPERATING COMPANY SDN BHD	PROVISION OF ENGINEERING DESIGN SERVICE FOR WHP10 DEVELOPMENT	MALAYSIA
	PETROCHINA GUANGXI PETROCHEMICAL COMPANY	PETROCHINA GUANGXI CRUDE OIL PROCESSING PROJECT	CHINA
	PETRONAS CHEMICALS FERTILISER SABAH ASN BHD	SABAH AMMONIA UREA (SAMUR) PROJECT	MALAYSIA
2011	PETROCHINA THROUGH HONG KONG NEW CENTURY CONTROL CO.LTD	PIPELINE 1: CHINA-BURMA	CHINA
		PIPELINE2: LANZHOU-CHENGDU	
		PIPELINE3: JINZHOU-ZHENGZHOU	
		PIPELINE4: DAQING-JINXI	
		PIPELINE5: CHANGQING-HOHHOT	
		PIPELINE6: JINLIN-CHANGCHUN	
2010	PTT AROMATIC & REFINING THROUGH SK ENGINEERING & CONSTRUCTION	CLEAN FUEL PROJECT AT MAP TA PHUT, THAILAND	THAILAND
2008	NESTE OIL OYI THROUGH TECHNIP ITALY	2308 - SINGAPORE NEXBTL PLANT PROJECT - CAST VALVES	SINGAPORE
	PETRONAS CARIGALI (TURKMENISTAN) SDN. BHD. THROUGH MMHE / TECHNIP JOINT VENTURE	TURKMENISTAN BLOCK 1 DEVELOPMENT PROJECT - ONSHORE GAS TERMINAL (OGT)	TURKMENISTAN
2004	KVAERNER PROCESS SYSTEMS (STATOIL & BP)	SHAH DENIZ PROJECT	AZERBAIJAN
	TECNICA REUNIDAS	CSPC NANHAI PETROCHEMICALS PROJECT	CHINA
2000	DESCON ENGINEERING LIMITED	"KADANWARI UP-GRADE & MIANO-FIELD DEVELOPMENT PROJECT"	PAKISTAN
1999	FOSTER WHEELER ITALIANA	EXXON – SINGAPORE ALCOHOL PROJECT	SINGAPORE



YEAR	CUSTOMER	PROJECT	DESTINATION
1997	PNOC	PHILIPPINE NATIONAL OIL COMPANY	PHILIPPINES
1996	GASCO-KELLOG	RUWAIIS LPG COMPLEX	INDIA
	PHILIPPINE NAT. OIL CO.	GEO THERMAL ENERGY DEVELOPMENT	PHILIPPINES
	RELIANCE	POLIPROPILENE PLANT	INDIA
1995	LINDE	DALIAN PROJECT	CHINA
	LINDE	UREGOY PROJECT	
1994	BABCOCK	HONG KONG GPP II	HONG KONG
	TECHINT	ALCOHOL ETOSSYLATION	CHINA



YEAR	CUSTOMER	PROJECT	DESTINATION
2013	INPEX OPERATIONS AUSTRALIA PTY LTD	ICHTHYS GAS FIELD DEVELOPMENT PROJECT OFFSHORE FACILITIES	AUSTRALIA
	MOBIL CEPU LIMITED THROUGH SAMSUNG ENGINEERING CO. LTD	MCL BANYU URIP PROJECT EPC1 PPF	INDONESIA
	SHELL AUSTRALIA THROUGH TECHNIP FRANCE	PRELUDE FLNG PROJECT	AUSTRALIA
	WOODSIDE ENERGY LTD	WOODSIDE PROJECT	
2011	CHEVRON AUSTRALIA PTY LTD	GORGON PROJECT BARROW ISLAND LNG PLANT	AUSTRALIA
	CONOCOPHILLIPS (GRISSIK) LTD.	SUMPAL EXPANSION PROJECT / SUMPAL GAS STATION	INDONESIA
	CONOCOPHILLIPS (GRISSIK) LTD. THROUGH PT REKAYASA INDUSTRI	DAYUNG COMPRESSION PROJECT (DC-1) & CENTRAL GAS PLANT DEBOTTLENECK PROJECT (CGPX)	
	INPEX OPERATIONS AUSTRALIA PTY LTD THROUGH JGC CORPORATION	ICHTHYS ONSHORE LNG FACILITIES PROJECT	AUSTRALIA
2005	JGC CORPORATION / BP BERAU LTD	TANGGUH LNG PROJECT	INDONESIA

ORION STEEL VALVES

Qualifications

QUALIFICATIONS CERTIFICATES

SYSTEM CERTIFICATES	CERTIFICATE	NO	ISSUED FROM
	ISO 9001:2008	257	APIQR®
	ISO TS 29001	TS-1498	APIQR®
	PED	DGR-0036-QS-762-15	TUV
	APIQ1®	Q1-1611	APIQR®

PRODUCT CERTIFICATES	CERTIFICATE	NO	ISSUED FROM
	API 600	600-0095	APIQR®
	API 6A	6A-0291	APIQR®
	API 6D	6D-0140	APIQR®
	API 6DSS	6DSS-0013	APIQR®
	API 594	594-0014	APIQR®
	SIL2 (Safety Integrity Level)	C-IS-242784-01 C-IS-242784-02	TUV®
	TR CU 032-2013	0255802	Politech Group

HEALTH SAFETY AND ENVIRONMENTAL CERTIFICATES

HSE CERTIFICATES	CERTIFICATE	NO	ISSUED FROM
	ISO 14001:2004	2008/509	Certification Europe
	OHSAS 18001:2007	2011/1343	Certification Europe

HEALTH, SAFETY & ENVIRONMENT (HSE)

ORION, being well aware of its responsibilities, gives the greatest commitment to a continuous improvement of the Integrated System for Safety and Environmental Protection Management in order to avoid any harmful effect to people and environment minimizing relevant risks.

ORION has obtained ISO 14001 and OHSAS 18001 certifications to guarantee a safe workplace, ensure the safe management of all the activities and the protection of the environment in compliance with national and international regulations through the application of the following principles:

- Reduction of environmental impacts.
- Improvement of environmental performance and safety standards in workplaces.
- Optimization the use of natural resources.
- Promotion of safety and active participation of personnel in the constant implementation and improvement of the Management System.
- Systematic assessment of environmental performance and safety standards through constant monitoring.
- Elimination or reduction of the risks affecting environment, safety and health of personnel.
- Analysis of the causes of any accidents, critical events, injuries or environmental emergencies in order to prevent their repeated occurrence.
- Awareness among all employees that environmental, safety and health issues, as well as the defined improvement objectives, are an integral part of the comprehensive corporate management system.

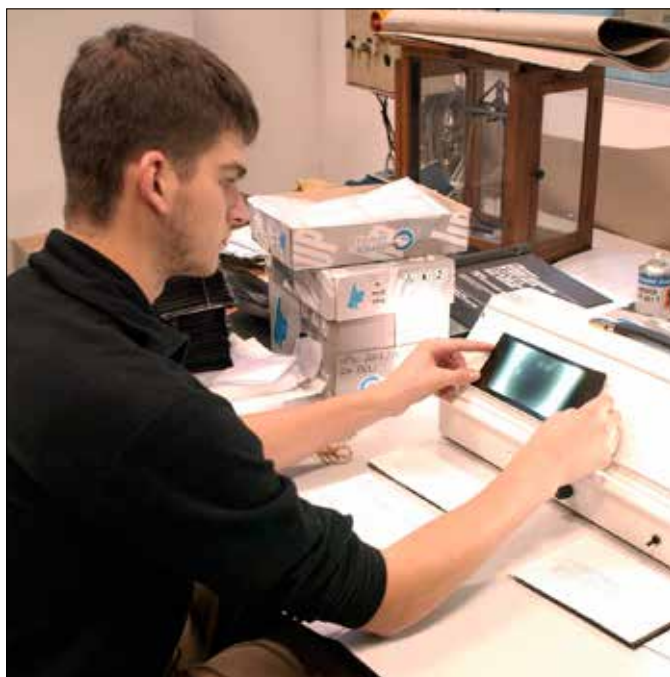




CHEMICAL ANALYSIS, SPECTROMETER
P.M.I. POSITIVE MATERIAL IDENTIFICATION



ULTRASONIC EXAMINATION



RADIOGRAPHIC EXAMINATION



MAGNETIC PARTICLE INSPECTION

ORION STEEL VALVES
Quality Control
NON DESTRUCTIVE TESTS



DYE PENETRANT INSPECTION



HARDNESS CONTROL



PAINTING CONTROL - PAINTING THICKNESS CHECK

ORION STEEL VALVES Fugitive Emission

FUGITIVE EMISSION TEST AND QUALIFICATION OF ORION VALVES

ACCORDING TO ISO 15848 Part 1 and 2

The risk associated to fugitive emissions from equipment in facilities which use, manufacture or transport toxic and dangerous fluid products, brought to new laws and regulations which aim is to reduce equipment leakage. Such regulations require in-service monitoring in order to ascertain valves performance to fugitive emissions maximum acceptance standards.

ORION S.p.A. has carried out valve *fugitive emission leak detection* in order to qualify its own production.

TEST EXECUTION:

Gate, Globe & Check Valves are tested at ambient, high and low temperature, with different number of mechanical cycles (open / close) with SATISFACTORY RESULTS.

ORION valves comply with TIGHTNESS CLASS DESIGNATION "A" and "B"

Test Equipment: Helium Detector Type

Manufacturer: PFEIFFER Vacuum

Equipment name: QUALITEST HTI 260

***ORION offers several solutions in order to reach total absence of emissions, such as bellow sealed valves for lethal , toxic and flammable services.**

[For details of the test conditions, data and test certificate please contact our Company.](#)

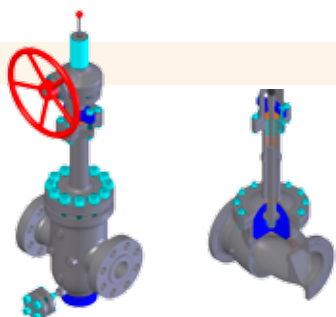
API 624 Qualification

Qualified API 624

Tested with Chesterton 1622 Low E Packing

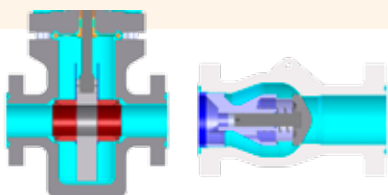
ORION STEEL VALVES

Special Technical Features



CRYOGENIC SERVICE VALVES

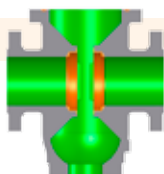
These valves are suitable for low temperature or cryogenic operating conditions, with a particular selection of materials suitable for low temperatures and the extended bonnet design in order to keep the stem packing protected from cryogenic fluid. (Design standards i.e. BS6364, MESC SPE 77-200, ...)



INTERNAL CLADDING

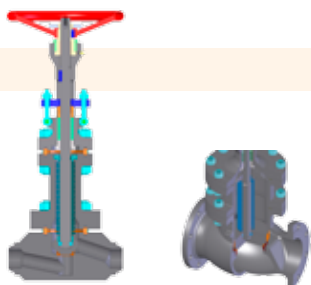
Valves internally cladded are the alternative offered by ORION in aggressive service conditions. We can use valves made of carbon steel with the entire internal surfaces lined with INCONEL®, HASTELLOY® alloys or other weldable steels or CRAs.

The latest technologies for weld depositing are available in ORION to provide a controlled layer of metal, able to improve the corrosive and erosive resistance of the valve parts.



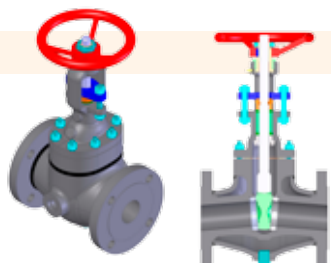
INTERNAL LINING

The entire production range of ORION valves is also available with an internal lining of polymeric products, like FBE lining. The exposed surfaces (floating seat pockets and gasket seating areas) are overlaid with a stainless steel or CRA which ensures a long lasting performance of the valve and a total protection of the wetted surfaces.



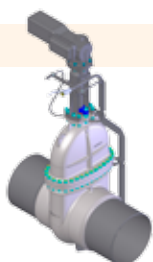
BELLOW SEALED VALVES

ORION offers bellow sealed valves for lethal, toxic and highly flammable services in order to reach the total absence of emissions. The bellow creates a physical barrier that isolates the fluid from the external environment. Traditional stem packing arrangement is still kept in place as a second contingency barrier and to maintain fire safe design.



JACKETED VALVES

To keep the valve operating temperature under control, a jacketed execution is available. The valve is enclosed into a cast steel or fabricated jacket, creating an interstice all around the body. A heating fluid is forced to flow through this interstice and keeps the valve at a controlled temperature, in order to keep the process fluid's viscosity low and avoid accumulation of material in the body. Usually sulphur and polymers application require this particular feature. The use of a jacket requires an increased flange size dimension, usually to the next size.



BURIED SERVICE VALVES

Extended drain, vent and injection piping is supplied for valves built for buried under-ground service.

POST - INDICATOR VALVES (PIV)

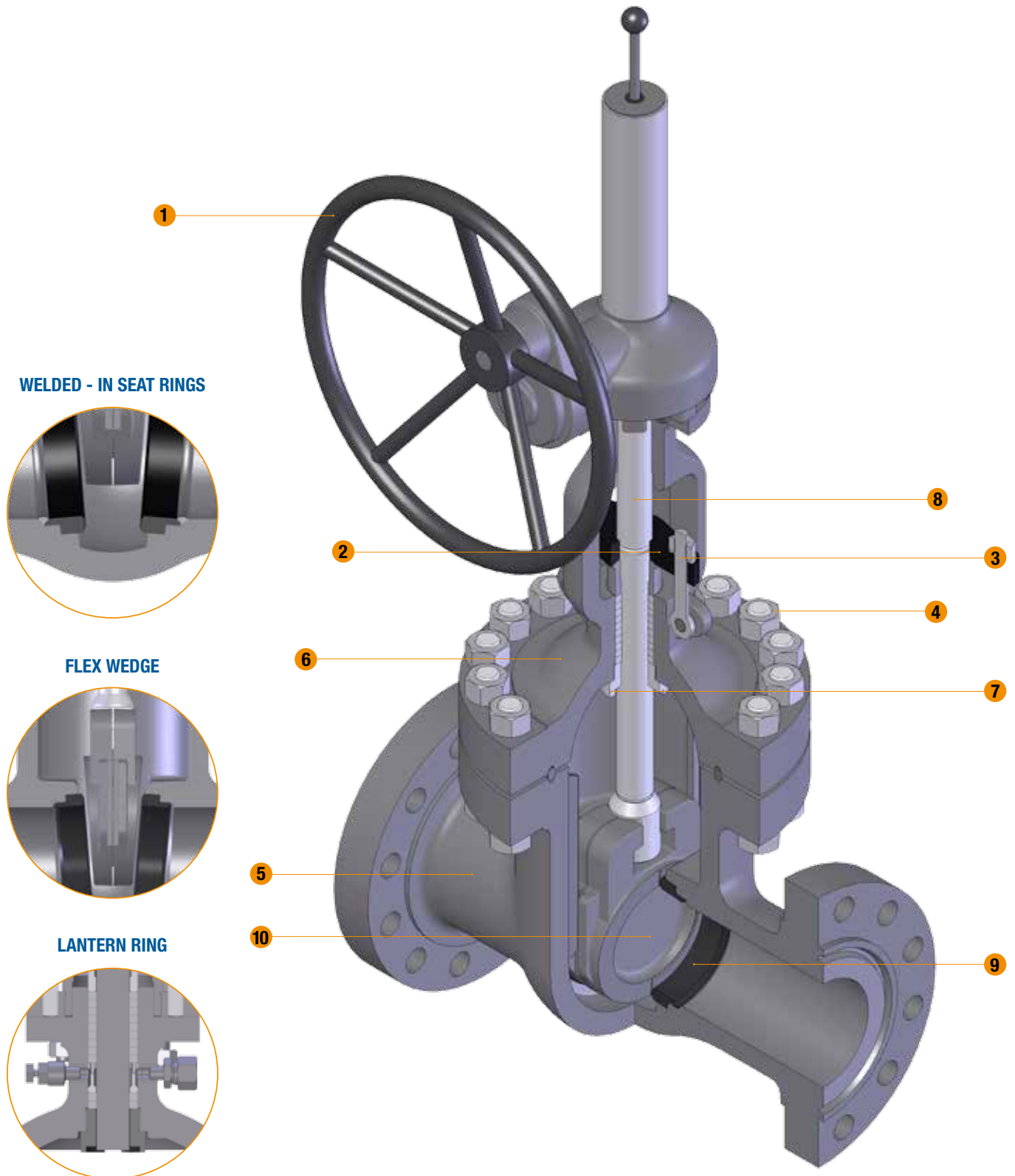
Similarly to buried valves, this kind of equipment has a stem extension with an open-close indicator directly positioned above ground, close to the handwheel, in order to easily check the opening status of the valve.

ORION STEEL VALVES
Gate Valves
API 600

GATE



ORION STEEL VALVES
Gate Valves
 API 600



CAST OR FORGED STEEL BODY, OUTSIDE SCREW AND YOKE, RISING STEM, NON-RISING OPERATOR, RENEWABLE SEATS, REMOVABLE YOKE SLEEVE, BACKSEAT FOR REPACKING UNDER PRESSURE.

- 1 OPERATOR**

The spoked handwheel is fabricated from steel pipe. The hub is coupled to the yoke sleeve by means of a key. Larger valves are equipped with a bevel or spur gear gearbox unit.
- 2 GLAND AND FLANGE**

They are in forged steel and are normally supplied in two pieces, self aligning design to permit the gland to descend parallel to the stem even if the eyebolts are unevenly tightened.
- 3 GLAND BOLTS AND NUTS**

The forged steel gland bolts are of the eyebolt type which can be swung outward for ease of gland repacking. They are fixed to the bonnet by hinge pins.
- 4 BONNET BOLTING**

Bonnet studs and nuts are manufactured from alloy steel to the relevant ASTM standard. The body to bonnet connection is designed according to ASME VIII DIV 1 standard.
- 5 BODY**

The body is in carbon or stainless steel and is available in many other CRA. It is carefully designed for total reliability and simple maintenance. The basic dimension, i.e. wall thickness, face to face and flanges comply with the relevant API and ASME standards. The body-to-bonnet flange is circular, except in the Class 150 where it is oval. The body-to-bonnet joint are flat face on Class 150 valves, male-and-female on Class 300 and ring joint on Class 600 and above. The body is basically supplied with renewable seats. Bosses are provided for drain taps or by-pass piping. The internal surfaces in contact with the fluid can be fully lined or clad for improved corrosion or erosion resistance.
- 6 BONNET**

As the body, the bonnet is in carbon or stainless steel and is available in many other CRA. It is machined to accept yoke sleeve and incorporates a stuffing box sized in accordance with the API standard. Lifting lugs can be provided integrally cast on the bonnet surface.
- 7 BONNET BUSHING**

The bonnet bushing or backseat is part of the valve trim. Its design allows valve repacking without valve's bleeding or draining. Hardfacing can be provided on stem seating surface.
- 8 STEM**

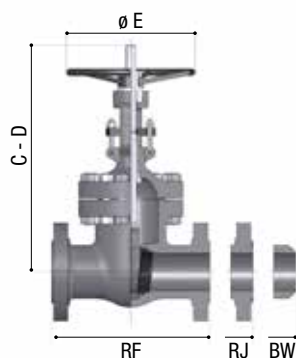
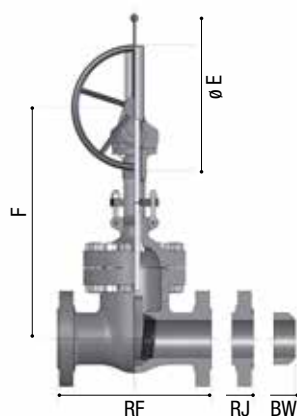
The stem is part of the trim and is available in a wide range of material in accordance to API 600 or customer's requirements. The stem is provided with a T-shaped head. A ground backseat is provided to ensure a perfectly tight seal to the stuffing box when the valve is fully open. The stem is highly finished in order to minimize friction and prevent damage to the packing. The thread is trapezoidal ACME type. All the stem sizes comply with the API 600 standard.
- 9 SEAT RINGS**

Welded-in seat rings are supplied as a standard. The rings are part of the trim of the valve. They can be externally threaded and internally notched for easy installation and dismantling. Special attention is given to the seating surfaces which are ground and lapped for a tight seal.
- 10 WEDGE**

The wedge is the main part of the trim. It is forged or cast in carbon or stainless steel and also available in CRA material. It is normally supplied as the solid wedge type. It is connected to the stem by means of a T-shaped joint. The guides on each side of the wedge are machined. Special care is given to the seating surfaces which are ground and lapped, integral or hardfaced. A cladding or lining can be applied to the wedge to improve its resistance against erosive and corrosive environments. For improved seating and unseating easiness, it can be machined with the flexible option.
- REMARKS**

A lantern ring is supplied upon request, in this case the stuffing box shall be drilled, tapped and fitted with an 1/4" NPT plug or grease fitting.
- INSTALLATION REMARKS**

Gate valves are best fit for vertical stem / horizontal flow installation. Special cases can be evaluated and developed on request.



Class ASME 150 (PN 20)

FIGURE NUMBERS - CLASS ASME 150 - ALL SIZES

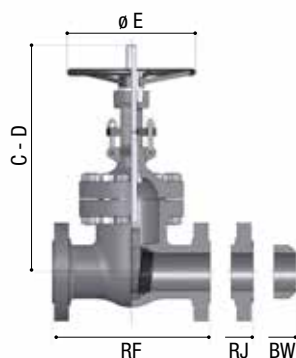
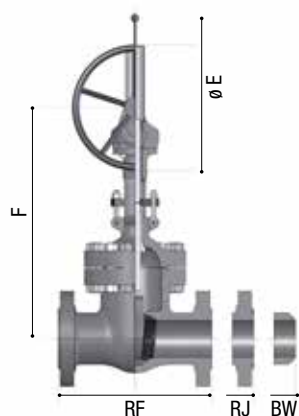
SR 150: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2.1/2"	3"	4"	6"	8"	10"	12"	14"
RF	178	190	203	229	267	292	330	356	381
RJ	191	203	216	242	280	305	343	369	394
BW	216	241	282	305	403	419	457	502	572
C-closed	357	415	445	556	712	862	1.020	1.178	1.318
D-open	417	490	530	671	877	1.082	1.290	1.498	1.676
E	204	204	254	305	356	406	457	502	610
F	/	/	/	/	/	/	/	/	/
Approximate WEIGHT (Kg)									
FLANGED	18	30	32	52	85	131	216	348	391
BW	14	24	27	43	77	123	203	339	370

SIZE	16"	18"	20"	22"	24"	26"	28"	30"	32"
RF	406	432	457	483	508	559	610	610	660
RJ	419	445	470	496	521	/	/	/	/
BW	610	660	711	762	813	864	914	914	965
C-closed	1.440	1.608	1.768	1.940	2.064	2.220	2.375	2.518	2.620
D-open	1.850	2.069	2.271	2.492	2.680	2.876	3.092	3.281	3.435
E	610	BG	BG	BG	BG	BG	BG	BG	BG
F	/	1.779	1.868	1.957	2.046	2.135	2.312	2.488	2.606
Approximate WEIGHT (Kg)									
FLANGED	468	570	760	880	1.050	1.453	1.650	1.956	2.200
BW	443	558	736	910	1.035	1.329	1.635	1.806	2.095

SIZE	34"	36"	38"	40"	42"	44"	46"	48"	50"
RF	711	711	762	762	787	826	864	864	940
RJ	/	/	/	/	/	/	/	/	/
BW	1.016	1.016	1.067	1.067	1.067	/	/	/	/
C-closed	2.970	2.970	3.228	3.228	3.372	3.558	3.630	3.702	3.915
D-open	3.876	3.876	4.228	4.228	4.415	4.685	4.799	4.912	5.188
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	2.701	2.878	3.054	/	3.402	3.574	3.747	3.773	3.916
Approximate WEIGHT (Kg)									
FLANGED	2.741	3.060	3.770	4.000	4.420	5.400	6.620	6.850	7.605
BW	2.665	2.850	3.430	3.665	4.070	5.886	6.120	6.350	7.060

SIZE	52"	54"	56"	58"	60"	66"
RF	1.016	1.067	1110	1.140	1.168	1.270
RJ	/	/	/	/	/	/
BW	/	/	/	/	/	/
C-closed	4.127	4.305	4.305	4.550	4.691	5.156
D-open	5.462	5.693	5.693	5.980	6.196	6.823
E	BG	BG	BG	BG	BG	BG
F	4.059	4.303	4.346	4.489	4.632	5.057
Approximate WEIGHT (Kg)						
FLANGED	8.360	9360	10.360	11.360	11.200	14.500
BW	7.770	9750	9.750	10.740	10.467	13.551



Class ASME 300 (PN 50)

FIGURE NUMBERS - CLASS ASME 300 - ALL SIZES

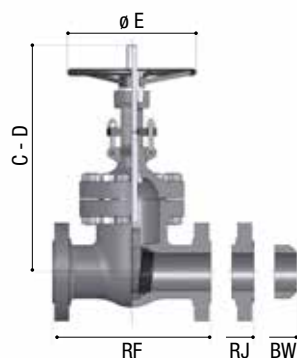
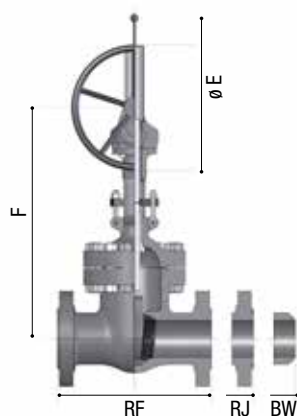
SR 300: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2.1/2"	3"	4"	6"	8"	10"	12"	14"
RF-BW	216	241	282	305	403	419	457	502	762
RJ	232	257	298	321	419	435	473	518	778
C-closed	370	430	445	556	712	890	1 069	1 245	1 325
D-open	430	510	530	671	877	1 110	1 339	1 580	1685
E	204	204	254	305	406	457	457	BG	BG
F	/	/	/	/	/	/	/	1 102	1 288
Approximate WEIGHT (Kg)									
FLANGED	23	41	52	76	142	220	325	545	710
BW	17	32	40	57	119	180	268	439	598

SIZE	16"	18"	20"	22"	24"	26"	28"	30"	32"
RF-BW	838	914	991	1.092	1.143	1.245	1.346	1.397	1.524
RJ	854	930	1.010	1.114	1.165	1.270	1.371	1.422	1.552
C-closed	1.480	1.620	1.796	1.948	2.122	2.430	2.430	2.596	2.705
D-open	1.890	2.069	2.287	2.500	2.729	3.146	3.146	3.355	3.515
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.474	1.660	1.793	1.925	2.091	2.256	2.441	2.569	2.705
Approximate WEIGHT (Kg)									
FLANGED	914	1.239	1.457	1.810	2.316	2.833	3.350	3.868	4.336
BW	771	1.076	2.43	1.555	2.003	2.437	2.870	3.338	3.806

SIZE	34"	36"	38"	40"	42"	44"	46"	48"	50"
RF-BW	1.626	1.727	1.829	1.930	1.981	2.066	2.151	2.235	2.285
RJ	1.654	1.755	/	/	/	/	/	/	/
C-closed	2.868	2.970	3.113	3.550	3.468	3.594	3.732	3.870	4.023
D-open	3.730	3.885	4.064	4.551	4.525	4.723	4.900	5.100	5.298
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	2.840	2.995	3.150	3.304	3.459	3.616	3.773	3.930	4.087
Approximate WEIGHT (Kg)									
FLANGED	4.996	5.655	7.112	8.570	9.164	11.053	12.294	/	/
BW	4.351	4.895	6.392	7.890	7.890	9.905	10.912	11.919	129.26

SIZE	52"	54"	56"	58"	60"
RF-BW	2.335	2.387	2.438	2.488	2.540
RJ	/	/	/	/	/
C-closed	4.176	4.330	4.503	4.650	4.810
D-open	5.500	5.700	5.928	6.122	6.330
E	BG	BG	BG	BG	BG
F	4.244	4.401	4.558	4.715	4.872
Approximate WEIGHT (Kg)					
FLANGED	/	/	/	/	/
BW	13.934	14.941	15.948	16.956	17.963



Class ASME 600 (PN 100)

FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

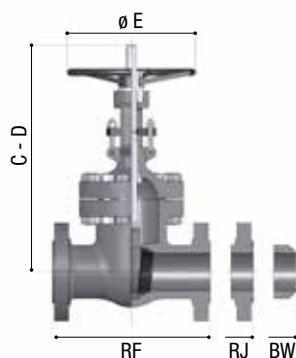
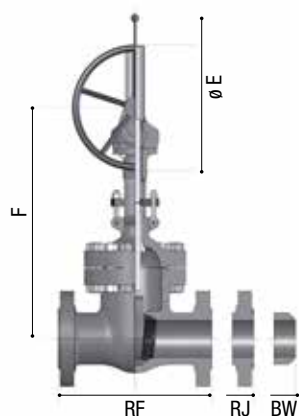
SR 600: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2.1/2"	3"	4"	6"	8"	10"	12"	14"
RF-BW	292	330	356	432	559	660	787	838	889
RJ	295	333	359	435	562	663	790	841	892
C-closed	371	448	515	600	840	925	1.120	1.318	1.429
D-open	431	528	620	720	1.003	1.138	1.400	1.644	1.781
E	204	254	305	356	502	BG	BG	BG	BG
F	/	/	/	/	/	918	1.073	1.227	1.382
Approximate WEIGHT (Kg)									
FLANGED	32	48	65	120	254	426	660	861	1.190
BW	27	39	55	96	200	355	531	730	1.037

SIZE	16"	18"	20"	22"	24"	26"	28"	30"	32"
RF-BW	991	1.092	1.194	1.295	1.397	1.448	1.549	1.651	1.778
RJ	994	1.095	1.200	1.305	1.407	1.461	1.562	1.664	1.794
C-closed	1.588	1.700	1.775	1.960	2.183	2.380	2.472	2.698	2.855
D-open	1.998	2.138	2.253	2.495	2.771	3.026	3.144	3.478	3.668
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.547	1.690	1.766	1.954	2.141	2.294	2.447	2.600	2.753
Approximate WEIGHT (Kg)									
FLANGED	1.547	1.820	2.520	3.189	3.858	4.693	5.900	7.730	8.837
BW	1.292	1.528	2.178	2.785	3.391	4.193	5.200	6.980	8.053

SIZE	34"	36"	38"	40"	42"	44"	46"	48"	50"
RF-BW	1.930	2.082	2.185	2.286	2.438	2.438	2.489	2.540	2.540
RJ	1.946	2.099	/	/	/	/	/	/	/
C-closed	3.012	3.168	3.342	3.516	3.690	3.655	3.903	4.100	4.174
D-open	3.870	4.078	4.298	4.493	4.720	4.724	5.042	5.280	5.414
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	2.906	3.058	3.211	3.364	3.517	3.670	3.915	3.976	4.248
Approximate WEIGHT (Kg)									
FLANGED	9.943	11.050	12.365	13.679	14.994	16.309	17.623	/	/
BW	9.127	10.200	12.215	14.229	16.244	18.258	202.73	22.287	24.302

SIZE	52"	54"	56"	58"	60"
RF-BW	2.805	2.905	2.692	2.743	3.203
RJ	/	/	/	/	/
C-closed	4.443	4.604	4.764	4.751	5.084
D-open	5.723	5.932	6.140	6.187	6.558
E	BG	BG	BG	BG	BG
F	4.388	4.529	4.671	4.809	4.949
Approximate WEIGHT (Kg)					
FLANGED	/	/	/	/	/
BW	26.316	28.331	30.345	32.360	34.374



Class ASME 900 (PN 150)

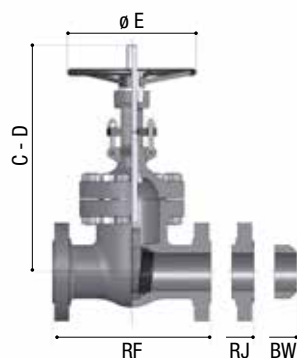
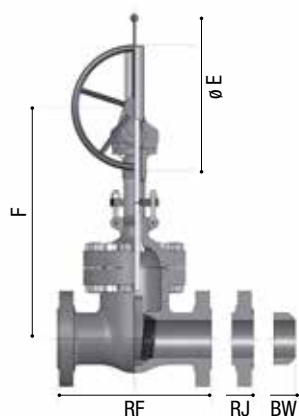
FIGURE NUMBERS - CLASS AINSI 900 - ALL SIZES

SR 900: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2.1/2"	3"	4"	6"	8"	10"	12"	14"
RF-BW	368	419	381	457	610	737	838	965	1029
RJ	371	422	384	460	613	740	841	968	1039
C-closed	505	530	530	655	875	1.070	1.180	1.305	1.400
D-open	575	615	618	780	1.040	1.305	1.440	1.607	1.746
E	305	356	356	406	BG	BG	BG	BG	BG
F	/	/	/	/	840	969	1.099	1.228	1.358
Approximate WEIGHT (Kg)									
FLANGED	92	110	105	170	343	570	950	1.204	1.630
BW	75	90	89	141	280	466	810	1.014	1.407

SIZE	16"	18"	20"	24"	26"	28"	30"	32"	34"
RF-BW	1.130	1.219	1.321	1.549	1.676	1.803	1.930	1.981	2.032
RJ	1.140	1.232	1.334	1.568	1.688	1.815	1.953	/	/
C-closed	1.518	1.730	1.896	2.260	2.423	2.587	2.750	2.917	3.084
D-open	1.901	21.60	2.370	2.830	3.041	3.249	3.455	3.674	3.885
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.487	1.780	1.923	2.279	24.56	2.634	2.812	3.004	3.197
Approximate WEIGHT (Kg)									
FLANGED	2.254	3.330	3.440	4.626	5.219	5.812	6.405	/	/
BW	1.824	3.844	2.980	4.136	4.714	5.292	5.870	6.448	7.026

SIZE	36"	38"	40"	42"	44"	46"	48"	50"	52"
RF-BW	2.083	2.232	2.380	2.485	2.589	2.695	2.799	2.904	3.009
RJ	/	/	/	/	/	/	/	/	/
C-closed	3.250	3.389	3.528	3.687	3.847	4.007	4.166	4.326	4.485
D-open	4.200	4.353	4.506	4.714	4.982	5.165	5.337	5.569	5.752
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	3.389	3.581	3.774	3.966	4.158	4.351	4.543	4.735	4.928
Approximate WEIGHT (Kg)									
FLANGED	/	/	/	/	/	/	/	/	/
BW	7.604	8.182	8.760	9.338	9.916	10.494	11.072	11.650	12.228



Class ASME 1500 (PN 250)

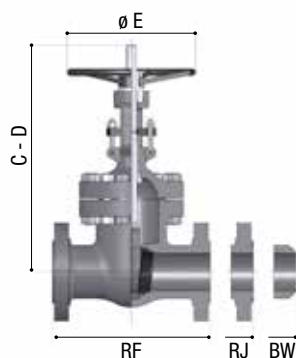
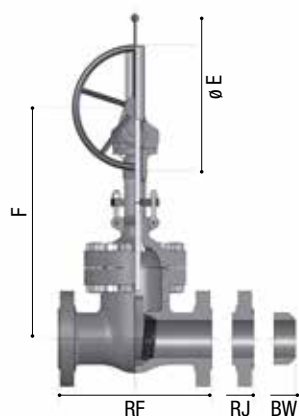
FIGURE NUMBERS - CLASS ASME 1500 - ALL SIZE

SR 1500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2.1/2"	3"	4"	6"	8"	10"	12"	14"
RF-BW	368	419	470	546	705	832	991	1.130	1.257
RJ	371	422	473	549	711	842	1.001	1.146	1.276
C-closed	505	530	557	715	915	1.065	1.270	1.318	1.450
D-open	575	615	636	845	1.085	1.263	1.515	1.604	1.760
E	305	356	406	457	BG	BG	BG	BG	BG
F	/	/	/	/	1.010	1.121	1.232	1.343	1.454
Approximate WEIGHT (Kg)									
FLANGED	92	110	143	261	560	1.052	1.650	2.210	3.040
BW	75	90	109	222	473	904	1.400	1.800	2.490

SIZE	16"	18"	20"	24"	26"	28"	30"	32"	34"
RF-BW	1.384	1.537	1.664	1.943	2.090	2.237	2.383	2.525	2.666
RJ	1.406	1.559	1.686	1.971	2.111	2.258	2.404	/	/
C-closed	1.565	1.760	2.075	2.330	2.533	2.736	2.940	2.964	3.126
D-open	1.925	2.158	2.540	2.860	3.108	3.360	3.605	3.662	3.866
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.565	1.877	2.079	2.484	2.686	2.889	3.091	3.293	3.496
Approximate WEIGHT (Kg)									
FLANGED	4.123	6.412	8.700	13.277	15.566	1.854	20.143	/	/
BW	3.438	5.469	7.500	11.562	13.593	15.624	17.655	19.686	21.717

SIZE	36"	38"	40"	42"
RF-BW	2.808	2.950	3.091	3.233
RJ	/	/	/	/
C-closed	3.289	3.452	3.614	3.776
D-open	4.070	4.274	4.478	4.682
E	BG	BG	BG	BG
F	3.698	3.900	4.103	4.305
Approximate WEIGHT (Kg)				
FLANGED	/	/	/	/
BW	23.748	25.779	27.810	29.841



Class ASME 2500 (PN 420)

FIGURE NUMBERS - CLASS ANSI 2500 - ALL SIZES

SR 2500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2.1/2"	3"	4"	6"	8"	10"	12"	14"
RF-BW	451	508	578	673	914	1.022	1.270	1.422	1.637
RJ	454	514	584	683	927	1.038	1.292	1.444	1.659
C-closed	504	554	620	716	1.070	1.386	1.502	1.639	1.983
D-open	568	620	700	816	1.215	1.556	1.717	1.889	2.272
E	300	350	400	450	BG	BG	BG	BG	BG
F	/	/	/	/	1.109	1.291	1.473	1.625	1.753
Approximate WEIGHT (Kg)									
FLANGED	143	217	290	451	1.030	1.874	2.964	4.640	6.316
BW	115	172	229	369	817	1.572	2.380	3.810	5.240

SIZE	16"	18"	20"	24"	26"
RF-BW	1.756	2.024	2.218	2.606	2.800
RJ	1.778	/	/	/	/
C-closed	2.227	2.471	2.715	3.204	3.448
D-open	2.554	2.836	3.118	3.682	3.964
E	BG	BG	BG	BG	BG
F	1.880	2.008	2.135	2.390	2.518
Approximate WEIGHT (Kg)					
FLANGED	7.992	/	/	/	/
BW	6.670	8.100	9.530	12.390	13.820

BG: bevel gear operated.

For size and pressure classes non mentioned in the above tables please contact ORION.

N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.

ORION STEEL VALVES
Globe Valves
BS 1873



GLOBE

GLOBE VALVES BS 1873 - p. 45

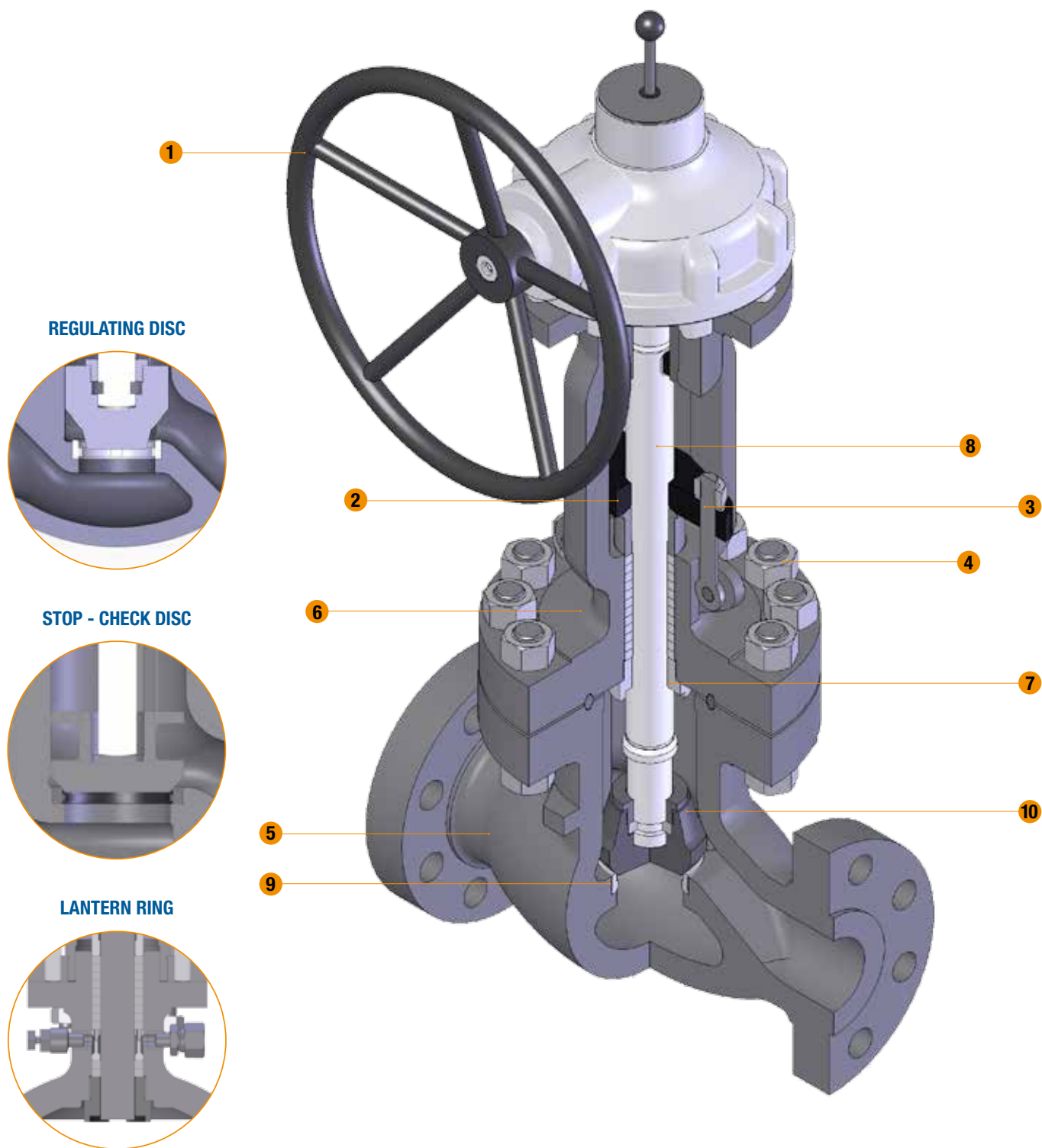
Class ASME 150 (PN 20) • 300 (PN 50) • 600 (PN 100)
900 (PN 150) • 1500 (PN 250) • 2500 (PN 420)

ANGLE GLOBE VALVES BS 1873 - p. 52

Class ASME 150 (PN 20) • 300 (PN 50) • 600 (PN 100)
900 (PN 150) • 1500 (PN 250) • 2500 (PN 420)

Y PATTERN BOLTED BONNET BS 1873 - p. 56

ORION STEEL VALVES
Globe Valves
BS 1873



CAST STEEL BODY, OUTSIDE SCREW AND YOKE, RISING STEM, NON-RISING OPERATOR, RENEWABLE SEATS, REMOVABLE YOKE SLEEVE, BACKSEAT FOR REPACKING UNDER PRESSURE.

- 1 OPERATOR**

The spoked handwheel is fabricated from steel pipe. The hub is coupled to the yoke sleeve by means of a key. Larger valves are equipped with a bevel or spur gear gearbox unit.
- 2 GLAND AND FLANGE**

They are in forged steel and are supplied in two pieces, self aligning design in order to allow the gland to slide parallel to the stem even if the eyebolts are unevenly tightened.
- 3 GLAND BOLTS AND NUTS**

The forged steel gland bolts are of the eyebolt type which can be swung outward for ease of gland repacking. They are fixed to the bonnet by hinge pins.
- 4 BONNET BOLTING**

Bonnet studs and nuts are manufactured from alloy steel to the relevant ASTM standard. The body to bonnet connection is designed according to ASME VIII DIV 1 standard.
- 5 BODY**

The body is in carbon or stainless steel and is also available in many other CRA. It is carefully designed for total reliability and simple maintenance. The basic dimension, i.e. wall thickness, face to face and flanges comply with the relevant BS and ASME standards. The body-to-bonnet flange is circular. The body-to-bonnet joint are male-and-female on Class 150 and 300 and ring joint on Class 600 and above. The body is basically supplied with renewable seats. Bosses are provided for draining connections.
The internal surfaces in contact with the fluid can be fully lined or clad (for larger sizes only) for improved corrosion or erosion resistance.
- 6 BONNET**

As the body, the bonnet is in carbon or stainless steel and is available in many other CRA. It is machined to accept yoke sleeve and incorporates a stuffing box sized in accordance with the BS standard. Lifting lugs can be provided integrally cast on the bonnet surface.
- 7 BONNET BUSHING**

The bonnet bushing or backseat is part of the valve trim. Its design allows valve repacking without valve's bleeding or draining. Hardfacing can be provided on stem seating surface.
- 8 STEM**

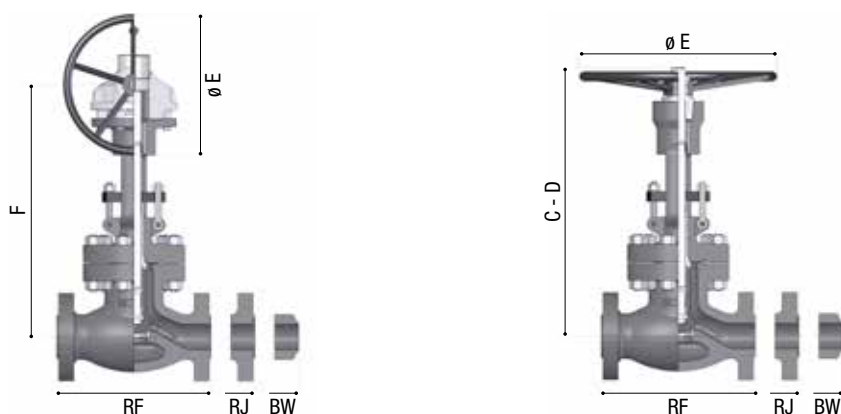
The stem is part of the trim and is available in a wide range of material in accordance to BS1873, API 600 or customer's requirements. The stem is provided with a ground backseat in order to ensure a perfectly tight seal to the stuffing box when the valve is fully open. The stem is highly finished in order to minimize friction and prevent damage to the packing. The thread is trapezoidal ACME type. All the stem sizes comply with the BS 1873 standard.
- 9 SEAT RING**

Threaded and seal-welded seat ring is supplied as a standard. The seats are part of the trim of the valve. They can be simply threaded for easy installation and dismantling. Special attention is given to the seating surface which is ground and lapped for a tight seal.
- 10 DISC**

The disc is the main part of the trim. It is connected to the stem by means of a swiveling half rings coupling and is guided in the body from 4" and above. The standard sealing profile is a spherical surface seating against a conical seat. If required a conical to conical seating can be supplied, and for flow throttling operations a regulating disc is adopted, shaped in order to give a linear opening. The stop check execution shows an externally guided disc, disconnected from the stem. A cladding or lining can be applied to larger discs to improve its resistance against erosive and corrosive environments.
- REMARKS**

A lantern ring is supplied upon request, in this case the stuffing box shall be drilled, tapped and fitted with an 1/4" NPT plug or grease fitting.
- INSTALLATION REMARKS**

Globe valves are best fit for vertical stem / horizontal flow installation. Special cases can be evaluated and developed on request.



Class ASME 150 (PN 20)

FIGURE NUMBERS - CLASS ASME 150 - ALL SIZES

GL 150: RF - RAISED FACE • GL 150 BW - WELDING ENDS

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	203	216	241	292	356	406	495	622	699
C-closed	385	420	455	525	595	655	750	890	1.080
D-open	417	433	475	545	615	740	840	1.005	1.210
E	200	200	250	250	350	BG	BG	BG	BG
F	/	/	/	/	/	650	787	924	1.062
Approximate WEIGHT (Kg)									
FLANGED	25	32	42	65	86	115	168	313	465
BW	20	26	34	55	73	100	149	287	425

SIZE	14"	16"	18"	20"	22"	24"	26"	28"	30"
RF-BW	787	914	950	978	1.067	1.295	1.295	1.448	1.524
C-closed	1.180	1.190	1.340	1.365	1.550	1.730	1.880	2.050	2.200
D-open	1.330	1.360	1.530	1.515	1.740	1.970	2.140	2.310	2.480
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.199	938	1.251	1.356	1.460	1.564	1.669	1.773	1.878
Approximate WEIGHT (Kg)									
FLANGED	688	910	1.063	1.214	1.365	1.516	1.667	1.818	1.969
BW	634	841	993	1.123	1.253	1.383	1.513	1.643	1.773

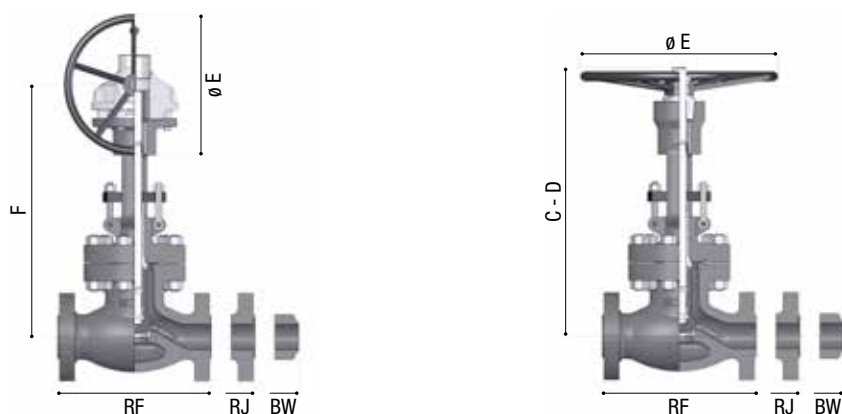
Class ASME 300 (PN 50)

FIGURE NUMBERS - CLASS ASME 300 - ALL SIZES

GL 300: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	268	292	318	356	400	445	559	622	711
RJ	284	308	334	372	416	461	575	638	727
C-closed	635	683	730	780	830	880	980	1.080	1.180
D-open	665	723	780	839	898	957	1.074	1.192	1.310
E	200	200	350	BG	BG	BG	BG	BG	BG
F	/	/	/	578	638	698	818	938	1.058
Approximate WEIGHT (Kg)									
FLANGED	30	51	56	94	105	180	316	420	705
BW	27	42	50	75	82	150	276	363	609

SIZE	14"	16"	18"	20"	22"	24"	26"	28"	30"
RF-BW	864	914	978	1.016	1.118	1.346	1.346	1.499	1.594
RJ	880	930	994	1.035	1.140	1.368	1.372	1.524	1.619
C-closed	1.368	1.557	1.745	1.934	2.122	2.311	2.499	2.688	2.876
D-open	1.550	1.790	2.030	2.270	2.511	2.751	2.991	3.231	3.471
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.178	1.200	1.221	1.243	1.265	1.286	1.308	1.330	1.351
Approximate WEIGHT (Kg)									
FLANGED	922	1.118	1.742	2.366	2.989	3.613	4.237	4.861	5.484
BW	808	975	1.556	21.38	2.719	3.300	3.881	4.463	5.044



Class ASME 600 (PN 100)

FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

GL 600: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	292	330	356	432	508	559	660	787	838
RJ	295	333	359	435	511	562	663	790	841
C-closed	445	496	548	650	731	813	975	1.138	1.300
D-open	485	544	603	720	809	898	1.075	1.253	1.430
E	250	300	BG	BG	BG	BG	BG	BG	BG
F	/	/	594	695	797	898	912	1.065	1.218
Approximate WEIGHT (Kg)									
FLANGED	40	64	78	133	237	284	578	630	1.010
BW	32	54	65	113	191	230	502	515	856

SIZE	14"	16"	18"	20"	22"	24"	26"	28"
RF-BW	889	991	1.092	1.194	1.295	1.397	1.448	1.600
RJ	892	994	1.095	1.200	1.305	1.407	/	/
C-closed	1.402	1.500	1.606	1.708	1.810	1.910	2.014	2.116
D-open	1.555	1.680	1.805	1.929	2.054	2.179	2.304	2.429
E	BG	BG	BG	BG	BG	BG	BG	BG
F	1.371	1.523	1.676	1.829	1.982	2.134	2.287	24.40
Approximate WEIGHT (Kg)								
FLANGED	1.500	1.804	2.108	2.415	2.716	3.020	3.324	3.628
BW	1.345	1.584	1.823	2.062	2.301	2.540	2.779	3.018

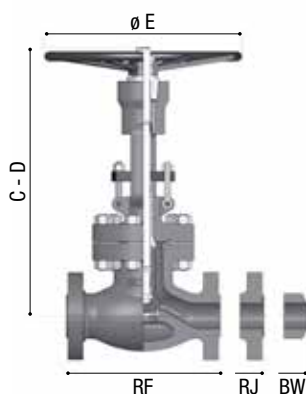
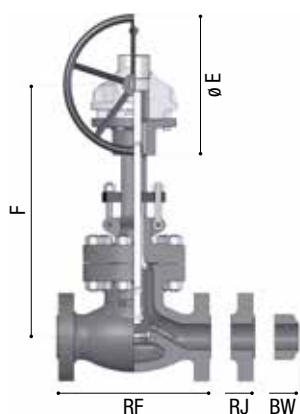
Class ASME 900 (PN 150)

FIGURE NUMBERS - CLASS ASME 900 - ALL SIZES

GL 900: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	368	419	381	457	559	610	737	838	965
RJ	371	422	384	460	562	613	740	841	968
C-closed	357	428	500	643	786	930	1.216	1.282	1.347
D-open	465	535	605	746	887	1.028	1.309	1.407	1.505
E	350	BG	BG	BG	BG	BG	BG	BG	BG
F	/	621	661	741	821	901	1.061	1.221	1.357
Approximate WEIGHT (Kg)									
FLANGED	89	110	120	202	330	430	723	973	1.515
BW	75	100	104	182	274	375	619	833	1.325

SIZE	14"	16"	18"	20"	24"
RF-BW	1.029	1.130	1.219	1.321	1.549
RJ	1.039	1.140	1.238	1.334	1.562
C-closed	1.413	1.478	1.544	1.610	1.741
D-open	1.604	1.702	1.800	1.898	2.095
E	BG	BG	BG	BG	BG
F	1.494	1.630	1.766	1.903	2.175
Approximate WEIGHT (Kg)					
FLANGED	3.370	4.298	5.225	6.000	8.008
BW	2.808	3.582	4.354	5.000	6.673



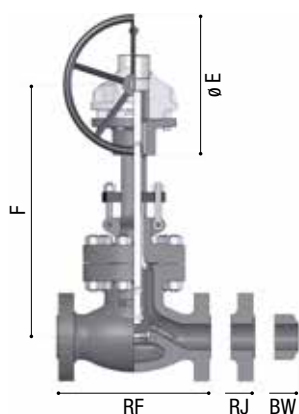
Class ASME 1500 (PN 250)

FIGURE NUMBERS - CLASS ASME 1500 - ALL SIZES

GL 1500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	368	419	470	546	673	705	832	991	1.130
RJ	371	422	473	549	676	711	842	1.001	1.146
C-closed	727	756	785	873	901	990	1.076	1.317	1.400
D-open	762	801	840	951	996	1.070	1.230	1.480	2.006
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	717	762	783	895	984	1.073	1.251	1.433	1.616
Approximate WEIGHT (Kg)									
FLANGED	89	134	208	320	630	1.135	1.790	3.355	4.325
BW	75	106	172	281	543	987	1.540	2.995	3.790

SIZE	14"	16"	18"	20"	24"
RF-BW	1.257	1.384	1.537	1.664	1.943
RJ	1.276	1.406	1.559	1.686	1.971
C-closed	1.694	1.988	2.282	2.576	3.164
D-open	2.164	2.321	2.479	2.673	3.280
E	BG	BG	BG	BG	BG
F	1.798	1.981	2.163	2.345	2.710
Approximate WEIGHT (Kg)					
FLANGED	5.295	6.265	7.235	8.205	10.145
BW	4.585	5.380	6.175	6.970	8.560



Class ASME 2500 (PN 420)

FIGURE NUMBERS - CLASS ASME 2500 - ALL SIZES

GL 2500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	451	508	578	673	794	914	1.022	1.270	1.422
RJ	454	514	584	683	807	927	1.038	1.292	1.444
C-closed	655	765	875	1.018	1.162	1.305	1.592	1.878	2.165
D-open	720	828	935	1.088	1.242	1.395	1.702	2.000	2.315
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	721	828	935	1.148	1.275	1.402	1.656	1.910	2.164
Approximate WEIGHT (Kg)									
FLANGED	169	287	405	597	1.100	1.603	2.609	3.615	4.621
BW	141	245	349	515	887	1.259	2.003	2.747	3.491

SIZE	14"	16"
RF-BW	1.638	1.831
RJ	/	/
C-closed	2.452	2.738
D-open	2.622	2.928
E	BG	BG
F	2.418	2.672
Approximate WEIGHT (Kg)		
FLANGED	/	/
BW	4.235	4.979

BG: bevel gear operated.

For size and pressure classes non mentioned in the above tables please contact ORION.

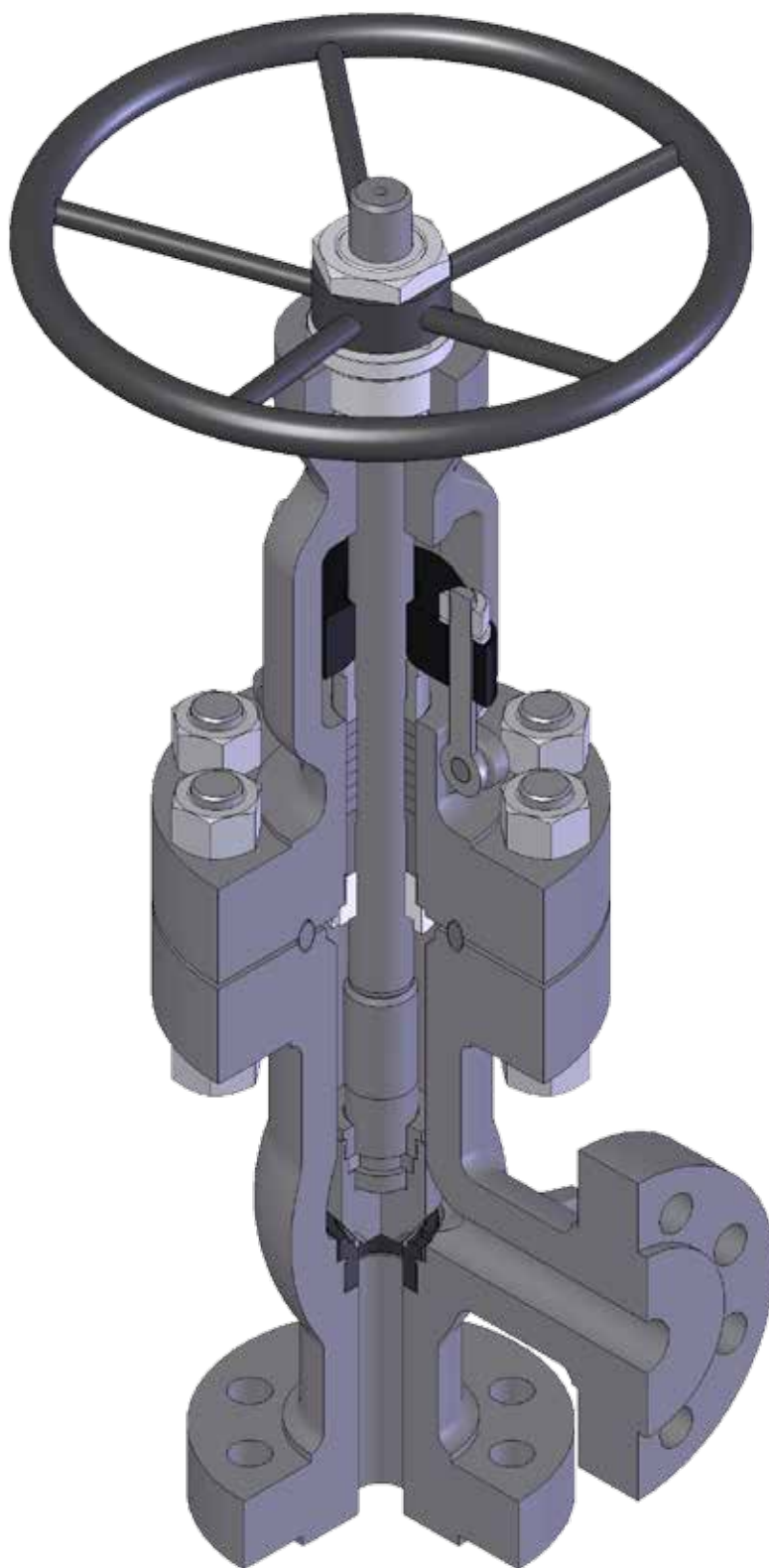
N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.

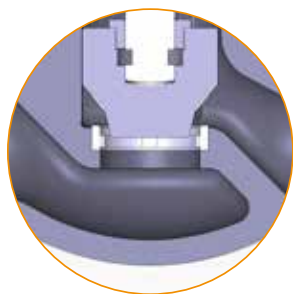
ORION STEEL VALVES

Angle Globe Valves

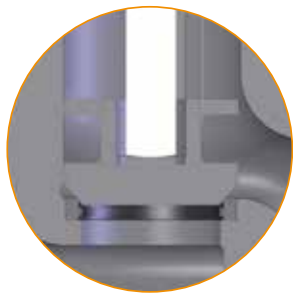
BS 1873



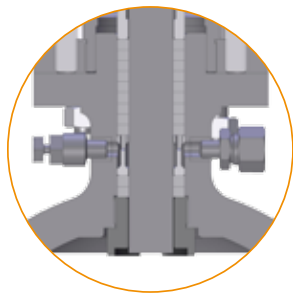
REGULATING DISC



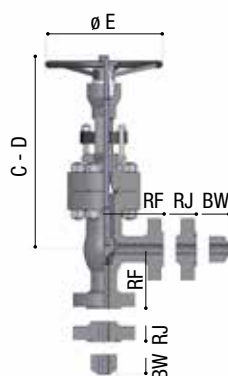
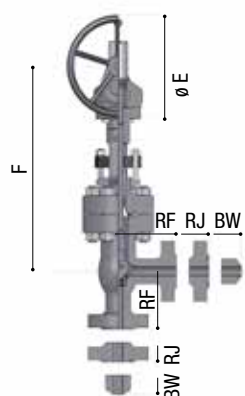
STOP - CHECK DISC



LANTERN RING



Note: For components description, make reference to p. 43



Class ASME 150 (PN 20)

FIGURE NUMBERS - CLASS ASME 150 - ALL SIZES

AN 150: RF - RAISED FACE • BW - WELDING ENDS

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	102	108	121	146	178	203	248	311	349
C-closed	375	388	425	480	545	655	750	830	1.000
D-open	420	433	475	545	615	730	840	945	1.130
E	200	200	250	250	350	350	450	BG	BG
F	/	/	/	/	/	/	/	867	1.037
Approximate WEIGHT (Kg)									
FLANGED	25	32	42	65	86	115	168	313	465
BW	20	26	34	55	73	100	149	287	425

SIZE	14"	16"	18"	20"	22"	24"	26"	28"	30"
RF-BW	394	457	475	489	533	648	648	724	762
C-closed	1.180	1.308	1.435	1.536	1.690	1.818	1.945	2.073	2.200
D-open	1.330	1.474	1.618	1.761	1.905	2.049	2.193	2.336	2.480
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.220	1.352	1.484	1.616	1.748	1.880	2.012	2.143	2.275
Approximate WEIGHT (Kg)									
FLANGED	688	910	1.063	1.214	1.365	1.516	1.667	1.818	1.969
BW	634	841	993	1.123	1.253	1.383	1.513	1.643	1.773

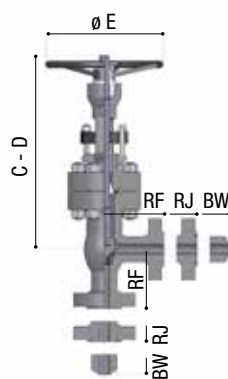
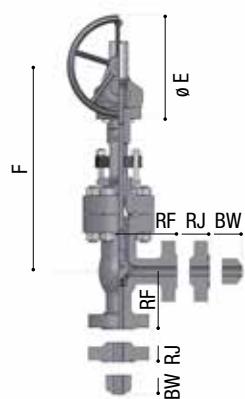
Class ASME 300 (PN 50)

FIGURE NUMBERS - CLASS ASME 300 - ALL SIZES

AN 300: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	133	146	159	178	200	222	279	311	356
RJ	141	154	167	186	208	230	287	319	364
C-closed	380	405	430	540	600	665	910	1.010	1.115
D-open	420	450	480	620	670	755	1.000	1.125	1.243
E	200	200	350	BG	BG	BG	BG	BG	BG
F	/	/	/	569	615	693	917	1.032	1.140
Approximate WEIGHT (Kg)									
FLANGED	30	51	56	94	105	180	316	420	705
BW	27	42	50	75	82	150	276	363	609

SIZE	14"	16"	18"	20"	22"	24"	26"	28"	30"
RF-BW	432	457	489	508	559	673	673	749	797
RJ	440	465	497	518	570	684	684	760	808
C-closed	1.265	1.415	1.565	1.715	1.865	2.015	2.165	2.315	2.465
D-open	1.405	1.568	1.730	1.893	2.055	2.218	2.380	2.543	2.705
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.289	1.439	1.587	1.737	1.885	2.035	2.183	2.333	2.482
Approximate WEIGHT (Kg)									
FLANGED	922	1.118	1.742	2.366	2.989	3.613	4.237	4.861	5.484
BW	808	975	1.556	2.138	2.719	3.300	3.881	4.463	5.044



Class ASME 600 (PN 100)

FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

AN 600: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	146	165	178	216	254	279	330	394	419
RJ	147,5	166,5	179,5	217,5	255,5	280,5	331,5	395,5	420,5
C-closed	445	520	563	650	760	883	1.120	1.197	1.273
D-open	485	575	623	720	845	973	1.230	1.317	1.403
E	250	300	BG	BG	BG	BG	BG	BG	BG
F	/	/	566	655	768	885	1.118	1.197	1.275
Approximate WEIGHT (Kg)									
FLANGED	40	64	78	133	237	284	578	630	1.010
BW	32	54	65	113	191	230	502	515	856

SIZE	14"	16"	18"	20"	22"	24"
RF-BW	445	495	546	597	648	699
RJ	446,5	496,5	547,5	600	653	704
C-closed	1.350	1.426	1.503	1.579	1.656	1.732
D-open	1.490	1.576	1.663	1.749	1.836	1.922
E	BG	BG	BG	BG	BG	BG
F	1.355	1.433	1.512	1.590	1.669	1.747
Approximate WEIGHT (Kg)						
FLANGED	1.500	1.804	2.108	2.415	2.716	3.020
BW	1.345	1.584	1.823	2.062	2.301	2.540

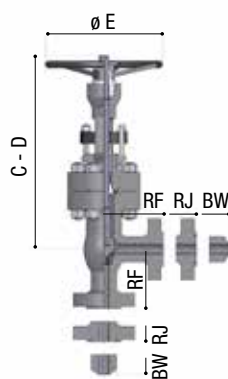
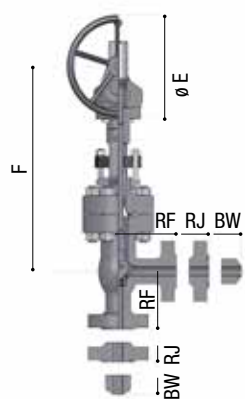
Class ASME 900 (PN 150)

FIGURE NUMBERS - CLASS ASME 900 - ALL SIZES

AN 900: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	184	210	190	229	279	305	368	419	483
RJ	185,5	211,5	191,5	230,5	280,5	306,5	369,5	420,5	484,5
C-closed	570	655	690	761	832	903	1.044	1.186	1.328
D-open	630	720	758	835	912	989	1.143	1.297	1.451
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	578	661	695	766	837	907	1.049	1.190	1.331
Approximate WEIGHT (Kg)									
FLANGED	135	140	120	202	330	430	723	973	1.515
BW	110	125	104	182	274	375	619	833	1.325

SIZE	14"	16"	18"	20"	24"
RF-BW	514	660	737	826	991
RJ	519,0	665,0	743,5	832,5	1.000,5
C-closed	1.469	1.611	1.750	1.894	2.177
D-open	1.605	1.759	1.920	2.066	2.374
E	BG	BG	BG	BG	BG
F	1.472	1.614	1.761	1.895	2.178
Approximate WEIGHT (Kg)					
FLANGED	3.370	4.298	5.225	6.000	8.008
BW	2.808	3.582	4.354	5.000	6.673



Class ASME 1500 (PN 250)

FIGURE NUMBERS - CLASS ASME 1500 - ALL SIZES

AN 1500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	184	210	235	273	337	353	416	495	565
RJ	185,5	211,5	236,5	274,5	338,5	356,0	421,0	500,0	573,0
C-closed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D-open	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	578	661	780	847	915	982	1.117	1.250	1.385
Approximate WEIGHT (Kg)									
FLANGED	135	140	208	320	630	1.135	1.790	3.355	4.325
BW	110	125	172	281	543	987	1.540	2.995	3.790

SIZE	14"	16"	18"	20"	24"
RF-BW	629	692	768	832	972
RJ	638,5	703,1	779,3	842,8	986
C-closed	N/A	N/A	N/A	N/A	N/A
D-open	N/A	N/A	N/A	N/A	N/A
E	BG	BG	BG	BG	BG
F	1.520	1.654	1.789	1.924	2.193
Approximate WEIGHT (Kg)					
FLANGED	5.295	6.265	7.235	9.925	14.620
BW	4.585	5.380	6.175	6.970	9.560

Class ASME 2500 (PN 420)

FIGURE NUMBERS - CLASS ASME 2500 - ALL SIZES

AN 2500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	226	254	289	337	397	457	511	635	711
RJ	227,5	257	292	342	403,5	463,5	519	646	722
C-closed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D-open	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	803	830	945	1.180	1.270	1.555	1.695	1.920	2.180
Approximate WEIGHT (Kg)									
FLANGED	236	290	408	610	1.120	1.421	2.352	4.010	5.134
BW	210	250	350	520	910	1.210	2.044	3.050	3.902

BG: bevel gear operated.

For size and pressure classes non mentioned in the above tables please contact ORION.

N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.

ORION STEEL VALVES

Y-Pattern Bolted Bonnet

BS 1873



*Also available as Y-pattern configuration both in bolted bonnet and pressure seal version.

ORION STEEL VALVES

Swing Check Valves

BS 1868



CHECK

SWING CHECK VALVES BS 1868 - p. 57

Class ASME 150 (PN 20) • 300 (PN 50) • 600 (PN 100)
900 (PN 150) • 1500 (PN 250) • 2500 (PN 420)

TILTING DISC CHECK VALVES - TOP ENTRY BS 1868 - p. 64

Class ASME 600 (PN 100) • 900 (PN 150) • 1500 (PN 250)
2500 (PN 420)

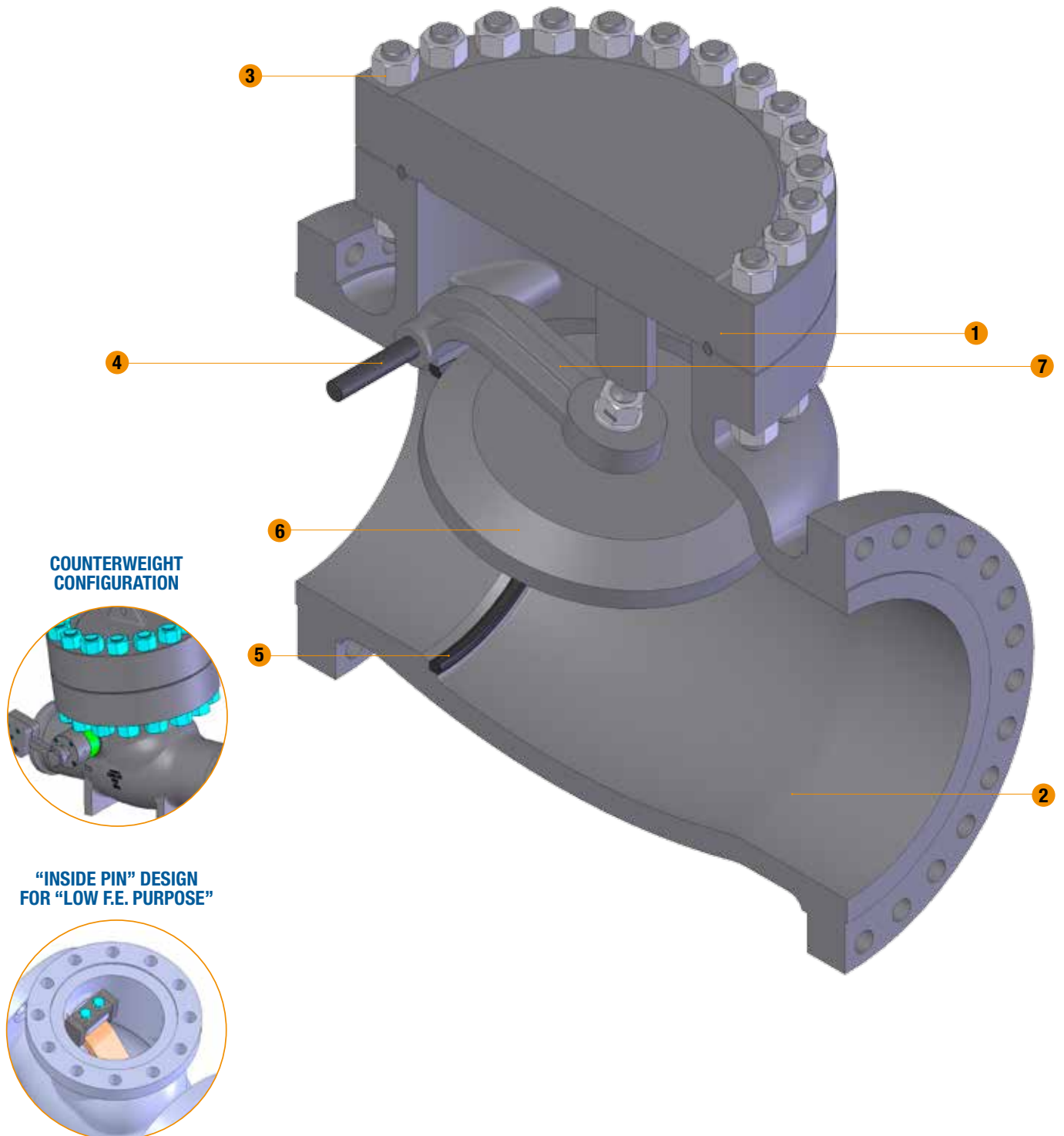
TILTING DISC CHECK VALVES - SPLIT BODY BS 1868 - p. 68

Class ASME 150 (PN 20) • 300 (PN 50) • 600 (PN 100)

ORION STEEL VALVES

Swing Check Valves

BS 1868



CAST STEEL, SWING TYPE DISC, RENEWABLE BODY SEAT RING, BOLTED BODY-TO-COVER CONNECTION.

1 COVER

The cover is in carbon or stainless steel and is also available in many other CRA. The connection sealing surfaces are raised face or ring joint to suit the valve rating.

2 BODY

The body is in carbon or stainless steel and is also available in many other CRA. It is carefully designed for total reliability, to keep the pressure drops to a minimum and simple maintenance. The basic dimensions, wall thickness, face to face and flanges, comply with the relevant BS, API and ASME standards. The body-to-cover flange is circular. The sealing surface for connection to the cover is recessed in the 150 and 300 Class and ring joint for higher ratings. The body is threaded for a renewable seat and an integral over-travel stop for the disc is incorporated. Two threaded bosses are provided for the location of the hinge pin. Bosses are eventually provided for drain threaded connection.

3 COVER BOLTING

Bonnet studs and nuts are manufactured from alloy steel to the relevant ASTM standard.

4 HINGE PIN

The hinge pin is part of the trim, in forged stainless steel and is machined from ground bar. The hinge pin is locked in the body with two threaded NPT plugs. The pin can be removed for maintenance of the valve.

5 SEAT RING

Welded-in-seat ring are supplied as a standard. The rings are part of the trim of the valve. For threaded solution, the outer diameter is threaded and its bore is notched for easy installation and dismantling. Special attention is given to the seating face which is ground and lapped, for a perfectly tight seal.

6 DISC

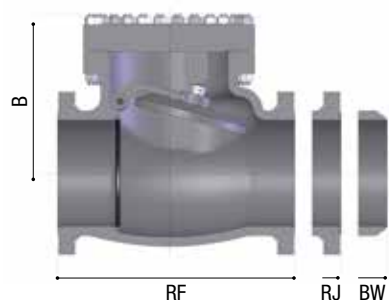
The disc is part of the trim and is in forged or cast steel. On the back face there is a threaded spigot for the connection to the hinge arm by a nut and cotter pin. The seating surface is ground and lapped.

7 HINGE

The hinge is made by forged steel and in cast steel.

INSTALLATION REMARKS

Swing check valves are best fit for horizontal pipeline installation. Special cases can be evaluated and developed upon request. For small valve sizes, a vertical installation (only with upward flow) is still possible, but for heavier weights of discs chattering issues can occur. Dampers or counterweight shall be then provided.



Class ASME 150 (PN 20)

FIGURE NUMBERS - CLASS ASME 150 - ALL SIZES

RT 150: RF - RAISED FACE • BW - WELDING ENDS

SIZE	2"	2½"	3"	4"	6"	8"	10"	12"	14"
RF-BW	203	216	241	292	356	495	622	699	787
B	162	167	187	207	255	304	352	375	399
Approximate WEIGHT (Kg)									
FLANGED	19	23	33	46	90	133	229	333	370
BW	14	16	23	36	75	114	203	294	303

SIZE	16"	18"	20"	22"	24"	26"	28"	30"	34"
RF-BW	864	978	978	1.067	1.295	1.295	1.448	1.524	1.651
B	422	471	520	569	617	666	715	764	862
Approximate WEIGHT (Kg)									
FLANGED	488	622	800	962	1363,5	1765	2.166,5	2.568	3.371
BW	419	552	709	852	1183,5	1515	1.846,5	2.178	2.841

SIZE	36"	42"	48"	50"	54"	60"	66"
RF-BW	1.956	2.083	1.956	2.359	2.537	2.802	3.068
B	911	1057	1.204	1.253	1.350	1.497	1.643
Approximate WEIGHT (Kg)							
FLANGED	3773	4.977	6.181,5	6.583	7.386	8.591	/
BW	3173	4.167	5.161,5	5.493	6.156	7.150	8.145

Class ASME 300 (PN 50)

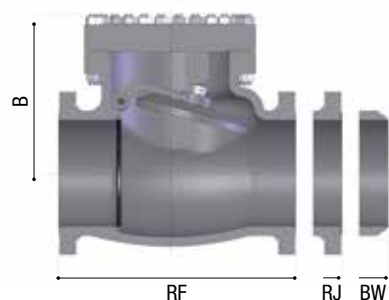
FIGURE NUMBERS - CLASS ASME 300 - ALL SIZES

RT 300: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	6"	8"	10"	12"	14"
RF-BW	267	292	318	356	445	533	622	711	838
RJ	283	308	14	372	460	549	638	727	854
B	167	179	190	213	260	306	352	399	445
Approximate WEIGHT (Kg)									
FLANGED	24	34	44	65	135	198	333	473	573
BW	18	25	32	46	105	160	276	388	459

SIZE	16"	18"	20"	22"	24"	26"	30"	36"	42"
RF-BW	864	977	1.016	1.118	1.346	1.346	1.594	2.083	2.198
RJ	880	994	1.035	1.140	1.369	1.371	1.622	2.108	/
B	491	538	584	741	761	781	821	881	941
Approximate WEIGHT (Kg)									
FLANGED	744	983	1.171	1.511	1.850	2.190	2.869	3.887	4.906
BW	601	794	951	1.244	1.537	1.830	2.416	3.295	4.174

SIZE	48"	50"	54"	60"
RF-BW	2.493	2.591	2.788	3.082
RJ	/	/	/	/
B	1.001	1.021	1.061	1.121
Approximate WEIGHT (Kg)				
FLANGED	5.924	6.264	6.943	7.961
BW	5.053	5.346	5.932	6.811



Class ASME 600 (PN 100)

FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

RT 600: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	292	330	356	432	508	559	660	787	838
RJ	295	333	359	435	511	562	664	791	841
B	175	188	200	224	273	321	370	419	467

Approximate WEIGHT (Kg)

FLANGED	33	48	58	88	138	187	318	520	721
BW	23	38	47	64	101	138	252	404	590

SIZE	14"	16"	18"	20"	24"	36"	40"	46"	50"
RF-BW	889	991	1.092	1.194	1.397	2.083	2.286	2.540	2.756
RJ	892	994	1.095	1.200	1.406	2.099	/	/	/
B	515	563	611	659	755	1.043	1.139	1.283	1.379

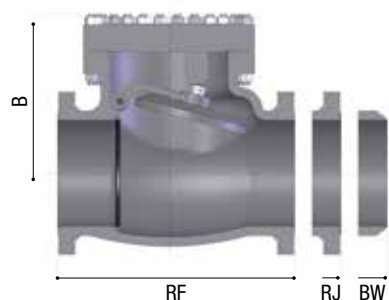
Approximate WEIGHT (Kg)

FLANGED	1.074	1.216	1.590	1.963	3.800	9.310	/	/	/
BW	919	975	1.284	1.593	3.310	8.460	10.177	12.752	14.469

SIZE	54"	60"
RF-BW	2.959	3.263
RJ	/	/
B	1.475	1.619

Approximate WEIGHT (Kg)

FLANGED	/	/
BW	16.185	18.761



Class ASME 900 (PN 150)

FIGURE NUMBERS - CLASS ASME 900 - ALL SIZES

RT 900: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	368	419	381	457	559	610	737	838	965
RJ	372	422	384	460	562	613	740	841	968
B	235	252	267	300	366	431	495	561	628
Approximate WEIGHT (Kg)									
FLANGED	65	110	84	143	206	269	507	740	1.470
BW	49	86	64	120	156,5	193	403	306	1.280

SIZE	14"	16"	20"	24"	30"	36"	40"	42"	46"
RF-BW	1.029	1.130	1.321	1.549	1.930	2.233	2.451	2.560	2.779
RJ	1.038	1.140	1.334	1.569	/	/	/	/	/
B	679	730	832	934	1.087	1.240	1.342	1.393	1.495
Approximate WEIGHT (Kg)									
FLANGED	1.890	2.300	3.331	5.471	/	/	/	/	/
BW	1.665	1.975	2.912	4.894	6.721	13.864	18.626	21.007	25.769

SIZE	48"
RF-BW	2.888
RJ	/
B	1.546
Approximate WEIGHT (Kg)	
FLANGED	/
BW	28.150

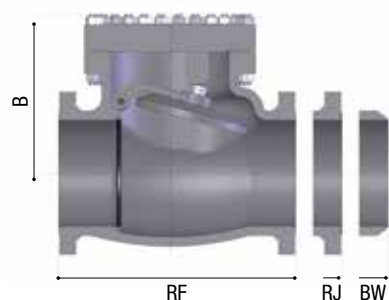
Class ASME 1500 (PN 250)

FIGURE NUMBERS - CLASS ASME 1500 - ALL SIZES

RT 1500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	368	419	470	546	673	705	832	991	1.130
RJ	372	422	473	549	676	711	841	1.000	1.146
B	223	256	288	353	418	483	550	646	741
Approximate WEIGHT (Kg)									
FLANGED	65	110	124	225	276	480	871	1.640	2.080
BW	49	86	98	188	222	412	723	1.390	1.713

SIZE	14"	16"	18"	20"	24"	30"	36"	42"
RF-BW	1.257	1.384	1.537	1.664	1.943	2.378	2.800	3.222
RJ	1.276	1.407	1.559	1.686	1.972	/	/	/
B	837	933	1.028	1.124	1.315	1.602	1.889	2.176
Approximate WEIGHT (Kg)								
FLANGED	2.815	3.705	5.310	6.690	9.260	/	/	/
BW	2.265	3.020	4.490	5.490	7.533	10.597	13.661	16.725



Class ASME 2500 (PN 420)

FIGURE NUMBERS - CLASS ASME 2500 - ALL SIZES

RT 2500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	16"	18"
RF-BW	451	578	673	914	1.022	1.270	1.422	1.826	2.019
RJ	454	584	683	927	1.038	1.292	1.445	/	/
B	381	413	445	597	723	849	967	1.203	1.321
Approximate WEIGHT (Kg)									
FLANGED	91	280	477	1.068	1.477	2.890	4.302	/	/
BW	63	205	395	855	1.175	2.242	3.309	5.443	6.510

SIZE	20"	24"
RF-BW	2.211	2.596
RJ	/	/
B	1.439	1.675
Approximate WEIGHT (Kg)		
FLANGED	/	/
BW	7.577	9.711

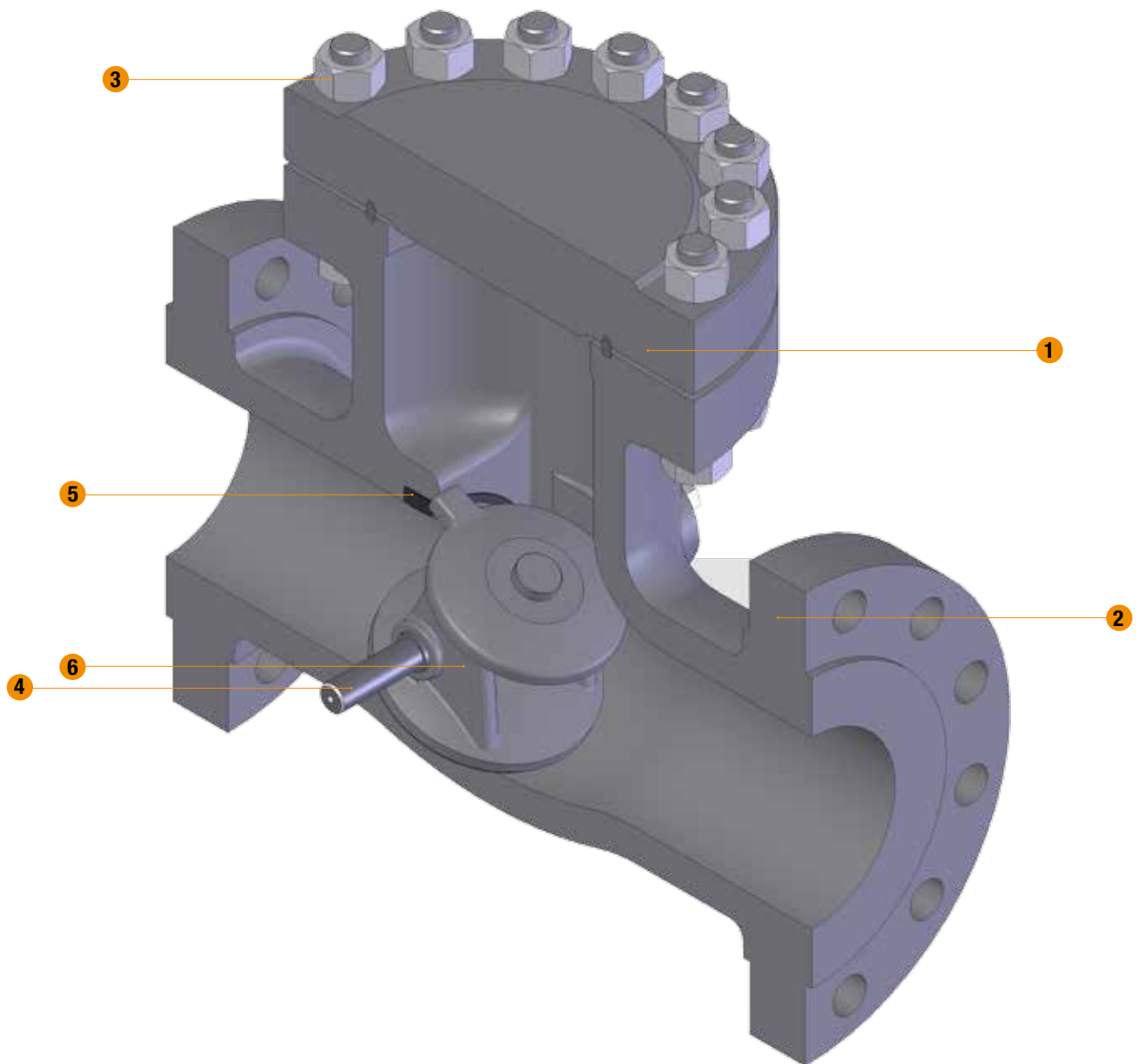
For size and pressure classes non mentioned in the above tables please contact ORION.

N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.

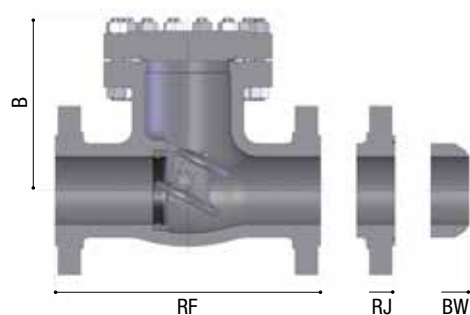
Tilting Disk Check Valve - Top Entry

ORION STEEL VALVES
BS 1868



CAST STEEL, BALANCED DISC, RENEWABLE BODY SEAT RING, BOLTED BODY-TO-COVER CONNECTION.

- | | |
|-----------------------------|--|
| 1 COVER | The cover is in carbon or stainless steel and is also available in many other CRA materials. The connection sealing surfaces are raised face or ring joint to suit the valve rating. |
| 2 BODY | The body is in carbon or stainless steel and is also available in many other CRA. It is carefully designed for total reliability, to keep the pressure drops to a minimum and simple maintenance. The basic dimensions, wall thickness, face to face and flanges, comply with the relevant BS, API and ASME standards. The body-to-cover flange is circular. The sealing surface for connection to the cover is recessed in the 150 and 300 Class and ring joint for higher ratings. The body is threaded for a renewable seat and an integral over-travel stop for the disc is incorporated. Two threaded or flanged hubs are provided sideways for the location of the hinge pins. Bosses are eventually provided for drain connections. |
| 3 COVER BOLTING | Bonnet studs and nuts are manufactured from alloy steel to the relevant ASTM standard. |
| 4 HINGE PIN | The disc pins are part of the trim. They are in forged stainless steel machined from ground bar. The disc pins are centred in position with two flanges and they can be easily removed for maintenance of the valve. |
| 5 SEAT RING | The ring is part of the trim of the valve, and is supplied as welded-in as a standard. In case the outer diameter is threaded and its bore is notched to easy installation and dismantling. Special attention is given to the seating face which is ground and lapped, for a perfectly tight seal. |
| 6 DISC | The tilting disc is part of the trim. The disc's balanced design allows to keep it in the open position by a minimum fluid flow and lets this one to return to closed position quickly, before flow reversal starts, and so far not causing a sudden water hammer effect (non slam effect). The conical seating surface is ground and lapped. |
| INSTALLATION REMARKS | <p>Tilting disc check valves (top entry) are best fit for horizontal pipeline installation, thus they can be used even in vertical piping with upward flow.</p> <p>Check anyway with ORION if the valve is suitable for the desired installed position.</p> |



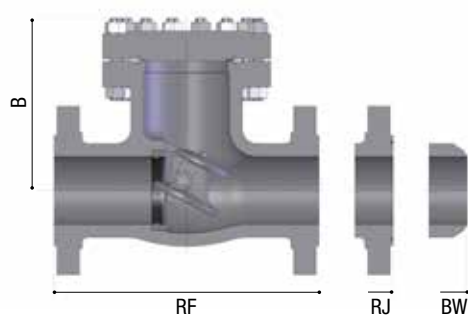
Class ASME 600 (PN 100)

FIGURE NUMBERS - CLASS ASME 900 - ALL SIZES

TR 600: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	292	356	432	559	660	787	838	889	991
RJ	295	359	435	562	663	790	841	892	994
B	245	302	359	472	491	550	609	654	726
Approximate WEIGHT (Kg)									
FLANGED	55	72	123	259	433	606	780	959	1.320
BW	42	55	104	219	366	513	660	812	1.279

SIZE	20"
RF-BW	1.194
RJ	1.200
B	869
Approximate WEIGHT (Kg)	
FLANGED	2.160
BW	2.215



Class ASME 900 (PN 150)

FIGURE NUMBERS - CLASS ASME 900 - ALL SIZES

TR 900: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	368	381	457	610	737	838	965	1.029	1.130
RJ	372	384	460	613	740	841	968	1.038	1.140
B	249	307	365	481	500	560	620	666	739
Approximate WEIGHT (Kg)									
FLANGED	94	122	208	440	735	1.029	1.324	1.628	2.566
BW	71	93	176	372	622	871	1.120	1.377	2.171

SIZE	20"	24"
RF-BW	1.321	1.549
RJ	1.334	1.569
B	885	1.092
Approximate WEIGHT (Kg)		
FLANGED	4.442	6.318
BW	3.758	5.345

Class ASME 1500 (PN 250)

FIGURE NUMBERS - CLASS ASME 1500 - ALL SIZES

TR 1500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	368	470	546	705	832	991	1.130	1.257	1.384
RJ	372	473	549	711	841	1.000	1.146	1.276	1.407
B	227	296	365	486	608	730	852	974	1.096
Approximate WEIGHT (Kg)									
FLANGED	111	144	245	518	865	1.572	1.558	1.916	3.020
BW	84	110	207	438	732	1.025	1.318	1.621	2.555

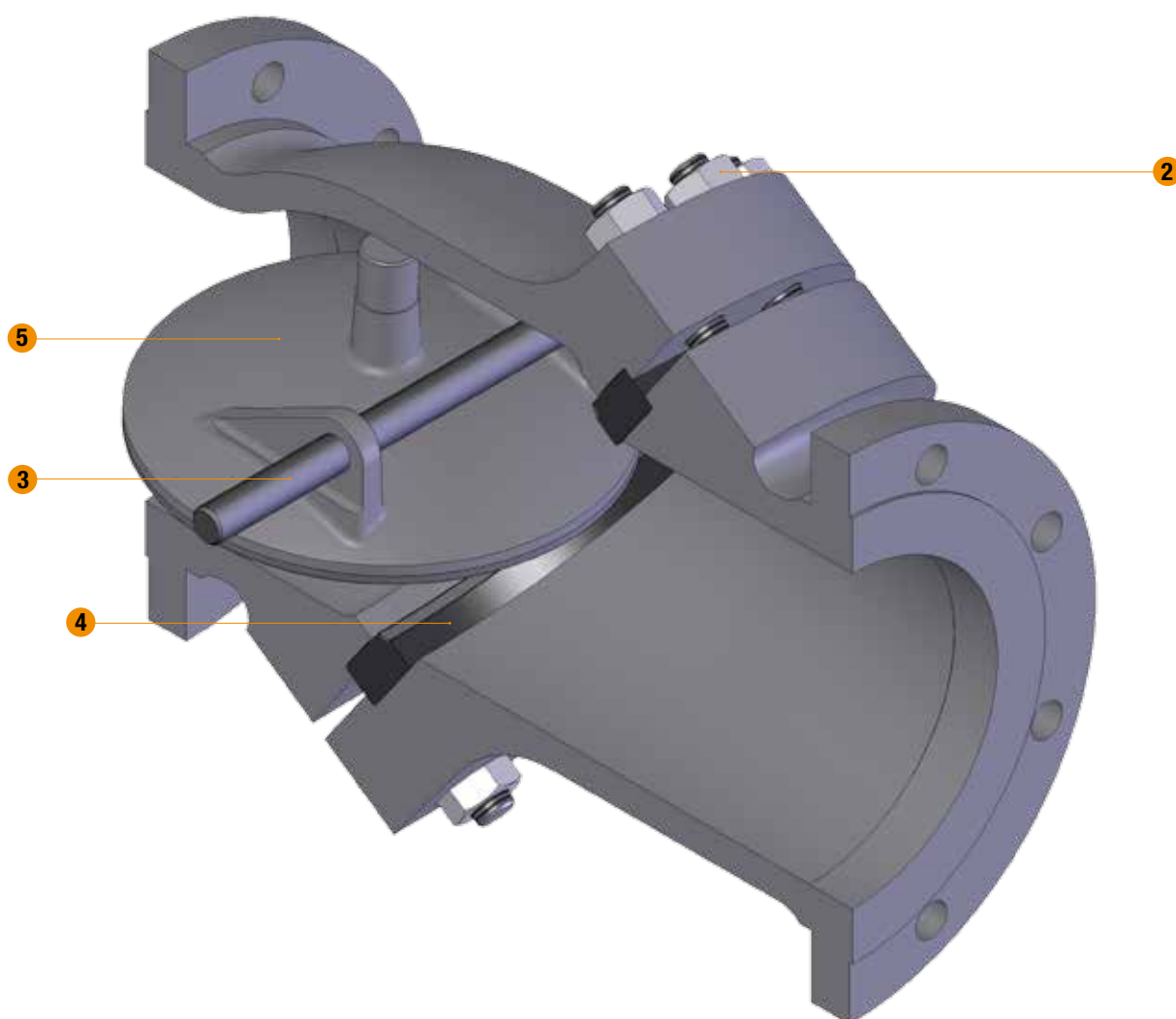
For size and pressure classes non mentioned in the above tables please contact ORION.

N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.

Tilting Disk Check Valve - Split Body

ORION STEEL VALVES
BS 1868



CAST STEEL, TWO PIECES BODY, RENEWABLE SEAT RING, BALANCED DISC.
THIS VALVE TYPE IS RECOMMENDED WHEN CHECK VALVES OPERATE AT LOW DIFFERENTIAL PRESSURE
OR WHEN IT IS NECESSARY TO REDUCE PRESSURE DROP AND TO AVOID THE SLAMMING PROBLEM
AND REDUCE THE WEAR OF MOVING PARTS.

1 BODY

The body is in carbon or stainless steel and is also available in many other CRA. It is carefully designed for total reliability, to keep the pressure drops to a minimum and simple maintenance. The body shall be two-piece, consisting of an entrance and a discharge section bolted together at an angle with the pipeline. The basic dimensions, wall thickness, face to face and flanges, comply with the relevant BS, API and ASME standards. Two threaded bosses are incorporated to ensure correct alignment of the hinge disc.

2 BODY BOLTING

Bonnet studs and nuts are manufactured from alloy steel to the relevant ASTM standard.

3 DISC PINS

The disc pins are part of the trim. They are in forged stainless steel machined from ground bar. The two disc pins are centred in position with two flanges and they can be easily removed for maintenance of the valve.

4 SEAT RING

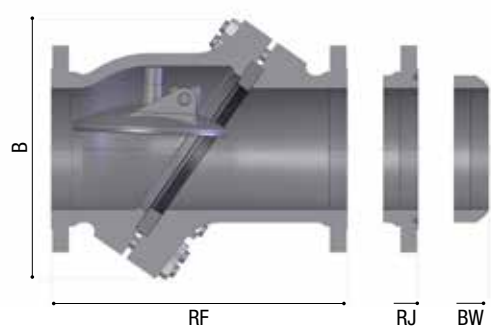
The rings are part of the trim of the valve. Special attention is given to the seating face which is ground and lapped, for a perfectly tight seal.

5 DISC

The disc is part of the trim and it is in forged steel or cast steel. The disc is balanced so that as flow decreases, it will pivot towards its closed position, closing before reverse flow actually commences. The seating surface is ground and lapped.

INSTALLATION REMARKS

Tilting disc check valve (top entry) is best fit for horizontal pipeline installation, it can be used even in vertical piping with flow up. Check anyway with ORION if the valve is suitable for the desired installed position.



Class ASME 150 (PN 20)

FIGURE NUMBERS - CLASS ASME 150 - ALL SIZES

TT 150: RF - RAISED FACE • BW - WELDING ENDS

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	203	216	241	292	330	356	495	622	699
B	84	95	105	126	143	159	196	232	269
Approximate WEIGHT (Kg)									
FLANGED	14	19	23	36	49,5	63	163	230	300
BW	9	11	13	26	37	48	142	204	261

SIZE	14"	16"	18"	20"	24"	28"	30"	32"
RF-BW	787	864	978	978	1.050	1.257	1.257	1.524
B	302	334	367	400	465	518	544	570
Approximate WEIGHT (Kg)								
FLANGED	534	696	858	1.020	1.200	2.100	2.280	1.955
BW	469	622	776	929	1.071	1.825	1.995	1.635

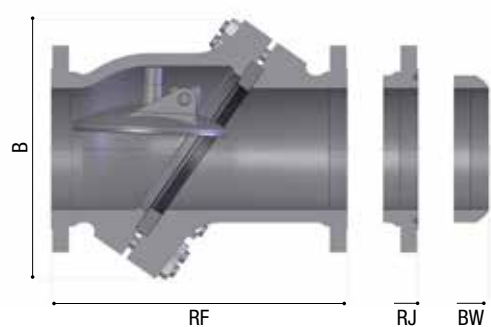
Class ASME 300 (PN 50)

FIGURE NUMBERS - CLASS ASME 300 - ALL SIZES

TT 300: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	267	292	318	356	400	445	533	622	711
RJ	283	308	333	372	416	460	549	638	727
B	107	119	130	153	158	162	201	240	280
Approximate WEIGHT (Kg)									
FLANGED	18	28	38	60	78	96	173	250	392
BW	12	19	26	41	54	66	130	193	306

SIZE	14"	16"	18"	20"	24"
RF-BW	838	921	978	1.016	1.260
RJ	854	936	966	999	1.282
B	345	380	415	450	520
Approximate WEIGHT (Kg)					
FLANGED	685	670	975	1.208	1.785
BW	555	527	800	988	1.472



Class ASME 600 (PN 100)

FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

TT 600: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	292	330	356	432	508	559	660	787	838
RJ	295	333	359	435	511	562	664	791	841
B	117	129	141	165	188	211	254	296	335
Approximate WEIGHT (Kg)									
FLANGED	23	35	47	87	139	190	293	480	625
BW	18	26	34	63	102	141	222	365	494

SIZE	14"	16"	18"	20"	24"
RF-BW	889	991	1.092	1.194	1.397
RJ	892	994	1.095	1.200	1.406
B	374	413	452	491	569
Approximate WEIGHT (Kg)					
FLANGED	770	915	1.060	1.205	1.495
BW	623	752	881	1.010	1.268

For size and pressure classes non mentioned in the above tables please contact ORION.

N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.

ORION STEEL VALVES

Axial Check Valves

API 6D



AXIAL

AXIAL CHECK VALVES API 6D - p. 73

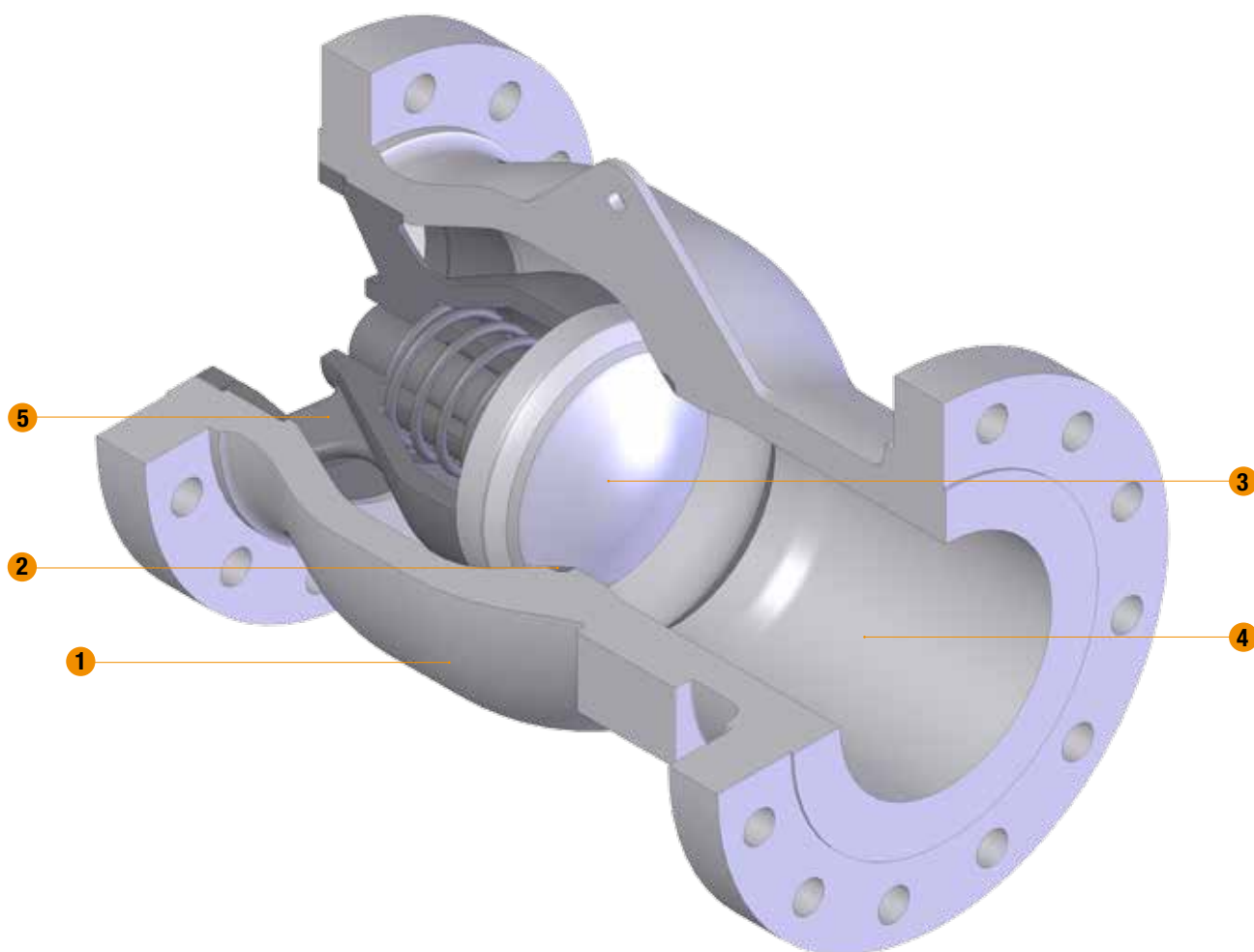
Class ASME 150 (PN 20) • 300 (PN 50) • 600 (PN 100) • 900 (PN 150) • 1500 (PN 250) • 2500 (PN 420)

AXIAL CHECK VALVES OPERATING CONDITIONS - p. 79

ORION STEEL VALVES

Axial Check Valves

API 6D



Note: Please fill in the attached questionnaire in order to give your valves installation details.

1 VALVE BODY

The body is cast or forged in carbon or stainless steel and is also available in many other CRA. For severe services and large valve sizes it can be internally lined or fully clad instead of having solid CRA. The internal profile is designed in order to minimize pressure losses, and basic dimensions (face to face and wall thickness) comply with API 6D and ASME B16.34 standards. Body connections can be provided as per ASME B 16.5 RF or RTJ, as well as BW end or hub connection are available.

2 SEAT

The seat ring is part of the trim. It can be integral with the body or renewable. A ground lapped surface allows the tightness.

3 VALVE DISC

The disc is the main part of the trim and allows fluid control. It comes in forged steel and in cast steel. Its shape is carefully designed in order to avoid turbulences and is assisted by a spring in closed position.

4 SPRING

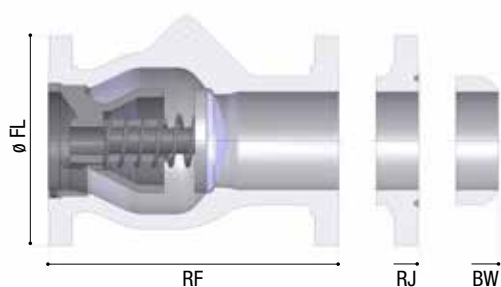
The valve will be closed quickly at fluid stop and reversal, giving its peculiar NON SLAM EFFECT, avoiding any reverse acceleration of fluid and consequent water-hammer. Selection of spring characteristics can be made upon engineering evaluation of specific applications.

5 DIFFUSER

The diffuser supports the disc and spring assembly and lets the fluid exiting from the valve with minor impact on pressure drop.

INSTALLATION REMARKS

As per ORION standard, the spring is sized for horizontal and vertical (downward-upward flow) installation, but it shall be properly sized to match specific installation, especially on larger valves where heavy discs are involved. An arrow is cast embossed on the body of the valve, indicating the fluid direction. Check anyway with ORION if the valve is suitable for the desired installed position.



Class ASME 150 (PN 20)

FIGURE NUMBERS - CLASS ASME 150 - ALL SIZES

RA 150: RF - RAISED FACE • BW - WELDING ENDS

SIZE	2"	2½"	3"	4"	6"	8"	10"	12"	14"
RF-BW	203	216	241	292	356	495	622	698	787
Ø FL	150	180	190	230	280	345	405	485	535
Approximate WEIGHT (Kg)									
FLANGED	9	13	18	33	56	122	188	284	399
BW	7	10	14	26	45	98	150	227	319

SIZE	16"	18"	20"	24"	26"	28"	30"	32"	34"
RF-BW	864	978	978	1.067	1.295	1.295	1.448	1.524	1.651
Ø FL	595	635	700	758	815	873	927	984	1.111
Approximate WEIGHT (Kg)									
FLANGED	543	510	979	1.270	1.560	1.851	2.141	2.432	3.013
BW	434	408	783	1.016	1.248	1.481	1.713	1.946	2.410

SIZE	36"	42"	48"	50"	54"	60"
RF-BW	1.956	2.083	1.956	2.360	2.537	2.802
Ø FL	1.168	1.346	1.511	1.568	1.683	1.854
Approximate WEIGHT (Kg)						
FLANGED	3.303	4.175	/	/	/	/
BW	2.642	3.340	4.037	4.270	4.734	5.431

Class ASME 300 (PN 50)

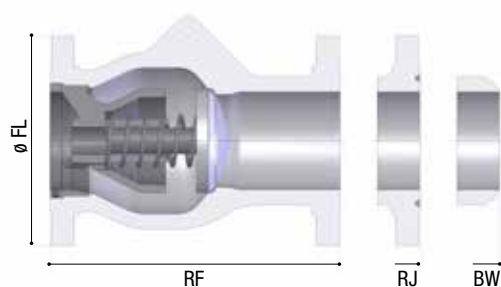
FIGURE NUMBERS - CLASS ASME 300 - ALL SIZES

RA 300: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	6"	8"	10"	12"	14"
RF-BW	267	292	318	356	444	533	622	711	838
RJ	283	308	334	372	460	549	638	727	854
Ø FL	165	190	210	255	320	380	445	520	585
Approximate WEIGHT (Kg)									
FLANGED	12	20	27	41	100	158	258	379	524
BW	10	16	22	33	80	126	206	303	419

SIZE	16"	18"	20"	22"	24"	26"	30"	36"	42"
RF-BW	864	977	1.016	1.118	1.346	1.346	1.594	2.083	2.198
RJ	880	993	1.035	1.140	1.368	/	/	/	/
Ø FL	650	710	775	838	915	972	1.092	1.270	1.289
Approximate WEIGHT (Kg)									
FLANGED	654	853	1.162	1.601	2.039	2.548	3.566	5.093	/
BW	523	682	930	1.281	1.631	2.038	2.853	4.074	5.296

SIZE	48"	50"	54"	60"
RF-BW	2.493	2.591	2.788	3.083
RJ	/	/	/	/
Ø FL	1.467	1.530	1.657	1.810
Approximate WEIGHT (Kg)				
FLANGED	/	/	/	/
BW	6.518	6.925	7.739	8.961



Class ASME 600 (PN 100)

FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

RA 600: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	292	330	356	432	508	559	660	787	838
RJ	295	333	359	435	511	562	663	790	841
Ø FL	165	190	210	275	330	355	420	510	560
Approximate WEIGHT (Kg)									
FLANGED	14	23	31	59	95	131	237	370	502
BW	11	18	25	47	76	105	190	296	402

SIZE	14"	16"	18"	20"	24"	36"	40"	46"	50"
RF-BW	889	991	1.092	1.194	1.397	2.083	2.286	2.540	2.756
RJ	892	994	1.095	1.200	1.407	2.098	/	/	/
Ø FL	605	685	745	815	940	1.314	1.321	1.511	1.670
Approximate WEIGHT (Kg)									
FLANGED	736	969	1.203	1.607	2.575	8.872	10.971	/	/
BW	589	775	962	1.286	2.060	7.098	8.777	11.295	12.974

SIZE	54"	60"
RF-BW	2.959	3.263
RJ	/	/
Ø FL	1.778	1.994
Approximate WEIGHT (Kg)		
FLANGED	/	/
BW	14.654	17.172

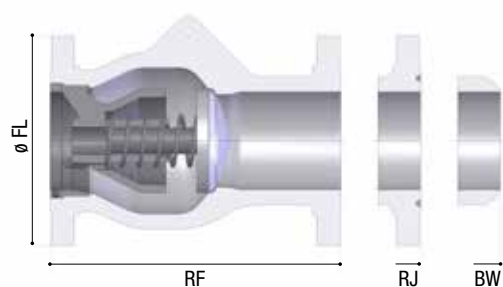
Class ASME 900 (PN 150)

FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

RA 600: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	368	419	381	457	559	610	737	838	965
RJ	371	422	384	460	562	613	740	841	968
Ø FL	215	245	240	290	350	380	470	545	610
Approximate WEIGHT (Kg)									
FLANGED	18	30	41	68	112	155	286	482	751
BW	14	24	33	54	90	124	229	386	601

SIZE	14"	16"	18"	20"	24"
RF-BW	1.029	1.130	1.537	1.321	1.549
RJ	1.039	1.140	1.550	1.334	1.568
Ø FL	640	705	785	855	1.040
Approximate WEIGHT (Kg)					
FLANGED	1.020	1.289	1.516	2.840	5.488
BW	816	1.031	1.213	2.272	4.390



Class ASME 1500 (PN 250)

FIGURE NUMBERS - CLASS ASME 1500 - ALL SIZES

RA 1500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	5"	6"	8"	10"	12"
RF-BW	368	419	470	546	673	705	832	991	1.130
RJ	371	422	473	549	676	711	842	1.001	1.146
Ø FL	215	245	265	310	375	395	485	585	675
Approximate WEIGHT (Kg)									
FLANGED	37	51	64	100	167	233	495	777	1.208
BW	30	41	51	80	134	186	396	622	966

SIZE	14"	16"	18"	20"	24"
RF-BW	1.257	1.384	1.537	1.664	1.943
RJ	1.276	1.406	1.559	1.686	1.971
Ø FL	750	825	915	985	1.170
Approximate WEIGHT (Kg)					
FLANGED	1.638	2.069	2.840	3.545	4.955
BW	1.310	1.655	2.272	2.836	3.964

Class ASME 2500 (PN 420)

FIGURE NUMBERS - CLASS ASME 2500 - ALL SIZES

RA 2500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	6"	8"	10"	12"
RF-BW	451	508	578	673	914	1.022	1.270	1.422
RJ	454	514	584	683	927	1.038	1.292	1.444
Ø FL	235	265	305	355	485	550	675	760
Approximate WEIGHT (Kg)								
FLANGED	60	82	103	162	377	804	1.231	1.658
BW	48	66	82	130	302	643	985	1.326

For size and pressure classes non mentioned in the above tables please contact ORION.

N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.



ORION CAST STEEL VALVES SpA

AXIAL CHECK VALVES OPERATING CONDITIONS

Please fill in all the below required informations, in order to let ORION to evaluate the best valve design for your application

VALVE / PIPE

Line Size:

Pressure Class:

Item / Tag No :

OPERATING POSITION:

Horizontal pipeline

Vertical Pipeline

Upward stream

Downward stream

PLANT LOCATION

Meters of straight pipe before/after the valve: / m

Suction

High Cycling Yes

Distance of the valve from a bend in Pip: m

Pump Discharge

No

DESIGN CONDITIONS

Operating Temperature Range (Min / Max): / °C

Pressure: bar g

OPERATING CONDITIONS AT VALVE INLET

Temperature: °C

Pressure: bar g

FLUID DETAILS AT VALVE INLET

Liquid:

2 Phase Liquid & Gas:

Gas / Vapour:

Fluid Type:

Operating Density: kg/m³

Molecular Wt. (for gas): kg/kmol

Compressibility Factor:

ACTUAL FLOW RATES

Liquid:

Gas / Vapour:

Maximum: m³/hr

Maximum: kg/hr

Normal: m³/hr

Normal: kg/hr

Minimum: m³/hr

Minimum: kg/hr

PUMP / COMPRESSOR DETAILS:

Type of Equipment	Flow	
	Non Pulsating	Pulsating*
Pump**		
Compressor		

*If Pulsating, please indicate

Hz

SYSTEM DECELERATION AT CHECK VALVE

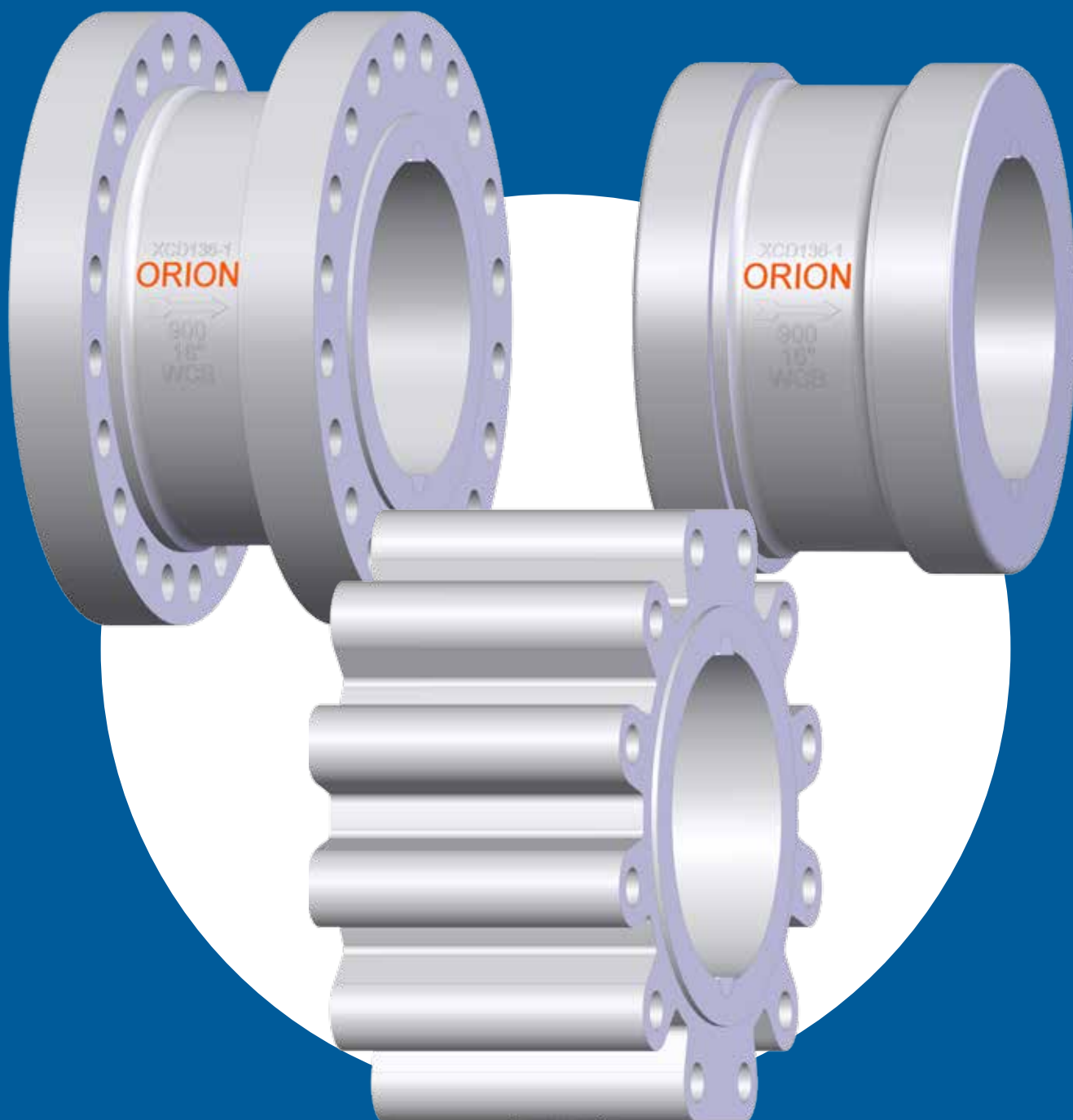
(if known):

m/s²

ORION STEEL VALVES

Dual Plate Check Valves

API 594



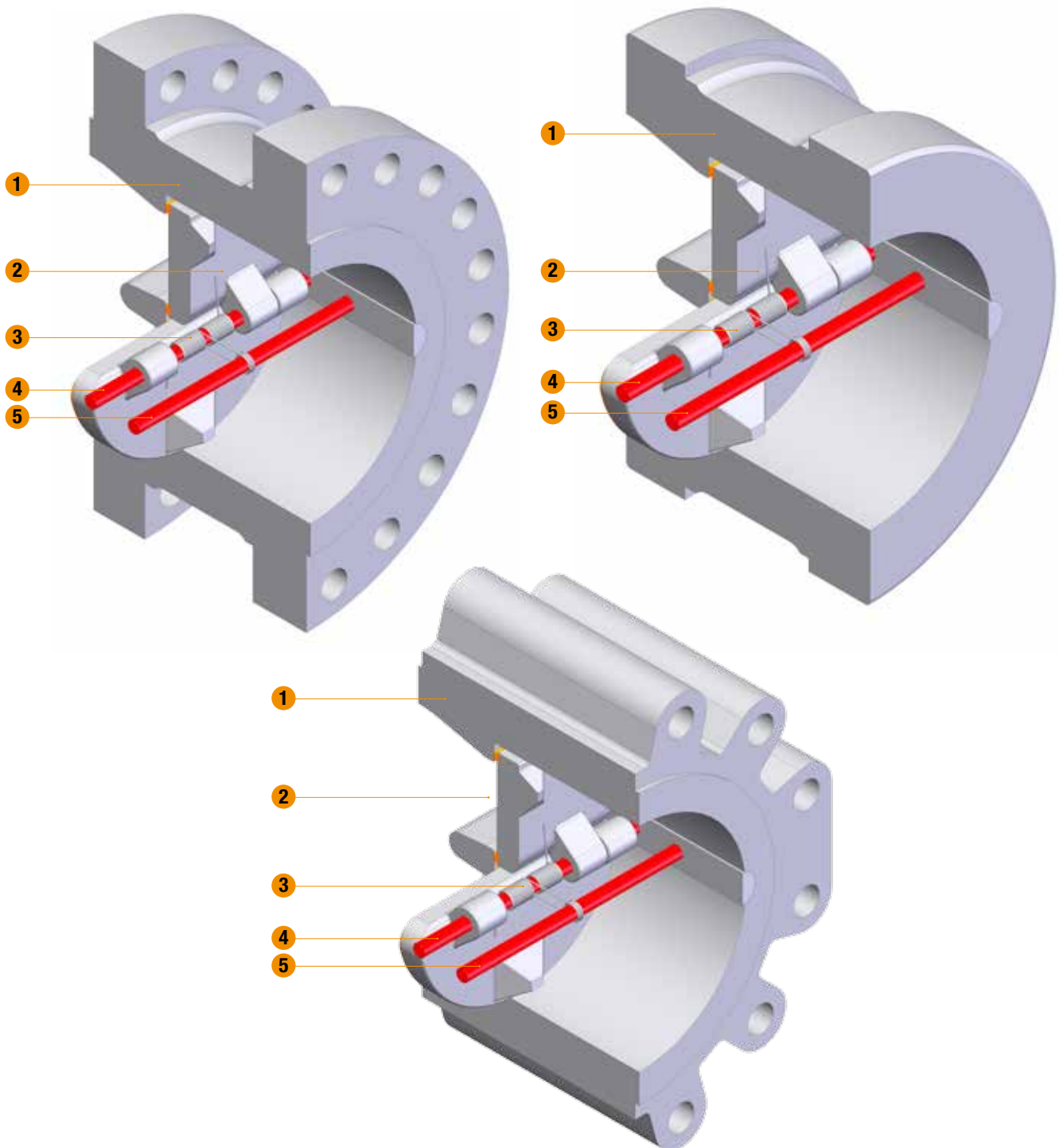
DUAL PLATE

DUAL PLATE WAFER CHECK VALVES API 594 - p. 84Class ASME 150 (PN 20) • 300 (PN 50) • 600 (PN 100)
900 (PN 150) • 1500 (PN 250) • 2500 (PN 420)**DUAL PLATE LUG CHECK VALVES API 594 - p. 88**Class ASME 150 (PN 20) • 300 (PN 50) • 600 (PN 100)
900 (PN 150) • 1500 (PN 250) • 2500 (PN 420)**DOUBLE FLANGED CHECK VALVES API 594 - p. 92**Class ASME 150 (PN 20) • 300 (PN 50) • 600 (PN 100)
900 (PN 150) • 1500 (PN 250) • 2500 (PN 420)**SPECIAL FEATURES - p. 95****INSTALLATION RECOMMENDATION - p. 96**

ORION STEEL VALVES

Dual Plate Check Valves

RETAINERLESS DESIGN ACCORDING TO API 594

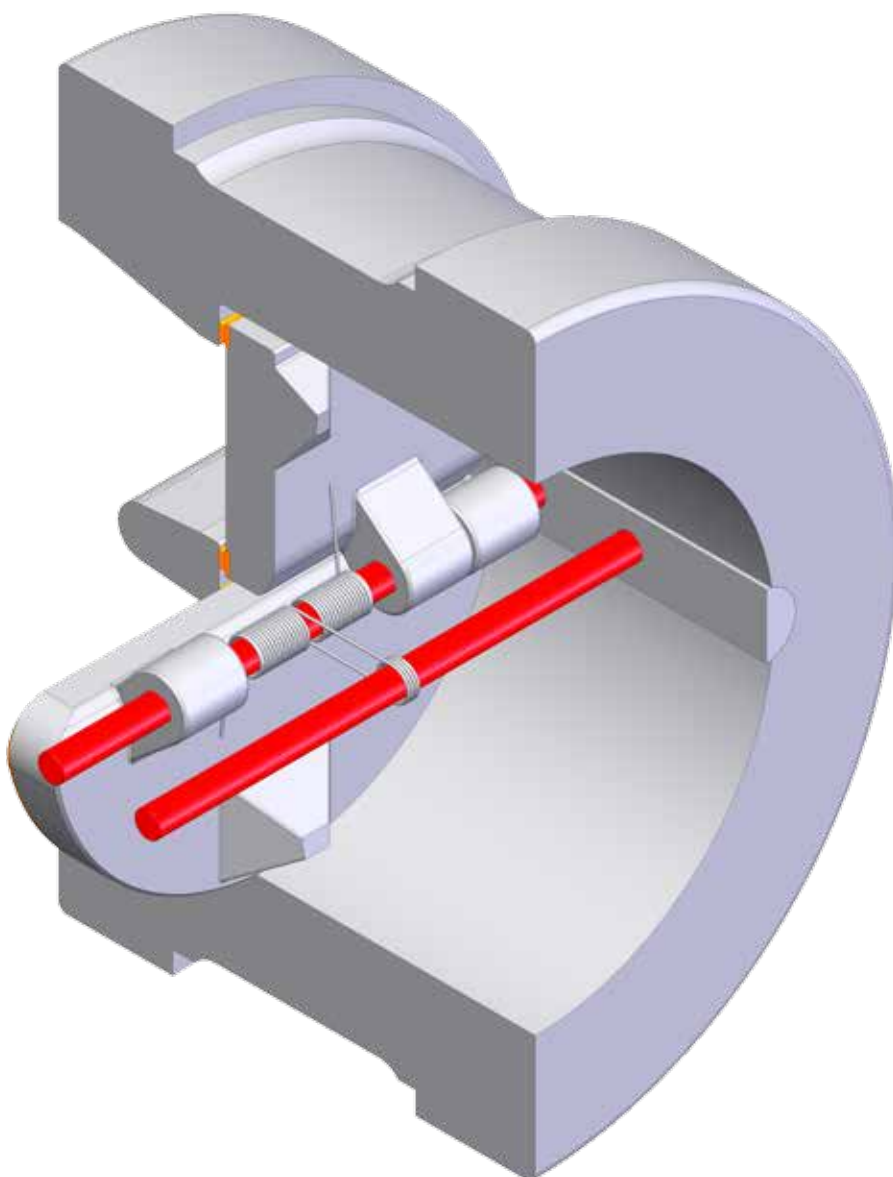


- | | |
|--------------------|---|
| 1 BODY | The body is realized in cast or forged steel, carefully designed in order to minimize the pressure drop. The basic dimensions, wall thickness, face to face and flanges, comply with the relevant API and ASME standards. Two guides are incorporated to ensure correct alignment of the hinge pin. The integral seat is part of trim. Special attention is given to the seating surface which is ground and lapped, for a perfectly tight seal. The total absence of through-body drills (retainerless design) avoids any possible accidental leakage from the system. |
| 2 DISC | The disc is in cast or forged steel. The attachment to the hinge pin allows the rotation and a small translation along the flow. The seating surface is ground and lapped. An integral over-travel stop for the discs is incorporated. |
| 3 SPRING | Torsion spring, available in various material, according to the desired service. |
| 4 HINGE PIN | The hinge pin is part of the trim, in forged stainless steel and is machined from ground bar. The hinge pin is held in position in the body with two supports. The pin can be easily removed for valve maintenance. For correct valve functioning it shall be always installed in vertical position, when used in horizontal pipeline. |
| 5 STOP PIN | The stop pin is part of the trim. It is machined from ground bar in forged stainless steel. It is held in position parallel to the hinge pin on the same support. It has a double function: it stops the disc and retains the spring's thrust. The pin can be easily removed for maintenance of the valve. |

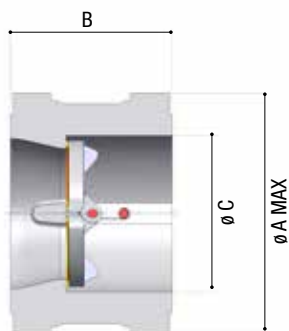
ORION STEEL VALVES

Dual Plate Wafer Check Valves

RETAINERLESS DESIGN ACCORDING TO API 594



Only as Example: For Installation Recommendation, please refer to page 96.



Class ASME 150 (PN 20)

FIGURE NUMBERS - CLASS ASME 250 - ALL SIZES

CD_W: 150 RF - RAISED FACE • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	6"	8"	10"	12"	14"
A	101	120	133	171	219	276	336	405	448
B	60	67	73	73	98	127	146	181	184
C	60	67	90	110	160	215	270	300	330
Approximate WEIGHT (Kg)									
	3	4	5	8	17	30	50	90	110

SIZE	16"	18"	20"	24"	30"	36"	42"	48"
A	511	546	603	714	879	1.044	1.216	1.381
B	191	203	219	222	305	368	432	524
C	380	435	485	575	740	887	1.040	1.192
Approximate WEIGHT (Kg)								
	147	169	221	307	502	817	1.282	1.887

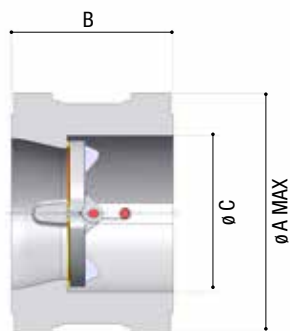
Class ASME 300 (PN 50)

FIGURE NUMBERS - CLASS ASME 300 - ALL SIZES

CD_W: 300 RF - RAISED FACE • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	6"	8"	10"	12"	14"
A	108	127	146	178	247	304	358	419	483
B	60	67	73	73	98	127	146	181	222
C	60	67	90	110	160	215	270	300	330
Approximate WEIGHT (Kg)									
	3	6	6	9	20	39	54	100	166

SIZE	16"	18"	20"	24"	30"	36"	42"	48"
A	537	593	650	771	949	1.114	1.162	1.320
B	232	264	292	318	368	483	568	629
C	380	435	481	580	740	887	1.040	1.192
Approximate WEIGHT (Kg)								
	203	248	324	488	850	1.247	2.268	3.867



Class ASME 600 (PN 100)

FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

CD_W 600: RF - RAISED FACE • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	6"	8"	10"	12"	14"
A	108	127	146	191	264	317	397	454	490
B	60	67	73	79	136	165	213	227	273
C	60	67	90	102	155	202	235	290	315
Approximate WEIGHT (Kg)									
	3	5	6	13	38	55	127	172	224

SIZE	16"	18"	20"	24"	30"	36"	42"
A	562	610	680	787	1096	1127	1216
B	305	362	368	438	505	635	701
C	370	427	480	580	740	887	1.040
Approximate WEIGHT (Kg)							
	352	471	558	807	1.687	2.126	2.929

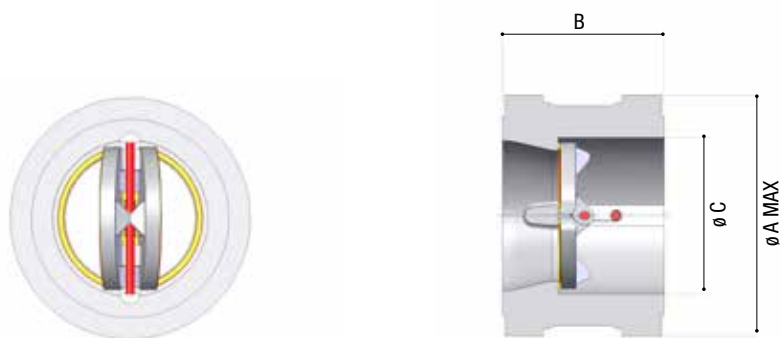
Class ASME 900 (PN 150)

FIGURE NUMBERS - CLASS ASME 900 - ALL SIZES

CD_W 900: RF - RAISED FACE • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	6"	8"	10"	12"	14"
A	139	161	165	203	285	355	431	495	517
B	70	83	83	102	159	206	241	292	356
C	58	54	78	102	155	202	245	290	330
Approximate WEIGHT (Kg)									
	6	8	11	19	56	90	189	249	357

SIZE	16"	18"	20"	24"
A	571	635	695	835
B	384	451	451	495
C	370	435	481	580
Approximate WEIGHT (Kg)				
	455	623	693	1.143



Class ASME 1500 (PN 250)

FIGURE NUMBERS - CLASS ASME 1500 - ALL SIZES

CD_W 1500: RF - RAISED FACE • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	6"	8"	10"	12"	14"
A	139	161	171	206	279	349	431	517	575
B	70	83	83	102	159	206	248	305	356
C	58	54	78	102	150	185	227	286	320
Approximate WEIGHT (Kg)									
	7	10	12	20	51	121	192	313	469

SIZE	16"	18"	20"	24"
A	638	701	752	898
B	384	468	533	559
C	370	435	481	580
Approximate WEIGHT (Kg)				
	589	827	1.227	2.202

Class ASME 2500 (PN 420)

FIGURE NUMBERS - CLASS ASME 2500 - ALL SIZES

CD_W 2500: RF - RAISED FACE • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	6"	8"	10"	12"
A	142	165	193	231	314	384	472	546
B	70	83	86	105	159	206	254	305
C	58	54	78	100	153	185	234	280
Approximate WEIGHT (Kg)								
	10	13	16	27	67	137	237	395

For size and pressure classes non mentioned in the above tables please contact ORION.

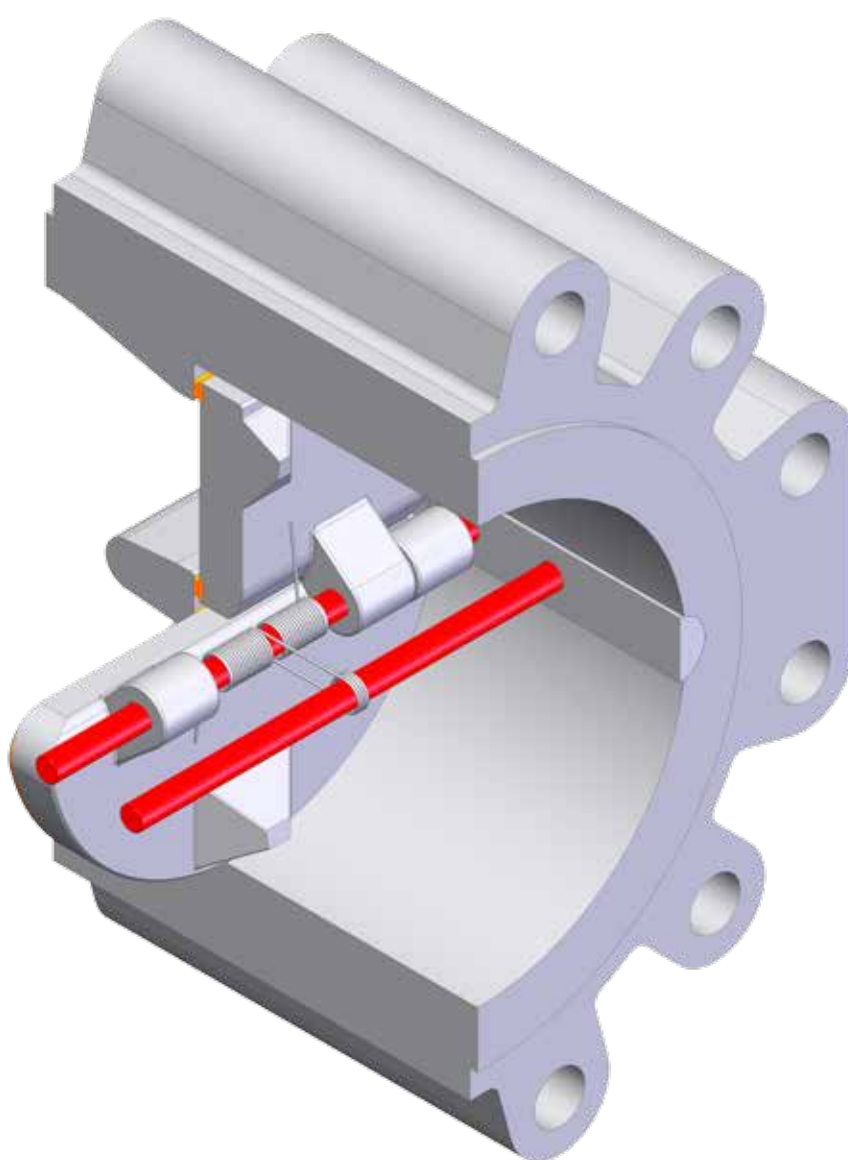
N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.

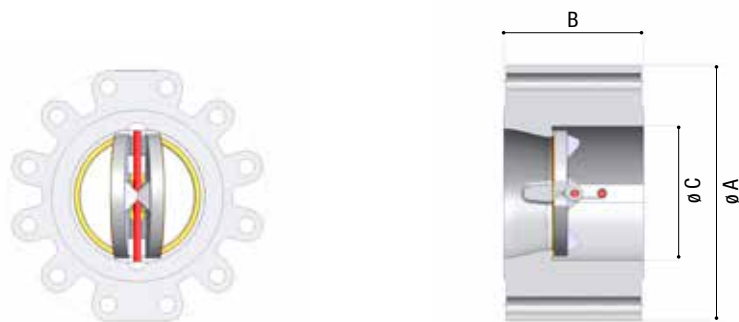
ORION STEEL VALVES

Dual Plate Lug Check Valves

RETAINERLESS DESIGN ACCORDING TO API 594



Only as Example: For Installation Recommendation, please refer to page 96.



Class ASME 150 (PN 20)

FIGURE NUMBERS - CLASS ASME 250 - ALL SIZES

CD_L 150: RF - RAISED FACE • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	6"	8"	10"	12"	14"
A	150	180	181,4	222,3	277	345	405	475	535
B	60	67	73	73	98	127	146	181	184
C	60	67	90	110	160	200	245	300	335
Approximate WEIGHT (Kg)									
	5	7	7	13	24	32	54	128	154

SIZE	16"	18"	20"	24"	30"	36"	42"	48"
A	587	635	700	815	985	1170	1345	1510
B	191	203	219	222	305	368	432	524
C	380	435	481	580	740	887	1.040	1.192
Approximate WEIGHT (Kg)								
	190	233	301	394	786	1.293	2.040	3.057

Class ASME 300 (PN 50)

FIGURE NUMBERS - CLASS ASME 300 - ALL SIZES

CD_L 300: RF - RAISED FACE • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	6"	8"	10"	12"	14"
A	156	190	200	235	306	371	433	520	585
B	60	67	73	73	98	127	146	181	222
C	60	67	90	110	160	215	270	301	335
Approximate WEIGHT (Kg)									
	5	9	10	14	31	57	82	162	257

SIZE	16"	18"	20"	24"	30"	36"	42"	48"
A	630	710	775	915	1.090	1.270	1.290	1.465
B	232	264	292	318	368	483	568	629
C	380	435	481	580	740	887	1.040	1.192
Approximate WEIGHT (Kg)								
	293	442	579	856	1.294	2.125	2.828	4.631



Class ASME 600 (PN 100)

FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

CD_L 600: RF - RAISED FACE • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	6"	8"	10"	12"	14"
A	156	190	203,3	254	335	396	494	560	587
B	60	67	73	79	136	165	213	229	273
C	60	67	90	102	155	202	235	290	315
Approximate WEIGHT (Kg)									
	5	7	9	17	38	83	185	256	325

SIZE	16"	18"	20"	24"	30"	36"	42"
A	677	745	797	940	1.130	1.315	1.405
B	305	362	368	438	505	635	701
C	372	435	480	580	740	887	1.040
Approximate WEIGHT (Kg)							
	494	721	765	1.388	1.687	3.602	4.451

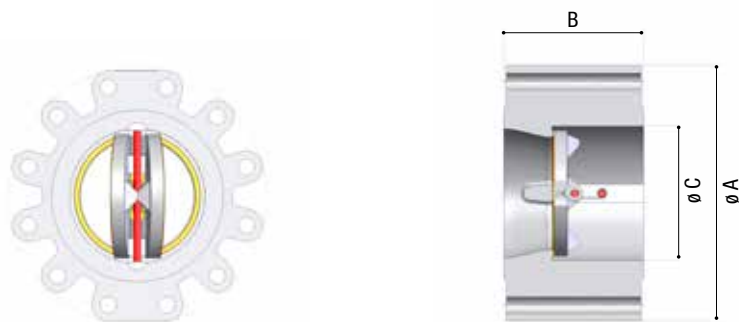
Class ASME 900 (PN 150)

FIGURE NUMBERS - CLASS ASME 900 - ALL SIZES

CD_L 900: RF - RAISED FACE • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	6"	8"	10"	12"	14"
A	215	245	240	290	380	461	545	610	640
B	70	83	83	102	159	206	241	292	356
C	58	54	78	110	155	202	245	290	330
Approximate WEIGHT (Kg)									
	18	22	28	45	120	150	341	394	583

SIZE	16"	18"	20"	24"
A	705	785	855	1.040
B	384	451	451	495
C	370	435	481	580
Approximate WEIGHT (Kg)				
	766	1.162	1.343	2.036



Class ASME 1500 (PN 250)

FIGURE NUMBERS - CLASS ASME 1500 - ALL SIZES

CD_L 1500: RF - RAISED FACE • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	6"	8"	10"	12"	14"
A	201	245	247	290	395	485	572	675	750
B	70	83	83	102	159	206	248	305	356
C	45	54	78	102	155	185	227	290	330
Approximate WEIGHT (Kg)									
	10	14	18	28	58	133	294	649	1.119

SIZE	16"	18"	20"	24"
A	825	915	985	1.170
B	384	468	533	559
C	370	435	481	580
Approximate WEIGHT (Kg)				
	1.161	1.813	2.686	3.331

Class ASME 2500 (PN 420)

FIGURE NUMBERS - CLASS ASME 2500 - ALL SIZES

CD_L 2500: RF - RAISED FACE • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	6"	8"	10"	12"
A	210	265	305	328	485	550	675	760
B	70	83	86	105	159	206	254	305
C	45	54	78	102	155	185	235	290
Approximate WEIGHT (Kg)								
	11	17	20	37	53	120	190	305

For size and pressure classes non mentioned in the above tables please contact ORION.

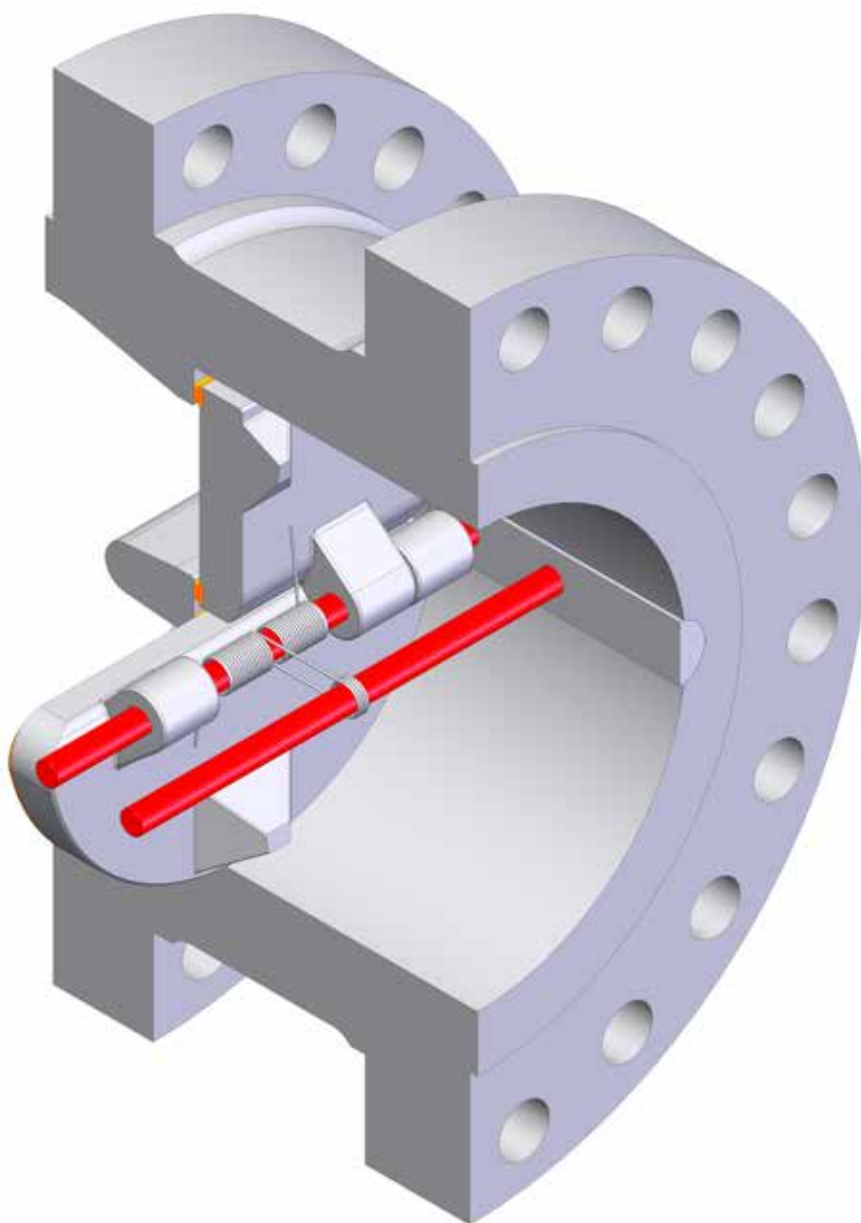
N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.

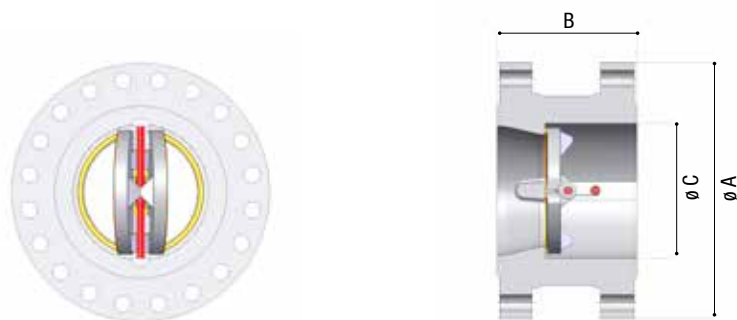
ORION STEEL VALVES

Double Flanged Check Valves

RETAINERLESS DESIGN ACCORDING TO API 594



Only as Example: For Installation Recommendation, please refer to page 96.



Class ASME 150 (PN 20)

FIGURE NUMBERS - CLASS ASME 150 - ALL SIZES

CD_F 150: RF - RAISED FACE • RJ - RING JOINT

SIZE	10"	12"	14"	16"	18"	20"	24"	30"	36"
A	405	485	535	595	635	700	815	985	1.170
B	146	181	184	191	203	219	222	305	368
C	270	301	335	370	435	481	580	740	887
Approximate WEIGHT (Kg)									
	59	115	125	204	194	226	373	589	838

SIZE	42"	48"	56"	60"
A	1.345	1.510	1.745	1.855
B	432	524	584	660
C	1.040	1.192	1.375	1.426
Approximate WEIGHT (Kg)				
	1.471	2.180	3.125	3.598

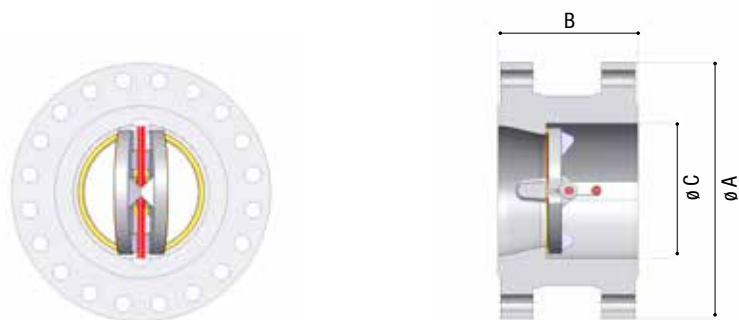
Class ASME 300 (PN 50)

FIGURE NUMBERS - CLASS ASME 300 - ALL SIZES

CD_F 300: RF - RAISED FACE • RJ - RING JOINT

SIZE	12"	14"	16"	18"	20"	24"	30"	36"	42"
A	520	585	650	710	775	915	1.090	1.270	1.290
B	181	222	232	264	292	318	368	483	568
C	301	330	370	435	481	580	740	887	1.040
Approximate WEIGHT (Kg)									
	153	222	366	367	361	468	911	1.816	2.235

SIZE	48"	56"	60"
A	1.465	1.710	1.810
B	629	737	826
C	1.192	584	660
Approximate WEIGHT (Kg)			
	3.078	4.202	4.764



Class ASME 600 (PN 100)

FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

CD_F 600: RF - RAISED FACE • RJ - RING JOINT

SIZE	12"	14"	16"	18"	20"	24"	30"	36"	42"
A	560	605	685	745	815	940	1.096	1.315	1.405
B	229	273	305	362	368	438	505	635	701
C	290	330	370	435	481	580	740	887	1.040
Approximate WEIGHT (Kg)									
	272	378	489	468	592	856	1.687	2.482	3.261

Class ASME 900 (PN 150)

FIGURE NUMBERS - CLASS ASME 900 - ALL SIZES

CD_F 900: RF - RAISED FACE • RJ - RING JOINT

SIZE	12"	14"	16"	18"	20"	24"
A	610	640	705	785	855	1.040
B	292	356	384	451	451	495
C	290	330	370	435	481	580
Approximate WEIGHT (Kg)						
	454	574	590	656	875	1.289

For size and pressure classes non mentioned in the above tables please contact ORION.

N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.

ORION STEEL VALVES Special Features

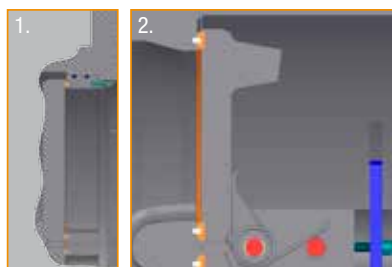
ORION is able to provide more valve preparations not listed in this catalogue as butt weld ends, hub ends or compact flange connections. Please contact ORION Sales Department for technical details as weight or end to end dimension.



DUAL PLATE

SOFT SEATING

- This feature is applicable on all body material
- Renewable seat is an option on all designs to enhance the material selection on trim components



1. Optional renewable seat zero leakage
2. Standard integral seat zero leakage

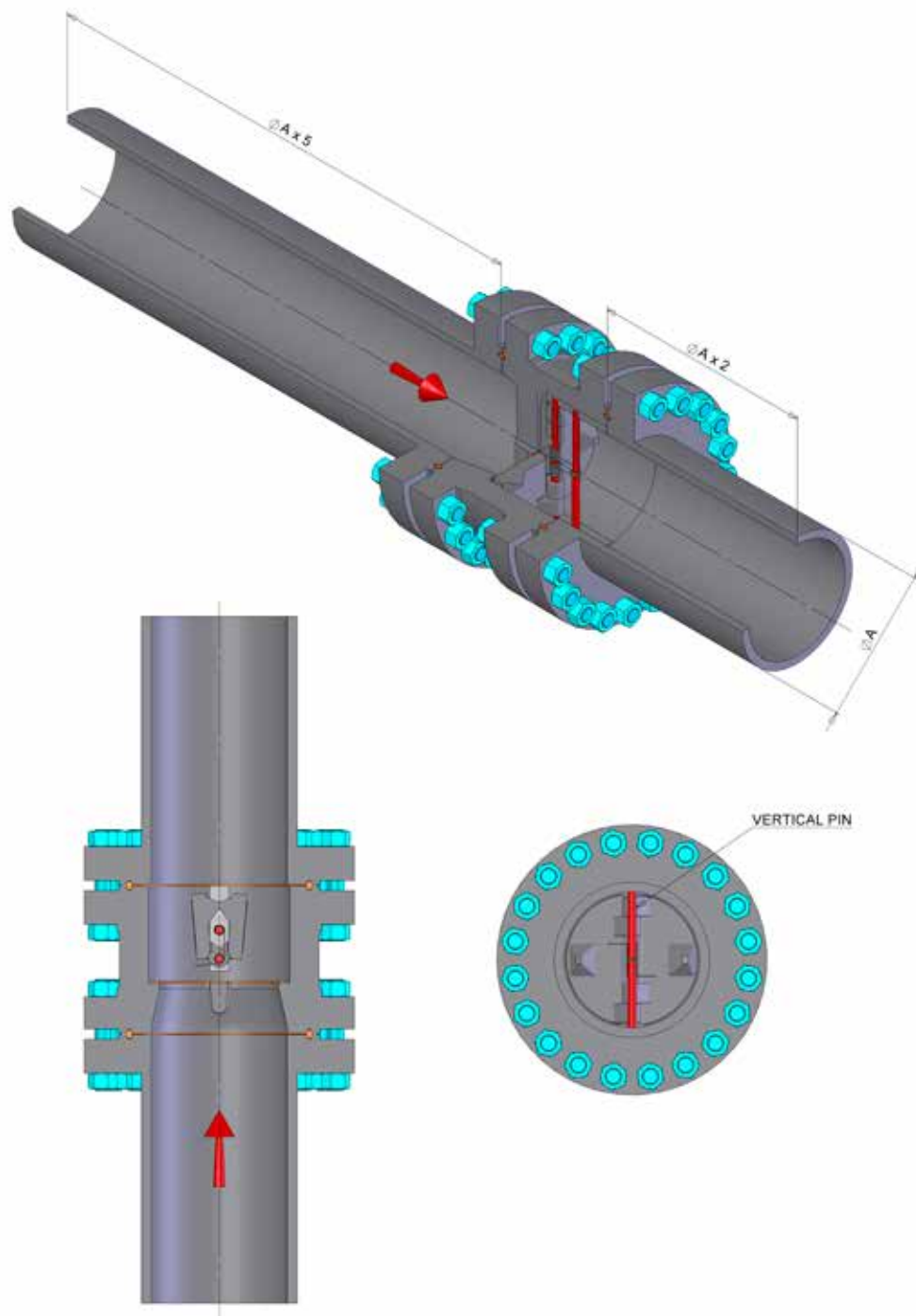
Installation Recommendation

The best working position for a dual plate check valve is on horizontal pipeline, with the hinge pin installed vertically.

The valve can be used on vertical flowlines as well, provided the flow direction is upward.

For the vertical downward stream installation, please explicitly ask for a special spring to be installed while ordering, in order to compensate the gravity effect on the plates.

EACH ORION DUAL PLATE CHECK VALVE HAS A FLOW INDICATION ARROW EMBOSSED ON THE BODY. FOR THE CORRECT INSTALLATION OF THIS VALVE, MAKE SURE THAT IT IS MATCHING THE FLOW DIRECTION.



ORION STEEL VALVES

API 6A

Pressure ratings • Temperature ratings • Material applications for bodies, bonnets and end and outlet connections
Material property requirements for bodies, bonnets and end and outlet connections • Material requirements
Body and trim material examples

- Wedge Gate Valves API 6A •
- Single Disc Valves API 6A •
- Globe Valves API 6A •
- Axial Valves API 6A •
- Check Valves API 6A •

WEDGE GATE VALVES API 6A - p. 100

10000 • 15000 • 20000

SINGLE DISC VALVES API 6A - p. 101

10000 • 15000 • 20000

GLOBE VALVES API 6A - p. 102

10000 • 15000 • 20000

AXIAL VALVES API 6A - p. 103

10000 • 15000 • 20000

CHECK VALVES API 6A - p. 104

10000 • 15000 • 20000

Pressure ratings

MPa	13.8	20.7	34.5	69.0	103.5	138.0
psi	2000	3000	5000	10000	150000	20000

Temperature ratings

Temperature Classification	Operating Range			
	°C		°F	
	MIN	MAX	MIN	MAX
K	-60	82	-75	180
L	-46	82	-50	180
N	-29	60	-50	140
P	-18	82	-20	180
S	-18	60	0	140
T	-18	82	0	180
U	-18	121	0	250
V	2	121	35	250

Material applications for bodies, bonnets and end and outlet connections

Part	Material designations for pressure ratings					
	13.8 MPa (2000 psi)	20.7 MPa (3000 psi)	34.5 MPa (5000 psi)	69.0 MPa (10000 psi)	103.5 MPa (15000 psi)	138.0 MPa (20000 psi)
Body, bonnet	36K,45K 60K, 75K	36K,45K 60K, 75K	36K,45K 60K, 75K	36K,45K 60K, 75K	45K 60K, 75K	60K, 75K
Integral end connection						
Flanged	60K, 75K	60K, 75K	60K, 75K	60K, 75K	75 K	75 K
Threaded	60K, 75K	60K, 75K	60K, 75K			
Loose connectors						
Welding neck	45 K	45 K	45 K	60K, 75K	75 K	75 K
Blind	60K, 75K	60K, 75K	60K, 75K	60K, 75K	75 K	75 K
Threaded	60K, 75K	60K, 75K	60K, 75K	NA	NA	NA

Material property requirements for bodies, bonnets and end and outlet connections

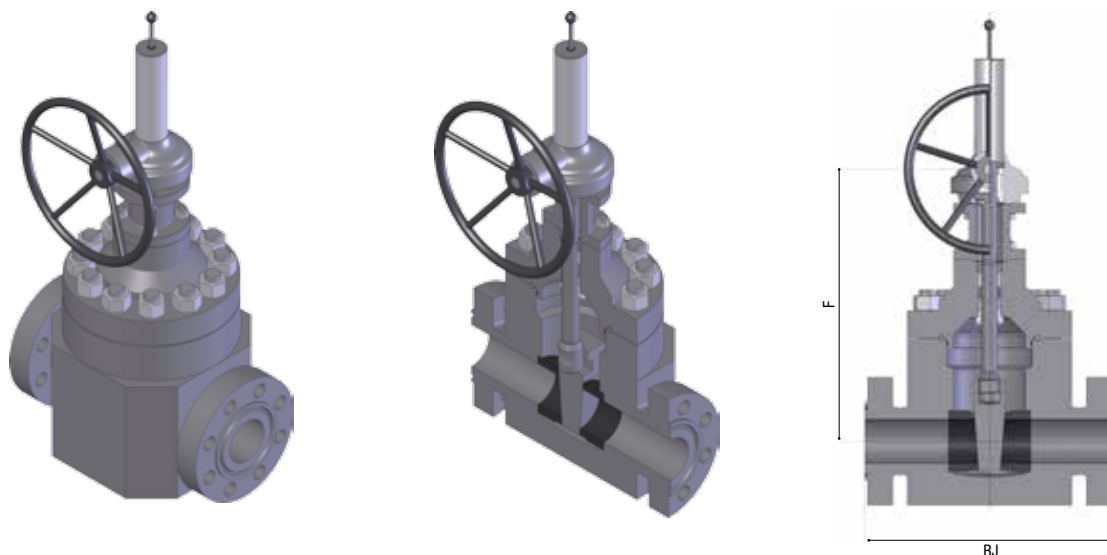
Material designation	0,2 % offset yield in Strength min		Tensile strength min		Elongation min 50 mm (2 in)	Reduction un area min
	MPa	psi	MPa	psi	%	%
36 K	248	36000	483	70000	21	No req
45 K	310	45000	483	70000	19	32
60 K	414	60000	586	85000	18	35
75 K	517	75000	655	95000	17	35

Material requirements

Material class		Minimum material requirements	
		Body, bonnet, end and outlet connections	Pressure-controlling parts, stems and mandrel hangers
AA	General service	Carbon or low-alloy steel	Carbon or low-alloy steel
BB	General service	Carbon or low-alloy steel	Stainless steel
CC	General service	Stainless steel	Stainless steel
DD	Sour service ^a	Carbon or low-alloy steel ^b	Carbon or low-alloy steel ^b
EE	Sour service ^a	Carbon or low-alloy steel ^b	Stainless steel ^b
FF	Sour service ^a	Stainless steel ^b	Stainless steel ^b
HH	Sour service ^a	CRA ^c	CRA ^c
^a as defined by ISO 15156 - NACE MR 0175 / ^b in accordance with ISO 15156 - NACE MR 0175 / ^c corrosion resistant alloy			

Body and trim material examples

Material Class	Body* and bonnet	Trim
AA	A 487 GR 4C	Low alloy + N
AA	AISI 4130	AISI 4135 +N/ STL6/ WC
BB	A 487 GR 4C	A 564 GR 630 + N
BB	AISI 4130	AISI 410 stainless steel + STL6/ WC
BB	A 487 GR 4C	A 240 GR F55
BB	A 487 GR 4C	A 240 GR F53
BB	A 217 GR C5	AISI 410 stainless steel + STL6/ WC
CC	A 217 GR CA15	A 564 GR 630 + N
CC	AISI 410 stainless steel	AISI 410 stainless steel + STL6/ WC
DD	A 487 GR 4C	Low alloy +N
DD	AISI 4130	AISI 4135 +N/ STL6/ WC
EE	A 487 GR 4C	A 564 GR 630 + N
EE	AISI 4130	AISI 410 stainless steel + STL6/ WC
EE	A 487 GR 4C	A 240 GR F55
EE	A 487 GR 4C	A 240 GR F53
FF	A 217 GR CA15	A 564 GR 630 + N
FF	AISI 410 stainless steel	AISI 410 stainless steel + STL6/ WC
HH	A 351 GR CF8M	A 564 GR 630 + WC
HH	A182 GR F316	A 564 GR 630 + WC
HH	INCONEL 625	INCONEL 625 + WC
N: nitrided; STL6: Stellite 6; WC: tungsten carbide / *Body can be manufactured with welded on flanges / Other materials are available upon request.		



WEDGE GATE VALVES API 6A 10000

VW 10000: RJ - RING JOINT

SIZE	1" 13/16	2" 1/16	2" 9/16	3" 1/16	4" 1/16	5" 1/8	7" 1/16
RJ	464	521	565	619	670	737	889
F	438	441	460	459	532	610	751

WEDGE GATE VALVES API 6A 15000

VW 15000: RJ - RING JOINT

SIZE	1" 13/16	2" 1/16	2" 9/16	3" 1/16	4" 1/16
RJ	457	483	533	589	737
F	440	453	473	498	553

WEDGE GATE VALVES API 6A 20000

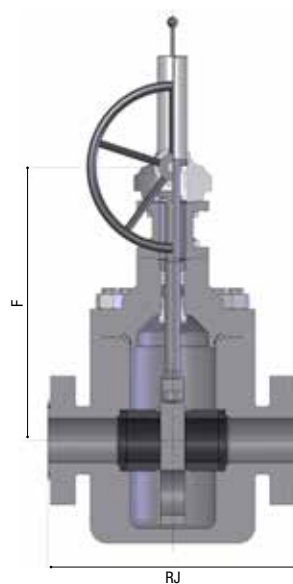
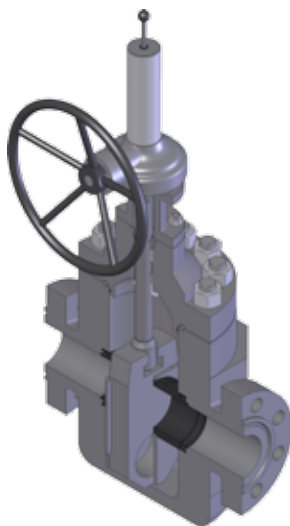
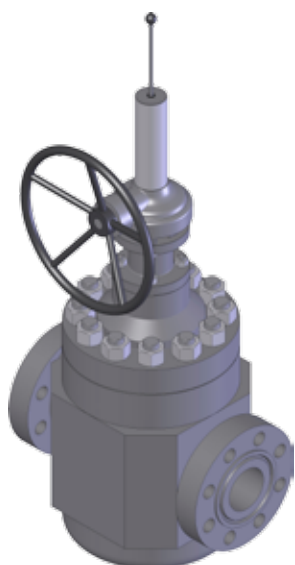
VW 20000: RJ - RING JOINT

SIZE	1" 13/16	2" 1/16	2" 9/16	3" 1/16
RJ	533	584	673	775
F	591	618	670	725

For size and pressure classes non mentioned in the above tables please contact ORION.

N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.



SINGLE DISC VALVES API 6A 10000

FW 10000: RJ - RING JOINT

SIZE	1" 13/16	2" 1/16	2" 9/16	3" 1/16	4" 1/16	5" 1/8	7" 1/16
RJ	464	521	565	619	670	737	889
F	574	586	609	672	763	862	985

SINGLE DISC VALVES API 6A 15000

FW 15000: RJ - RING JOINT

SIZE	1" 13/16	2" 1/16	2" 9/16	3" 1/16	4" 1/16
RJ	457	483	533	589	737
F	598	612	662	721	823

SINGLE DISC VALVES API 6A 20000

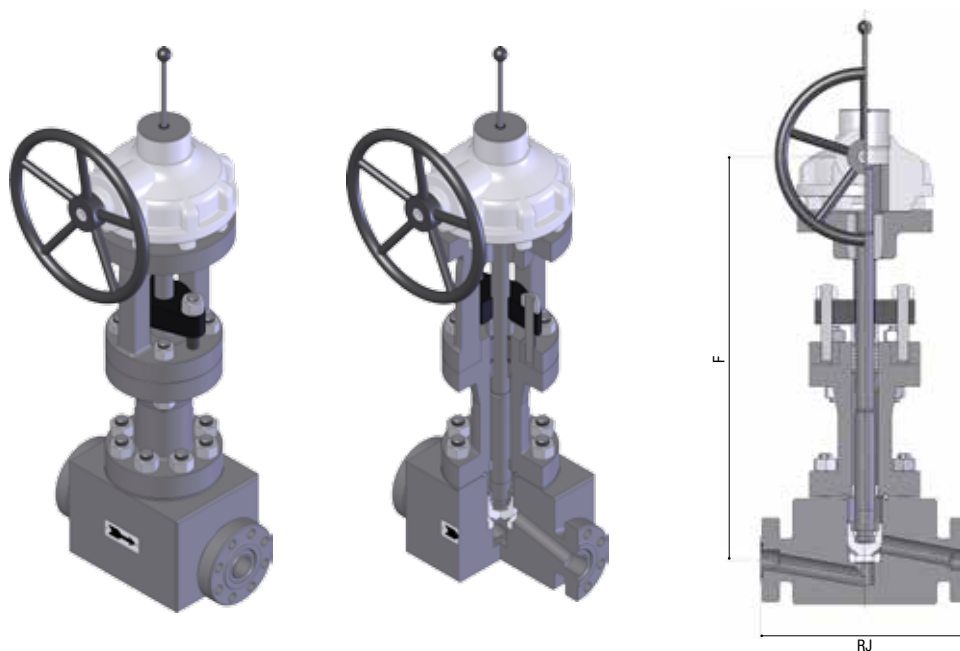
FW 20000: RJ - RING JOINT

SIZE	1" 13/16	2" 1/16	2" 9/16	3" 1/16
RJ	533	584	673	775
F	652	680	720	780

For size and pressure classes non mentioned in the above tables please contact ORION.

N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.



GLOBE VALVES API 6A 10000

GW 10000: RJ - RING JOINT

SIZE	1" 13/16	2" 1/16	2" 9/16	3" 1/16	4" 1/16	5" 1/8	7" 1/16
RJ	464	521	565	619	670	737	889
F	418	422	448	471	544	622	766

GLOBE VALVES API 6A 15000

GW 15000: RJ - RING JOINT

SIZE	1" 13/16	2" 1/16	2" 9/16	3" 1/16	4" 1/16
RJ	457	483	533	589	737
F	421	451	512	572	639

GLOBE VALVES API 6A 20000

GW 20000: RJ - RING JOINT

SIZE	1" 13/16	2" 1/16	2" 9/16	3" 1/16
RJ	533	584	673	775
F	552	570	624	678

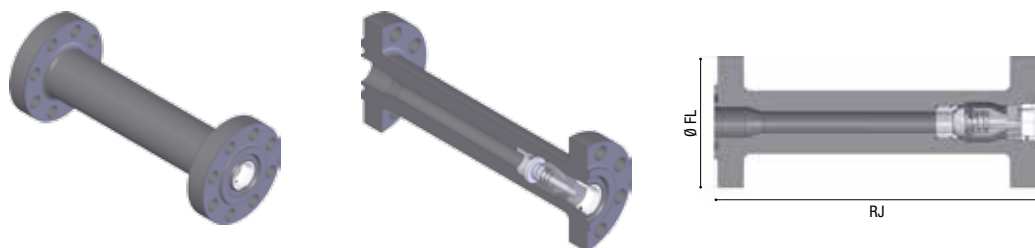
*API 6A Globe Valves are available in standard configuration or extended bonnet as well.

The above pictures represent extended bonnet version for cryogenic service.

For size and pressure classes non mentioned in the above tables please contact ORION.

N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.



AXIAL VALVES API 6A 10000

RB 10000: RJ - RING JOINT

SIZE	1" 13/16	2" 1/16	2" 9/16	3" 1/16	4" 1/16	5" 1/8	7" 1/16
RJ	464	521	565	619	670	737	889
Ø FL	185	200	230	270	315	360	480

AXIAL VALVES API 6A 15000

RB 15000: RJ - RING JOINT

SIZE	1" 13/16	2" 1/16	2" 9/16	3" 1/16	4" 1/16
RJ	457	483	533	589	737
F	210	220	255	290	360

AXIAL VALVES API 6A 20000

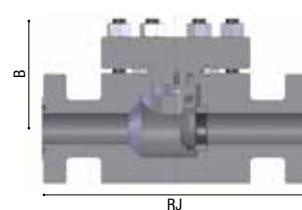
RB 20000: RJ - RING JOINT

SIZE	1" 13/16	2" 1/16	2" 9/16	3" 1/16
RJ	533	584	673	775
F	255	285	325	355

For size and pressure classes non mentioned in the above tables please contact ORION.

N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.



CHECK VALVES API 6A 10000

RW 10000: RJ - RING JOINT

SIZE	1" 13/16	2" 1/16	2" 9/16	3" 1/16	4" 1/16	5" 1/8	7" 1/16
RJ	464	521	565	619	670	737	889
B	107	115	131	146	176	208	266

CHECK VALVES API 6A 15000

RW 15000: RJ - RING JOINT

SIZE	1" 13/16	2" 1/16	2" 9/16	3" 1/16	4" 1/16
RJ	457	483	533	589	737
B	121	127	144	158	203

CHECK VALVES API 6A 20000

RW 20000: RJ - RING JOINT

SIZE	1" 13/16	2" 1/16	2" 9/16	3" 1/16
RJ	533	584	673	775
B	145	165	184	195

For size and pressure classes non mentioned in the above tables please contact ORION.

N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.

ORION STEEL VALVES

Pressure Seal Valves

Pressure Seal Bonnet Gate Valves •
ASME B16.34/API 600

Pressure Seal Bonnet Globe Valves •
ASME B16.34/BS 1873

Pressure Seal Cover Swing Check Valves •
ASME B16.34/BS 1868

Pressure Seal Cover Tilting Disc Check Valves •
ASME B16.34/BS 1868

Pressure Seal Bonnet Gate Double Disc •
ASME B16.34/API 600



PRESSURE SEAL BONNET GATE VALVES

ASME B16.34/API 600 - p. 106

Class ASME 600 (PN 100) • 900 (PN 150) • 1500 (PN 250) • 2500 (PN 420)

PRESSURE SEAL BONNET GLOBE VALVES

ASME B16.34/API 1873 - p. 112

Class ASME 600 (PN 100) • 900 (PN 150) • 1500 (PN 250) • 2500 (PN 420)

PRESSURE SEAL COVER SWING CHECK VALVES

ASME B16.34/API 1868 - p. 118

Class ASME 600 (PN 100) • 900 (PN 150) • 1500 (PN 250) • 2500 (PN 420)

PRESSURE SEAL COVER TILTING DISC CHECK VALVES - TOP ENTRY

ASME B16.34/API 1868 - p. 122

Class ASME 600 (PN 100) • 900 (PN 150) • 1500 (PN 250) • 2500 (PN 420)

PRESSURE SEAL BONNET GATE DOUBLE DISC

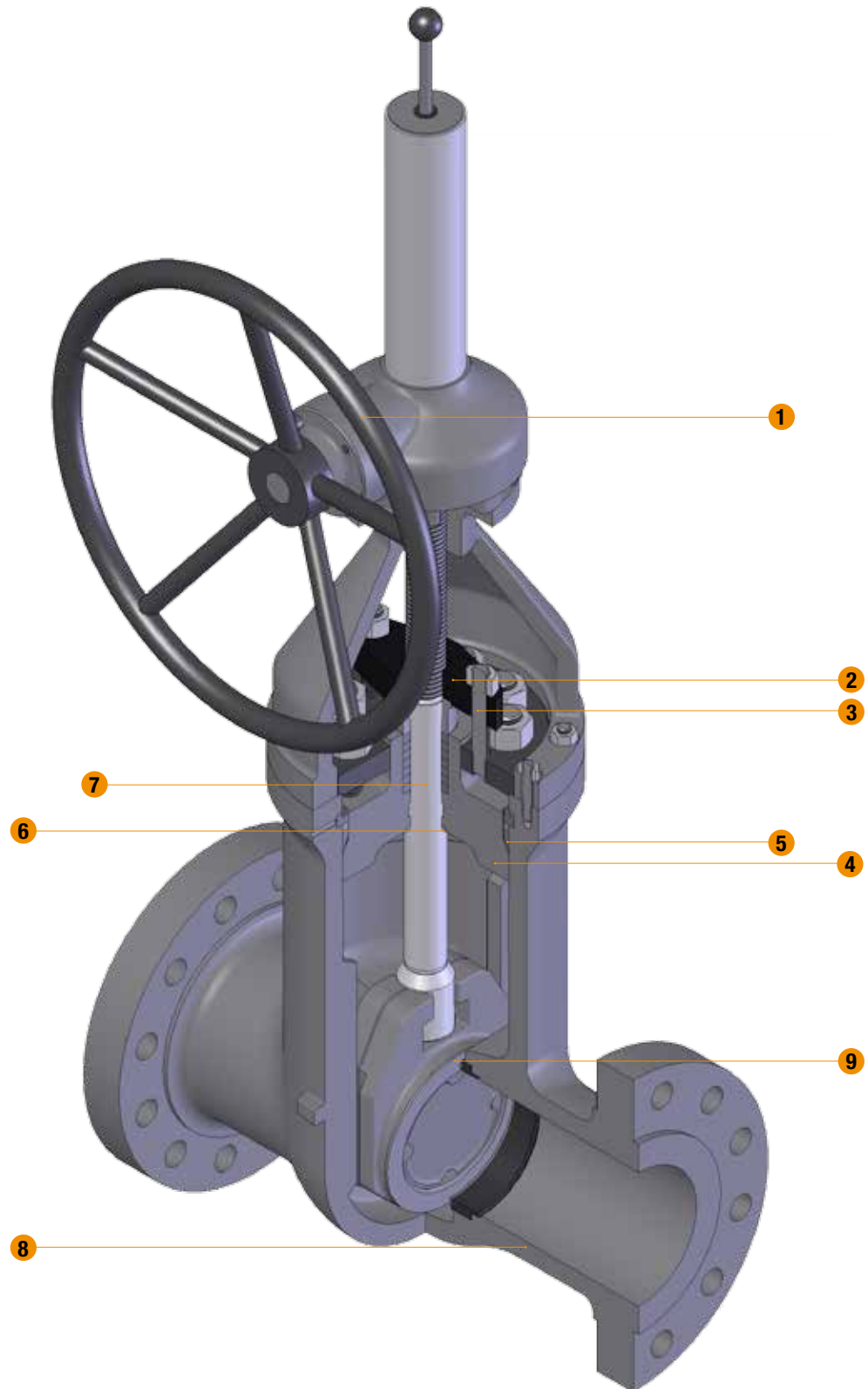
ASME B16.34/API 600 - p. 126

Class ASME 600 (PN 100) • 900 (PN 150) • 1500 (PN 250) • 2500 (PN 420)

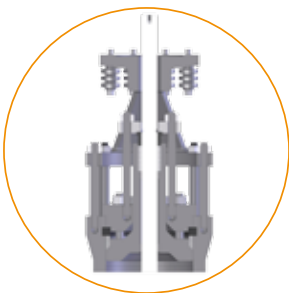
ORION STEEL VALVES

Pressure Seal Bonnet Gate Valves

ASME B16.34/API 600



EXTENDED BONNET
FOR HIGH TEMPERATURE



CAST OR CARBON ALLOY STEEL, OUTSIDE SCREW AND YOKE, RISING STEM, NON-RISING HANDWHEEL, WELDED-IN SEAT RINGS, REMOVABLE YOKE SLEEVE, GLAND REPACKING UNDER PRESSURE.

- 1 OPERATOR**

The spoked handwheel is fabricated from steel pipe. The hub is coupled to the yoke sleeve by means of a key. Larger valves are equipped with a bevel or spur gear gearbox unit.
- 2 GLAND AND FLANGE**

They are in forged steel and are supplied in two pieces, self aligning design to allow the gland to slide parallel to the stem even if the eyebolts are unevenly tightened.
- 3 GLAND BOLTS AND NUTS**

The forged steel gland bolts are of the eyebolt type which can be swung outward for ease of gland repacking. They are fixed to the bonnet by hinge pins.
- 4 BONNET**

It is machined in the same grade of the body or in superior alloys, if required. The pressure seal design keeps it tight to the body at high pressures even if bolts are loose or material dilatation occurs. It can be cast or machined from bar. It incorporates a stuffing box sized in accordance with the API standard, and in case can be extended for very high temperature applications. A locking flange with a set of bolts pulls the bonnet outward, against the gasket, giving a preload for initial sealing between body and bonnet.
- 5 PRESSURE SEAL RING**

It is basically supplied in graphite for best fit up to class 1500 and in AISI 316L stainless steel for 2500, carefully machined to provide a perfect tight seal. Upon request, AISI 316L can be installed on every pressure rating.
- 6 BACKSEAT**

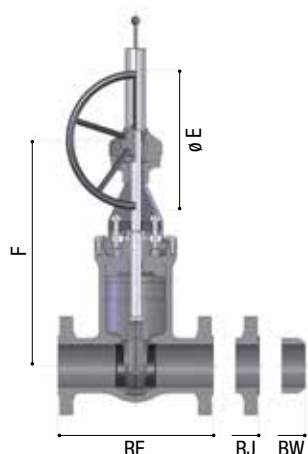
It is integral with the bonnet and hardfaced and will provide a perfect tight seal between stem and bonnet, which will allow emergency repacking operation even under pressure.
- 7 STEM**

The stem is part of the trim and is available in a wide range of materials in accordance to API 600 or customer's requirements. The stem is provided with a T-shaped head. A ground backseat is provided to ensure a perfectly tight seal to the stuffing box when the valve is fully open. The stem is highly finished in order to minimize friction and prevent damage to the packing. The thread is trapezoidal ACME type. All the stem sizes comply with the API 600 standard.
- 8 BODY**

The body is in carbon or stainless steel and is available in many other CRA. It is carefully designed for total reliability, low pressure drop and simple maintenance. The basic dimension, i.e. wall thickness, face to face and flanges comply with the relevant API and ASME standards. Wall thickness and design can be both B16.34 or API600. The body neck is cylindrical in order to host the pressure seal bonnet. The body is basically supplied with renewable welded-in seats. Bosses are provided for drain taps or by-pass piping. The internal surfaces in contact with the fluid can be fully lined or clad for improved corrosion or erosion resistance.
- 9 WEDGE**

The wedge is the main part of the trim. It is forged steel, alloy or cast. It is normally supplied as flexible wedge type for improved seating and unseating capability. It is connected to the stem by means of a T-shaped joint. The guides on each side of the wedge are machined. Special care is given to the seating surfaces which are ground and lapped, integral or hardfaced. A cladding or lining can be applied to the wedge to improve its resistance against erosive and corrosive environments. It can be machined with the flexible option.
- INSTALLATION REMARKS**

Pressure seal valves are best fit for vertical stem / horizontal flow installation. Special cases can be evaluated and developed on request.



Class ASME 600 (PN 100)

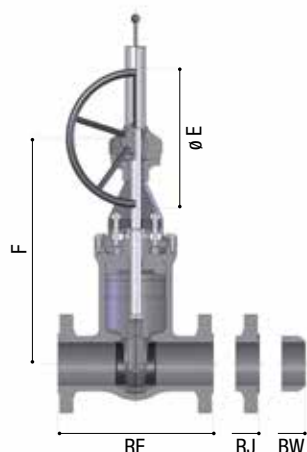
FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

SZ 600: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	292	356	432	559	660	787	838	889	991
BW (short)	178	254	305	457	584	711	813	/	/
RJ	295	359	435	562	663	790	841	892	994
C-closed	403	487	571	848	946	1.140	1.315	1.427	1.665
D-open	459	571	683	1.010	1.164	1.398	1.634	1.779	2.106
E	300	350	350	BG	BG	BG	BG	BG	BG
F	/	/	/	811	957	1.128	1.382	1.496	1.650
Approximate WEIGHT (Kg)									
FLANGED	24	48	87	182	313	541	876	1.211	1.546
BW	17	35	60	133	242	426	745	1.064	1.383

SIZE	18"	20"	22"	24"	26"	28"	30"	32"	34"
RF-BW	1.092	1.194	1.295	1.397	1.448	1.549	1.651	1.778	1.930
BW (short)	/	/	/	/	/	/	/	/	/
RJ	1.095	1.200	1.305	1.407	1.461	1.562	1.664	1.794	1.946
C-closed	1.840	2.015	2.190	2.365	2.540	2.715	2.890	3.065	3.240
D-open	2.342	2.578	2.814	3.050	3.286	3.522	3.758	3.994	4.230
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.824	1.998	2.172	2.346	2.520	2.694	2.868	3.042	3.216
Approximate WEIGHT (Kg)									
FLANGED	1.881	2.216	2.551	2.886	3.221	3.556	3.891	4.226	4.561
BW	1.702	2.021	2.340	2.659	2.978	3.297	3.616	3.935	4.254

SIZE	36"
RF-BW	2.082
BW (short)	/
RJ	2.099
C-closed	3.415
D-open	4.466
E	BG
F	3.390
Approximate WEIGHT (Kg)	
FLANGED	4.896
BW	4.573



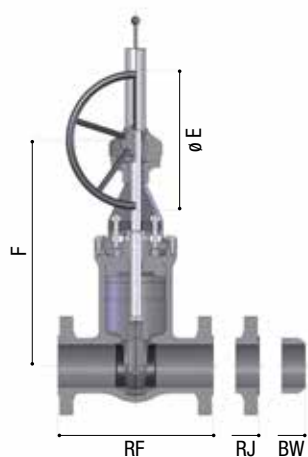
Class ASME 900 (PN 150)

FIGURE NUMBERS - CLASS ASME 900 - ALL SIZES

SZ 900: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	368	381	457	610	737	838	965	1.029	1.130
BW (short)	216	305	356	508	660	787	914	991	1.092
RJ	371	384	460	613	740	841	968	1.039	1.140
C-closed	416	480	594	829	948	1.096	1.156	1.480	1.783
D-open	476	558	698	982	1.143	1.356	1.316	1.795	2.171
E	300	350	450	BG	BG	BG	BG	BG	BG
F	/	/	/	808	907	1.224	1.275	1.433	1.894
Approximate WEIGHT (Kg)									
FLANGED	28	66	130	210	289	620	962	1.588	2.213
BW	21	50	101	171	240	466	822	1.388	1.953

SIZE	18"	20"	24"	26"	28"	30"	32"	34"	36"
RF-BW	1.219	1.321	1.549	1.676	1.803	1.930	1.981	2.032	2.083
BW (short)	/	/	/	/	/	/	/	/	/
RJ	1.232	1.334	1.568	/	/	/	/	/	/
C-closed	1.765	1.900	2.384	2.360	2.536	2.712	2.888	2.903	3.239
D-open	2.193	2.345	2.921	2.999	3.229	3.459	3.689	3.709	4.229
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.732	1.972	2.354	2.431	2.609	2.788	2.966	3.070	3.610
Approximate WEIGHT (Kg)									
FLANGED	2.839	3.465	4.090	/	/	/	/	/	/
BW	2.519	3.085	3.650	7.731	8.564	9.396	10.228	11.061	11.893



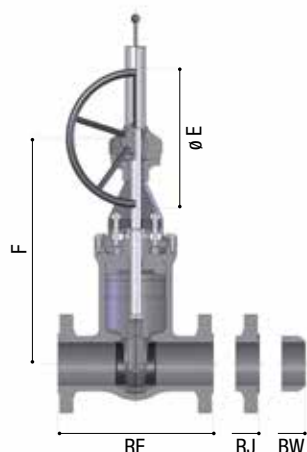
Class ASME 1500 (PN 250)

FIGURE NUMBERS - CLASS ASME 1500 - ALL SIZES

SZ 1500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	368	470	546	705	832	991	1.130	1.257	1.384
BW (short)	216	305	406	559	711	864	991	1.067	1.194
RJ	371	422	473	549	711	842	1.001	1.146	1.276
C-closed	376	480	594	775	1.064	1.189	1.316	1.586	1.777
D-open	428	558	698	930	1.256	1.433	1.606	1.898	2.130
E	300	350	BG	BG	BG	BG	BG	BG	BG
F	/	/	614	764	1.135	1.174	1.459	1.745	1.909
Approximate WEIGHT (Kg)									
FLANGED	32	90	144	330	638	1.072	1.783	2.493	3.204
BW	23	58	105	243	490	822	1.388	1.953	2.519

SIZE	18"	20"	24"	26"	28"	30"	32"	34"	36"
RF-BW	1.537	1.664	1.943	2.090	2.237	2.383	2.525	2.666	2.808
BW (short)	1.346	1.473	/	/	/	/	/	/	/
RJ	1.406	1.559	/	/	/	/	/	/	/
C-closed	1.840	1.959	2.384	2.567	2.750	2.933	3.116	3.299	3.482
D-open	2.240	2.468	2.921	3.154	3.387	3.620	3.853	4.086	4.319
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.998	2.156	2.693	2.655	2.899	3.143	3.387	3.631	3.875
Approximate WEIGHT (Kg)									
FLANGED	4.056	5.484	8.340	/	/	/	/	/	/
BW	3.380	4.570	6.950	8.140	9.330	10.520	11.710	12.900	14.090



Class ASME 2500 (PN 420)

FIGURE NUMBERS - CLASS ASME 900 - ALL SIZES

SZ 2500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	6"	8"	10"	12"	14"
RF-BW	451	508	578	673	914	1.022	1.270	1.422	1.637
BW (short)	279	330	368	457	610	762	914	1.041	1.118
RJ	454	514	584	683	927	1.038	1.292	1.444	/
C-closed	487	467	594	684	9.52	1.202	1.453	1.716	1.904
D-open	564	657	666	775	1.086	1.368	1.666	1.967	2.182
E	300	350	BG	BG	BG	BG	BG	BG	BG
F	/	/	606	676	1.041	1.191	1.549	1.876	2.018
Approximate WEIGHT (Kg)									
FLANGED	98	123	147	196	587	1.960	2.217	3.396	/
BW	70	88	105	140	419	1.400	1.584	2.426	2.511

SIZE	16"	18"	20"	24"	26"
RF-BW	1.756	2.024	2.218	2.606	2.800
BW (short)	1245	1397	/	/	/
RJ	/	/	/	/	/
C-closed	2.004	2.148	2.292	2.615	2.724
D-open	2.313	2.421	2.583	3.092	3.069
E	BG	BG	BG	BG	BG
F	2.134	2.107	2.249	2.835	2.675
Approximate WEIGHT (Kg)					
FLANGED	/	/	/	/	/
BW	2.595	2.680	2.764	2.934	3.019

For size and pressure classes non mentioned in the above tables please contact ORION.

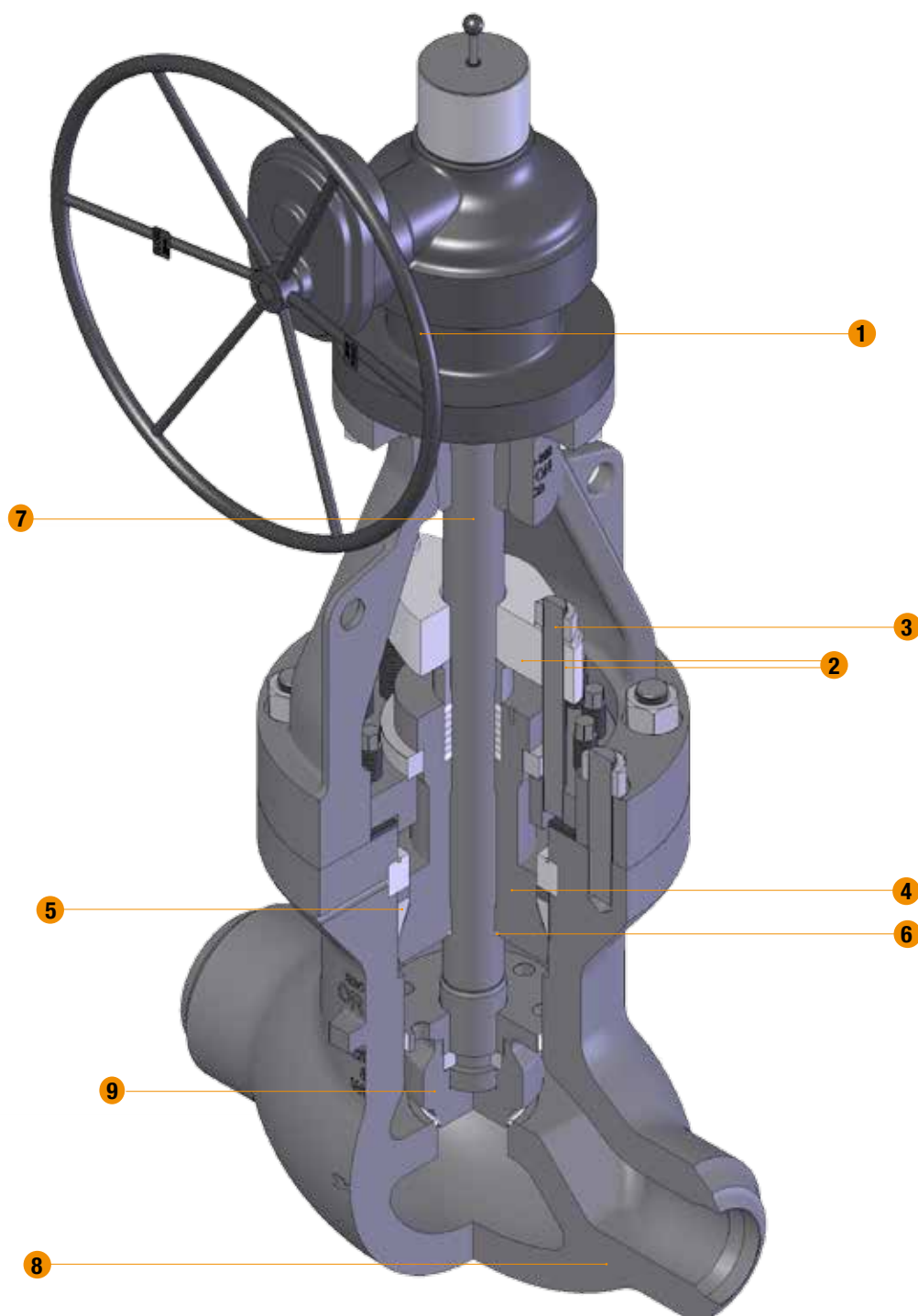
N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.

ORION STEEL VALVES

Pressure Seal Bonnet Globe Valves

ASME B16.34/BS 1873



CAST OR CARBON ALLOY STEEL, OUTSIDE SCREW AND YOKE, RISING STEM, GUIDED SWIVEL PLUG DISC, WELDED-IN SEAT RING, GLAND REPACKING UNDER PRESSURE.

- 1 OPERATOR**

The spoked handwheel is fabricated from steel pipe. The hub is coupled to the yoke sleeve by means of a key. Larger valves are equipped with a bevel or spur gear gearbox unit.
- 2 GLAND AND FLANGE**

They are in forged steel and are supplied in two pieces, self aligning design in order to allow the gland to slide parallel to the stem even if the eyebolts are unevenly tightened.
- 3 GLAND BOLTS AND NUTS**

The forged steel gland bolts are of the eyebolt type which can be swung outward for ease of gland repacking. They are fixed to the bonnet by hinge pins.
- 4 BONNET**

It is machined in the same grade of the body or in superior alloys, if required. The pressure seal design keeps it tight to the body at high pressures even if bolts are loose or material dilatation occurs. It can be cast or machined from bar. It incorporates a stuffing box sized in accordance with the BS standard, and in case can be extended for very high temperature applications. A locking flange with a set of bolts pulls the bonnet outward, against the gasket, giving a preload for initial sealing between body and bonnet.
- 5 PRESSURE SEAL RING**

It is basically supplied in graphite for best fit up to class 1500 and in AISI 316L stainless steel for 2500, carefully machined to provide a perfect tight seal. Upon request, AISI 316L can be installed on every pressure rating. It is integral with the bonnet and hardfaced and will provide a perfect tight seal between stem and bonnet, which will allow emergency repacking operation even under pressure.
- 6 BACKSEAT**

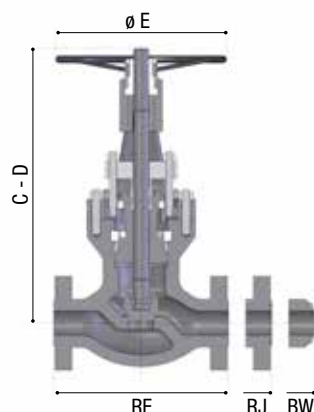
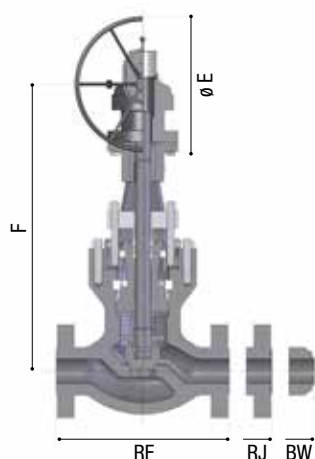
It is integral with the bonnet and hardfaced and will provide a perfect tight seal between stem and bonnet, which will allow emergency repacking operation even under pressure.
- 7 STEM**

The stem is part of the trim and is available in a wide range of material in accordance with BS1873, API 600 or customer's requirements. The stem is provided with a ground backseat in order to ensure a perfectly tight seal to the stuffing box when the valve is fully open. The stem is highly finished in order to minimize friction and prevent damage to the packing. The thread is trapezoidal ACME type. All the stem sizes comply with the BS 1873 standard.
- 8 BODY**

The body is in carbon or stainless steel and is also available in many other CRA. It is carefully designed for total reliability and simple maintenance. The basic dimension, i.e. wall thickness, face to face, butt-weld ends and flanges comply with the relevant BS and ASME standards. The body neck is cylindrical in order to host the pressure seal bonnet. Disc guides are integral, and the seat ring can be hardfaced integrally or threaded and welded in the body. The connection ends are typically butt welding type for high temperature applications.
- 9 DISC**

The disc is the main part of the trim. It is connected to the stem by means of a swiveling half rings coupling and is guided in the body from 4" and above. The standard sealing profile is a spherical surface seating against a conical seat. If required a conical to conical seating can be supplied, and for flow throttling operations a regulating disc is adopted, shaped in order to give a linear opening. The stop check execution shows an externally guided disc, disconnected from the stem. A cladding or lining can be applied to larger discs to improve its resistance against erosive and corrosive environments.
- INSTALLATION REMARKS**

Pressure seal valves are best fit for vertical stem / horizontal flow installation. Special cases can be evaluated and developed on request.



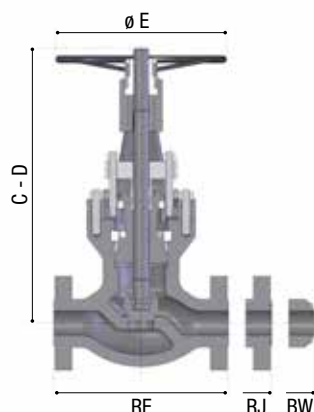
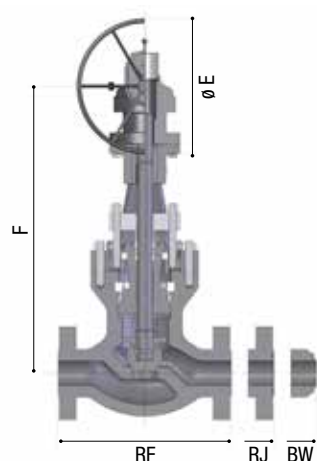
Class ASME 600 (PN 100)

FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

GZ 600: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	292	356	432	559	660	787	838	889	991
BW (short)	178	254	305	457	584	711	813	/	/
RJ	295	359	435	562	663	790	841	892	994
C-closed	427	521	616	806	995	1.121	1.247	1.373	1.499
D-open	456	559	662	869	1.075	1.221	1.367	1.513	1.659
E	300	350	400	BG	BG	BG	BG	BG	BG
F	/	/	/	824	844	986	1.128	1.269	1.410
Approximate WEIGHT (Kg)									
FLANGED	24	53	92	232	396	625	843	1.265	1.686
BW	18	40	68	178	325	510	680	1.020	1.360

SIZE	18"	20"	22"	24"	26"	28"
RF-BW	1.092	1.194	1.295	1.397	1.448	1.600
BW (short)	/	/	/	/	/	/
RJ	1.095	1.200	1.305	1.407	1.473	1.625
C-closed	1.625	1.751	1.877	2.003	2.129	2.255
D-open	1.805	1.951	2.097	2.243	2.389	2.535
E	BG	BG	BG	BG	BG	BG
F	1.552	1.694	1.835	1.976	2.118	2.259
Approximate WEIGHT (Kg)						
FLANGED	2.232	2.976	3.720	4.464	5.208	5.952
BW	1.800	2.400	3.000	3.600	4.200	4.800



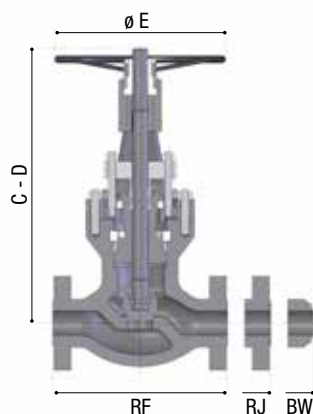
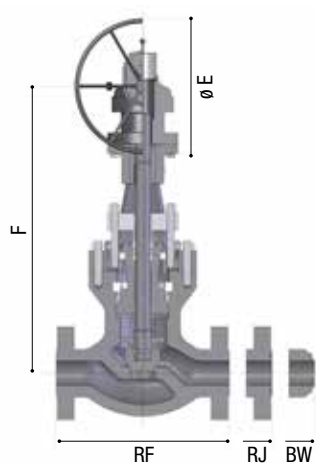
Class ASME 900 (PN 150)

FIGURE NUMBERS - CLASS ASME 900 - ALL SIZES

GZ 900: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	368	381	457	610	737	838	965	1.029	1.130
BW (short)	/	305	356	508	660	787	914	991	1.092
RJ	371	384	460	613	740	841	968	1.039	1.140
C-closed	428	575	739	1.070	1.398	1.474	1.549	1.625	1.700
D-open	468	613	753	1.038	1.322	1.421	1.520	1.620	1.719
E	400	500	BG	BG	BG	BG	BG	BG	BG
F	/	/	748	910	1.072	1.233	1.371	1.509	1.646
Approximate WEIGHT (Kg)									
FLANGED	34	77	149	399	694	843	1.265	1.897	2.530
BW	25	61	120	306	560	680	1.020	1.530	2.040

SIZE	18"	20"	24"
RF-BW	1.219	1.321	1.549
BW (short)	/	/	/
RJ	1.238	1.334	1.562
C-closed	1.776	1.852	2.002
D-open	1.818	1.917	2.116
E	BG	BG	BG
F	1.784	1.922	2.197
Approximate WEIGHT (Kg)			
FLANGED	3.348	4.464	6.696
BW	2.700	3.600	5.400



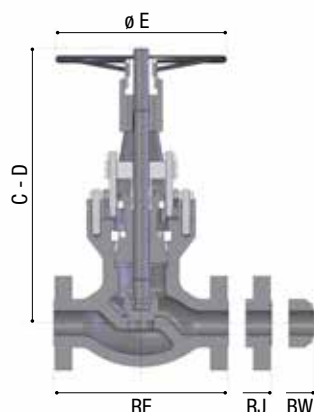
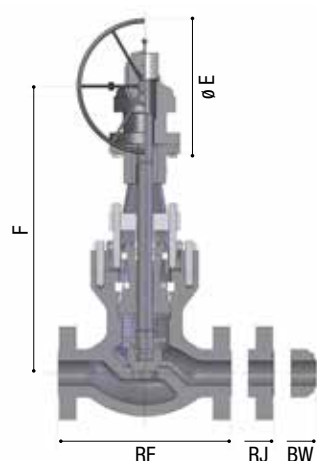
Class ASME 1500 (PN 250)

FIGURE NUMBERS - CLASS ASME 1500 - ALL SIZES

GZ 1500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	368	470	546	705	832	991	1.130	1.257	1.384
BW (short)	/	305	356	508	660	787	914	991	1.092
RJ	371	473	549	711	842	1.001	1.146	1.276	1.406
C-closed	538	575	683	1.119	1.092	1.336	1.421	1.719	2.018
D-open	578	613	728	1.220	1.248	1.466	2.036	2.196	2.356
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	560	588	797	1.089	1.270	1.454	1.640	1.825	2.011
Approximate WEIGHT (Kg)									
FLANGED	54	87	160	571	1.064	1.423	2.128	3.192	4.256
BW	40	61	120	438	800	1.070	1.600	2.400	3.200

SIZE	18"	20"	24"
RF-BW	1.537	1.664	1.943
BW (short)	/	/	/
RJ	1.559	1.686	1.971
C-closed	2.316	2.615	3.211
D-open	2.516	2.713	3.329
E	BG	BG	BG
F	2.195	2.380	2.751
Approximate WEIGHT (Kg)			
FLANGED	5.586	7.448	11.305
BW	4.200	5.600	8.500



Class ASME 2500 (PN 420)

FIGURE NUMBERS - CLASS ASME 2500 - ALL SIZES

GZ 2500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	451	578	673	914	1.022	1.270	1.422	1.638	1.831
B (short)	216	305	406	559	711	864	991	1.067	1.194
RJ	454	584	683	927	1.038	1.292	1.444	/	/
C-closed	786	1.050	1.222	1.566	1.910	2.254	2.598	2.942	3.286
D-open	864	1.122	1.306	1.674	2.042	2.400	2.778	3.146	3.514
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	653	836	1.018	1.383	1.613	1.847	2.083	2.318	2.554
Approximate WEIGHT (Kg)									
FLANGED	86	186	306	838	1.729	2.394	3.724	/	/
BW	65	140	230	630	1.300	1.800	2.800	3.650	4.400

For size and pressure classes non mentioned in the above tables please contact ORION.

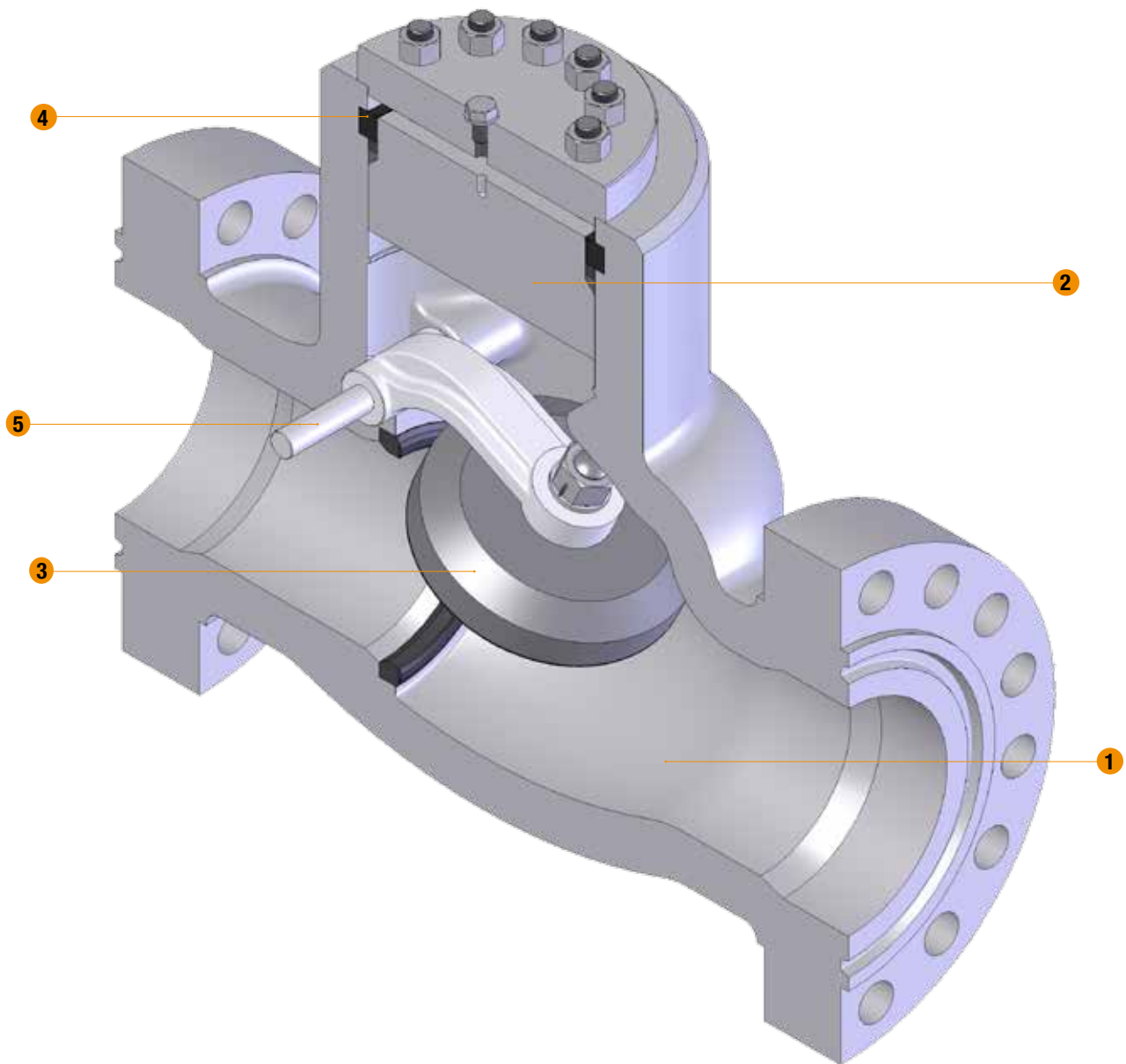
N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.

ORION STEEL VALVES

Pressure Seal Cover Swing Check Valves

ASME B16.34/BS 1868



CAST CARBON OR ALLOY STEEL, SWING TYPE DISC, RENEWABLE SEAT RING.

1 BODY

The body is in carbon or stainless steel and is also available in many other CRA. It is carefully designed for total reliability, to keep the pressure drops to a minimum and simple maintenance. The basic dimensions, wall thickness, face to face and flanges, comply with the relevant BS, API and ASME standards. The body neck is cylindrical in order to host the pressure seal bonnet. The seat is welded in or threaded if required and an integral over-travel stop for the disc is incorporated. Two threaded bosses are provided for the location of the hinge pin, closed by threaded or welded plugs for absolute tightness in temperature. Valves are eventually provided with drain threaded or welded connection. The connection ends are typically butt-welding type for high temperature applications.

2 COVER

The cover is in forged or cast steel. It is cylindrical, generally machined from bar-stock material and accommodates a conical surface for body gasket seating at the lower peripheral edge. A locking flange with a set of bolts pulls the cover outward, against the gasket, giving a preload for initial sealing.

3 DISC

The disc is part of the trim and is in forged or cast steel. Opposite to the seating surface there is a threaded spigot for the connection to the hinge arm by a nut and cotter pin. The seating surface is ground and lapped.

4 PRESSURE SEAL RING

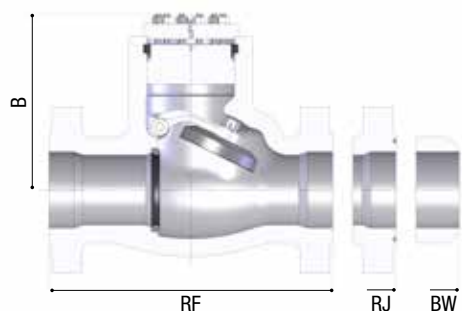
It is basically supplied in graphite for best fit up to class 1500 and in AISI 316L stainless steel for 2500, carefully machined to provide a perfect tight seal. Upon request, AISI 316L can be installed on every pressure rating.

5 HINGE PIN

The hinge pin is part of the trim. It is machined from ground bar in stainless steel. The hinge pin is centred in the body with two threaded NPT plugs. The pin can be easily removed for valve maintenance. If welded plugs are required, a better tightness and safety is ensured, despite of accessibility. On larger valves, blind flanges or pressure seal blinds are provided as well.

INSTALLATION REMARKS

Swing check valves are best fit for horizontal pipeline installation. For small valve sizes, a vertical installation (up to 4 ") with upward flow only is still possible, but for heavier weights of discs chattering and high noise issues can occur, so far balanced discs are more indicated (tilting type) in vertical applications. Check anyway with ORION if the valve is suitable for the desired installed position.



Class ASME 600 (PN 100)

FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

RC 600: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	292	356	432	559	660	787	838	889	991
RJ	295	359	435	562	664	791	841	892	994
B	203	234	265	327	388	450	475	537	634
Approximate WEIGHT (Kg)									
FLANGED	31	57	103	241	252	342	518	691	864
BW	19	43	78	183	191	261	393	524	656

SIZE	18"	20"	22"	24"	26"	28"	30"	32"	34"
RF-BW	1.069	1.433	2.163	2.163	2.772	3.381	3.991	4.600	5.209
RJ	901	1.224	1.871	1.871	2.440	3.010	3.579	4.149	4.718
B	710	788	846	904	959	1.013	1.068	822	1.177
Approximate WEIGHT (Kg)									
FLANGED	1.069	1.433	2.163	2.163	2.772	3.381	3.991	4.600	5.209
BW	901	1.224	1.871	1.871	2.440	3.010	3.579	4.149	4.718

SIZE	36"
RF-BW	2.083
RJ	2.111
B	1.232
Approximate WEIGHT (Kg)	
FLANGED	5.819
BW	5.288

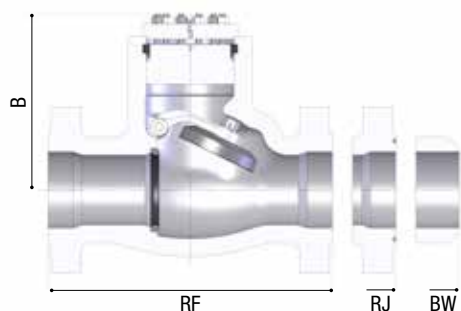
Class ASME 900 (PN 150)

FIGURE NUMBERS - CLASS ASME 900 - ALL SIZES

RC 900: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	368	381	457	610	737	838	965	1.029	1.130
RJ	372	384	460	613	740	841	968	1.038	1.139
B	223	251	279	335	390	446	480	532	640
Approximate WEIGHT (Kg)									
FLANGED	37	68	123	289	454	620	786	951	1.117
BW	23	52	94	219	345	470	595	721	846

SIZE	20"	24"	26"	28"	36"
RF-BW	1.321	1.549	1.930	2.290	2.343
RJ	1.334	1.569	/	/	/
B	928	1.100	1.116	1.133	1.198
Approximate WEIGHT (Kg)					
FLANGED	1.448	1.780	/	/	/
BW	1.097	1.347	1.473	1.598	2.099



Class ASME 1500 (PN 250)

FIGURE NUMBERS - CLASS ASME 1500 - ALL SIZES

RC 1500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	368	470	546	705	832	991	1.130	1.257	1.384
RJ	372	473	549	711	841	1.000	1.146	1.276	1.407
B	246	204	255	355	421	480	593	679	765
Approximate WEIGHT (Kg)									
FLANGED	44	78	133	310	592	874	1.156	1.438	1.720
BW	27	52	94	242	444	646	848	1.050	1.252

Class ASME 2500 (PN 420)

FIGURE NUMBERS - CLASS ASME 2500 - ALL SIZES

RC 2500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	451	578	673	914	1.022	1.270	1.422	1.574	1.826
RJ	454	584	683	927	1.038	1.292	1.445	/	/
B	295	296	296	519	580	640	701	761	822
Approximate WEIGHT (Kg)									
FLANGED	81	109	137	386	636	885	1.305	/	/
BW	49	73	97	291	486	680	990	1.069	1.263

For size and pressure classes non mentioned in the above tables please contact ORION.

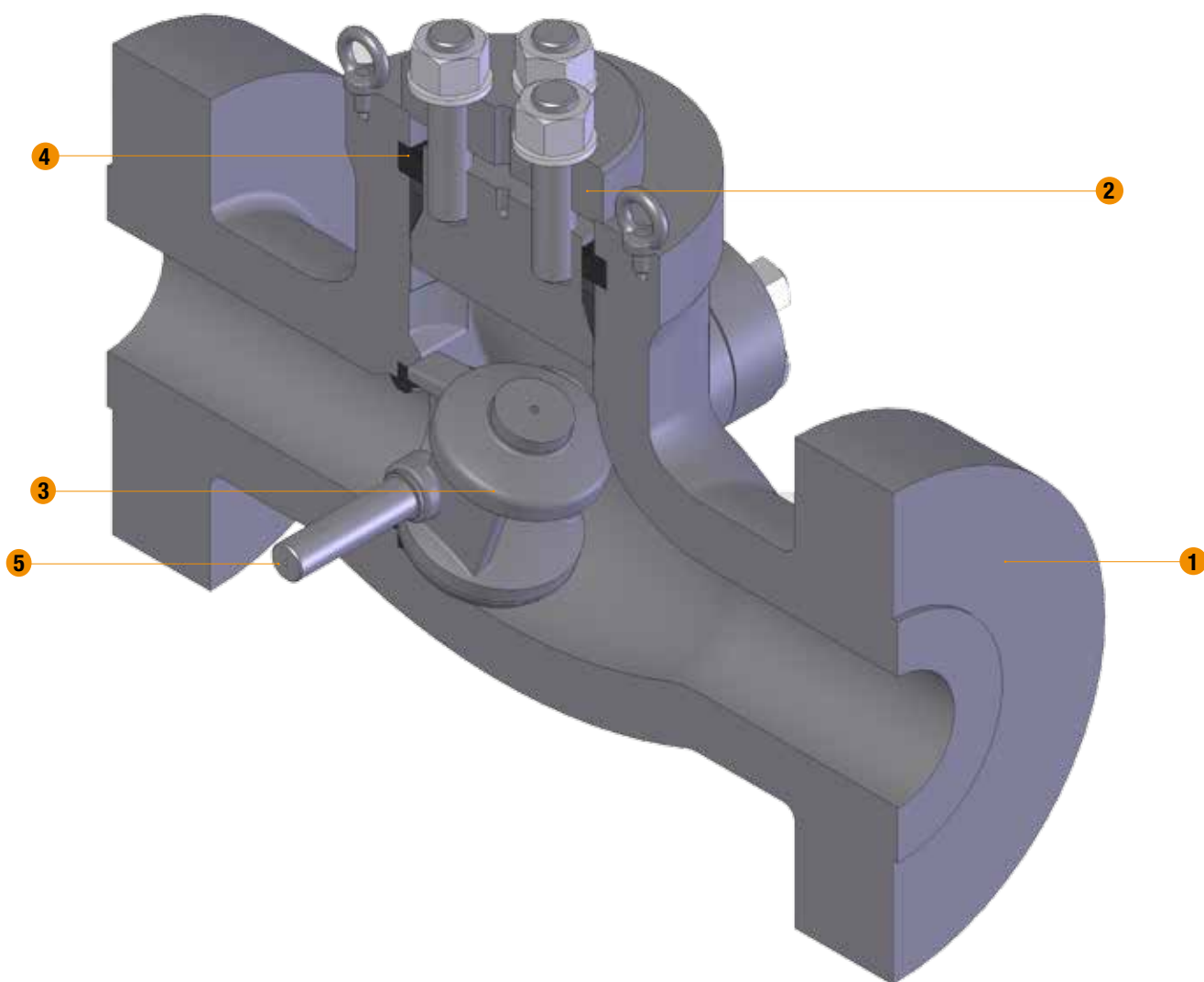
N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.

ORION STEEL VALVES

Pressure Seal Cover Tilting Disc Check Valves - Top Entry

ASME B16.34/BS 1868



CAST CARBON OR ALLOY STEEL, BALANCED DISC, NON SLAM EFFECT, RENEWABLE SEAT.

1 BODY

The body is in carbon or stainless steel and is also available in many other CRA. It is carefully designed for total reliability, to keep the pressure drops to a minimum and simple maintenance. The basic dimensions, wall thickness, face to face and flanges, comply with the relevant BS, API and ASME standards. The body neck is cylindrical in order to host the pressure seal bonnet. The seat is welded-in as a standard or is threaded upon request. Two flanged hubs are provided for the location of the hinge pins. Bosses are eventually provided for drain threaded connection.

2 COVER

The cover is in forged or cast steel. It is cylindrical, generally machined from bar-stock material and accommodates a conical surface for body gasket seating at the lower peripheral edge. A locking flange with a set of bolts pulls the cover outward, against the gasket, giving a preload for initial sealing.

3 DISC

The tilting disc is part of the trim. It is generally supplied as cast, machined from bar material for small sizes (up to 2"). The disc's balanced design allows to keep it in the open position by a minimum fluid flow and lets this one to return to closed position quickly, before flow reversal starts, and so far not causing a sudden water hammer effect (non slam effect). The conical seating surface is ground and lapped.

4 PRESSURE SEAL RING

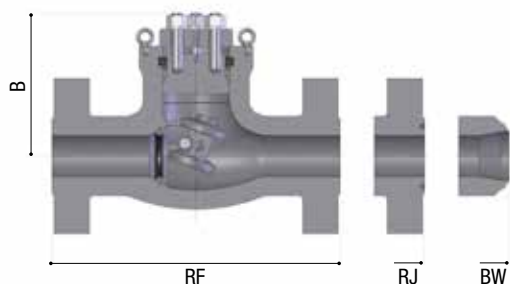
It is basically supplied in graphite for best fit up to class 1500 and in AISI 316L stainless steel for 2500, carefully machined to provide a perfect tight seal. Upon request, AISI 316L can be installed on every pressure rating.

5 HINGE PIN

The disc pins are part of the trim. They are in forged stainless steel machined from ground bar. The disc pins are held in position with two small blind flanges and they can be easily removed for valve maintenance.

INSTALLATION REMARKS

Tilting disc check valves are best fit for horizontal pipeline installation, thus they can be used even in vertical piping with upward flow. Check anyway with ORION if the valve is suitable for the desired installed position.



Class ASME 600 (PN 100)

FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

TS 600: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	292	356	432	559	660	787	838	889	991
RJ	295	359	435	562	664	791	841	892	994
B	103	124	159	226	316	305	355	584	674
Approximate WEIGHT (Kg)									
FLANGED	33	45	88	186	362	599	911	1.306	1.701
BW	17	27	72	126	259	427	658	943	1.228

SIZE	20"	24"	26"	28"	36"
RF-BW	1.194	1.397	1.448	1.549	2.083
RJ	1.200	1.407	1.473	1.574	2.111
B	764	854	896	941	1.120
Approximate WEIGHT (Kg)					
FLANGED	2.096	2.491	2.689	2.886	3.677
BW	1.514	1.799	1.942	2.085	2.655

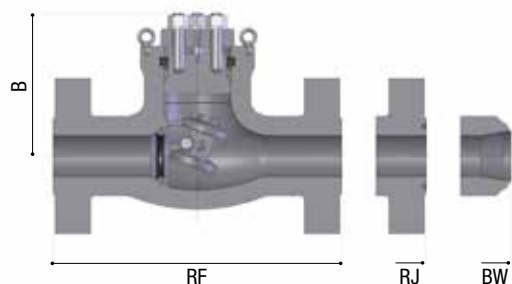
Class ASME 900 (PN 150)

FIGURE NUMBERS - CLASS ASME 900 - ALL SIZES

TS 900: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	368	381	457	610	737	838	965	1.029	1.130
RJ	372	384	460	613	740	841	968	1.038	1.139
B	117	141	181	256	359	347	403	665	767
Approximate WEIGHT (Kg)									
FLANGED	34	52	101	214	416	689	1.048	1.502	1.956
BW	18	31	72	145	298	490	756	1.085	1.413

SIZE	20"	24"	26"	28"	36"
RF-BW	1.321	1.549	1.930	2.290	2.343
RJ	1.334	1.569	/	/	/
B	869	971	1.022	1.073	1.277
Approximate WEIGHT (Kg)					
FLANGED	2.411	2.865	/	/	/
BW	1.741	2.069	2.233	2.397	3.054



Class ASME 1500 (PN 250)

FIGURE NUMBERS - CLASS ASME 1500 - ALL SIZES

TS 1500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	368	470	546	705	832	991	1.130	1.257	1.384
RJ	372	473	549	711	841	1.000	1.146	1.276	1.407
B	145	175	224	318	445	430	500	824	951
Approximate WEIGHT (Kg)									
FLANGED	36	65	127	270	524	868	1.320	1.893	2.465
BW	19	39	72	183	376	618	953	1.367	1.780

SIZE	18"	20"
RF-BW	1.537	1.664
RJ	1.558	1.685
B	1.077	1.204
Approximate WEIGHT (Kg)		
FLANGED	3.038	3.610
BW	2.194	2.607

Class ASME 2500 (PN 420)

FIGURE NUMBERS - CLASS ASME 2500 - ALL SIZES

TS 2500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	451	578	673	914	1.022	1.270	1.422	1.574	1.826
RJ	454	584	683	927	1.038	1.292	1.445	/	/
B	192	233	298	423	506	571	665	1.096	1.264
Approximate WEIGHT (Kg)									
FLANGED	40	65	303	1.067	1.255	1.731	2.207	/	/
BW	21	60	236	900	940	1.292	1.644	1.996	2.348

For size and pressure classes non mentioned in the above tables please contact ORION.

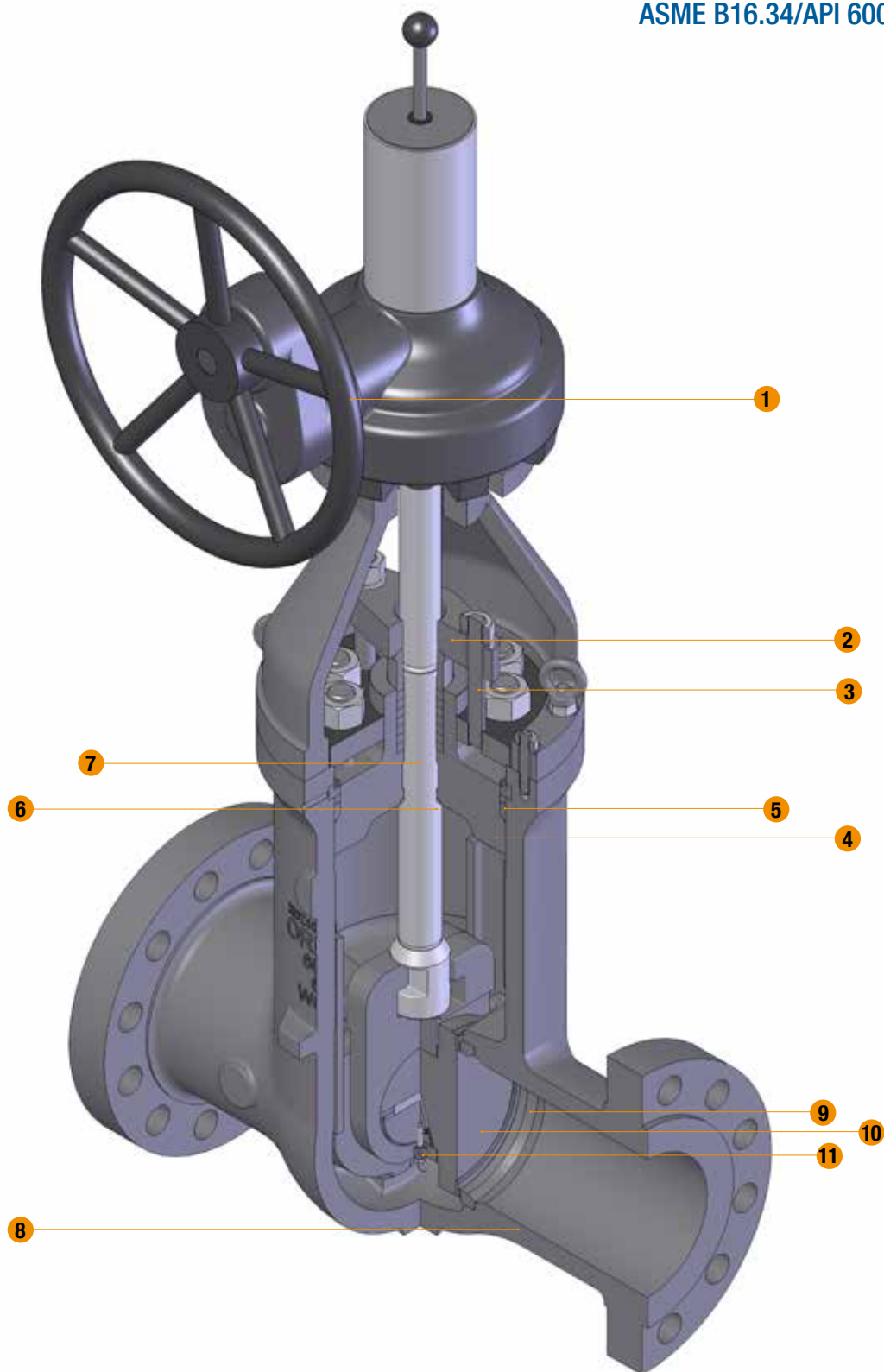
N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.

ORION STEEL VALVES

Pressure Seal Bonnet Gate Double Disc

ASME B16.34/API 600



CAST OR CARBON ALLOY STEEL, OUTSIDE SCREW AND YOKE, RISING STEM, NON-RISING HANDWHEEL, WELDED-IN SEAT RINGS, REMOVABLE YOKE SLEEVE, GLAND REPACKING UNDER PRESSURE.

- 1 OPERATOR**

The spoked handwheel is fabricated from steel pipe. The hub is coupled to the yoke sleeve by means of a key. Larger valves are equipped with a bevel or spur gear gearbox unit.
- 2 GLAND AND FLANGE**

They are in forged steel and are supplied in two pieces, self aligning design to allow the gland to slide parallel to the stem even if the eyebolts are unevenly tightened.
- 3 GLAND BOLTS AND NUTS**

The forged steel gland bolts are of the eyebolt type which can be swung outward for ease of gland repacking. They are fixed to the bonnet by hinge pins.
- 4 BONNET**

It is machined in the same grade of the body or in superior alloys, if required. The pressure seal design keeps it tight to the body at high pressures even if bolts are loose or material dilatation occurs. It can be cast or machined from bar. It incorporates a stuffing box sized in accordance with the API standard, and in case can be extended for very high temperature applications. A locking flange with a set of bolts pulls the bonnet outward, against the gasket, giving a preload for initial sealing between body and bonnet.
- 5 PRESSURE SEAL RING**

It is basically supplied in graphite for best fit up to class 1500 and in AISI 316L stainless steel for 2500, carefully machined to provide a perfect tight seal. Upon request, AISI 316L can be installed on every pressure rating.
- 6 BACKSEAT**

It is integral with the bonnet and hardfaced and will provide a perfect tight seal between stem and bonnet, which will allow emergency repacking operation even under pressure.
- 7 STEM**

The stem is part of the trim and is available in a wide range of materials in accordance to API 600 or customer's requirements. The stem is provided with a T-shaped head. A ground backseat is provided to ensure a perfectly tight seal to the stuffing box when the valve is fully open. The stem is highly finished in order to minimize friction and prevent damage to the packing. The thread is trapezoidal ACME type. All the stem sizes comply with the API 600 standard.
- 8 BODY**

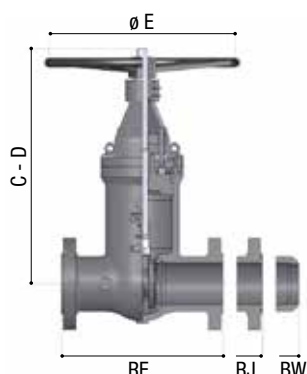
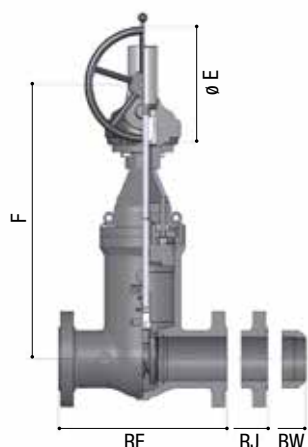
The body is in carbon or stainless steel and is available in many other CRA. It is carefully designed for total reliability, low pressure drop and simple maintenance. The basic dimension, i.e. wall thickness, face to face and flanges comply with the relevant API and ASME standards. Wall thickness and design can be both B16.34 or API600. The body neck is cylindrical in order to host the pressure seal bonnet. The body is basically supplied with renewable welded-in seats. Bosses are provided for drain taps or by-pass piping. The internal surfaces in contact with the fluid can be fully lined or clad for improved corrosion or erosion resistance.
- 9 SEAT RINGS**

The rings are part of the trim of the valve. Welded-in seat rings are supplied as a standard. The two seating surfaces in the closed position provide a seal against pressure from both ends of the valve. They can be externally threaded and internally notched for easy installation and dismantling. Special attention is given to the seating surfaces which are ground and lapped for a tight seal.
- 10 PARALLEL DISCS**

The wedge effect between the two discs converts downward stem force into axial force and forces the parallel discs firmly against the valve seats, providing a seal against pressure at both ends of the valve. The central yoke ring forces one of the two discs during seating action and transmits the stem action to the disc assembly. It also keeps the discs aligned together during the travel.
- 11 BELLEVILLE SPRINGS**

Belleville springs packing ensures rapid unseating during opening operation.
- INSTALLATION REMARKS**

Pressure seal valves are best fit for vertical stem / horizontal flow installation. Special cases can be evaluated and developed on request.



Class ASME 600 (PN 100)

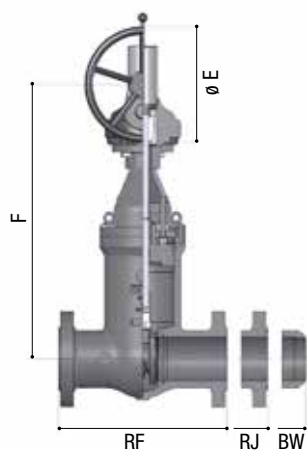
FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

DZ 600: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	292	356	432	559	660	787	838	889	991
BW (short)	178	254	305	457	584	711	813	/	/
RJ	295	359	435	562	663	790	841	892	994
C-closed	403	493	571	847	997	1.140	1.315	1.427	1.665
D-open	459	576	683	1.011	1.212	1.398	1.634	1.779	2.106
E	300	350	350	BG	BG	BG	BG	BG	BG
F	/	/	/	811	996	1.128	1.382	1.496	1.650
Approximate WEIGHT (Kg)									
FLANGED	24	48	87	182	313	541	876	1.211	1.546
BW	17	35	60	133	242	426	745	1.064	1.383

SIZE	18"	20"	22"	24"	26"	28"	30"	32"	34"
RF-BW	1.092	1.194	1.295	1.397	1.448	1.549	1.651	1.778	1.930
BW (short)	/	/	/	/	/	/	/	/	/
RJ	1.095	1.200	1.305	1.407	1.461	1.562	1.664	1.794	1.946
C-closed	1.840	1.988	2.190	2.365	2.540	2.715	2.890	3.065	3.240
D-open	2.342	2.530	2.814	3.050	3.286	3.522	3.758	3.994	4.230
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.824	1.998	2.172	2.346	2.520	2.694	2.868	3.042	3.216
Approximate WEIGHT (Kg)									
FLANGED	1.881	2.216	2.551	2.886	3.221	3.556	3.891	4.226	4.561
BW	1.702	2.021	2.340	2.659	2.978	3.297	3.616	3.935	4.254

SIZE	36"
RF-BW	2.082
BW (short)	/
RJ	2.099
C-closed	3.415
D-open	4.466
E	BG
F	3.390
Approximate WEIGHT (Kg)	
FLANGED	4.896
BW	4.573



Class ASME 900 (PN 150)

FIGURE NUMBERS - CLASS ASME 900 - ALL SIZES

DZ 900: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	368	381	457	610	737	838	965	1.029	1.130
BW (short)	216	305	356	508	660	787	914	991	1.092
RJ	371	384	460	613	740	841	968	1.039	1.140
C-closed	416	559	594	902	948	1.096	1.353	1.480	1.782
D-open	476	642	698	1.059	1.143	1.356	1.645	1.795	2.161
E	300	350	450	BG	BG	BG	BG	BG	BG
F	/	/	/	878	907	1.224	1.467	1.433	1.894

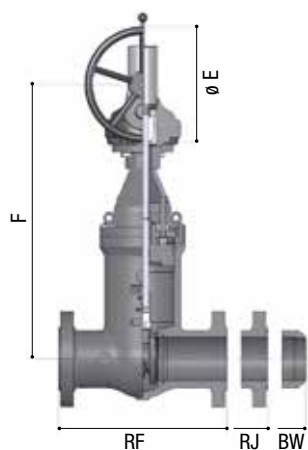
Approximate WEIGHT (Kg)

FLANGED	28	66	130	210	289	620	962	1.588	2.213
BW	21	50	101	171	240	466	822	1.388	1.953

SIZE	18"	20"	24"	26"	28"	30"	32"	34"	36"
RF-BW	1.219	1.321	1.549	1.676	1.803	1.930	1.981	2.032	2.083
BW (short)	/	/	/	/	/	/	/	/	/
RJ	1.232	1.334	1.568	/	/	/	/	/	/
C-closed	1.765	1.900	2.384	2.360	2.536	2.712	2.888	2.903	3.239
D-open	2.193	2.345	2.921	2.999	3.229	3.459	3.689	3.709	4.229
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.732	1.972	2.354	2.431	2.609	2.788	2.966	3.070	3.610

Approximate WEIGHT (Kg)

FLANGED	2.839	3.465	4.090	/	/	/	/	/	/
BW	2.519	3.085	3.650	7.731	8.564	9.396	10.228	11.061	11.893



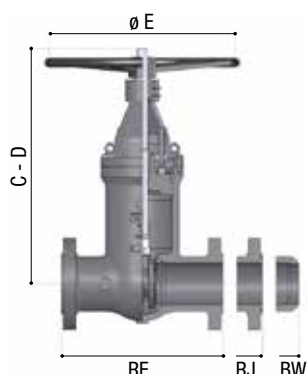
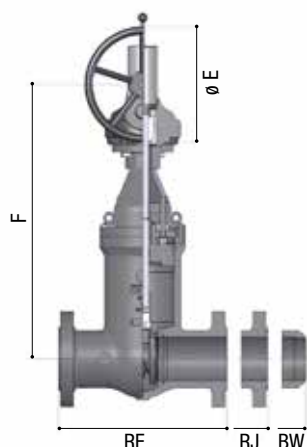
Class ASME 1500 (PN 250)

FIGURE NUMBERS - CLASS ASME 1500 - ALL SIZES

DZ 1500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	368	470	546	705	832	991	1.130	1.257	1.384
BW (short)	216	305	406	559	711	864	991	1.067	1.194
RJ	371	422	473	549	711	842	1.001	1.146	1.276
C-closed	376	724	613	775	1.013	1.189	1.316	1.586	1.777
D-open	428	807	720	930	1.222	1.433	1.606	1.898	2.130
E	300	BG	BG	BG	BG	BG	BG	BG	BG
F	/	679	614	764	1.106	1.174	1.459	1.745	1.909
Approximate WEIGHT (Kg)									
FLANGED	32	90	144	330	638	1.072	1.783	2.493	3.204
BW	23	58	105	243	490	822	1.388	1.953	2.519

SIZE	18"	20"	24"	26"	28"	30"	32"	34"	36"
RF-BW	1.537	1.664	1.943	2.090	2.237	2.383	2.525	2.666	2.808
BW (short)	1.346	1.473	/	/	/	/	/	/	/
RJ	1.406	1.559	/	/	/	/	/	/	/
C-closed	1.840	1.959	2.384	2.567	2.750	2.933	3.116	3.299	3.482
D-open	2.240	2.468	2.921	3.154	3.387	3.620	3.853	4.086	4.319
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.998	2.156	2.693	2.655	2.899	3.143	3.387	3.631	3.875
Approximate WEIGHT (Kg)									
FLANGED	4.056	5.484	8.340	/	/	/	/	/	/
BW	3.380	4.570	6.950	8.140	9.330	10.520	11.710	12.900	14.090



Class ASME 2500 (PN 420)

FIGURE NUMBERS - CLASS ASME 900 - ALL SIZES

DZ 2500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2½"	3"	4"	6"	8"	10"	12"	14"
RF-BW	451	508	578	673	914	1.022	1.270	1.422	1.637
BW (short)	279	330	368	457	610	762	914	1.041	1.118
RJ	454	514	584	683	927	1.038	1.292	1.444	/
C-closed	487	467	594	684	952	1.202	1.453	1.716	1.904
D-open	564	657	666	775	1.086	1.368	1.666	1.967	2.182
E	300	350	BG	BG	BG	BG	BG	BG	BG
F	/	/	606	676	1.081	1.191	1.549	1.876	2.018
Approximate WEIGHT (Kg)									
FLANGED	98	123	147	196	587	1.960	2.217	3.396	/
BW	70	88	105	140	419	1.400	1.584	2.426	2.511

SIZE	16"	18"	20"	24"	26"
RF-BW	1.756	2.024	2.218	2.606	2.800
BW (short)	1.245	1.397	/	/	/
RJ	/	/	/	/	/
C-closed	2.004	2.148	2.292	2.615	2.724
D-open	2.313	2.421	2.583	3.092	3.069
E	BG	BG	BG	BG	BG
F	2.134	2.107	2.249	2.835	2.675
Approximate WEIGHT (Kg)					
FLANGED	/	/	/	/	/
BW	2.595	2.680	2.764	2.934	3.019

BG: bevel gear operated

For size and pressure classes non mentioned in the above tables please contact ORION.

N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.

ORION STEEL VALVES Pipeline Valves

- Single Disc Gate Valves API 6D •
- Expanding Gate Valves API 6D •
- Swing Check Valves API 6D •



SINGLE DISC GATE VALVES API 6D - p. 134

Class ASME 150 (PN 20) • 300 (PN 50) • 600 (PN 100) • 900 (PN 150)
1500 (PN 250) • 2500 (PN 420)

EXPANDING GATE VALVES API 6D - p. 142

Class ASME 150 (PN 20) • 300 (PN 50) • 600 (PN 100) • 900 (PN 150)
1500 (PN 250) • 2500 (PN 420)

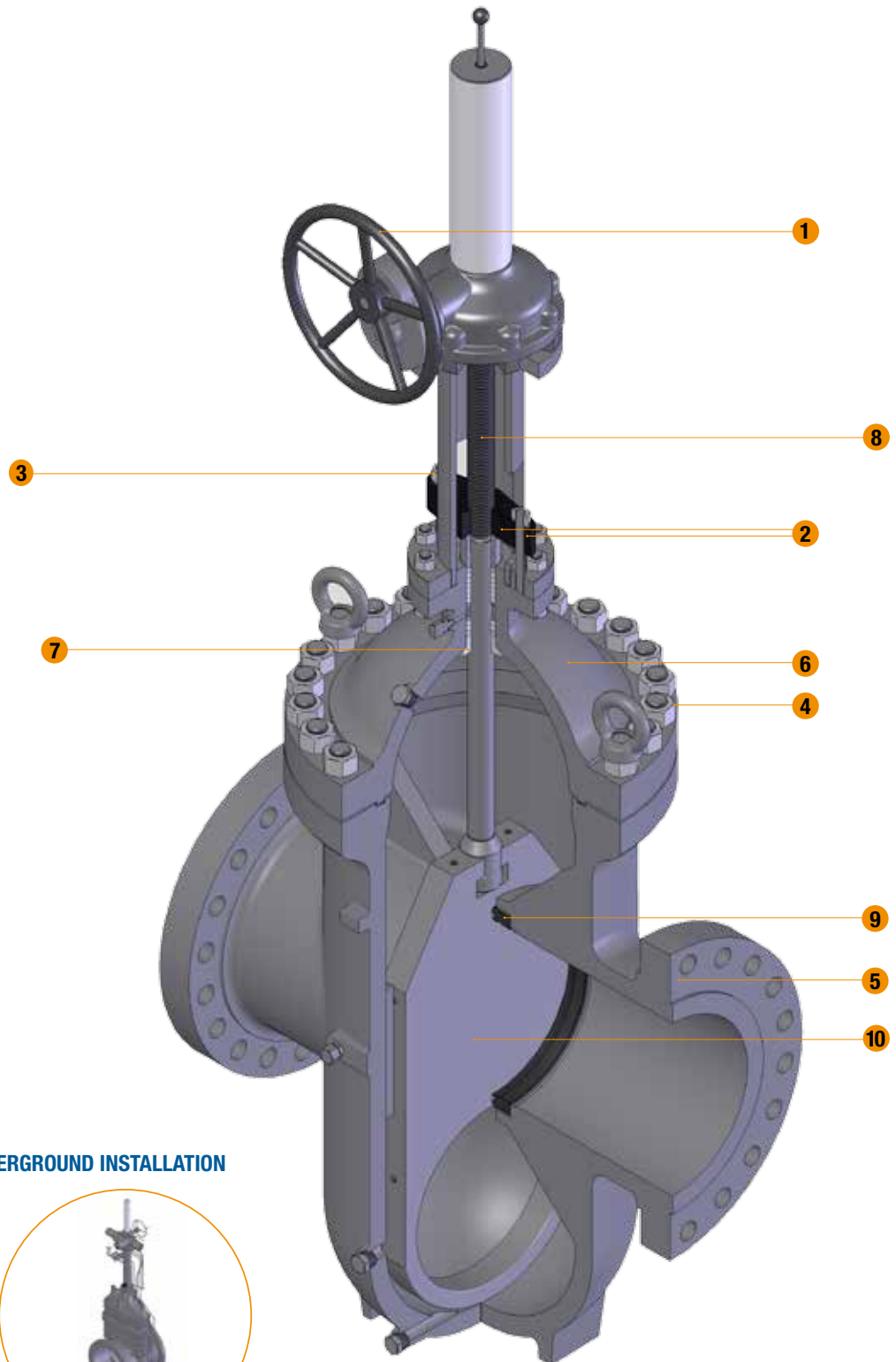
SWING CHECK VALVES - FULL OPENING API 6D - p. 148

Class ASME 150 (PN 20) • 300 (PN 50) • 600 (PN 100) • 900 (PN 150)
1500 (PN 250) • 2500 (PN 420)

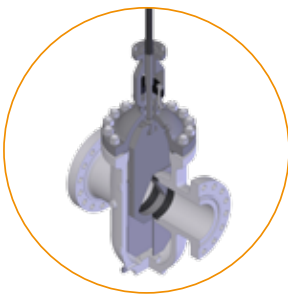
ORION STEEL VALVES

Single Disc Gate Valves

API 6D



MODULATING



EXTENDED PIPING FOR UNDERGROUND INSTALLATION

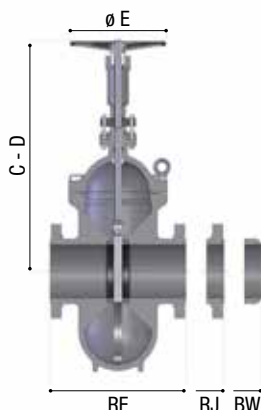
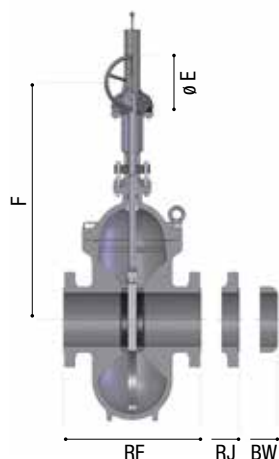


CAST STEEL, CONDUIT TYPE PIPELINE GATE VALVES, SINGLE DISC, NORMAL ACTING OR REVERSE ACTING, OUTSIDE SCREW AND YOKE, RISING STEM, METAL TO METAL OR SOFT INSERT SEATS, REMOVABLE YOKE SLEEVE, GLAND REPACKING UNDER PRESSURE.

- 1 OPERATOR** The spoked handwheel is fabricated from steel pipe. The hub is coupled with the yoke sleeve by means of a of a key. Larger valves are equipped with a bevel or spur gear gearbox unit.
- 2 GLAND AND FLANGE** They are in forged steel and are supplied in two pieces, self aligning design to permit the gland to descend parallel to the stem even if the eyebolts are unevenly tightened.
- 3 GLAND BOLTS AND NUTS** The forged steel gland bolts are of the eyebolt type which can be swung outward for ease of gland repacking. They are fixed to the bonnet by hinge pins.
- 4 BONNET BOLTING** Bonnet studs and nuts are manufactured from alloy steel to the relevant ASTM standard. The body to bonnet connection is designed according to ASME VIII DIV 1 standard.
- 5 BODY** The body is in carbon or stainless steel and is available in many other CRA. It is carefully designed for total reliability and simple maintenance. The basic dimension, i.e. wall thickness, face to face and flanges comply with the relevant ASME and API standards, in particular the API 6D standard. The body-to-bonnet flange is circular, except for class 150, where an oval flange is used. Standard "through conduit" design allows for passage of scrapers and spheres. The body-to-bonnet joint are flat face on Class 150 valves, male-and-female on Class 300 and 600 and ring joint on Class 900 and above. Bosses are provided for drain taps or by-pass piping. The internal surfaces in contact with the fluid can be fully lined or clad for improved corrosion or erosion resistance.
- 6 BONNET** As the body, the bonnet is in carbon or stainless steel and is available in many other CRA. It is machined to accept yoke sleeve and incorporates a stuffing box dimensioned in accordance with the API standard. Lifting lugs can be provided integrally cast on the bonnet surface.
- 7 BONNET BUSHING** The bonnet bushing or backseat is part of the valve trim. Its design allows valve repacking without valve's bleeding or draining. Hardfacing can be provided on stem seating surface.
- 8 STEM** The stem is part of the trim and is available in a wide range of material in accordance to API 600 or customer's requirements. The stem is provided with a T head. A ground backseat is provided to ensure a perfectly tight seal to the stuffing box when the valve is fully open. The stem is highly finished to minimize friction and prevent damage to packing. The threading is trapezoidal ACME type.
- 9 SEAT RING** The seat rings are floating in their respective pockets in the body. These pockets can be lined to avoid corrosion development on sliding surfaces. The seats are sealing against the body through a lip seal or an O-R. Graphite fire safe gasket can be supplied, in addition to the main gasket. A set of coil springs pushes each seat against the gate and allows the bleeding of any overpressure in the body cavity to the upstream, giving the self relieving capability of the valve, without the need of external relief systems. ORION Slab Gate valves are always double block and bleed type, and is possible to isolate the body cavity from the line in both closed or open position, by bleeding the body cavity.
- 10 SLAB GATE** The slab is part of the trim. It is machined out from plates or forged steel. It is connected to the stem by means of a T- shaped joint. Special care is given to the seating surfaces which are ground and lapped, integral or hardfaced. A cladding or lining can be applied to the larger gates to improve its resistance against erosive and corrosive environments, instead of having those integral in high grades of steel. Seat skirts are installed on valves up to 8" and act both as a gate guide and to limit fluid ingress into the body during open/close operation. Larger sizes can be equipped with skirts as well, but solid sliding guides are holding the gate weight.

Accessories: A lantern ring can be supplied upon request, in this case the stuffing box shall be drilled, tapped and fitted with an 1/4" NPT plug or grease fitting, for emergency stem sealing. The seats as well can be equipped with seat sealant injectors, with giant buttonhead connection grease fitting. Special actuator /handwheel extension can be arranged in order to lift the actuation position, and as well drain / bleed / injection connections can be extended up to the operator level for underground pipeline application.

- INSTALLATION REMARKS** Best fit for vertical stem/horizontal flow installation. Special cases can be evaluated and developed on request.



Class ASME 150 (PN 20)

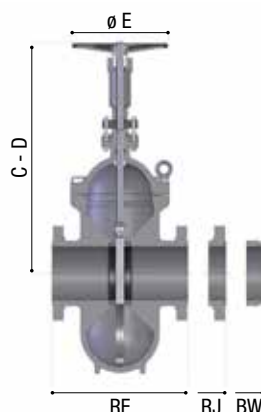
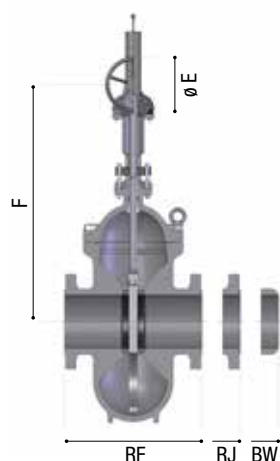
FIGURE NUMBERS - CLASS ASME 150 - ALL SIZES

SD 150: RF - RAISED FACE • BW - WELDING ENDS

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF	178	203	229	267	292	330	356	394	406
BW	216	282	305	403	419	457	502	572	610
C-closed	544	607	670	795	920	1.046	1.171	1.324	1.477
D-open	610	699	788	966	1.144	1.322	1.500	1.696	1.892
E	200	200	200	250	250	300	300	350	400
F	/	/	/	/	/	/	/	/	/
Approximate WEIGHT (Kg)									
FLANGED	34	54	73	108	196	296	410	550	660
BW	30	47	64	100	188	284	394	530	635

SIZE	18"	20"	24"	26"	28"	30"	32"	34"	36"
RF	432	457	508	559	610	660	711	762	813
BW	660	711	813	864	914	914	965	1.016	1.016
C-closed	1.680	1.883	2.289	2.492	2.538	2.400	2.945	3.489	4.034
D-open	2.147	2.403	2.914	3.169	3.169	3.170	4.097	5.025	5.952
E	430	450	500	550	600	650	700	750	BG
F	/	/	/	/	/	/	/	/	2.896
Approximate WEIGHT (Kg)									
FLANGED	702	920	1230	1.637	2.044	2.370	2.857	3.036	3.214
BW	690	903	1217	1.608	2.000	2.395	2.782	2.923	3.064

SIZE	40"	42"	48"	52"	56"	60"
RF	914	965	1.118	1.301	1.392	1.483
BW	1.067	1.067	/	/	/	/
C-closed	4.403	4.588	5.141	5.510	5.879	6.248
D-open	5.416	5.148	4.344	3.808	3.272	2.736
E	BG	BG	BG	BG	BG	BG
F	3.204	3.358	3.809	4.110	4.410	4.711
Approximate WEIGHT (Kg)						
FLANGED	3.571	3.750	/	/	/	/
BW	3.346	3.488	3.911	4.193	4.475	4.757



Class ASME 300 (PN 50)

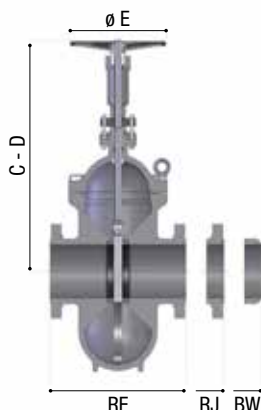
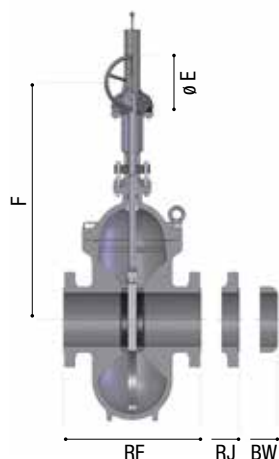
FIGURE NUMBERS - CLASS ASME 300 - ALL SIZES

SD 300: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	16"	20"
RF - BW	216	282	305	403	419	457	502	838	991
RJ	232	298	321	419	435	473	518	854	1.010
C-closed	507	577	646	785	924	1.063	1.202	1.407	1.612
D-open	572	668	764	970	1.148	1.340	1.532	1.891	2.249
E	200	200	250	250	250	300	BG	BG	BG
F	/	/	/	/	/	/	1.150	1.526	1.727
Approximate WEIGHT (Kg)									
FLANGED	38	57	82	173	231	280	410	671	1.370
BW	32	44	63	145	203	235	346	569	1.142

SIZE	24"	26"	28"	30"	32"	34"	36"	40"	42"
RF - BW	1.143	1.245	1.346	1.397	1.524	1.626	1.727	1.930	1.981
RJ	1.165	1.270	1.371	1.422	1.552	1.654	1.755	/	/
C-closed	2.046	2.262	2.479	2.696	2.698	2.824	2.950	3.273	3.434
D-open	2.739	2.983	3.228	3.473	3.510	3.693	3.875	4.534	4.864
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	2.145	2.273	2.417	2.562	2.706	2.850	2.975	3.398	3.609
Approximate WEIGHT (Kg)									
FLANGED	2.100	2.538	2.976	3.414	4.586	5.757	6.929	10.352	12.064
BW	1.750	2.179	2.607	3.036	4.176	5.317	6.457	9.771	11.429

SIZE	48"	52"	56"	60"
RF - BW	2.235	2.335	2.438	2.540
RJ	/	/	/	/
C-closed	3.731	3.683	3.635	3.587
D-open	6.778	8.054	9.330	10.606
E	BG	BG	BG	BG
F	4.150	4.511	4.872	5.233
Approximate WEIGHT (Kg)				
FLANGED	/	/	/	/
BW	16.400	19.714	22.857	27.619



Class ASME 600 (PN 100)

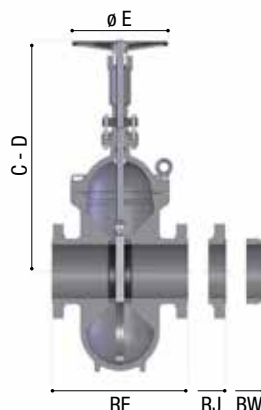
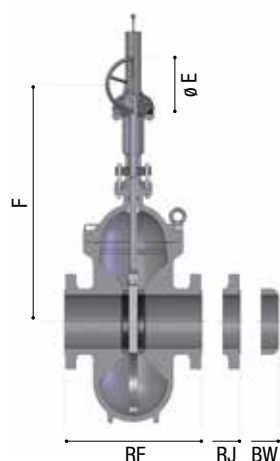
FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

SD 600: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF - BW	292	356	432	559	660	787	838	889	991
RJ	295	359	435	562	663	790	841	892	994
C-closed	460	544	628	796	965	1.133	1.302	1.470	1.645
D-open	531	640	749	967	1.185	1.404	1.622	1.840	2.066
E	200	200	200	300	400	450	BG	BG	BG
F	/	/	/	/	/	/	1.298	1.475	1.615
Approximate WEIGHT (Kg)									
FLANGED	53	87	148	270	462	462	1.005	1.547	2.090
BW	43	74	121	216	391	391	884	1.377	1.870

SIZE	18"	20"	24"	26"	28"	30"	32"	34"	36"
RF - BW	1.092	1.194	1.295	1.397	1.549	1.651	1.778	1.930	2.083
RJ	1.095	1.200	1.305	1.407	1.562	1.664	1.794	1.946	2.099
C-closed	1.820	1.995	2.170	2.345	2.695	2.870	3.398	3.926	4.454
D-open	2.291	2.517	2.743	2.968	3.419	3.645	4.223	4.802	5.380
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.781	1.946	2.112,5	2.279	2.789	2.953	3.298	3.553	3.808
Approximate WEIGHT (Kg)									
FLANGED	3.622	5.153	6.685	8.216	11.279	9.458	14.342	15.874	17.405
BW	3.237	4.604	5.971	7.338	10.072	8.250	12.807	14.174	15.541

SIZE	42"	48"	52"	56"	60"
RF - BW	2.438	2.540	2.805	2.692	3.203
RJ	/	/	/	/	/
C-closed	6.038	7.622	8.678	9.734	10.790
D-open	7.115	8.850	10.007	11.163	12.320
E	BG	BG	BG	BG	BG
F	4.573	5.337	5.847	6.356	6.866
Approximate WEIGHT (Kg)					
FLANGED	22.000	26.595	/	/	/
BW	19.642	23.743	26.477	39.212	41.946



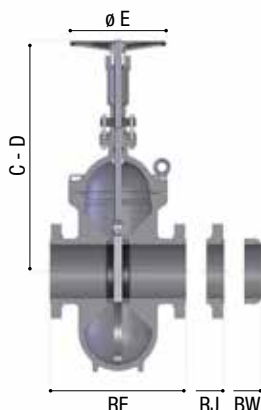
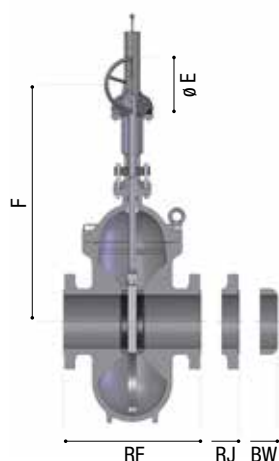
Class ASME 900 (PN 150)

FIGURE NUMBERS - CLASS ASME 900 - ALL SIZES

SD 900: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF - BW	368	381	457	610	737	838	965	1.029	1.130
RJ	371	384	460	613	740	841	968	1.039	1.140
C-closed	820	864	907	994	1.081	1.245	1.409	1.573	1.737
D-open	881	953	1024	1.167	310	1.529	1.748	1.967	2.186
E	300	300	400	BG	BG	BG	BG	BG	BG
FLANGED	/	/	/	805	1.062	1.212	1.362	1.512	1.662
Approximate WEIGHT (Kg)									
FLANGED	88	140	250	405	740	1.250	1.450	1.960	2.580
BW	77	122	217	352	643	1.087	1.261	1.704	2.243

SIZE	20"	24"	26"	32"	36"	40"	48"	56"
RF - BW	1.321	1.549	1.676	1.981	2.083	2.380	2.799	3.200
RJ	1.334	1.568	/	/	/	/	/	/
C-closed	2.065	2.393	2.557	3.049	3.377	3.705	4.361	5.017
D-open	2.624	3.062	3.281	3.938	4.376	4.814	5.690	6.566
E	BG	BG	BG	BG	BG	BG	BG	BG
FLANGED	1.962	2.662	2.412	2.862	3.162	3.462	4.062	4.662
Approximate WEIGHT (Kg)								
FLANGED	4.900	8.200	/	/	/	/	/	/
BW	4.261	7.130	8.609	13.043	18.609	24.174	35.304	46.435



Class ASME 1500 (PN 250)

FIGURE NUMBERS - CLASS ASME 1500 - ALL SIZES

SD 1500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF - BW	368	470	546	705	832	991	1.130	1.257	1.384
RJ	371	473	549	711	842	1.001	1.146	1.276	1.406
C-closed	553	629	705	983	1.260	1.538	1.815	2.093	2.370
D-open	614	757	899	1.188	1.476	1.800	2.130	2.550	2.800
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	539	647	755	933	1.115	1.283	1.451	1.618	1.786
Approximate WEIGHT (Kg)									
FLANGED	108	231	354	672	1.260	1.980	3.200	4.200	5.800
BW	94	201	308	584	1.096	1.722	2.783	3.652	5.043

SIZE	18"	20"	24"
RF - BW	1.537	1.664	1.943
RJ	1.559	1.686	/
C-closed	2648	2.925	3.480
D-open	3.150	3.485	4.280
E	BG	BG	/
FLANGED	1.954	2.122	2.457
Approximate WEIGHT (Kg)			
FLANGED	8.100	11.333	17.800
BW	7.043	9.855	15.478

Class ASME 2500 (PN 420)

FIGURE NUMBERS - CLASS ASME 2500 - ALL SIZES

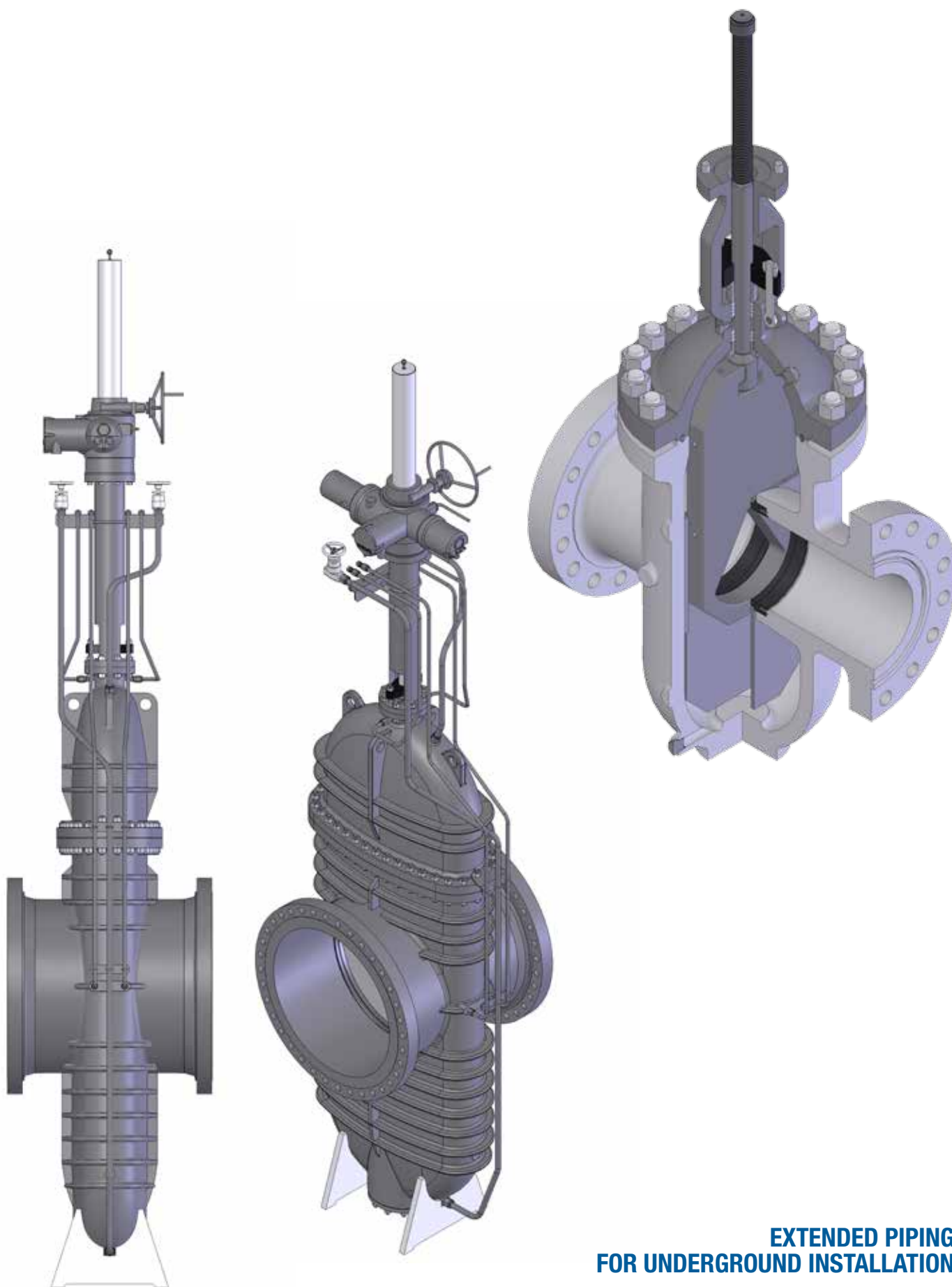
SD 2500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	4"	6"	8"	10"	12"
RF - BW	451	673	914	1.022	1.270	1.422
RJ	454	683	927	1.038	1.292	1.444
C-closed	1.000	1.107	1.255	1.322	2.959	3.664
D-open	1.050	1.208	1.439	1.544	3.250	4.000
E	BG	BG	BG	BG	BG	BG
F	578	851	1.124	1.286	1.448	1.610
Approximate WEIGHT (Kg)						
FLANGED	193	590	1.340	2.240	3.850	6.100
BW	168	513	1.165	1.948	3.348	5.304

For size and pressure classes non mentioned in the above tables please contact ORION.

N.B. all dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

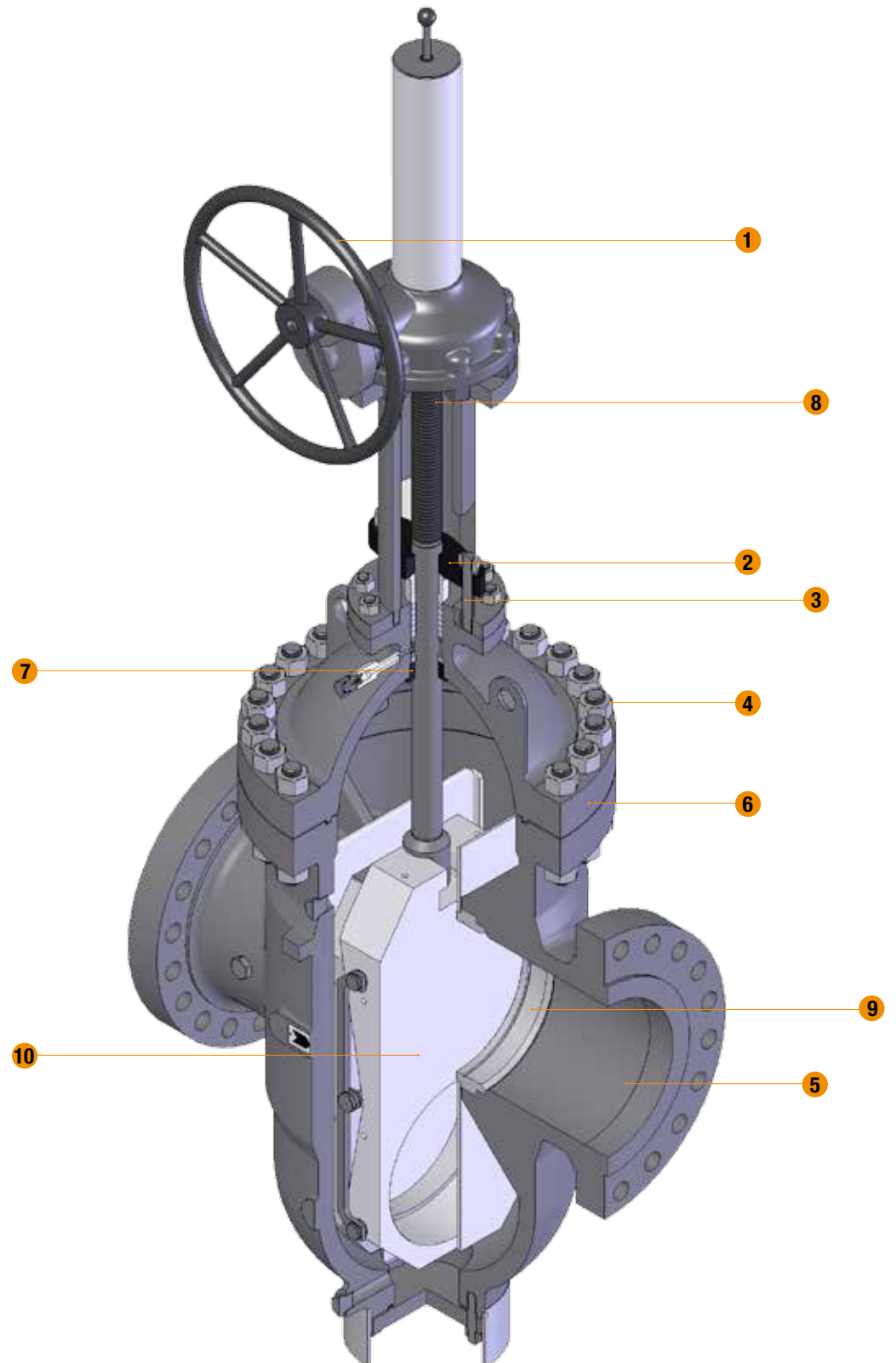
Dimensions and weight may change from above values without notice.

MODULATING SLAB GATE**EXTENDED PIPING
FOR UNDERGROUND INSTALLATION**

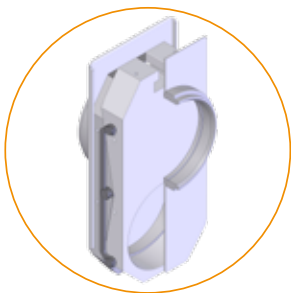
ORION STEEL VALVES

Expanding Gate Valves

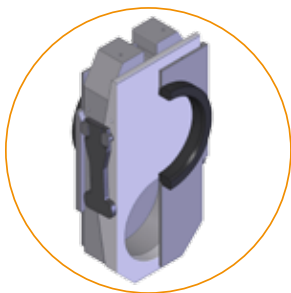
API 6D



SPRING RETURN SYSTEM



MECHANICAL RETURN SYSTEM



CAST STEEL, CONDUIT TYPE PIPELINE EXPANDING GATE VALVES, OUTSIDE SCREW AND YOKE, RISING SYSTEM, METAL TO METAL OR SOFT SEATS, REMOVABLE YOKE SLEEVE, GLAND REPACKING UNDER PRESSURE.

- 1 OPERATOR**

The spoked handwheel is fabricated from steel pipe. The hub is coupled with the yoke sleeve by means of a key. Larger valves are equipped with a bevel or spur gear gearbox unit.
- 2 GLAND AND FLANGE**

They are in forged steel and are supplied in two pieces, self aligning design to permit the gland to descend parallel to the stem even if the eyebolts are unevenly tightened.
- 3 GLAND BOLTS AND NUTS**

The forged steel gland bolts are of the eyebolt type which can be swung outward for ease of gland repacking. They are fixed to the bonnet by hinge pins.
- 4 BONNET BOLTING**

Bonnet studs and nuts are manufactured from alloy steel to the relevant ASTM standard. The body to bonnet connection is designed according to ASME VIII DIV 1 standard.
- 5 BODY**

The body is in carbon or stainless steel and is available in many other CRA. It is carefully designed for total reliability and simple maintenance. The basic dimension, i.e. wall thickness, face to face and flanges comply with the relevant ASME and API standards, in particular the API 6D standard. The body-to-bonnet flange is circular. Standard "through conduit" design allows for passage of scrapers and spheres. The body is basically supplied with renewable seats. Bosses are provided for drain taps or by-pass piping. The internal surfaces in contact with the fluid can be fully lined or clad for improved corrosion or erosion resistance.
- 6 BONNET**

As the body, the bonnet is in carbon or stainless steel and is available in many other CRA. It is machined to accept yoke sleeve and incorporates a stuffing box dimensioned in accordance with the API standard. Lifting lugs can be provided integrally cast on the bonnet surface.
- 7 BONNET BUSHING**

The bonnet bushing is part of the valve trim. Its design allows on request safe valve repacking without valve's bleeding or draining using auxiliary seals. It doesn't allow the classical backseating position in contact with the stem head, but if the application allows to use O-R or lip seals, it is possible to include an auxiliary seal for repacking.
- 8 STEM**

The stem is part of the trim and is available in a wide range of material in accordance to API 600 or customer's requirements. The stem is provided with a T-shaped head. The stem is highly finished to minimize friction and prevent damage to gland packing. The thread is trapezoidal ACME type. Because of the intrinsic design of the valve, it is not possible to create a backseating position.
- 9 SEAT RING**

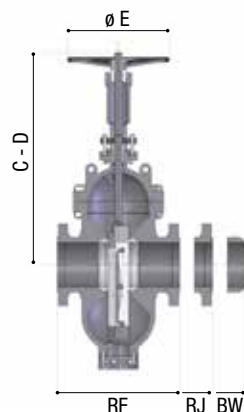
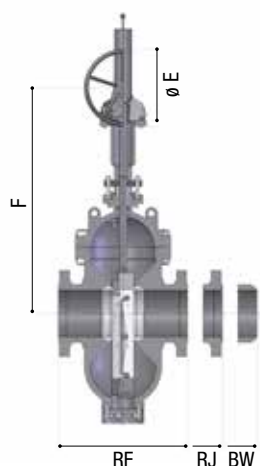
Welded-in seat rings are supplied as a standard, and floating seats can be supplied as well. The rings are part of the trim of the valve and are usually hardfaced or coated by tungsten carbide.
- 10 DISC**

The concave and convex disc are part of the trim. They are forged in stainless steel. They are connected to the stem by means of a T joint. Special attention is given to the seating surfaces which are ground and lapped, and can be hardfaced or coated with tungsten carbide.

Accessories: The double block and bleed feature of this valve and the seats fixed in the body require always to provide a body pressure relief system. Usually, an external piping with a check valve is supplied to bleed upstream any overpressure may be trapped in body cavity. A manual drain/vent valve or connection is always suggested. A lantern ring is supplied only upon request, in this case the stuffing box shall be drilled, tapped and fitted with an 1/4" NPT plug or grease fitting. Special actuator /handwheel extension can be arranged in order to lift the actuation position, and as well drain / bleed / injection connections can be extended up to the operator level for underground pipeline application.

- INSTALLATION REMARKS**

Pipeline valves are best fit for vertical stem / horizontal flow installation. Special cases can be evaluated and developed on request.



Class ASME 600 (PN 100)

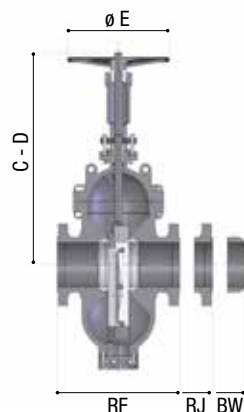
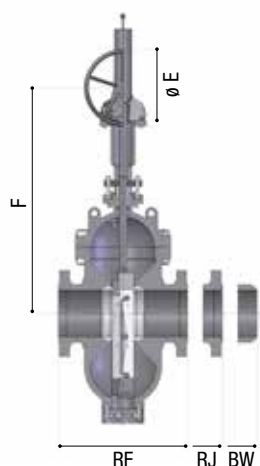
FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

EG 600: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF - BW	292	356	432	559	660	787	838	889	991
RJ	295	359	435	562	663	790	841	892	994
C-closed	626	698	771	917	1.062	1.208	1.353	1.499	1.644
D-open	775	866	958	1.142	1.325	1.509	1.692	1.876	2.059
E	200	300	350	500	BG	BG	BG	BG	BG
F	/	/	/	/	1082	1.227	1.371	1.564	1.757
Approximate WEIGHT (Kg)									
FLANGED	141	263	385	630	874	1.119	1.363	2.381	3.398
BW	131	250	361	576	803	10.04	1.232	2.230	3.150

SIZE	18"	20"	22"	24"	28"	32"	34"	36"	42"
RF - BW	1.092	1.194	1.295	1.397	1.549	1.778	1.930	2.082	2.438
RJ	1.095	1.200	1.305	1.407	1.562	1.794	1.946	2.099	/
C-closed	1.790	1.935	2.081	2.518	2.906	3.295	3.489	3.683	4.266
D-open	2.243	2.426	2.610	3.153	3.640	4.127	4.371	4.614	5.345
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.951	2.144	2.337	2.670	2.917	3.303	3.496	3.689	4.269
Approximate WEIGHT (Kg)									
FLANGED	4.416	5.433	6.451	7.468	9.503	11.538	12.556	13.573	/
BW	4.148	5.091	6.051	7.001	8.803	10.748	11.726	12.723	15.584,808

SIZE	48"	52"	56"	60"
RF - BW	2.540	2.805	2.692	3.203
RJ	/	/	/	/
C-closed	4.848	5.236	5.625	6.013
D-open	6.075	6.562	7.049	7.536
E	BG	BG	BG	BG
F	4.849	5.235	5.621	6.008
Approximate WEIGHT (Kg)				
FLANGED	/	/	/	/
BW	18.445,678	20.353,238	22.260,797	24.168,357



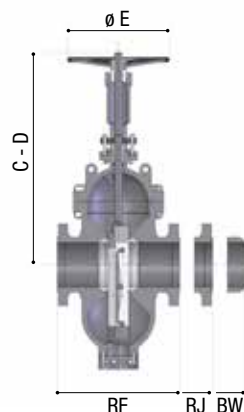
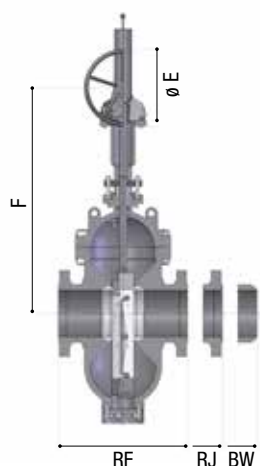
Class ASME 900 (PN 150)

FIGURE NUMBERS - CLASS ASME 900 - ALL SIZES

EG 900: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF - BW	368	381	457	610	737	838	965	1.029	1.130
RJ	371	384	460	613	740	841	968	1.039	1.140
C-closed	443	523	628	778	1.068	1.228	1.299	1.466	1.708
D-open	689	792	896	1.104	1.311	1.519	1.726	1.934	2.141
E	350	350	400	BG	BG	BG	BG	BG	BG
F	/	/	/	762	1.048	1.211	1.374	1.537	1.700
Approximate WEIGHT (Kg)									
FLANGED	115	242	366	651	932	1.536	2.141	2.745	3.349
BW	98	217	336	586	828	1.396	1.951	2.520	2.917

SIZE	20"	24"	26"	32"	36"	40"	48"	56"
RF - BW	1.321	1.549	1.676	1.981	2.083	2.380	2.799	3.200
RJ	1.334	1.568	/	/	/	/	/	/
C-closed	1.950	2.210	2.450	2.900	3.240	3.565	3.726	4.865
D-open	2.556	2.971	3.179	3.801	4.216	4.631	5.461	6.291
E	BG	BG	BG	BG	BG	BG	BG	BG
F	2.026	2.352	2.515	3.004	3.330	3.656	4.308	4.960
Approximate WEIGHT (Kg)								
FLANGED	4.558	5.766	/	/	/	/	/	/
BW	4.098	5.131	5.520	7.163	8.272	9.336	11.465	13.593



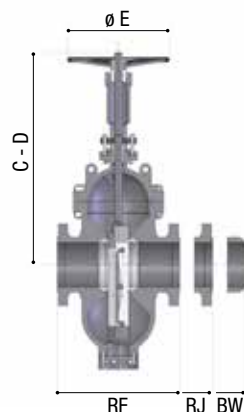
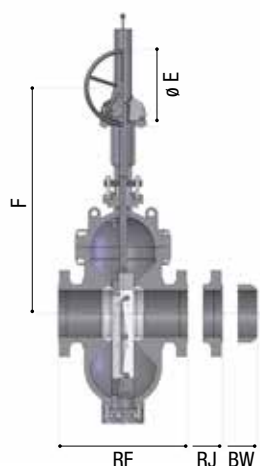
Class ASME 1500 (PN 250)

FIGURE NUMBERS - CLASS ASME 1500 - ALL SIZES

EG 1500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF - BW	368	470	546	705	832	991	1.130	1.257	1.384
RJ	371	473	549	711	842	1.001	1.146	1.276	1.406
C-closed	443	667	765	930	1.148	1.340	1.532	1.527	1.621
D-open	689	769	893	1.116	1.385	1.632	1.879	1.874	1.995
E	350	450	500	BG	BG	BG	BG	BG	BG
F	/	/	/	940	1.143	1.345	1.437	1.528	1.686
Approximate WEIGHT (Kg)									
FLANGED	115	418	366	820	1.518	2.342	3.582	3.990	5.490
BW	98	392	336	683	1.370	2.092	3.215	3.440	4.805

SIZE	18"	20"	24"	26"	28"	36"	42"
RF - BW	1.537	1.664	1.943	2.090	2.237	2.808	3.233
RJ	1.559	1.686	1.971	/	/	/	/
C-closed	1.714	1.808	1.995	2.088	2.182	2.556	2.836
D-open	2.116	2.237	2.479	2.600	2.731	3.205	3.568
E	BG	BG	BG	BG	BG	BG	BG
F	1.844	2.002	2.318	2.476	2.634	3.266	3.740
Approximate WEIGHT (Kg)							
FLANGED	6.990	8.490	11.490	/	/	/	/
BW	6.170	72.90	9.590	10.842	10.842	17.102	18.698



Class ASME 2500 (PN 420)

FIGURE NUMBERS - CLASS ASME 2500 - ALL SIZES

EG 2500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	4"	6"	8"	10"	12"	14"	16"	24"
RF - BW	451	673	914	1.022	1.270	1422	1.637	1.756	2.606
RJ	454	683	927	1.038	1.292	1.444	/	/	/
C-closed	443	628	1.135	1.427	1.773	2.119	2.465	2.811	4.320
D-open	503	732	1.315	1.662	2.068	2.474	2.880	3.286	4.929
E	400	500	BG	BG	BG	BG	BG	BG	BG
F	/	/	1.129	1.291	1.473	1.625	17.53	1.880	2.390
Approximate WEIGHT (Kg)									
FLANGED	162	590	1.367	2.712	4.058	5.403	/	/	/
BW	134	508	1.154	2.410	3.473	4.573	5.548	6.393	10.644

SIZE	30"	36"
RF - BW	3.244	3.881
RJ	/	/
C-closed	4.887	5.200
D-open	5.649	6.100
E	BG	BG
F	2.773	3.155
Approximate WEIGHT (Kg)		
FLANGED	/	/
BW	13.832	17.020

For size and pressure classes non mentioned in the above tables please contact ORION.

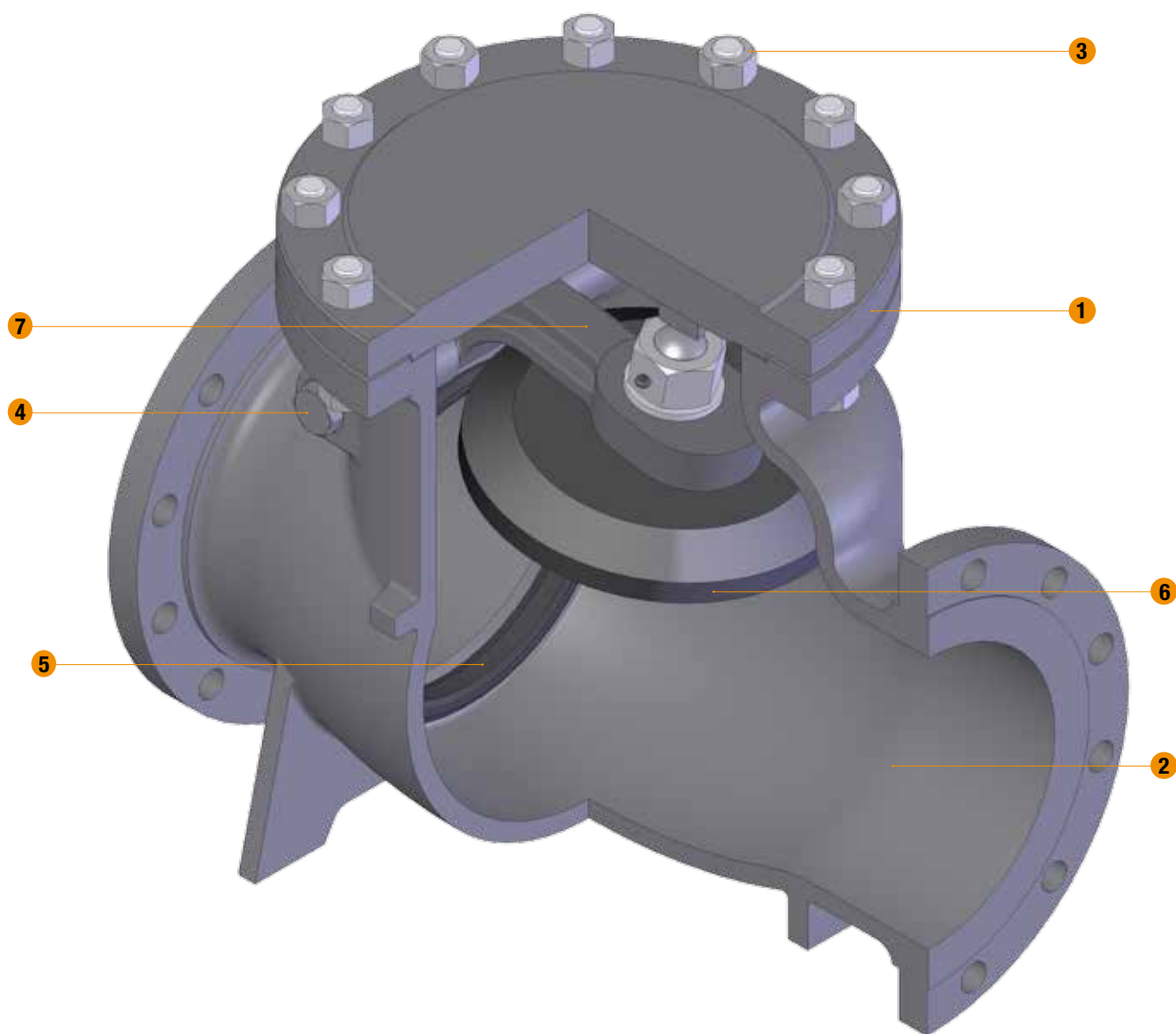
N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.

ORION STEEL VALVES

Swing Check Valves Full Opening

API 6D



CAST STEEL, SWING TYPE DISC, RENEWABLE BODY SEAT RING, BOLTED BODY-TO-COVER CONNECTION.

1 COVER

The cover is in or forged steel. The connection sealing surfaces are raised face or ring joint to suit the valve rating.

2 BODY

The body is in carbon or stainless steel and is also available in many other CRA materials. It is carefully designed for total reliability, to keep the pressure drops to a minimum and simple maintenance. The basic dimensions, wall thickness, face to face and flanges, comply with the relevant, ASME and API 6D standard. The body-to-cover flange is circular. The sealing surface for connection to the cover is recessed in the 150 and 300 Class and ring joint for higher ratings. The body is threaded for a renewable seat and an integral over-travel stop for the disc is incorporated. Two threaded bosses are provided for the location of the hinge pin. Bosses are eventually provided for drain threaded connection. Standard "full opening" design allows for passage of scrapers and spheres.

3 COVER BOLTING

Bonnet studs and nuts are manufactured from alloy steel to the relevant ASTM standard.

4 HINGE PIN

The hinge pin is part of the trim, in forged stainless steel and is machined from ground bar. The hinge pin is locked in the body with two threaded NPT plugs. The pin can be easily removed for maintenance of the valve. The pin can be replaced by a grooved shaft capable of giving control to the disc from the external. For instance, an hydraulic damper can be installed to avoid chattering, or a lock-open lever can be provided, as well as an external counterweight.

5 SEAT RING

The rings are part of the trim of the valve. Welded-in-seat ring are supplied as a standard. In alternative, the seat outer diameter can be threaded and its bore is notched for easy installation and dismantling. Special attention is given to the seating face which is ground and lapped, for a perfectly tight seal.

6 DISC

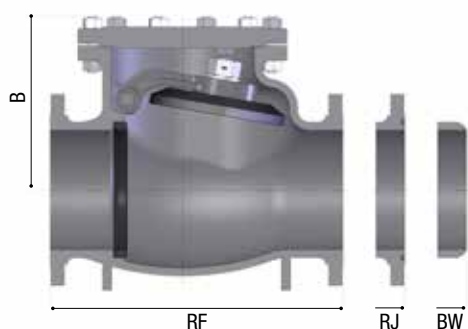
The disc is part of the trim and is in forged or cast steel. On the back face there is a threaded spigot for the connection to the hinge arm by a nut and cotter pin. The seating surface is ground and lapped.

7 HINGE

The hinge comes in forged steel for small diameters and in cast steel for valves from 14" upwards.

INSTALLATION REMARKS

Swing check valves are best fit for horizontal pipeline installation. For small valve sizes (up to 4"), a vertical flow installation (only with upward flow) is still possible, but for heavier weights of discs chattering issues can occur. Dampers or counterweight shall be then provided. Check anyway with ORION if the valve is suitable for the desired installed position.



Class ASME 150 (PN 20)

FIGURE NUMBERS - CLASS ASME 150 - ALL SIZES

RP 150: RF - RAISED FACE • BW - WELDING ENDS

SIZE	2"	2.1/2"	3"	4"	6"	8"	10"	12"	14"
RF-BW	203	216	241	292	356	495	622	699	787
B	166	177	187	211	259	314	369	396	430
Approximate WEIGHT (Kg)									
FLANGED	20	29	39	58	95	264	433	602	771
BW	15	23	31	48	80	203	326	449	572

SIZE	16"	18"	20"	22"	24"	26"	28"	30"	32"
RF-BW	864	978	978	1.067	1.295	1.295	1.448	1.524	1.524
B	467	503	538	570	601	672	734	764	836
Approximate WEIGHT (Kg)									
FLANGED	939	1.108	1.277	1.446	1.615	1.520	1.735	2.330	2.500
BW	694	817	940	1.063	1.186	1.275	1.460	2.045	2.188

SIZE	34"	36"	42"	48"	52"	56"	60"	66"
RF-BW	1.651	1.956	2.083	1.956	2.448	2.625	2.803	3.068
B	908	980	1.196	1.412	1.556	1.700	1.844	2.060
Approximate WEIGHT (Kg)								
FLANGED	2.670	4.100	4.900	/	/	/	/	/
BW	2.330	3.740	4.290	4.556	4.733	4.911	5.088	5.354

Class ASME 300 (PN 50)

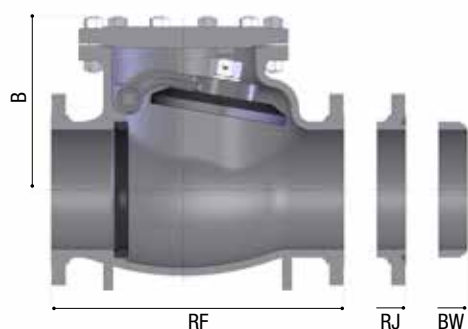
FIGURE NUMBERS - CLASS ASME 300 - ALL SIZES

RP 300: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2.1/2"	3"	4"	6"	8"	10"	12"	14"
RF-BW	267	292	318	356	445	533	622	711	838
RJ	283	308	333	372	460	549	638	727	854
B	200	212	224	248	295	343	390	438	485
Approximate WEIGHT (Kg)									
FLANGED	24	35	46	68	112	282	451	621	791
BW	16	25	34	52	87	233	379	525	672

SIZE	16"	18"	20"	22"	24"	30"	32"	36"	42"
RF-BW	864	977	1.016	1.118	1.346	1.594	1.594	2.083	2.215
RJ	880	994	1.035	1.140	1.369	1.622	1.622	2.108	/
B	533	580	628	685	742	878	914	985	1.213
Approximate WEIGHT (Kg)									
FLANGED	961	1.130	1.300	1.590	1.590	2.750	3.613	5.340	/
BW	818	964	1.110	1.332	1.332	2.220	3.040	4.680	5820

SIZE	48"	52"	56"	60"
RF-BW	2.513	2.712	2.910	20
RJ	/	/	/	/
B	1.441	1.593	1.745	1.897
Approximate WEIGHT (Kg)				
FLANGED	/	/	/	/
BW	6.960	7.720	7.720	9.240



Class ASME 600 (PN 100)

FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

RP 600: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2.1/2"	3"	5"	4"	6"	8"	10"	12"
RF-BW	292	330	356	432	508	559	660	787	838
RJ	295	333	359	435	511	562	664	791	841
B	225	232	239	280	308	336	393	449	477

Approximate WEIGHT (Kg)

FLANGED	43	74	106	168	231	294	419	545	670
BW	38	63	88	138	188	238	339	439	539

SIZE	14"	16"	18"	20"	24"	30"	32"	36"	42"
RF-BW	889	991	1.092	1.194	1.397	1.651	1.778	2.083	2.267
RJ	892	994	1.095	1.200	1.406	1.664	1.806	2.099	/
B	555	633	710	788	904	762	813	1.232	1.396

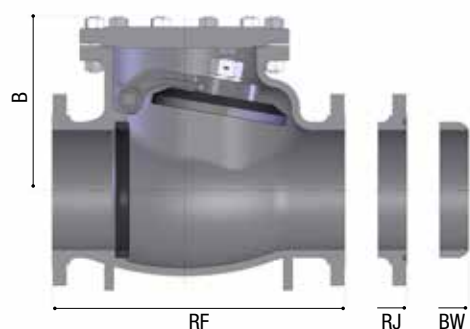
Approximate WEIGHT (Kg)

FLANGED	992	1.314	1.710	2.293	3.460	6.385	7.360	9.310	/
BW	817	1.094	1.442	1.959	2.993	5.727	6.638	8.460	10.111

SIZE	46"	52"	56"	60"
RF-BW	2.460	2.750	2.943	3.136
RJ	/	/	/	/
B	1.505	1.669	1.779	1.888

Approximate WEIGHT (Kg)

FLANGED	/	/	/	/
BW	17.083	27.541	34.513	41.485



Class ASME 900 (PN 150)

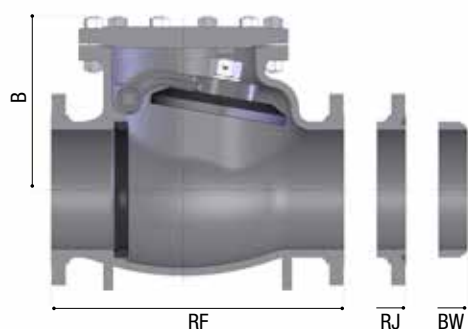
FIGURE NUMBERS - CLASS ASME 900 - ALL SIZES

RP 900: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2.1/2"	3"	5"	4"	6"	8"	10"	12"
RF-BW	368	419	381	457	559	610	737	838	965
RJ	372	422	384	460	562	613	740	841	968
B	260	277	293	327	360	393	460	526	622
Approximate WEIGHT (Kg)									
FLANGED	71	83	95	158	247	336	517	814	1.384
BW	54	67	79	132	207	281	413	664	1.172

SIZE	14"	16"	20"	24"	26"	28"	30"	34"	36"
RF-BW	1.029	1.130	1.321	1.549	1.930	2.290	1.930	2.134	2.343
RJ	1.038	1.140	1.334	1.569	/	/	/	/	/
B	718	814	913	1.071	1.145	1.223	1.301	1.456	1.533
Approximate WEIGHT (Kg)									
FLANGED	1.954	2.524	3.664	6.018	/	/	/	/	/
BW	1.680	2.188	3.204	5.383	6.288	7.194	8.550	9.430	10.815

SIZE	42"	48"	52"	60"
RF-BW	2.693	3.043	3.276	3.861
RJ	/	/	/	/
B	1.765	1.997	2.152	2.462
Approximate WEIGHT (Kg)				
FLANGED	/	/	/	/
BW	13.531	16.247	18.058	21.679



Class ASME 1500 (PN 250)

FIGURE NUMBERS - CLASS ASME 1500 - ALL SIZES

RP 1500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	2.1/2"	3"	5"	4"	6"	8"	10"	12"
RF-BW	368	419	470	546	673	705	832	991	1.130
RJ	372	422	473	549	676	711	841	1.000	1.146
B	295	320	345	394	444	493	743	993	1.021
Approximate WEIGHT (Kg)									
FLANGED	71	110	149	226	304	495	887	1.484	2.080
BW	54	86	117	181	244	408	738	1.226	1.713

SIZE	14"	16"	18"	20"	24"	28"	30"	34"	42"
RF-BW	1.257	1.384	1.537	1.664	1.943	2.237	2.378	2.659	3.222
RJ	1.276	1.407	1.559	1.686	1.972	/	/	/	/
B	1.048	1.076	1.108	1.139	1.202	1.265	1.297	1.360	1.486
Approximate WEIGHT (Kg)									
FLANGED	3.233	4.385	5.538	6.690	10.186	/	/	/	/
BW	2.657	3.602	4.546	5.490	8.286	11.082	12.480	15.276	20.868

SIZE	48"
RF-BW	3.790
RJ	/
B	1.580
Approximate WEIGHT (Kg)	
FLANGED	/
BW	25.062

Class ASME 2500 (PN 420)

FIGURE NUMBERS - CLASS ASME 2500 - ALL SIZES

RP 2500 RF... RAISED FACE • RP 2500 BW... WELDING ENDS • RP 2500 RJ... RING JOIN

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF-BW	406	578	673	914	1.022	1.252	1.447	1.641	1.835
RJ	454	584	683	927	1.038	1.274	1.469	/	/
B	354	384	414	473	1.263	1.688	1.736	1.782	1.829
Approximate WEIGHT (Kg)									
FLANGED	87	183	279	374	729	1.522	2.374	/	/
BW	66	144	222	300	601	1.266	1.961	2.574	4.252

SIZE	18"	20"	24"	30"
RF-BW	2.030	2.224	2.613	3.230
RJ	/	/	/	/
B	1.884	1.936	2.043	2.205
Approximate WEIGHT (Kg)				
FLANGED	/	/	/	/
BW	5.762	6.939	9.292	21.124

For size and pressure classes non mentioned in the above tables please contact ORION.

N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.

ORION STEEL VALVES

Compact Expanding Gate

API 6D

Double Disc Parallel Slide

API 600



PARALLEL SLIDE

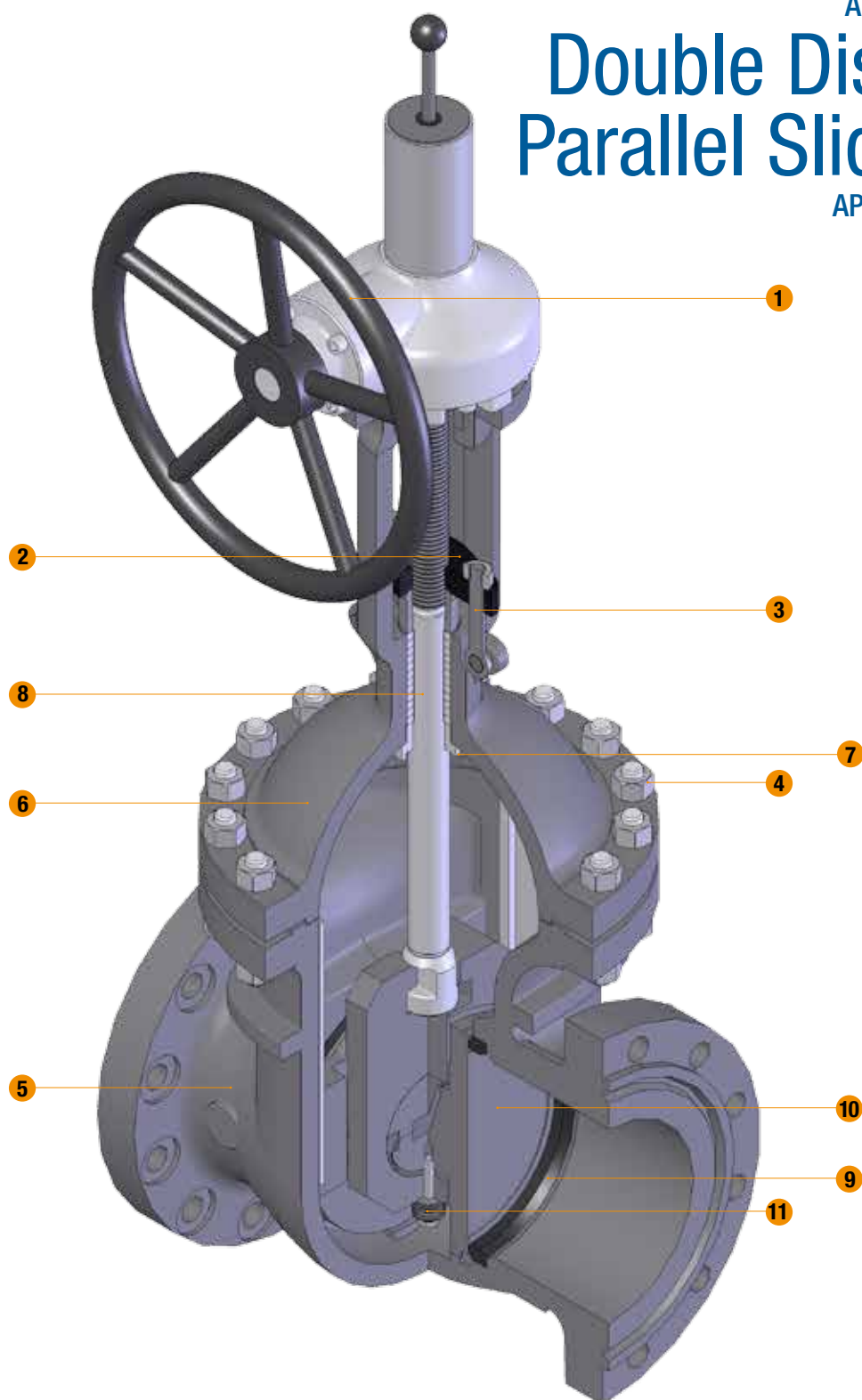
ORION STEEL VALVES

Compact Expanding Gate

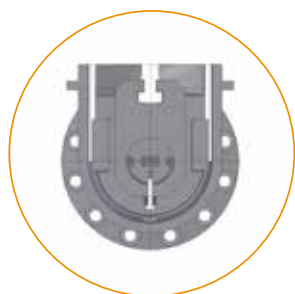
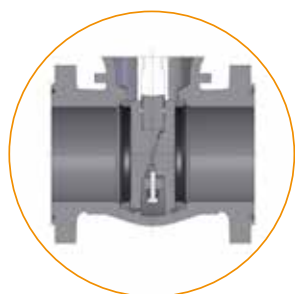
API 6D

Double Disc Parallel Slide

API 600

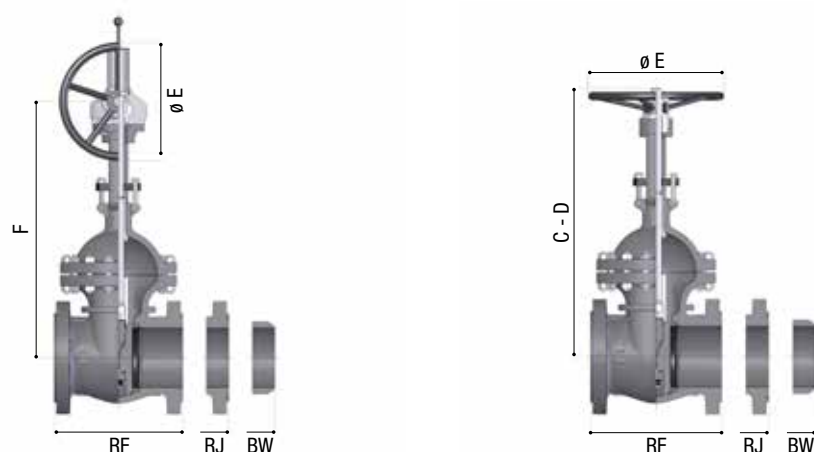


DOUBLE DISC EXPANDING FEATURES



STEEL, OUTSIDE SCREW AND YOKE, RISING STEM, NON-RISING HANDWHEEL, RENEWABLE SEATS, REMOVABLE YOKE SLEEVE, GLAND REPACKING UNDER PRESSURE.

- | | |
|-------------------------------|--|
| 1 HANDWHEEL | The spoked handwheel is fabricated from steel pipe. The hub is coupled to the yoke sleeve by means of a key. Larger valves are equipped with a bevel or spur gear gearbox unit. |
| 2 GLAND AND FLANGE | They are in forged steel and are supplied in two pieces, self aligning design in order to allow the gland to slide parallel to the stem even if the eyebolts are unevenly tightened. |
| 3 GLAND BOLTS AND NUTS | The forged steel gland bolts are of the eyebolt type which can be swung outward for ease of gland repacking. They are fixed to the bonnet by hinge pins. |
| 4 BONNET BOLTING | Bonnet studs and nuts are manufactured from alloy steel to the relevant ASTM standard. The body to bonnet connection is designed according to ASME VIII DIV 1 standard |
| 5 BODY | The body is in carbon, stainless steel or in CRA materials. The basic dimension, i.e. wall thickness, face to face and flanges comply with the relevant API and ASME standards. Body-to-bonnet flange is circular, except for Class 150 where it is oval. The body-to-bonnet joint are flat face for Class 150 valves, male-and-female on Class 300 and RJ on Class 600 and above. The body is basically supplied with renewable seats. Bosses are provided for drain taps or by-pass piping. The internal surfaces in contact with the fluid can be fully lined or clad for improved corrosion or erosion resistance. Body "C" shaped guides are welded inside the body to drive the discs assembly during the travel action. |
| 6 BONNET | As the body, the bonnet is in carbon or stainless steel and is available in many other CRA. It is machined to accept yoke sleeve and incorporates a stuffing box sized in accordance with API standards. Lifting lugs can be provided integrally cast on the bonnet surface. |
| 7 BONNET BUSHING | The bonnet bushing or backseat is in forged stainless and forms part of the trim. Special attention is given to its machining. |
| 8 STEM | The stem is part of the trim and is available in a wide range of material in accordance to API 600 or customer's requirements. The stem is provided with a T-shaped head. A ground backseat is provided to ensure a perfectly tight seal to the stuffing box when the valve is fully open. The thread is trapezoidal ACME type. All the stem sizes comply with the API 600 standard. |
| 9 SEAT RINGS | The rings are part of the trim of the valve. Welded-in seat rings are supplied as a standard. The two seating surfaces in the closed position provide a seal against pressure from both ends of the valve. They can be externally threaded and internally notched for easy installation and dismantling. Special attention is given to the seating surfaces which are ground and lapped for a tight seal. |
| 10 PARALLEL DISCS | The wedge effect between the two discs converts downward stem force into axial force and forces the parallel discs firmly against the valve seats, providing a seal against pressure at both ends of the valve. The central yoke ring forces one of the two discs during seating action and transmits the stem action to the disc assembly. It also keeps the discs aligned together during the travel. |
| 11 BELLEVILLE SPRINGS | Belleville springs packing ensures rapid unseating during opening operation. |
| REMARKS | A lantern ring is supplied upon request, in this case the stuffing box shall be drilled, tapped and fitted with an 1/4" NPT plug or grease fitting. |
| SAFETY RELIEF | Double Block and Bleed valves are capable to hold the pressure in both direction and having the body bled to atmosphere, but can as well trap the pressure inside the body cavity, with problems during opening or dangerous pressure build up. ORION strongly suggest to provide an automatic pressure relief system, internally (disc hole) or externally (pipe and check valve to the upstream), in order to avoid such occurrence. If no harmful/polluting fluid is interested, a normal automatic relief valve can be used to vent cavity to atmosphere. |
| INSTALLATION REMARKS | Valves are best fit for vertical stem / horizontal flow installation. Special cases can be evaluated and developed on request. |



Class ASME 150 (PN 20)

FIGURE NUMBERS - CLASS ASME 150 - ALL SIZES

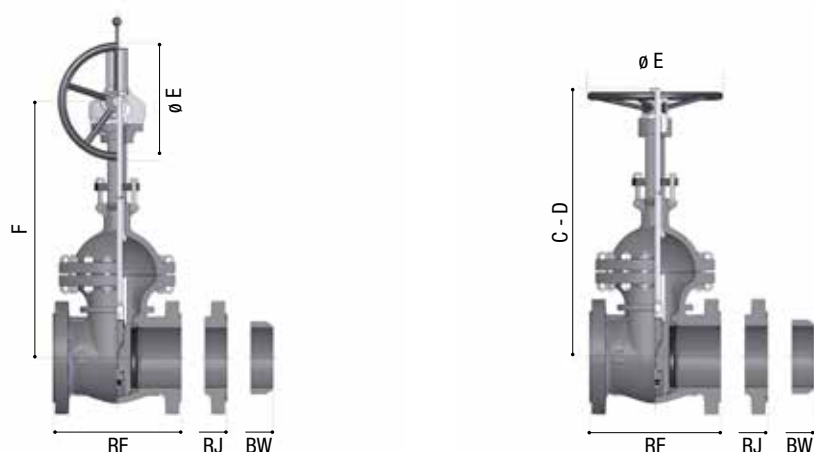
DD 150: RF - RAISED FACE • BW - WELDING ENDS

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF	178	203	229	267	292	330	356	381	406
BW	216	282	305	403	419	457	502	572	610
C-closed	357	445	556	712	862	1.020	1.178	1.318	1440
D-open	417	530	671	877	1.082	1.290	1.498	1.676	1850
E	204	254	305	356	406	457	502	610	610
F	/	/	/	/	/	/	/	/	/
Approximate WEIGHT (Kg)									
FLANGED	18	32	52	85	157	230	302	548	794
BW	14	27	40	73	140	208	275	463	651

SIZE	18"	20"	22"	24"	26"	28"	30"	32"	34"
RF	432	457	483	508	559	610	610	660	711
BW	660	711	762	813	864	914	914	965	1.016
C-closed	1.608	1.768	1940	2.064	2.220	2.375	2.518	2.620	2.690
D-open	2.069	2.271	2.492	2.680	2.876	3.092	3.281	3.435	3.555
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.779	1.868	1.957	2.046	2.135	2.312	2.488	2.606	2.701
Approximate WEIGHT (Kg)									
FLANGED	1.040	1.286	1.531	1.777	2.023	2.269	2.515	3.668	4.821
BW	838	1.026	1.214	1.402	1.589	1.777	1.965	2.866	3.766

SIZE	36"	38"	40"	42"	44"	46"	48"	50"	52"
RF	711	762	762	787	826	864	864	940	1.016
BW	1.016	1.067	1.067	1.067	/	/	/	/	/
C-closed	2.970	3.228	3.228	3.372	3.558	3.630	3.702	3.915	4.127
D-open	3.876	4.228	4.228	4.415	4.685	4.799	4.912	5.188	5.462
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	2.878	3.054	3.229	3.402	3.574	3.747	3.773	3.916	4.059
Approximate WEIGHT (Kg)									
FLANGED	5.974	7.127	8.280	9.433	10.586	11.739	12.892	/	/
BW	4.667	5.568	6.469	7.370	8.270	9.171	10.072	10.973	11.873

SIZE	54"	56"	58"	60"	66"
RF	1.067	1.110	1.140	1.168	1.270
BW	/	/	/	/	/
C-closed	4.305	4.305	4.550	4.691	5.156
D-open	5.693	5.693	5.980	6.196	6.823
E	BG	BG	BG	BG	BG
F	4.203	4.346	4.489	4.632	5.057
Approximate WEIGHT (Kg)					
FLANGED	/	/	/	/	/
BW	12.774	13.675	14.576	15.477	18.179



Class ASME 300 (PN 50)

FIGURE NUMBERS - CLASS ASME 300 - ALL SIZES

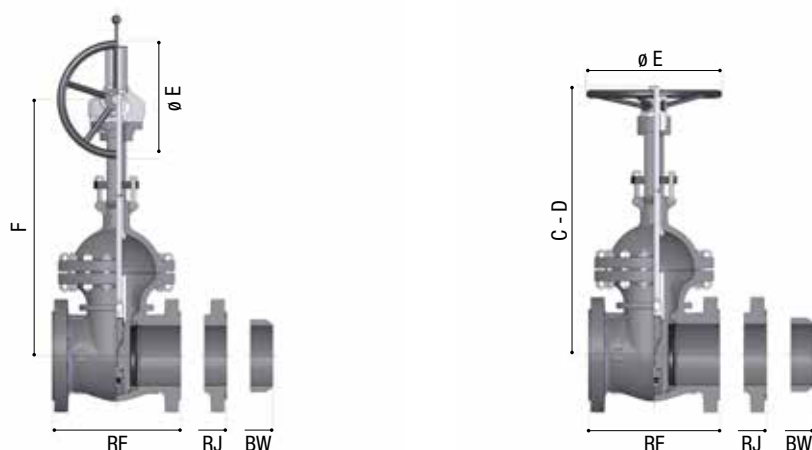
DD 300: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF - BW	216	282	305	403	419	457	502	762	838
RJ	232	298	321	419	435	473	518	778	854
C-closed	370	445	556	712	890	1.069	1.245	1.325	1.480
D-open	430	530	671	877	1.110	1.339	1.580	1.685	1.890
E	204	254	305	406	457	457	BG	BG	BG
F	/	/	/	/	/	/	1.102	1.288	1.474
Approximate WEIGHT (Kg)									
FLANGED	26	49	80	130	246	351	462	838	1.214
BW	22	38	62	102	192	275	361	655	949

SIZE	18"	20"	22"	24"	26"	28"	30"	32"	34"
RF - BW	914	991	1.092	1.143	1.245	1.346	1.397	1.524	1.626
RJ	930	1.010	1.114	1.165	1.270	1.371	1.422	1.552	1.654
C-closed	1.620	1.796	1.948	2.122	2.430	2.430	2.596	2.705	2.868
D-open	2.069	2.287	2.500	2.729	3.146	3.146	3.355	3.515	3.730
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.660	1.793	1.925	2.091	2.256	2.441	2.569	2.705	2.840
Approximate WEIGHT (Kg)									
FLANGED	1.591	1.760	2.343	2.719	3.096	3.472	3.850	5.612	7.376
BW	1.243	1.375	1.831	2.124	2.418	2.712	3.320	4.384	5.763

SIZE	36"	38"	40"	42"	44"	46"	48"	50"	52"
RF - BW	1.727	1.829	1.930	1.981	2.066	2.151	2.235	2.285	2.335
RJ	1.755	/	/	/	/	/	/	/	/
C-closed	2.970	3.113	3.550	3.468	3.594	3.732	3.870	4.023	4.176
D-open	3.885	4.064	4.551	4.525	4.723	4.900	5.100	5.298	5.500
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	2.995	3.150	3.304	3.459	3.616	3.773	3.930	4.087	4.244
Approximate WEIGHT (Kg)									
FLANGED	9.140	10.904	12.668	14.432	16.197	17.961	/	/	/
BW	7.141	85.19	9.897	11.275	12.654	14.032	15.410	16.788	18.166

SIZE	54"	56"	58"	60"
RF - BW	2.387	2.438	2.488	2.540
RJ	/	/	/	/
C-closed	4.330	4.503	4.650	4.810
D-open	5.700	5.928	6.122	6.330
E	BG	BG	BG	BG
F	4.401	4.558	4.715	4.872
Approximate WEIGHT (Kg)				
FLANGED	/	/	/	/
BW	19.545	20.923	22.301	23.679



Class ASME 600 (PN 100)

FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

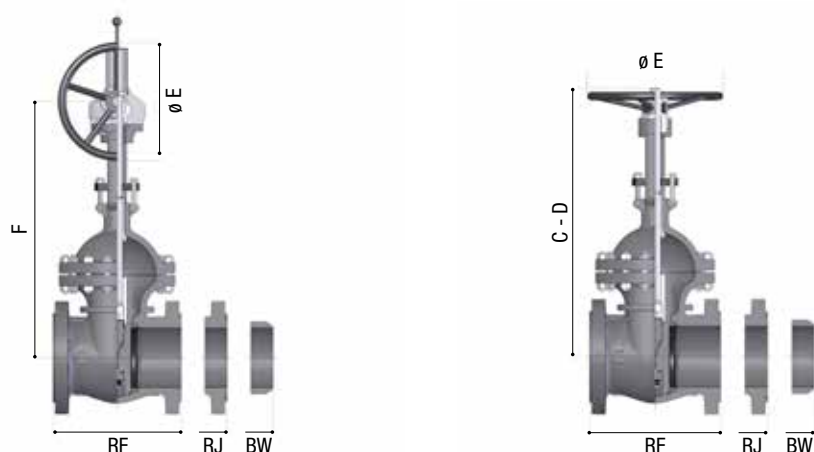
DD 600: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF - BW	292	356	432	559	660	787	838	889	991
RJ	295	359	435	562	663	790	841	892	994
C-closed	371	515	600	840	925	1.120	1.318	1.429	1.588
D-open	431	620	720	1.003	1.138	1.400	1.644	1.781	1.998
E	204	305	356	502	BG	BG	BG	BG	BG
F	/	/	/	/	918	1.073	1.227	1.382	1.547
Approximate WEIGHT (Kg)									
FLANGED	41	87	142	231	440	625	822	1.492	2.162
BW	37	79	129	210	400	569	748	1.356	1.965

SIZE	18"	20"	22"	24"	26"	28"	30"	32"	34"
RF - BW	1.092	1.194	1.295	1.397	1.448	1.549	1.651	1.778	1.930
RJ	1.095	1.200	1.305	1.407	1.461	1.562	1.664	1.794	1.946
C-closed	1.700	1.775	1.960	2.183	2.380	2.472	2.698	2.855	3.012
D-open	2.138	2.253	2.495	2.771	3.026	3.144	3.478	3.668	3.870
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.690	1.766	1.954	2.141	2.294	2.447	2.600	2.753	2.906
Approximate WEIGHT (Kg)									
FLANGED	2.831	3.000	4.171	4.115	5.147	6.180	8.295	9.989	13.130
BW	2.574	2.727	3.792	3.741	4.679	5.618	7.545	9.081	11.936

SIZE	36"	38"	40"	42"	44"	46"	48"	50"	52"
RF - BW	2.082	2.185	2.286	2.438	2.438	2.489	2.540	2.540	2.805
RJ	2.099	/	/	/	/	/	/	/	/
C-closed	3.168	3.342	3.516	3.690	3.655	3.903	4.100	4.174	4.443
D-open	4.078	4.298	4.493	4.720	4.724	5.042	5.280	5.414	5.723
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	3.058	3.211	3.364	3.517	3.670	3.915	3.976	4.248	4.388
Approximate WEIGHT (Kg)									
FLANGED	16.270	19.410	22.550	2.5690	28.830	31.970	35.110	/	/
BW	14.791	17.645	20.500	23.354	26.209	29.064	31.918	34.773	37.627

SIZE	54"	56"	58"	60"
RF - BW	2.905	2.692	2.743	3.203
RJ	/	/	/	/
C-closed	4.604	4.764	4.751	5.084
D-open	5.932	6.140	6.187	6.558
E	BG	BG	BG	BG
F	4.529	4.671	4.809	4.949
Approximate WEIGHT (Kg)				
FLANGED	/	/	/	/
BW	40.482	43.337	46.191	49.046



Class ASME 900 (PN 150)

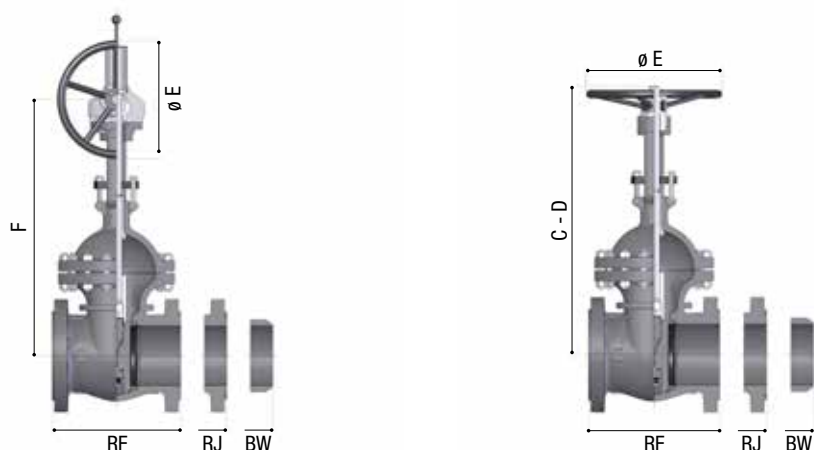
FIGURE NUMBERS - CLASS ASME 900 - ALL SIZES

DD 900: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF - BW	368	381	457	610	737	838	965	1.029	1.130
RJ	371	384	460	613	740	841	968	1.039	1.140
C-closed	505	530	655	875	1.070	1.180	1.305	1.400	1.518
D-open	575	618	780	1.040	1.305	1.440	1.607	1.746	1.901
E	305	356	406	BG	BG	BG	BG	BG	BG
F	/	/	/	840	969	1.099	1.228	1.358	1.487
Approximate WEIGHT (Kg)									
FLANGED	56	108	176	362	611	869	1.290	1.672	3.005
BW	51	98	160	329	555	790	1.173	1.520	2.732

SIZE	18"	20"	24"	26"	28"	30"	32"	34"	36"
RF - BW	1.219	1.321	1.549	1.676	1.803	1.930	1.981	2.032	2.083
RJ	1.232	1.334	1.568	/	/	/	/	/	/
C-closed	1.730	1.896	2.260	2.423	2.587	2.750	2.917	3.084	3.250
D-open	2.160	2.370	2.830	3.041	3.249	3.455	3.674	3.885	4.200
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.780	1.923	2.279	2.456	2.634	2.812	3.004	3.197	3.389
Approximate WEIGHT (Kg)									
FLANGED	3.936	4.170	5.797	5.720	7.154	8.590	/	/	/
BW	3.578	3.791	5.270	5.200	6.504	7.809	10.482	12.623	16.591

SIZE	38"	40"	42"	44"	46"	48"	50"	52"
RF - BW	2.232	2.380	2.485	2.589	2.695	2.799	2.904	3.009
RJ	/	/	/	/	/	/	/	/
C-closed	3.389	3.528	3.687	3.847	4.007	4.166	4.326	4.485
D-open	4.353	4.506	4.714	4.982	5.165	5.337	5.569	5.752
E	BG	BG	BG	BG	BG	BG	BG	BG
F	3.581	3.774	3.966	4.158	4.351	4.543	4.735	4.928
Approximate WEIGHT (Kg)								
FLANGED	/	/	/	/	/	/	/	/
BW	20.559	24.527	28.495	32.463	36.431	40.398	44.366	48.334



Class ASME 1500 (PN 250)

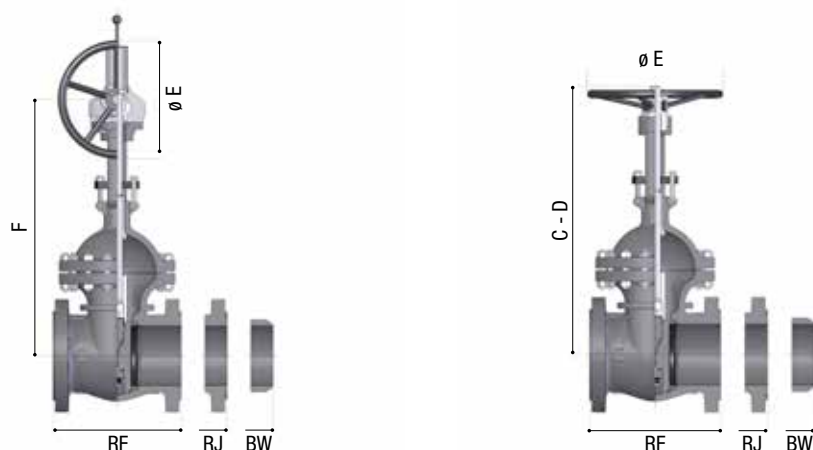
FIGURE NUMBERS - CLASS ASME 1500 - ALL SIZES

DD 1500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF - BW	368	470	546	705	832	991	1.130	1.257	1.384
RJ	371	473	549	711	842	1.001	1.146	1.276	1.406
C-closed	505	557	715	915	1.065	1.270	1.318	1.450	1.565
D-open	575	636	845	1.085	1.263	1.515	1.604	1.760	1.925
E	305	406	457	BG	BG	BG	BG	BG	BG
F	/	/	/	1.010	1.121	1.232	1.343	1.454	1.565
Approximate WEIGHT (Kg)									
FLANGED	87	169	275	565	953	1.702	2.012	2.608	4.688
BW	79	154	250	513	867	1.547	1.829	2.371	4.261

SIZE	18"	20"	24"	26"	28"	30"	32"	34"	36"
RF - BW	1.537	1.664	1.943	2.090	2.237	2.383	2.525	2.666	2.808
RJ	1.559	1.686	1.971	/	/	/	/	/	/
C-closed	1.760	2.075	2.330	2.533	2.736	2.940	2.964	3.126	3.289
D-open	2.158	2.540	2.860	3.108	3.360	3.605	3.662	3.866	4.070
E	BG	BG	BG	BG	BG	BG	BG	BG	BG
F	1.877	2.079	2.484	2.686	2.889	3.091	32.93	3.496	3.698
Approximate WEIGHT (Kg)									
FLANGED	6.140	6.505	9.044	8.923	11.161	/	/	/	/
BW	5.582	5.914	8.222	8.112	10.146	12.182	16.352	19.692	25.882

SIZE	38"	40"	42"
RF - BW	2.950	3.091	3.233
RJ	/	/	/
C-closed	3.452	3.614	3.776
D-open	4.274	4.478	4.682
E	BG	BG	BG
F	3.900	4.103	4.305
Approximate WEIGHT (Kg)			
FLANGED	/	/	/
BW	32.072	38.262	44.452



Class ASME 2500 (PN 420)

FIGURE NUMBERS - CLASS ASME 2500 - ALL SIZES

DD 2500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
RF - BW	451	578	673	914	1.022	1.270	1.422	1.637	1.756
RJ	454	584	683	927	1.038	1.292	1.444	/	/
C-closed	504	620	716	1.070	1.386	1.502	1.639	1.983	2.227
D-open	568	700	816	1.215	1.556	1.717	1.889	2.272	2.554
E	300	400	450	BG	BG	BG	BG	BG	BG
F	/	/	/	1.109	1.291	1.473	1.625	1.753	1.880
Approximate WEIGHT (Kg)									
FLANGED	138	270	434	892	1.506	2.689	3.180	/	/
BW	125	245	394	811	1.369	2.445	2.891	3.746	6.733

SIZE	18"	20"	24"	26"
RF - BW	2.024	2.218	2.606	2.800
RJ	/	/	/	/
C-closed	2.471	2.715	3.204	3.448
D-open	2.836	3.118	3.682	3.964
E	BG	BG	BG	BG
F	2.008	2.135	2.390	2.518
Approximate WEIGHT (Kg)				
FLANGED	/	/	/	/
BW	8.819	9.344	12.990	12.817

For size and pressure classes non mentioned in the above tables please contact ORION.

N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.

ORION STEEL VALVES Special Features

**SPECIAL FEATURES - p. 154**

By pass and drain connection standard
Special Features

DIMENSIONS - p. 158

Flange dimensions and ring joint face • Facing dimensions for all
ASME B16.5 - 2009 • Butt - welding ends

FLOW COEFFICIENTS - p. 168

Flow formulation using Cv coefficients • Flow Coefficient

MATERIALS - p. 173

Material specifications • Bolting • O-Ring Materials • Trim

RATINGS - p. 178

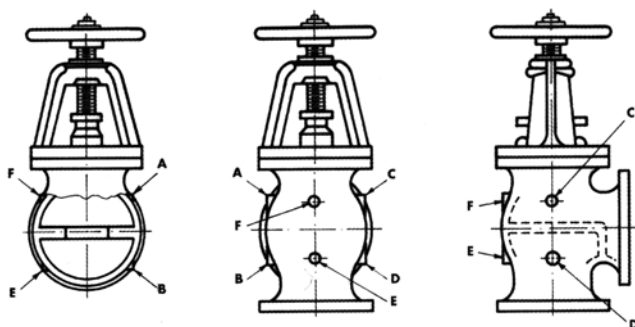
Pressure temperature ratings

ORION STEEL VALVES

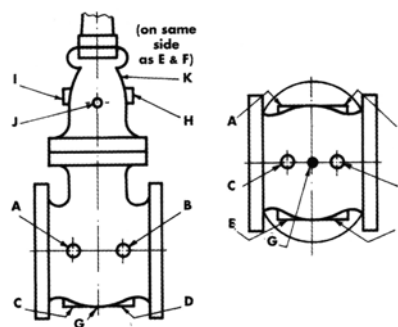
Special Features

BY PASS AND DRAIN CONNECTION STANDARD

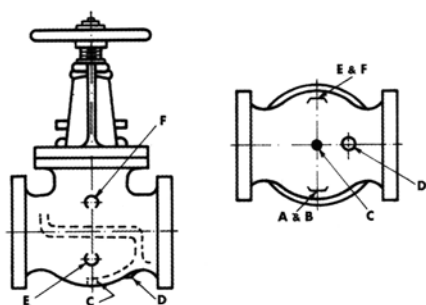
ANGLE VALVE



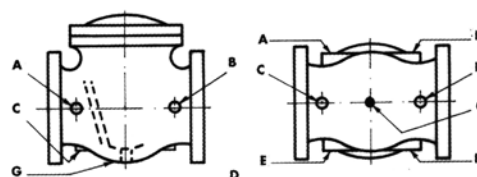
GATE VALVE



GLOBE VALVE



CHECK VALVE

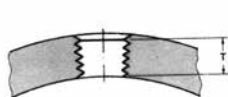


These illustration show the location of tapped holes.

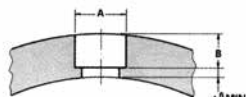
When placing an order please quote the letters in the above illustrations designating the location of the tapped holes.

For more information see MSS-SP-45.

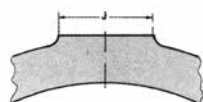
DRAIN AND BY PASS DIMENSION



Thread for Connection Tapping



Socket Welding for Connections



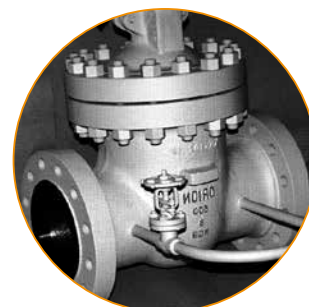
Bosses for Connections

SIZE OF VALVE	2" to 4"	5" to 8"	10" to 24"
Size of Trapping	1/2"	3/4"	1"
Length of Thread	T	14	18
Min. Diam. of Socket	A	27	34
Min. Depth of Socket	B	6,5	6,5
Diameter of Boss	I	44	54

ORION valves can be equipped with by-passes which allow equalization of pressure on both sides of the valve.

Unless otherwise specified "Built-up" by-passes will be supplied on the side of the main valve.

By-passes of other types can be made according to client request. Enquires should give complete description or drawings. By-pass valves are bolted bonnet, outside screw and yoke, socket-weld and globe valves, and materials are suitable for the same service as the main valve.



ORION STEEL VALVES

Special Features

Fig. 12
Lift Indicator

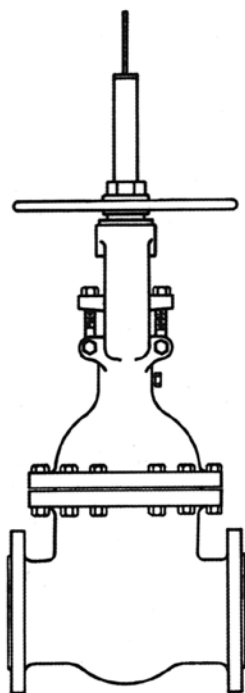


Fig. 3
Limit Micro Switches

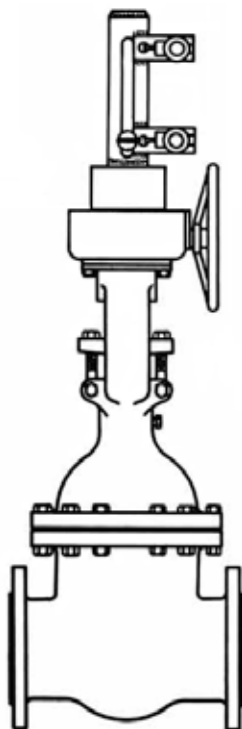


Fig. 23
Pneumatic Operator

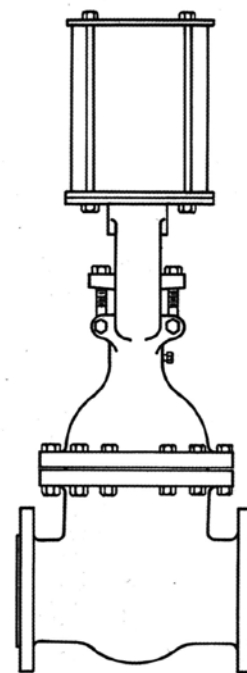


Fig. 8
Bevel Gearing

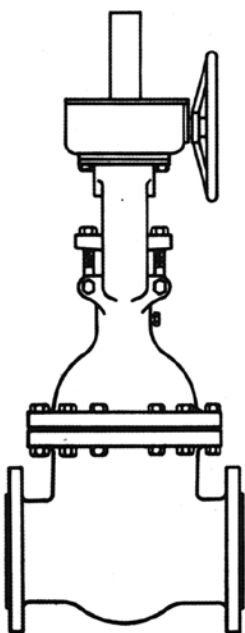


Fig. 9
Bevel Gearing with Horizontal Handwheel

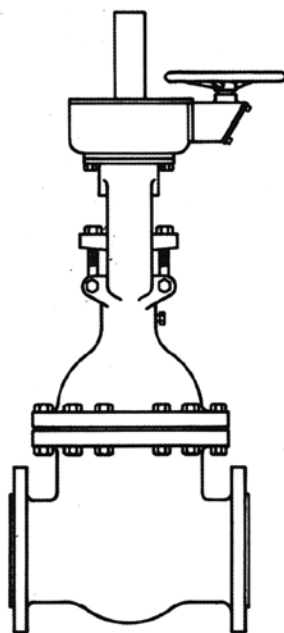
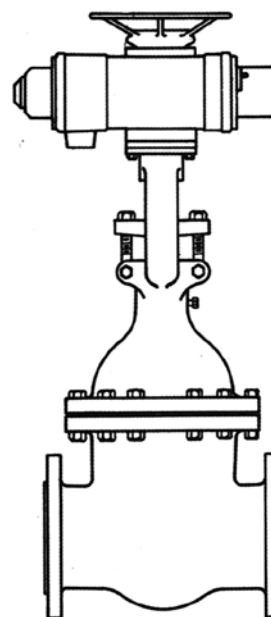


Fig. 16
Electric Actuator

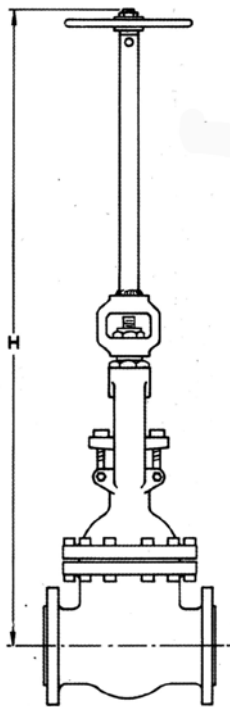


ORION STEEL VALVES

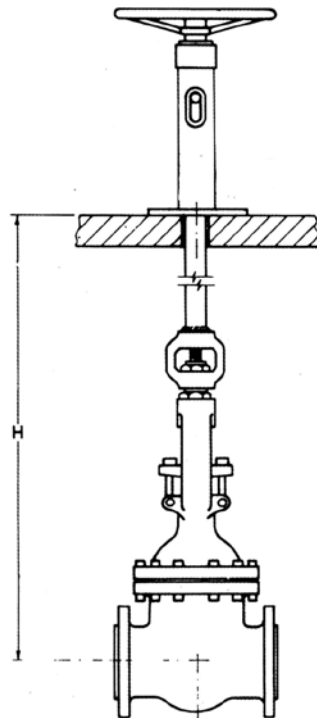
Special Features

Fig. 2

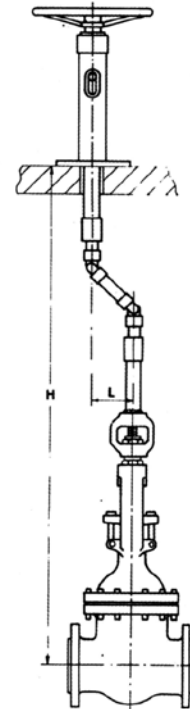
Extension Stern

**Fig. 34**

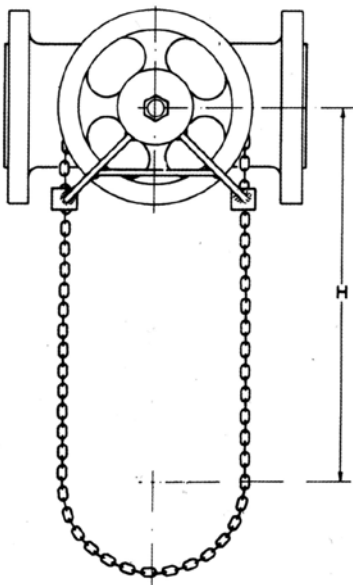
Floor Stand

**Fig. 41**

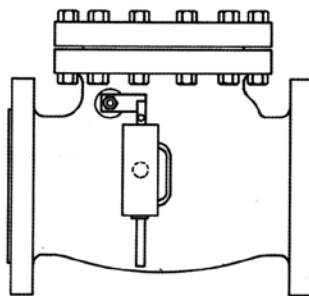
Floor Stand with Universal Joint

**Fig. 33**

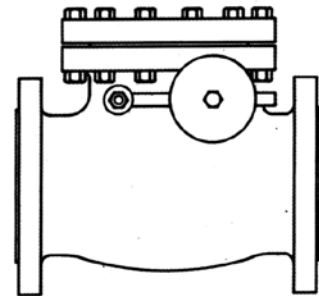
Chain Wheel

**Fig. 30**

Check Valve with Dash-Pot

**Fig. 31**

Check Valve with Outside lever and Weight

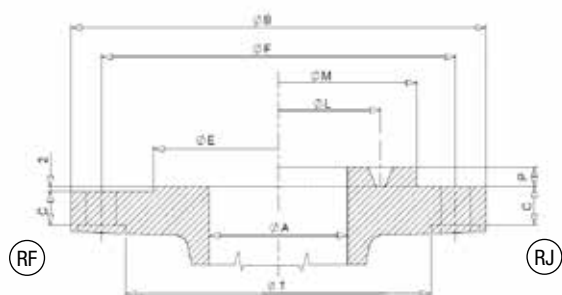


Dimensions H and L to be indicated by the customer.

ORION STEEL VALVES

Dimensions

FLANGE DIMENSION AND RING JOINT FACING



FLANGE DIMENSION AND RING JOINT FACING

ASME B16.5 FROM 1-1/2", MSS SP-44 AND B16.47 SERIES "A" FOR 22" AND FOR 26" AND OVER

DN	Bore ⁽¹⁾	Outside Diameter	Thickness of Flange (Min)	Raised Face Diameter	Diameter of Bolt Circle	Number of Bolt Holes	Diameter of Bolts	Pitch Diameter of Groove	Raised Portion Diameter	Depth of Groove	N°Rj
CLASS 150	A	B	C ⁽³⁾	E	F			L	M	P	
1/2"	12,7	90	8,0	34,9	60,3	4	1/2"	/	/	/	/
3/4"	19,1	100	8,9	42,9	69,9	4	1/2"	/	/	/	/
1"	25,4	110	9,6	50,8	79,4	4	1/2"	47,63	63,5	6,35	R15
1.1/4"	31,8	115	11,2	63,5	88,9	4	1/2"	57,15	73,0	6,35	R17
1.1/2"	38,1	125	12,7	73,0	98,4	4	1/2"	65,07	82,5	6,35	R19
2"	50,8	150	14,3	92,1	120,7	4	5/8"	82,55	102,0	6,35	R22
2.1/2"	63,5	180	15,9	104,8	139,7	4	5/8"	101,60	121,0	6,35	R25
3"	76,2	190	17,5	127,0	152,4	4	5/8"	114,30	133,0	6,35	R29
3.1/2"	88,9	215	19,1	139,7	177,8	8	5/8"	131,78	154,0	6,35	R33
4"	101,6	230	22,3	157,2	190,5	8	5/8"	149,23	171,0	6,35	R36
5"	127,0	255	22,3	185,7	215,9	8	3/4"	171,45	194,0	6,35	R40
6"	152,4	280	23,9	215,9	241,3	8	3/4"	193,68	219,0	6,35	R43
8"	203,2	345	27,0	269,9	298,5	8	3/4"	247,65	273,0	6,35	R48
10"	254,0	405	28,6	323,8	362,0	12	7/8"	304,80	330,0	6,35	R52
12"	304,8	485	30,2	381,0	431,8	12	7/8"	381,00	406,0	6,35	R56
14"	336,6	535	33,4	412,8	476,3	12	1"	396,88	425,0	6,35	R59
16"	387,4	595	35,0	469,9	539,8	16	1"	454,03	483,0	6,35	R64
18"	438,2	635	38,1	533,4	577,9	16	1.1/8"	517,53	546,0	6,35	R68
20"	489,0	700	41,3	584,2	635,0	20	1.1/8"	558,80	597,0	6,35	R72
22" ⁽²⁾	539,8	750	44,5	641,4	692,2	20	1.1/4"	/	/	/	/
24"	590,6	815	46,1	692,2	749,3	20	1.1/4"	673,10	711,0	6,35	R76
CLASS 300	A	B	C	E	F			L	M	P	
1/2"	12,7	95	12,7	34,9	66,7	4	1/2"	34,14	51	5,54	R11
3/4"	19,1	115	14,3	42,9	82,6	4	5/8"	42,88	63,5	6,35	R13
1"	25,4	125	15,9	50,8	88,9	4	5/8"	50,80	70	6,35	R16
1.1/4"	31,8	135	17,5	63,5	98,4	4	5/8"	60,33	79,5	6,35	R18
1.1/2"	38,1	155	19,1	73,0	114,3	4	3/4"	68,27	90,5	6,35	R20
2"	50,8	165	20,7	92,1	127,0	8	5/8"	82,55	108	7,92	R23
2.1/2"	63,5	190	23,9	104,8	149,2	8	3/4"	101,60	127	7,92	R26
3"	76,2	210	27,0	127,0	168,3	8	3/4"	123,83	146	7,92	R31
3.1/2"	88,9	230	28,6	139,7	184,2	8	3/4"	131,78	159	7,92	R34
4"	101,6	255	30,2	157,2	200,0	8	3/4"	149,23	175	7,92	R37
5"	127,0	280	33,4	185,7	235,0	8	3/4"	180,98	210	7,92	R41
6"	152,4	320	35,0	215,9	269,9	12	3/4"	211,12	241	7,92	R45
8"	203,2	380	39,7	269,9	330,2	12	7/8"	269,88	302	7,92	R49
10"	254,0	445	46,1	323,8	387,4	16	1"	323,85	356	7,92	R53
12"	304,8	520	49,3	381,0	450,8	16	1.1/8"	381,00	413	7,92	R57
14"	336,6	585	52,4	412,8	514,4	20	1.1/8"	419,10	457	7,92	R61
16"	387,4	650	55,6	469,9	571,5	20	1.1/4"	469,90	508	7,92	R65
18"	431,8	710	58,8	533,4	628,6	24	1.1/4"	533,40	575	7,92	R69
20"	482,6	775	62,0	584,2	685,8	24	1.1/4"	584,20	635	9,53	R73
22" ⁽²⁾	533,4	840	65,1	641,5	743,0	24	1.1/2"	635,00	686	11,13	R81
24"	584,2	915	68,3	692,2	812,8	24	1.1/2"	692,15	749	11,13	R77

N.B. All dimensions are given in millimeters • ⁽¹⁾ Bore Diameter as for ASME B16.34 • ⁽²⁾ As for MSS-SP-44

⁽³⁾ THICKNESSES ARE CORRESPONDING TO FITTINGS' VALUES (TAB.9 OF ASME B16.5) AS SPECIFIED BY ASME B 16.34 2009-6.22

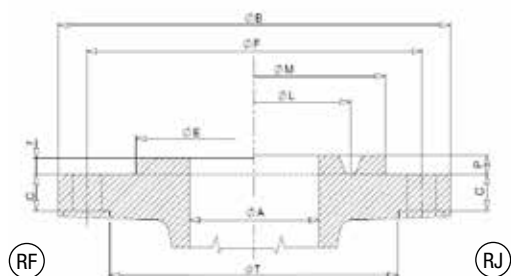
All 150 and 300 Class flanged end valves are normally supplied with (1/16 in) 2 mm raised face with surface finish to 125-250 AARH.

Thickness of flange for Class 150, from 1-1/2" to 3", is valid only for flanges casted integral with the body, for loose flanges see ASME B16.5 table 9.

ORION STEEL VALVES

Dimensions

FLANGE DIMENSION AND RING JOINT FACING



FLANGE DIMENSION AND RING JOINT FACING

ASME B16.5 FROM 1-1/2", MSS SP-44 AND B16.47 SERIES "A" FOR 22" AND FOR 26" AND OVER

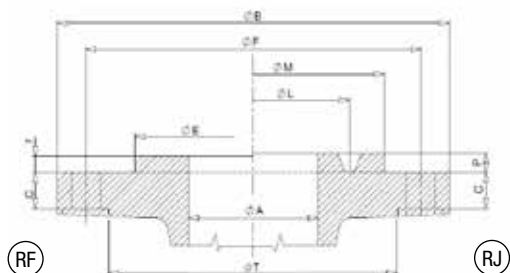
DN	Bore ⁽¹⁾	Outside Diameter	Thickness of Flange (Min)	Raised Face Diameter	Diameter of Bolt Circle	Number of Bolt Holes	Diameter of Bolts	Pitch Diameter of Groove	Raised Portion Diameter	Depth of Groove	N°Rj
CLASS 600	A	B	C	E	F			L	M	P	
1/2"	12,7	95	14,3	34,9	66,7	4	1/2"	34,14	51	5,54	R11
3/4"	19,1	115	15,9	42,9	82,6	4	5/8"	42,88	63,5	6,35	R13
1"	25,4	125	17,5	50,8	88,9	4	5/8"	50,80	70	6,35	R16
1.1/4"	31,8	135	20,7	63,5	98,4	4	5/8"	60,33	79,5	6,35	R18
1.1/2"	38,1	155	22,3	73,0	114,3	4	3/4"	68,27	90,5	6,35	R20
2"	50,8	165	25,4	92,1	127,0	8	5/8"	82,55	108	7,92	R23
2.1/2"	63,5	190	28,6	104,8	149,2	8	3/4"	101,60	127	7,92	R26
3"	76,2	210	31,8	127,0	168,3	8	3/4"	123,83	146	7,92	R31
3.1/2"	88,9	230	35,0	139,7	184,2	8	7/8"	131,78	159	7,92	R34
4"	101,6	275	38,1	157,2	215,9	8	7/8"	149,23	175	7,92	R37
5"	127,0	330	44,5	185,7	266,7	8	1"	180,98	210	7,92	R41
6"	152,4	355	47,7	215,9	292,1	12	1"	211,12	241	7,92	R45
8"	199,9	420	55,6	269,9	349,2	12	1.1/8"	269,88	302	7,92	R49
10"	247,7	510	63,5	323,8	431,8	16	1.1/4"	323,85	356	7,92	R53
12"	298,5	560	66,7	381,0	489,0	20	1.1/4"	381,00	413	7,92	R57
14"	326,9	605	69,9	412,8	527,0	20	1.3/8"	419,10	457	7,92	R61
16"	374,7	685	76,2	469,9	603,2	20	1.1/2"	469,90	508	7,92	R65
18"	419,1	745	82,6	533,4	654,0	20	1.5/8"	533,40	575	7,92	R69
20"	463,6	815	88,9	584,2	723,9	24	1.5/8"	584,20	635	9,53	R73
22" ⁽²⁾	511,0	870	95,3	641,4	777,8	24	1.3/4"	635,00	686	11,13	R81
24"	558,8	940	101,6	692,2	838,2	24	1.7/8"	692,15	749	11,13	R77
CLASS 900	A	B	C	E	F			L	M	P	
1/2"	12,7	120	22,3	34,9	82,6	4	3/4"	39,67	60,5	6,35	R12
3/4"	17,5	130	25,4	42,9	88,9	4	3/4"	44,45	66,5	6,35	R14
1"	22,1	150	28,6	50,8	101,6	4	7/8"	50,80	71,5	6,35	R16
1.1/4"	28,4	160	28,6	63,5	111,1	4	7/8"	60,33	81,0	6,35	R18
1.1/2"	34,8	180	31,8	73,0	123,8	4	1"	68,27	92,0	6,35	R20
2"	47,5	215	38,1	92,1	165,1	8	7/8"	95,25	124	7,92	R24
2.1/2"	57,2	245	41,3	104,8	190,5	8	1"	107,95	137	7,92	R27
3"	72,9	240	38,1	127,0	190,5	8	7/8"	123,83	156	7,92	R31
4"	98,3	290	44,5	157,2	235,0	8	1.1/8"	149,23	181	7,92	R37
5"	120,7	350	50,8	185,7	279,4	8	1.1/4"	180,98	216	7,92	R41
6"	146,1	380	55,6	215,9	317,5	12	1.1/8"	211,12	241	7,92	R45
8"	190,5	470	63,5	269,9	393,7	12	1.3/8"	269,88	308	7,92	R49
10"	238,0	545	69,9	323,8	469,9	16	1.3/8"	323,85	362	7,92	R53
12"	282,4	610	79,4	381,0	533,4	20	1.3/8"	381,00	419	7,92	R57
14"	311,2	640	85,8	412,8	558,8	20	1.1/2"	419,10	467	11,13	R62
16"	355,6	705	88,9	469,9	616,0	20	1.5/8"	469,90	524	11,13	R66
18"	400,1	785	101,6	533,4	685,8	20	1.7/8"	533,40	594	12,7	R70
20"	444,5	855	108,0	584,2	749,3	20	2"	584,20	648	12,7	R74
24"	533,4	1040	139,7	692,2	901,7	20	2.1/2"	692,15	772	15,88	R78

N.B. All dimensions are given in millimeters • ⁽¹⁾ Bore Diameter as for ASME B16.34 • ⁽²⁾ As for MSS-SP-44

ORION STEEL VALVES

Dimensions

FLANGE DIMENSION AND RING JOINT FACING



FLANGE DIMENSION AND RING JOINT FACING

ASME B16.5 FROM 1-1/2", MSS SP-44 AND B16.47 SERIES "A" FOR 22" AND FOR 26" AND OVER

DN	Bore ⁽¹⁾	Outside Diameter	Thickness of Flange (Min)	Raised Face Diameter	Diameter of Bolt Circle	Number of Bolt Holes	Diameter of Bolts	Pitch Diameter of Groove	Raised Portion Diameter	Depth of Groove	N°Rj
CLASS 1500	A	B	C	E	F			L	M	P	
1/2"	12,7	120	22,3	34,9	82,6	4	3/4"	39,67	60,5	6,35	R12
3/4"	17,5	130	25,4	42,9	88,9	4	3/4"	44,45	66,5	6,35	R14
1"	22,1	150	28,6	50,8	101,6	4	7/8"	50,80	71,5	6,35	R16
1.1/4"	28,4	160	28,6	63,5	111,1	4	7/8"	60,33	81,0	6,35	R18
1.1/2"	34,8	180	31,8	73,0	123,8	4	1"	68,27	92,0	6,35	R20
2"	47,5	215	38,1	92,1	165,1	8	7/8"	95,25	124	7,92	R24
2.1/2"	57,2	245	41,3	104,8	190,5	8	1"	107,95	137	7,92	R27
3"	69,9	265	47,7	127,0	203,2	8	1.1/8"	136,53	168	7,92	R35
4"	91,9	310	54,0	157,2	241,3	8	1.1/4"	161,93	194	7,92	R39
5"	111,0	375	73,1	185,7	292,1	8	1.1/2"	193,68	229	7,92	R44
6"	136,4	395	82,6	215,9	317,5	12	1.3/8"	211,14	248	9,53	R46
8"	177,8	485	92,1	269,9	393,7	12	1.5/8"	269,88	318	11,13	R50
10"	222,3	585	108,0	323,8	482,6	12	1.7/8"	323,85	371	11,13	R54
12"	263,4	675	123,9	381,0	571,5	16	2"	381,00	438	14,27	R58
14"	288,8	750	133,4	412,8	635,0	16	2.1/4"	419,10	489	15,88	R63
16"	330,2	825	146,1	469,9	704,8	16	2.1/2"	469,90	546	17,48	R67
18"	371,3	915	162,0	533,4	774,7	16	2.3/4"	533,40	613	17,48	R71
20"	415,8	985	177,8	584,2	831,8	16	3"	584,20	673	17,48	R75
24"	498,3	1170	203,2	692,2	990,6	16	3.1/2"	692,15	794	20,62	R79
CLASS 2500	A	B	C	E	F			L	M	P	
1/2"	11,2	135	30,2	34,9	88,9	4	3/4"	42,88	65,0	6,35	R13
3/4"	14,2	140	31,8	42,9	95,2	4	3/4"	50,80	73,0	6,35	R16
1"	19,1	160	35,0	50,8	108,0	4	7/8"	60,33	82,5	6,35	R18
1.1/4"	25,4	185	38,1	63,5	130,2	4	1"	72,23	102	7,92	R21
1.1/2"	28,4	205	44,5	73,0	146,0	4	1.1/8"	82,55	114	7,92	R23
2"	38,1	235	50,9	92,1	171,4	8	1"	101,60	133	7,92	R26
2.1/2"	47,5	265	57,2	104,8	196,8	8	1.1/8"	111,13	149	9,53	R28
3"	57,2	305	66,7	127,0	228,6	8	1.1/4"	127,00	168	9,53	R32
4"	72,9	355	76,2	157,2	273,0	8	1.1/2"	157,18	203	11,13	R38
5"	91,9	420	92,1	185,7	323,8	8	1.3/4"	190,50	241	12,70	R42
6"	111,0	485	108,0	215,9	368,3	8	2"	228,60	279	12,70	R47
8"	146,1	550	127,0	269,9	438,2	12	2"	279,40	340	14,27	R51
10"	184,2	675	165,1	323,8	539,8	12	2.1/2"	342,90	425	17,48	R55
12"	218,9	760	184,2	381,0	619,1	12	2.3/4"	406,40	495	17,48	R60

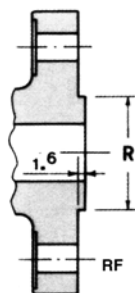
N.B. All dimensions are given in millimeters • ⁽¹⁾ Bore Diameter as for Asme B16.34

ORION STEEL VALVES

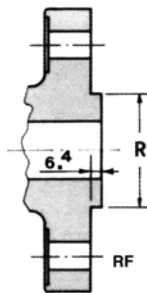
Dimensions

FACING DIMENSION FOR ALL PRESSURE ASME B16.5 2009

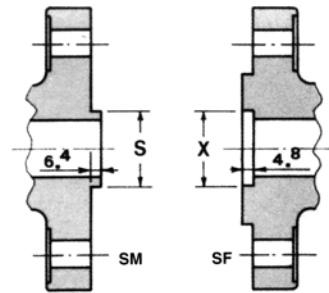
1/16" RAISED FACE



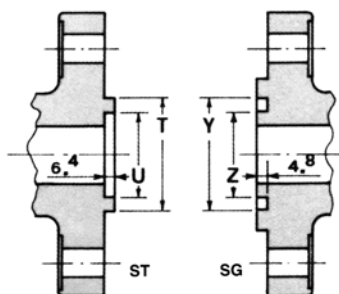
1/4" RAISED FACE



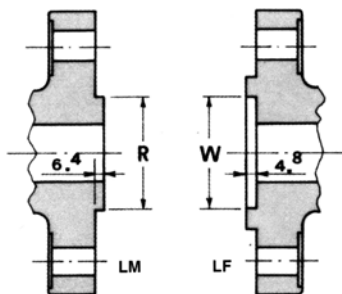
SMALL MALE - FEMALE



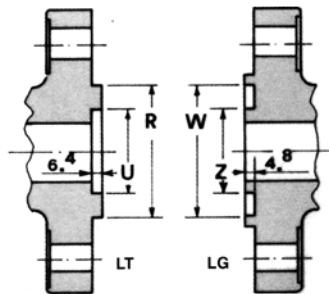
SMALL TONGUE - GROOVE



LARGE MALE - FEMALE



LARGE TONGUE - GROOVE



NOMINAL SIZE	OUTSIDE DIAMETERS						INSIDE DIAMETERS	
	Raised Face Large Male And Large Tongue	Small Male	Small Tongue	Large Female and Large Groove	Small Female	Small Groove	Large And Small Tongue	Large And Small Groove
	R	S	T	W	X	Y	U	Z
1 1/2"	73	44,5	63,5	74,7	46	65	54	52,3
2"	92,1	57,2	82,6	93,7	58,7	84,1	73	71,4
2 1/2"	104,8	68,3	95,3	106,4	69,9	96,8	85,9	84,1
3"	127	84,1	117,5	128,5	85,9	119,1	108	106,4
4"	157,2	109,5	144,5	158,8	111,3	146,1	131,8	130,2
5"	185,7	136,5	173	187,5	138,2	174,8	160,3	158,8
6"	215,9	162,9	203,2	217,4	163,6	204,7	190,5	188,9
8"	269,9	212,7	254	271,5	214,4	255,5	238,3	236,5
10"	323,8	266,7	304,8	325,4	268,2	306,3	285,8	284,2
12"	381	317,5	362	382,5	319	363,5	342,9	341,4
14"	412,8	349,3	393,7	414,3	350,8	395,2	374,7	373,1
16"	469,9	400,1	447,5	471,4	401,6	449,3	425,5	423,9
18"	533,4	450,9	511	534,9	452,4	512,8	489	487,4
20"	584,2	501,7	558,8	585,7	503,2	560,3	533,4	531,9
24"	692,2	603,3	666,8	693,7	604,8	668,3	641,4	639,8

N.B. All dimensions are given in millimeters

1) Large male and female facing and large tongue and groove facing are not applicable to 150 Class because of potential dimensional conflict

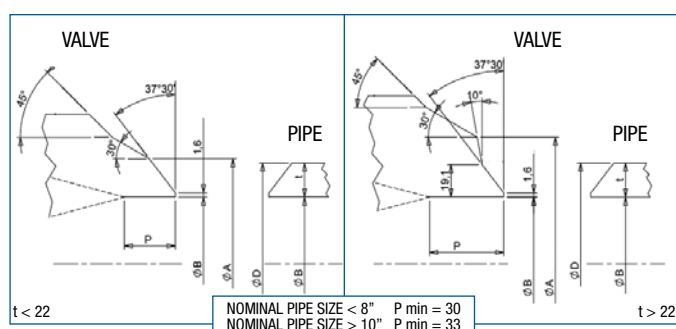
2) A tolerance of plus or minus 0.016 in. (1/64 in.) is allowed on the inside and outside diameters of all facings

3) Male faces are finished with 125-250 AARH. Female tongue and grooved faces are finished with 125-250 AARH

ORION STEEL VALVES

Dimensions

BUTT - WELDING ENDS



BUTT - WELDING ENDS

STANDARD PREPARATION AND DIMENSIONS OF WELDING ENDS

DESIGNATION PER ASME B16.5, ASME B16.25, ASME B36.10, ASME B36.19

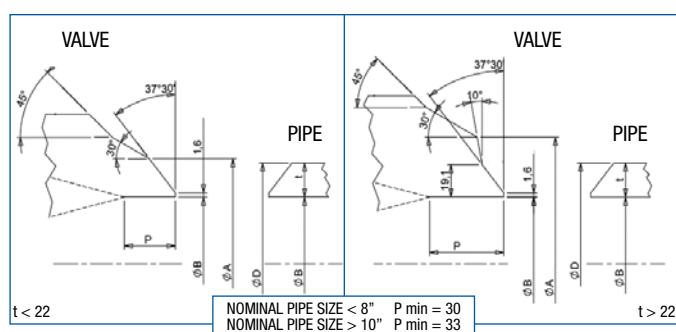
Nominal Pipe Size	Valve	Nominal Pipe	Identification Schedule	Nominal ID	Wall Thickness Of Pipe
	A	D		B	T
1 1/2"	48,3	48,3	40 - 40S - STD	40,90	3,68
			5S	45,00	1,65
			10 - 10 S	42,80	2,77
			80 - 80S - XS	38,10	5,08
			160	34,00	7,14
			XXS	28,00	10,16
2"	60,3	60,3	40 - 40S - STD	52,50	3,91
			5S	57,00	1,65
			10 - 10 S	54,80	2,77
			80 - 80S - XS	49,20	5,54
			160	42,80	8,74
			XXS	28,00	10,16
2 1/2"	75	73	40 - 40S - STD	62,70	5,16
			5S	68,80	2,11
			10 - 10 S	66,90	3,05
			80 - 80S - XS	59,00	7,01
			160	54,00	9,53
			XXS	45,00	14,02
3"	91	88,9	40 - 40S - STD	82,20	3,05
			5S	77,90	5,50
			10 - 10 S	84,70	2,11
			80 - 80S - XS	73,70	7,60
			160	66,60	11,10
			XXS	58,40	15,20
3 1/2"	105	101,6	40 - 40S - STD	90,10	5,74
			5S	97,40	2,11
			10 - 10 S	95,50	3,05
			80 - 80S - XS	85,40	8,08
			40 - 40S - STD	102,3	6
4"	117	114,3	5S	110,1	2,11
			10 - 10 S	108,2	3,05
			80 - 80S - XS	97,2	8,6
			120	92	11,1
			160	87,3	13,5
			XXS	80,1	17,1
			40 - 40S - STD	128,2	6,5
5"	144	141,3	5S	135,8	2,77
			10 - 10 S	134,5	3,4
			80 - 80S - XS	122,2	9,5
			120	115,9	12,7
			160	109,5	15,9
			XXS	103,2	19

STD = Standard Wall Thickness • XS = Extra Strong Wall Thickness • XXS = Double Extra Strong Wall Thickness

ORION STEEL VALVES

Dimensions

BUTT - WELDING ENDS

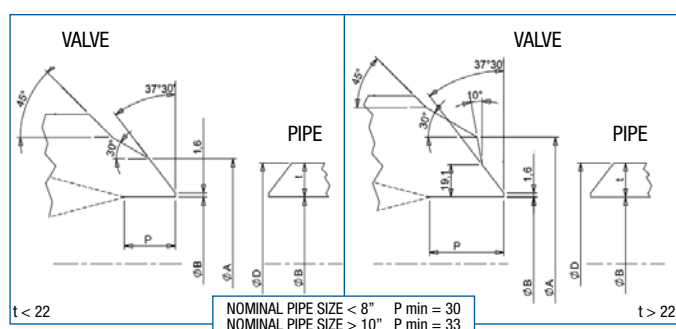


Nominal Pipe Size	Valve	Nominal Pipe	Identification Schedule	Nominal ID	Wall Thickness Of Pipe
	A	D		B	T
6"	172	168,3	40 - 40S - STD	154,1	7,1
			5S	162,8	2,77
			10 - 10 S	161,5	3,4
			80 - 80S - XS	146,4	11
			120	139,8	14,3
			160	131,8	18,3
			XXS	124,4	22
8"	223	219,1	40 - 40S - STD	202,7	8,2
			5S	213,6	2,77
			10 - 10 S	211,6	3,76
			20	206,4	6,35
			30	205	7,04
			60	198,5	10,3
			80 - 80S - XS	193,7	12,7
			100	188,9	15,1
			120	182,6	18,3
			140	177,9	20,6
			XXS	174,6	22,2
			160	173,1	23
10"	278	273	40 - 40S - STD	254,6	9,3
			XS	247,7	12,7
			5S	266,3	3,4
			10 - 10 S	264,7	4,19
			20	260,4	6,35
			30	257,5	7,8
			60	247,7	12,7
			80	242,9	15,1
			80 S	247,7	12,7
			100	236,6	18,3
			120	230,2	21,4
			140	222,3	25,4
			XXS	222,3	25,4
			160	215,9	28,6

ORION STEEL VALVES

Dimensions

BUTT - WELDING ENDS



BUTT - WELDING ENDS

STANDARD PREPARATION AND DIMENSIONS OF WELDING ENDS

DESIGNATION PER ASME B16.5, ASME B16.25, ASME B36.10, ASME B36.19

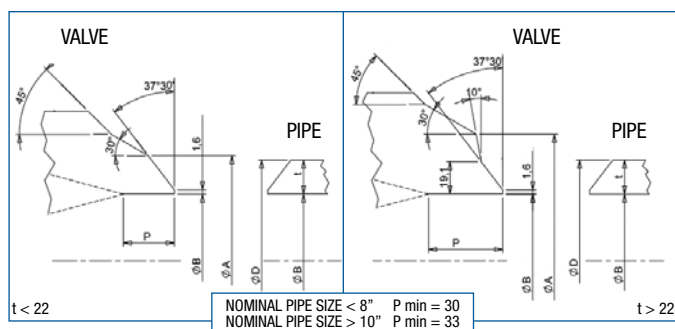
Nominal Pipe Size	Valve	Nominal Pipe	Identification Schedule	Nominal ID	Wall Thickness Of Pipe
	A	D		B	T
12"	329	323,8	STD	304,8	9,5
			40	303,3	10,3
			40 S	304,8	9,53
			XS	298,5	12,7
			5S	316	3,96
			10 - 10 S	314,8	4,57
			20	311,2	6,35
			30	307,1	8,38
			60	295,4	14,3
			80	288,9	17,5
			80 S	298,5	12,7
			100	281	21,4
			120	273,1	25,4
			140	266,7	28,6
			XXS	273,1	25,4
			160	257,3	33,3
14"	362	355,6	STD	336,5	9,5
			40	333,3	11,1
			40 S	336,5	9,53
			XS	330,2	12,7
			5S	347,7	3,96
			10	342,9	6,35
			10 S	346,04	4,78
			20	333,8	7,92
			30	336,5	9,53
			60	325,4	15,1
			80	317,5	19
			80 S	330,2	12,7
			100	307,9	23,8
			120	300	27,8
			140	292,1	31,7
			160	284,2	35,7

STD = Standard Wall Thickness • XS = Extra Strong Wall Thickness • XXS = Double Extra Strong Wall Thickness

ORION STEEL VALVES

Dimensions

BUTT - WELDING ENDS



Nominal Pipe Size	Valve	Nominal Pipe	Identification Schedule	Nominal ID	Wall Thickness Of Pipe
	A	D		B	T
16"	413	406,4	STD	387,3	9,5
			40	381	12,7
			40 S	387,34	9,53
			5S	398	4,19
			10	393,7	6,35
			10 S	369,84	4,78
			20	390,6	7,92
			30	387,3	9,53
			60	373,1	16,7
			80	363,5	21,4
			80 S	381	12,7
			100	354	26,2
			120	344,5	31
			140	333,3	36,5
			160	325,4	40,5
18"	464	457,2	40	428,7	14,3
			40 S	437,94	9,53
			XS	431,8	12,7
			5S	448,8	4,19
			10	444,5	6,35
			10 S	447,44	4,78
			20	441,4	7,92
			30	434,9	11,13
			60	419,1	19
			80	409,5	23,8
			80 S	431,6	12,7
			100	398,5	29,4
			120	387,3	34,9
			140	377,9	39,7
			160	366,7	45,2
20"	516	508	STD	489	9,53
			40	477,8	15,1
			40 S	488,94	9,53
			XS	482,6	12,7
			5S	498,4	4,78
			10	495,3	6,35
			10 S	496,92	5,54
			20	488,9	9,53
			30	482,6	12,7
			60	466,8	20,6
			80	455,6	25,2
			80 S	482,6	12,7
			100	442,9	32,5
			120	431,8	38,1
			140	419,1	44,4
			160	408	50

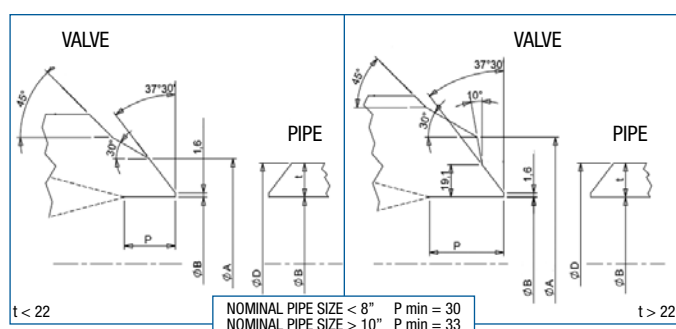
N.B. All dimension are given in millimeters.

Important: when ordering butt welding end valves please state the type of ends required and give the pipe dimensions or schedule number.

ORION STEEL VALVES

Dimensions

BUTT - WELDING ENDS



BUTT - WELDING ENDS

STANDARD PREPARATION AND DIMENSIONS OF WELDING ENDS

DESIGNATION PER ASME B16.5, ASME B16.25, ASME B36.10, ASME B36.19

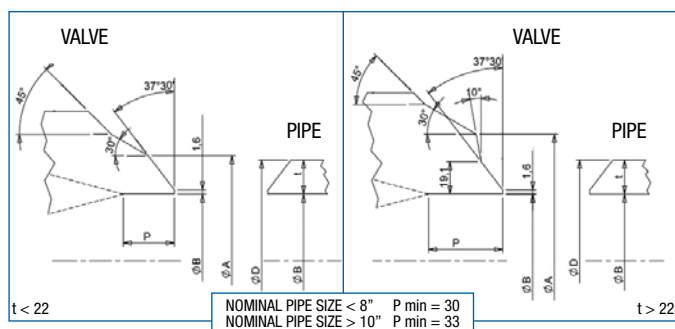
Nominal Pipe Size	Valve	Nominal Pipe	Identification Schedule	Nominal ID	Wall Thickness Of Pipe
	A	D		B	T
22"	567	558,8	STD	539,8	9,53
			XS	533,4	12,7
			5S	549,2	4,78
			10	546,1	6,35
			10 S	547,92	5,54
			20	539,7	9,53
			30	533,4	12,7
			60	514,3	22,23
			80	501,6	28,58
			100	488,9	34,93
			120	476,2	41,28
			140	463,5	47,63
24"	619	609,6	STD	539,8	9,53
			40	574,6	17,48
			40 S	590,94	9,53
			XS	533,4	12,7
			5S	549,2	4,78
			10	546,1	6,35
			20	539,7	9,53
			30	533,4	12,7
			60	514,3	22,23
			80	501,6	28,58
			80 S	584,6	12,7
			100	488,9	34,93
26"	670	660,4	STD	641,3	9,53
			XS	635	12,7
			10 - 10S	644,6	7,92
			20	635	12,7
28"	721	711,2	STD	692,1	9,53
			XS	685,8	12,7
			10 - 10 S	695,4	7,92
			20	685,8	12,7
30"	772	762	30	679,4	15,88
			STD	742,9	9,53
			XS	736,6	12,7
			5S	749,3	6,35
			10 - 10 S	746,2	7,92
			20	736,6	12,7
			30	730,2	15,88

STD = Standard Wall Thickness • XS = Extra Strong Wall Thickness • XXS = Double Extra Strong Wall Thickness

ORION STEEL VALVES

Dimensions

BUTT - WELDING ENDS



Nominal Pipe Size	Valve	Nominal Pipe	Identification Schedule	Nominal ID	Wall Thickness Of Pipe
	A	D		B	T
32"	825	812,8	STD	793,7	9,53
			40 - 40 S	777,8	17,48
			XS	787,4	12,7
			10 - 10 S	797	7,92
			20	787,4	12,7
			30	781	15,88
34"	876	863,6	STD	844,5	9,53
			40 - 40 S	828,6	17,48
			XS	838,2	12,7
			10 - 10 S	847,8	7,92
			20	838,2	12,7
			30	831,8	15,88
36"	927	914,4	STD	895,3	9,53
			40 - 40 S	876,3	19,05
			XS	889	12,7
			10 - 10 S	898,6	7,92
			20	889	12,7
			30	882,6	15,88
38"	978	965,2	STD	946	9,53
			XS	940	12,7
40"	1029	1016	STD	997	9,53
			XS	990,5	12,7
42"	1079	1066,8	STD	1047,5	9,53
			XS	1041,5	12,7
44"	1130	1117,6	STD	1098,5	9,53
			XS	1092	12,7
46"	1181	1168,4	STD	1149,5	9,53
			XS	1143	12,7
48"	1232	1219,2	STD	1200	9,53
			XS	1194	12,7

ORION STEEL VALVES Flow Coefficient

FLOW FORMULATION USING Cv COEFFICIENT

FLOW COEFFICIENT "Cv" DEFINITION: flow rate (gallons/minute) of water (60° F) with 1.0 psi pressure drop across valve.

FLOW COEFFICIENT "Kv" DEFINITION: flow rate (m³/h) of water (from 5 to 40°C) with 1.0 bar pressure drop across valve.

$$K_v = \frac{C_v}{1.156}$$

Type flow	Flow Rate English Units	Flow Rate Metric units
Liquid	$Q = C_v \sqrt{\frac{\Delta P}{S}}$	$Q = 0.865 C_v \sqrt{\Delta P \frac{\rho_0}{\rho}}$
Gas $\Delta P < 0.5 P_1$	$q'_m = 22.6 C_v \sqrt{\frac{\Delta P \cdot P_1}{T_1 \cdot S_g}}$	$q'_H = 414.97 C_v \sqrt{\frac{\Delta P \cdot P_1}{T_1 \cdot S_g}}$
Gas $\Delta P \geq 0.5 P_1$	$q'_m = \frac{13.9 P_1 C_v}{\sqrt{T_1 \cdot S_g}}$	$q'_H = \frac{255.2 P_1 C_v}{\sqrt{T_1 \cdot S_g}}$
Dry saturated steam $\Delta P < 0.5 P_1$	$W = 2.97 C_v \sqrt{\Delta P \cdot P_1}$	$W = 19.53 C_v \sqrt{\Delta P \cdot P_1}$
Dry saturated steam $\Delta P \geq 0.5 P_1$	$W = 1.82 C_v P_1$	$W = 11.97 C_v P_1$
Superheated steam $\Delta P < 0.5 P_1$	$W = \frac{2.97 C_v \sqrt{\Delta P \cdot P_1}}{(1 + 0.0007s)}$	$W = \frac{19.1 C_v \sqrt{\Delta P \cdot P_1}}{(1 + 0.00123s)}$
Superheated steam $\Delta P \geq 0.5 P_1$	$W = \frac{1.82 C_v P_1}{(1 + 0.0007s)}$	$W = \frac{11.71 C_v P_1}{(1 + 0.00123s)}$
Nomenclature	P_1 = Absolute inlet pressure (psia) P_2 = Absolute outlet pressure (psia) P = pressure drop (psi) Q = liquid flow (gpm) q'_m = rate of gas flow (ft³/min) at 14.7 psia and 60°F S = specific gravity of flowing liquid relative to water at 60° F S_g = specific gravity of gas relative to air s = number of degrees of superheated steam in °F T_1 = absolute inlet temperature (°R) W = steam of vapour flow rate (lbs/h)	P_1 = Absolute inlet pressure (bar) P_2 = Absolute outlet pressure (bar) P = pressure drop (bar) Q = liquid flow (m³/h) q'_H = rate of gas flow (m³/h) at 1.01 bar and 15.6°C S = specific gravity of flowing liquid relative to water at 60° F S_g = specific gravity of gas relative to air s = number of degrees of superheated steam in °F T_1 = absolute inlet temperature (°R) W = steam of vapour flow rate (lbs/h)

ORION STEEL VALVES Flow Coefficient

FLOW FORMULATION USING CV COEFFICIENT

Type flow	Pressure Drop English Units	Pressure Drop Metric units
Liquid	$\Delta P = S \left(\frac{Q}{C_v} \right)^2$	$\Delta P = 1.34 S \left(\frac{Q}{C_v} \right)^2$
Gas	$\Delta P = \frac{0.00195 T_1 S_g}{P_1} \left(\frac{Q}{C_v} \right)^2$	$\Delta P = \frac{5.8 \cdot 10^{-6} T_1 S_g}{P_1} \left(\frac{Q_H}{C_v} \right)^2$
Dry saturated steam	$\Delta P = \frac{0.113}{P_1} \left(\frac{W}{C_v} \right)^2$	$\Delta P = \frac{0.00262}{P_1} \left(\frac{W}{C_v} \right)^2$
Superheated steam	$\Delta P = \frac{0.113}{P_1} \left(\frac{W (1 + 0.0007s)}{C_v} \right)^2$	$\Delta P = \frac{0.00274}{P_1} \left(\frac{W (1 + 0.00123s)}{C_v} \right)^2$
Nomenclature	P_1 = Absolute inlet pressure (psia) P_2 = Absolute outlet pressure (psia) P = pressure drop (psi) Q = liquid flow (gpm) q'_m = rate of gas flow (ft³/min) at 14.7 psia and 60°F S = specific gravity of flowing liquid relative to water at 60° F S_g = specific gravity of gas relative to air s = number of degrees of superheated steam in °F T_1 = absolute inlet temperature (°R) W = steam of vapour flow rate (lbs/h)	P_1 = Absolute inlet pressure (bar) P_2 = Absolute outlet pressure (bar) P = pressure drop (bar) Q = liquid flow (m³/h) q'_H = rate of gas flow (m³/h) at 1.01 bar and 15.6°C S = specific gravity of flowing liquid relative to water at 60° F S_g = specific gravity of gas relative to air s = number of degrees of superheated steam in °F T_1 = absolute inlet temperature (°R) W = steam of vapour flow rate (lbs/h)

ORION STEEL VALVES

Flow Coefficient

AXIAL CHECK VALVES FLOW COEFFICIENTS						
DN	150	300	600	900	1500	2500
2"	63	/	/	109	109	/
3"	155	/	/	/	(	125
4"	410	410	410	380	380	290
6"	520	500	500	422	389	322
8"	765	765	765	769	702	610
10"	1.203	1.205	1.202	1.208	1.087	946
12"	3.744	3.720	3.600	3.500	3.500	2.900
14"	5.150	5.060	5.010	4.980	4.200	4.200
16"	5.230	5.150	5.150	5.000	4.900	4.800
18"	5.900	5.900	5.900	5.140	5.120	5.120
20"	7.271	7.271	7.271	5.800	5.800	4.900
22"	8.800	8.800	8.800	5.583	5.583	-
24"	10.500	10.500	10.500	8.700	8.700	-
26"	15.080	15.080	15.080	9.800	9.800	-
28"	17.500	17.500	17.500	13.500	12.300	-
30"	20.050	20.050	20.050	19.600	19.500	-
32"	22.850	22.850	22.850	20.100	20.100	-
34"	25.800	25.800	25.800	22.600	22.580	-
36"	30.000	30.000	30.000	25.800	25.800	-

THROUGH CONDUIT GATE VALVES FLOW COEFFICIENTS							
DN (inch)	150	300	400	600	900	1500	2500
2"	500	500	500	500	500	500	376
2 1/2"	797	797	797	797	797	797	564
3"	1.180	1.180	1.180	1.180	1.180	1.180	797
4"	2.161	2.161	2.161	2.161	2.161	2.161	1.630
5"	3.447	3.447	3.447	3.447	3.447	3.079	2.465
6"	5.074	5.074	5.074	5.074	5.074	4.609	3.822
7"	6.984	6.984	6.984	6.984	6.984	6.235	5.300
8"	9.228	9.228	9.228	9.228	9.228	8.360	7.236
10"	14.860	14.860	14.860	14.860	14.860	13.320	11.490
12"	21.800	21.800	21.800	21.800	21.800	19.465	16.460
14"	26.750	26.750	26.750	26.750	24.670	23.700	/
16"	35.900	35.900	35.900	35.900	33.370	31.146	/
18"	46.570	46.570	46.570	46.570	43.610	32.870*	/
20"	58.800	58.800	58.800	58.800	54.665	41.655*	/
22"	72.690	72.690	72.690	72.690	67.980	51.058*	/
24"	88.300	88.300	88.300	88.300	82.090	61.260*	/
26"	102.870	102.870	102.870	102.870	97.490	72.690*	/
28"	120.900	120.900	120.900	120.900	113.930	86.290*	/
30"	140.570	140.570	140.570	140.570	131.800	99.600*	/
32"	159.300	159.300	159.300	159.300	150.900	/	/
34"	182.140	182.140	182.140	182.140	171.980	/	/
36"	203.780	203.780	203.780	203.780	194.380	/	/
38"	228.840	228.840	228.840	228.840	/	/	/
40"	255.880	255.880	255.880	255.880	/	/	/
42"	280.600	280.600	280.600	280.600	/	/	/
44"	307.080	307.080	307.080	307.080	/	/	/
46"	341.100	341.100	341.100	341.100	/	/	/
48"	374.770	374.770	374.770	374.770	/	/	/

Value are calculated for bore diameter as per API 6D FULL BORE

*Value are calculated for bore diameter as per ASME B16.34

For Cv valves not mentioned in the table above, please ask ORION Technical Department.

ORION STEEL VALVES

Flow Coefficient

WEDGE GATE VALVES FLOW COEFFICIENTS							
DN	150	300	400	600	900	1500	2500
1 1/2"	130	130	130	130	112	112	73
2"	240	240	240	240	210	210	130
2 1/2"	380	380	380	380	310	310	230
3"	560	560	560	560	520	475	310
4"	1.000	1.000	1.000	1.000	950	850	520
5"	1.650	1.650	1.650	1.650	1.500	1.400	900
6"	2.400	2.400	2.400	2.400	2.230	1.900	1.300
8"	4.400	4.400	4.400	4.300	4.000	3.500	2.400
10"	7.100	7.100	7.100	6.800	6.130	5.500	3.750
12"	10.200	10.200	10.200	9.800	9.000	8.000	5.400
14"	13.000	13.000	12.300	11.900	11.000	9.500	/
16"	17.000	17.000	16.200	15.900	14.500	12.500	/
18"	22.000	21.500	21.500	20.100	18.500	16.000	/
20"	27.500	27.000	26.000	25.000	24.000	20.000	/
22"	34.300	33.500	32.600	30.700	28.100	24.400	/
24"	40.200	39.800	39.500	37.500	34.000	29.500	/
26"	49.900	48.800	46.700	43.700	40.000	34.600	/
28"	58.300	57.200	54.400	50.900	46.800	40.800	/
30"	67.800	66.500	63.000	58.900	53.900	48.000	/
32"	75.500	75.500	75.500	75.500	/	/	/
36"	96.000	96.000	96.000	96.000	/	/	/
42"	132.000	132.000	132.000	132.000	/	/	/
48"	175.000	175.000	175.000	175.000	/	/	/
60"	279.000	279.000	279.000	279.000	/	/	/

Bore diameter as per ASME B16.34
For 32" and over bore diameter was considered as per API 6D

GLOBE VALVES FLOW COEFFICIENTS							
DN	150	300	400	600	900	1500	2500
1 1/2"	26	26	26	26	21	21	14
2"	47	47	47	47	43	43	27
2 1/2"	75	75	75	75	60	60	45
3"	110	110	110	110	100	93	62
4"	205	205	205	205	190	170	105
5"	325	325	325	325	290	245	170
6"	428	428	428	428	396	342	225
8"	765	765	765	747	675	585	387
10"	1.120	1.120	1.120	1.056	960	840	560
12"	1.680	1.680	1.680	1.552	1.384	1.210	808
14"	1.950	1.950	1.838	1.770	1.590	1.470	/
16"	2.550	2.550	2.445	2.362	2.282	1.950	/
18"	3.270	3.172	3.172	2.985	2.921	2.470	/
20"	4.125	4.020	3.960	3.701	3.650	3.180	/
24"	/	/	/	/	/	4.650	/

Bore diameter as per ASME B16.34
For 32" and over bore diameter was considered as per API 6D

ORION STEEL VALVES

Flow Coefficient

SWING CHECK VALVES FLOW COEFFICIENTS							
DN	150	300	400	600	900	1500	2500
1 1/2"	40	40	40	40	30	30	23
2"	75	75	75	75	65	65	42
2 1/2"	120	120	120	120	95	95	68
3"	175	175	175	175	160	145	98
4"	320	320	320	320	300	265	150
5"	510	510	510	510	460	390	270
6"	760	760	760	760	700	610	400
8"	1.400	1.400	1.400	1.350	1.250	1.050	720
10"	2.250	2.250	2.250	2.150	1.950	1.700	1.200
12"	3.300	3.300	3.300	3.200	2.900	2.500	1.700
14"	4.100	4.100	4.000	3.800	3.500	2.900	/
16"	5.300	5.300	5.200	5.050	4.500	3.800	/
18"	7.000	6.800	6.800	6.500	6.000	5.000	/
20"	8.800	8.600	8.300	7.900	7.000	6.250	/
22"	10.800	10.500	10.200	9.600	8.700	7.500	/
24"	13.500	13.000	12.500	11.800	10.800	9.400	/
26"	15.500	15.200	14.600	13.700	/	/	/
28"	18.200	17.800	17.000	15.800	/	/	/
30"	21.100	20.700	19.600	18.400	/	/	/
32"	23.600	23.600	23.600	23.600	/	/	/
36"	30.300	30.300	30.300	30.300	/	/	/
42"	41.800	41.800	41.800	41.800	/	/	/
48"	55.000	55.000	55.000	55.000	/	/	/
60"	76.000	76.000	76.000	76.000	/	/	/

Bore diameter as per ASME B16.34
For 32" and over bore diameter was considered as per API 6D

DUAL PLATE CHECK VALVES FLOW COEFFICIENTS						
NPS	150	300	600	900	1500	2500
2"	55	55	44	44	45	45
2 1/2"	122	122	110	110	112	112
3"	133	133	125	125	126	126
4"	326	326	220	220	196	196
6"	820	820	590	590	524	524
8"	1.428	1.428	1.142	1.142	1.009	1.009
10"	2.665	2.665	2.132	2.132	1.884	1.884
12"	3.889	3.889	3.111	3.111	2.776	2.776
14"	5.100	4.590	/	/	/	/
16"	7.323	6.590	/	/	/	/
18"	10.150	9.135	/	/	/	/
20"	12.648	11.383	/	/	/	/
24"	23.575	21.218	/	/	/	/
30"	40.600	36.540	/	/	/	/
36"	60.600	54.540	/	/	/	/
42"	/	/	/	/	/	/
48"	/	/	/	/	/	/

For Cv valves not mentioned in the table above, please ask ORION Technical Department.

ORION STEEL VALVES

Materials

MATERIAL SPECIFICATIONS

		CAST			FORGED		
Application Fields	Material Type	ASTM	Symbol	Material Group Asme B16.34-2013	ASTM	Symbol	Material Group Asme B16.34-2013
GENERAL SERVICE AND HIGH TEMPERATURE SERVICE	CARBON STEEL						
	C-Si	A 216 GR WCB	WCB	1.1	A 105	A105	1.1
					A 515 GR 70	GR70	1.1
					A 106 GR C	A106-C	1.2
	C-Mn-Si			A 106 GR A	A106-A	N/A	
		A 216 GR WCC	WCC	1.2			
	A 216 GR WCA	WCA	N/A				
HIGH TEMPERATURE SERVICE	Alloy steel						
	C- 0,5 Mo	A 217 GR WC1	WC1	1.3	A 182 GR F1	F1	1.5
	0,5 Cr - 0,5 Mo				A 182 GR F2	F2	1.7
	1,25 Cr - 0,5 Mo	A 217 GR WC6	WC6	1.9			
	1,25 Cr - 0,5 Mo	A 217 GR WC11	WC11	N/A			
	1,25 Cr - 0,5 Mo - Si				A 182 GR F11 CL.2	F11-cl2	1.9
	1Cr - 0,5 Mo				A 182 GR F12 CL.2	F12-cl2	1.17
	2,25 Cr - 1Mo	A 217 GR WC9	WC9	1.10	A 182 GR F22 CL3	F22-cl3	1.10
	3 Cr - 1 Mo				A 182 GR F21 CL.1	F21-cl1	NA
	5Cr - 0,5 Mo	A 217 GR C5	C5	1.13	A 182 GR F5A	F5A	1.13
	5Cr - 0,5 Mo				A 182 GR F5	F5	1.17
	9 Cr - 1 Mo	A 217 GR C12	C12	1.14	A 182 GR F9	F9	1.14
	9 Cr - 1 Mo - 0.2 V	A 217 GR C12A	C12A	1.15			
	1 Ni - 0,5 Cr - 0,5 Mo	A 217 GR WC4	WC4	1.7			
	0.75 Ni - 0.75 Cr - 1 Mo	A 217 GR WC5	WC5	1.7			
HIGH TEMPERATURE SERVICE, CORROSIVE / CRYOGENIC SERVICE	STAINLESS STEEL						
	13 Cr	A 217 GR CA15	CA15	N/A	A 182 GR F6A	F6A	N/A
	13 Cr - 0,75 Mo	A 487 GR CA15M	CA15M	N/A			
	13 Cr - 4 Ni				A 182 GR F6NM	F6NM	N/A
	13 Cr - 4 Ni - 0,7 Mo	A 352 GR CA6NM	CA6NM	N/A			
	14 Cr	A 487 GR CA15	CA15	N/A			
	16 Cr - 12 Ni - 2 Mo	A 351 GR CF8M	CF8M	2.2	A 182/ A 240 GR F316	316	2.2
	16 Cr - 12 Ni - 2 Mo - Low C	A 351 GR CF3M	CF3M	2.2			
	16 Cr - 12 Ni - 2 Mo				A 182/ A 240 GR F316H	316H	2.2
	16 Cr - 12 Ni - 2 Mo - Low C				A 182/ A 240 GR F316L	316L	2.3
	16 Cr - 4 Ni				A 564 GR 630	17-4 PH	N/A
	17 Cr				A 182 GR F430	430	N/A
	18 Cr - 10 Ni - Nb				A 182/ A 240 GR F347H	347H	2.5
	18 Cr - 10 Ni - Ti				A 182 / A 240 GR F321	321	2.4
	18 Cr - 8 Ni	A 351 GR CF8	CF8	2.1	A 182/ A 240 GR F304	304	2.1
	18 Cr - 8Ni	A 351 GR CF10	CF10	2.1	A 182/ A 240 GR F304H	304H	2.1
	19 Cr - 10 Ni - 3 Mo	A 351 GR CG3M	CG3M	2.2			
	19 Cr - 10 Ni - Nb				A 182/ A 240 GR F347	347	2.5
	19 Cr - 10 Ni - Ti				A 182/ A 240 GR F321H	321H	2.4
	19 Cr - 9 Ni - Low C	A 351 GR CF3	CF3	2.1	A 182/ A 240 GR F304L	304L	2.3
	19 Cr - 9 Ni - Nb	A 351 GR CF8C	CF8C	2.11			
	20 Cr - 10 Ni - 3 Mo	A 351 GR CG8M	CG8M	2.2			
	20 Cr - 18 Ni - 6 Mo	A 351 GR CK3MCuN	CK3MCUN	2.8	A 182 GR F44	F44	2.8
	22 cr - 13 Ni - 5 Mo				A 182/ A 240 GR FXM-19	XM19	N/A
	25 Cr - 20 Ni	A 351 GR CK20	CK20	2.12			
	26 Cr - 20 Ni				A 182/ A 240 GR F310H	310H	2.7

ORION STEEL VALVES

Materials

MATERIAL SPECIFICATIONS

Application Fields	Material Type	CAST			FORGED		
		ASTM	Symbol	Material Group Asme B16.34-2013	ASTM	Symbol	Material Group Asme B16.34-2013
HIGH TEMPERATURE SERVICE, HIGHER CORROSION RESISTANCE	DUPLEX STAINLESS STEEL						
	20 Cr - 29 Ni - 2,5 Mo	A 351 GR CN7M	CN7M	3.17			
	21 Cr - 24 Ni - 6 Mo-Cu-N	A 351 GR CN3MN	CN3MN	3.12			
	22 Cr - 5 Ni - 3 Mo	A 890 GR 4A	4A	N/A	A 182/ A 240 GR F51	F51	2.8
	25 Cr - 5 Ni - Mo-Cu-N	A 995 GR 1B (a)	1B	N/A			
	25 Cr - 7 Ni - 4 Mo - N	A 890 GR 5A	5A	N/A			
	25 Cr - 7 Ni - 4 Mo - N				A 182/ A 240 GR F53	F53	2.8
	25 Cr - 7,5 Ni - 3,5 Mo -N-Cu-W				A 182/ A 240 GR F55	F55	2.8
	25 Cr 7,5 Ni 3,5 Mo	A 890 GR 6A	6A	N/A			
LOW TEMPERATURE SERVICE	26 Cr - 5,35 Ni - 2 Mo	A 890 GR 1A	1A	N/A	A 182 GR F50	F50	N/A
	LOW TEMPERATURE STEEL						
	0,5 Mo	A 352 GR LC1	LC1	1.3			
	2 Ni	A 352 GR LC2	LC2	1.2			
	3 Ni	A 352 GR LC2 CL. 1	LC2-1	N/A			
	3,5 Ni	A 352 GR LC3	LC3	1.2	A 350 GR LF3	LF3	1.1
	4,5 Ni	A 352 GR LC4	LC4	N/A			
	9 Ni	A 352 GR LC9	LC9	N/A			
	Cr - Mn - Si	A 352 GR LCA	LCA	N/A			
	Cr - Mn - Si	A 352 GR LCB	LCB	1.3	A 350 GR LF2	LF2	1.1
	Cr - Mn - Si	A 352 GR LCC	LCC	1.2			
EXCELLENT CORROSION RESISTANCE	Cr - Mo	A 757 GR D1Q2	D1Q2	N/A			
	CORROSION RESISTANT ALLOYS						
	Monel 400 (Ni-Cu)	A 494 GR M35-1	M35-1	3.4	B 564 GR N04400	M400	3.4
	Monel K500 (Ni-Cu)	A 494 GR M30H	MK500	N/A	B 865 GR N05500	MK500	N/A
	Hastelloy C-22 (Ni-Cr-Mo)	A 494 GR CX2MW	CX2MW	N/A			
	Hastelloy C-276 (Ni-Cr-Mo)	A 494 GR CW12MW	HASTC	3.15			
	Hastelloy B (Ni-Mo)	A 494 GR N12MV	N12MV	3.15	B 335	HASTB	N/A
	Hastelloy B2 (Ni-Mo)	A 494 GR N7M	N7M	N/A			
	Incoloy 825 (Ni-Fe-Cr)	A 494 GR CU5MCuC	CU5MCUC	N/A	B 564 GR N08825	IL8825	3.8
	Incoloy 20 (Ni-Fe-Cr)				B 473 GR N08020	IL20	3.1
	Inconel 600 (Ni-Cr)	A 494 GR CY40	CY40	N/A	B 166 GR N06600	IN600	3.5
	Inconel 625 (Ni-Cr-Mo-Nb)	A 494 GR CW8MC	IN625	N/A	B 564 GR N06625	IN625	3.8
	Inconel 718 (Ni-Cr)				B 637 GR N07718	IN718	N/A
					B 670 GR N07718	IN718	N/A
	Titanium alloy				B367 GR C2	TiC2	N/A

(a) replaces the A 351 GR CD4MCu

ORION STEEL VALVES

Materials

BOLTING

BOLTING

Application Fields	Material Type	ASTM	
		BOLTS	NUTS
HIGH TEMPERATURE SERVICE	Alloy Steel	A 193 GR B16	A 194 GR 4
		A 193 GR B7	A 194 GR 2H
		A 193 GR B7M	A 194 GR 2HM
		A 193 GR L7	A 194 GR 7
		A 193 GR L7M	A 194 GR 7M
	Stainless Steel	A 193 GR B8	A 194 GR 8
		A 193 GR B8M CL.1	A 194 GR 8M
		A 193 GR B8MN	A 194 GR 8MN
		A 193 B8T	A 194 GR 8T
		A 320 GR L7	A 194 GR 4
LOW TEMPERATURE SERVICE	Alloy Steel	A 320 GR L7M	A194 GR 2HM
		A 320 GR B8	A 194 GR 8
	Stainless Steel	A 320 GR B8M	A 194 GR 8M

ORION STEEL VALVES

O-Ring Materials

Material Type	Short Name	T Range (°C)	Compatibility with Methanol	Compatibility with H2S dry-cold	Compatibility with H2S dry and wet - hot	Compatibility with H2S wet - cold	Compatibility with gasoline
Polyacrylate rubber	ACM	-20 ÷ 150	bad	bad	bad	bad	very good
Tetrafluoroethylene-propylene elastomer (Aflas)	FEPM	0 ÷ 200	n/a	n/a	n/a	n/a	good
Butyl rubber	IIR	-35 ÷ 120	very good	very good	very good	very good	bad
Hydrogenated acrylonitrile-butadiene rubber	HNBR	-25 ÷ 160	good	very good	bad	bad	good
Epichlorohydrin copolymer rubber	ECO	-30 ÷ 150	n/a	n/a	n/a	n/a	very good
Ethylene-propylene diene rubber	EPM/EPDM	-45 ÷ 120	very good	very good	very good	very good	bad
Tetrafluoroethylene (Teflon)	PTFE	-200 ÷ 250	n/a	n/a	n/a	n/a	very good
Fluorocarbon (Viton)	FKM	-15 ÷ 200	bad	bad	bad	very good	very good
Fluorosilicone	FVMQ	-60 ÷ 180	very good	fair	fair	fair	good
Chlorosulphonated Polyethylene rubber	CSM	-30 ÷ 120	very good	very good	fair	good	bad
Perfluoro rubber (Kalrez)	FFKM	-25 ÷ 315	very good	very good	very good	very good	very good
Natural rubber	NR	-50 ÷ 100	very good	very good	bad	bad	bad
Chloroprene rubber	CR	-40 ÷ 120	good	very good	good	very good	fair
Nitrile rubber	NBR	-30 ÷ 120	good	very good	bad	bad	good
Polyurethane	AU/EU	-15 ÷ 85	bad	n/a	n/a	n/a	good
Silicone rubber	VMQ	-60 ÷ 200	very good	fair	fair	fair	bad

Material Type	Short Name	Compatibility with fuel oils	Compatibility with aromatic hydrocarbons	Compatibility with diluted alkalis	Compatibility with diluted acids
Polyacrylate rubber	ACM	very good	fair	bad	bad
Tetrafluoroethylene-propylene elastomer (Aflas)	FEPM	very good	fair	good	very good
Butyl rubber	IIR	bad	bad	very good	very good
Hydrogenated acrylonitrile-butadiene rubber	HNBR	good	fair	good	very good
Epichlorohydrin copolymer rubber	ECO	very good	bad	good	fair
Ethylene-propylene diene rubber	EPM/EPDM	bad	bad	very good	good
Tetrafluoroethylene (Teflon)	PTFE	very good	very good	very good	very good
Fluorocarbon (Viton)	FKM	very good	very good	good	very good
Fluorosilicone	FVMQ	good	very good	good	fair
Chlorosulphonated Polyethylene rubber	CSM	fair	bad	very good	bad
Perfluoro rubber (Kalrez)	FFKM	very good	very good	very good	very good
Natural rubber	NR	bad	bad	good	fair
Chloroprene rubber	CR	fair	bad	good	fair
Nitrile rubber	NBR	good	fair	good	fair
Polyurethane	AU/EU	fair	bad	bad	bad
Silicone rubber	VMQ	bad	bad	good	fair

ORION STEEL VALVES

Trim

API 600 Trim n°	Gate Valves Wedge Check Valves Disc	Gate - Check Valves Seat Ring	Globe Disc	Globe Seat Ring	Back Seat	Stem - Hinge Pin
1	F6					
2	F304					
3	F310					
4	F6 HARD				F6 HARD	
5	STELLITE				F6	
6	F6	MONEL		F6		
7	F6	F6 HARD	F6	F6 HARD		
8	F6	STELLITE	F6	STELLITE	F6	
9	MONEL					
10	316					
11	MONEL	STELLITE	MONEL	STELLITE	MONEL	
12	316	STELLITE	316	STELLITE	316	
13	ALLOY 20					
14	ALLOY 20	STELLITE	ALLOY 20	STELLITE	ALLOY 20	
15	STELLITE				304	
16	STELLITE				316	
17	347					
18	STELLITE				B473	

ORION STEEL VALVES

Pressure Temperature Ratings

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CLASS 150

		Group 1.1		Group 1.2		Group 1.3		Group 1.5		Group 1.7		Group 1.9		Group 1.10	
CAST		WCB(1)		LC2 (4)		WC1 (2) (12)				WC4 (6) (12)		WC6 (7) (12)		WC9 (7) (12)	
				LC3 (4)		LCB (4)				WC5 (12)					
				LCC (4)		LC1 (4)									
				WCC (1)											
FORGED		A105 (1)		A106-C (5)				F1 (2)		F2 (6)		F11-cl2 (3) (12)		F22-cl3 (3)	
		LF2 (1)													
		LF3 (4)													
		GR70 (1)													
TEMP.°F	TEMP.°C	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
-20 to 100	-29 to 38	284	20	287	19,8	267	18,4	267	18,4	287	19,8	287	19,8	287	19,8
122	50	278	19	283	19,5	264	18,2	267	18,4	283	19,5	283	19,5	283	19,5
212	100	257	18	257	17,7	252	17,4	257	17,7	257	17,7	257	17,7	257	17,7
302	150	229	16	231	15,9	229	15,8	229	15,8	229	15,8	229	15,8	229	15,8
392	200	200	14	200	13,8	200	13,8	200	13,8	200	13,8	200	13,8	200	13,8
482	250	175	12	175	12,1	175	12,1	175	12,1	175	12,1	175	12,1	175	12,1
572	300	148	10	148	10,2	148	10,2	148	10,2	148	10,2	148	10,2	148	10,2
617	325	135	9	135	9,3	135	9,3	135	9,3	135	9,3	135	9,3	135	9,3
662	350	122	8	122	8,4	122	8,4	122	8,4	122	8,4	122	8,4	122	8,4
707	375	107	7	107	7,4	107	7,4	107	7,4	107	7,4	107	7,4	107	7,4
752	400	94	7	94	6,5	94	6,5	94	6,5	94	6,5	94	6,5	94	6,5
797	425	80	6	80	5,5	80	5,5	80	5,5	80	5,5	80	5,5	80	5,5
842	450	67	5	67	4,6	67	4,6	67	4,6	67	4,6	67	4,6	67	4,6
887	475	54	4	54	3,7	54	3,7	54	3,7	54	3,7	54	3,7	54	3,7
932	500	41	3	41	2,8	41	2,8	41	2,8	41	2,8	41	2,8	41	2,8
1000	538	20	1	20	1,4	20	1,4	20	1,4	20	1,4	20	1,4	20	1,4
1022	550	/	/	/	/	/	/	/	/	20 (a)	1,4 (a)	20 (a)	1,4 (a)	20 (a)	1,4 (a)
1067	575	/	/	/	/	/	/	/	/	20 (a)	1,4 (a)	20 (a)	1,4 (a)	20 (a)	1,4 (a)
1112	600	/	/	/	/	/	/	/	/	/	/	20 (a)	1,4 (a)	20 (a)	1,4 (a)
1157	625	/	/	/	/	/	/	/	/	/	/	20 (a)	1,4 (a)	20 (a)	1,4 (a)
1202	650	/	/	/	/	/	/	/	/	/	/	16 (a)	1,1 (a)	16 (a)	1,1 (a)
1247	675	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1292	700	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1337	725	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1382	750	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1427	775	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1472	800	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1501	816	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Shell test		426,3	29,4	430,7	29,7	400,2	27,6	400,2	27,6	430,7	29,7	430,7	29,7	430,7	29,7
Seat test		312,6	21,6	315,8	21,8	293,5	20,2	293,5	20,2	315,8	21,8	315,8	21,8	315,8	21,8

General Notes:

Materials shall not be used beyond temperature limits specified in the governing Code.

(1) Permissible, but not recommended for prolonged usage above about 425°C / 800°F.

(2) Permissible, but not recommended for prolonged usage above about 470°C / 875°F.

(3) Permissible, but not recommended for prolonged usage above about 595°C / 1100°F.

(4) Not to be used over 345°C / 650°F.

(5) Not to be used over 425°C / 800°F.

(6) Not to be used over 538°C / 1000°F.

(7) Not to be used over 595°C / 1103°F.

ORION STEEL VALVES

Pressure Temperature Ratings

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Group 1.13		Group 1.14		Group 1.15		Group 1.17		Group 2.1		Group 2.2		Group 2.3		Group 2.4	
C5 (12)		C12 (12)		C12A				CF8 (11)		CF8M (11)					
								CF10		CG3M (9)					
								CF3 (5)		CG8M (6)					
										CF3M (5)					
F5A		F9				F5		304		316 (11)		304L (5)		321 (6)	
						F12-cl2 (3) (12)		304H (11)		316H		316L		321H (14)	
PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
290	20,0	290	20	290	20	287	19,8	276	19	276	19	231	15,9	276	19
283	19,5	283	19,5	283	19,5	283	19,5	265	18,3	267	18,4	222	15,3	270	18,6
257	17,7	257	17,7	257	17,7	257	17,7	228	15,7	235	16,2	193	13,3	247	17
229	15,8	229	15,8	229	15,8	229	15,8	206	14,2	215	14,8	174	12	200	13,8
200	13,8	200	13,8	200	13,8	200	13,8	191	13,2	199	13,7	162	11,2	175	12,1
175	12,1	175	12,1	175	12,1	175	12,1	175	12,1	175	12,1	152	10,5	148	10,2
148	10,2	148	10,2	148	10,2	148	10,2	148	10,2	148	10,2	145	10	135	9,3
135	9,3	135	9,3	135	9,3	135	9,3	135	9,3	135	9,3	135	9,3	122	8,4
122	8,4	122	8,4	122	8,4	122	8,4	122	8,4	122	8,4	122	8,4	107	7,4
107	7,4	107	7,4	107	7,4	107	7,4	107	7,4	107	7,4	107	7,4	94	6,5
94	6,5	94	6,5	94	6,5	94	6,5	94	6,5	94	6,5	94	6,5	80	5,5
80	5,5	80	5,5	80	5,5	80	5,5	80	5,5	80	5,5	80	5,5	67	4,6
67	4,6	67	4,6	67	4,6	67	4,6	67	4,6	67	4,6	67	4,6	54	3,7
54	3,7	54	3,7	54	3,7	54	3,7	54	3,7	54	3,7	/	/	41	2,8
41	2,8	41	2,8	41	2,8	41	2,8	41	2,8	41	2,8	/	/	20	1,4
20	1,4	20	1,4	20	1,4	20	1,4	20	1,4	20	1,4	/	/	20 (a)	1,4 (a)
20	1,4 (a)	20	1,4 (a)	20 (a)	1,4 (a)	20 (a)	1,4 (a)	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)
20	1,4 (a)	20	1,4 (a)	20 (a)	1,4 (a)	20 (a)	1,4 (a)	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)
20	1,4 (a)	20	1,4 (a)	20 (a)	1,4 (a)	20 (a)	1,4 (a)	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)
20	1,4 (a)	20	1,4 (a)	20 (a)	1,4 (a)	20 (a)	1,4 (a)	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)
13	0,9 (a)	20	1,4 (a)	20 (a)	1,4 (a)	13 (a)	0,9 (a)	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)
/	/	/	/	/	/	/	/	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)
/	/	/	/	/	/	/	/	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)
/	/	/	/	/	/	/	/	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)
/	/	/	/	/	/	/	/	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)
/	/	/	/	/	/	/	/	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)
/	/	/	/	/	/	/	/	17 (a)	1,2 (a)	17 (a)	1,2 (a)	/	/	17 (a)	1,2 (a)
/	/	/	/	/	/	/	/	15 (a)	1 (a)	15 (a)	1 (a)	/	/	15 (a)	1 (a)
435,0	30,0	435,0	30,0	435,0	30,0	430,7	29,7	413,3	28,5	413,3	28,5	345,8	23,9	413,3	28,5
319,0	22,0	319,0	22,0	319,0	22,0	315,8	21,8	303,1	20,9	303,1	20,9	253,6	17,5	303,1	20,9

(8) Not to be used over 315°C / 599°F.

(9) Not to be used over 455°C / 851°F.

(10) Not to be used over 645°C / 1193°F.

(11) At temperatures above 538°C / 1000°F use only when the carbon content is 0.04% or higher.

(12) Use normalized and tempered material only.

(13) Only use solution annealed material.

(14) At temperatures above 538°C, use only if the material is heat treated by heating to a minimum temperature of 1095°F.

(a) Flanged-end valve ratings terminate at 538°C / 1000°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

CLASS 150

		Group 2.5		Group 2.7		Group 2.8		Group 2.11		Group 2.12		Group 3.1		Group 3.4	
CAST		CF8C				CK3MCUN		CF8C (11)		CK20 (11)				M35-1 (13)	
FORGED		347H		310H		F51 (8)						IL20 (13)		M400 (13)	
		347 (6)				F53 (8)									
						F55									
						F44									
TEMP.°F	TEMP.°C	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
-20 to 100	-29 to 38	275,5	19	275,5	19	290	20	275,5	19	258	17,8	290	20	290	20
122	50	271,15	18,7	268,25	18,5	282,75	19,5	271,15	18,7	247	17	282,75	19,5	282,75	19,5
212	100	252,3	17,4	240,7	16,6	256,65	17,7	252,3	17,4	209	14,4	256,65	17,7	256,65	17,7
302	150	229,1	15,8	221,85	15,3	229,1	15,8	229,1	15,8	194	13,4	229,1	15,8	229,1	15,8
392	200	200,1	13,8	200,1	13,8	200,1	13,8	200,1	13,8	187	12,9	200,1	13,8	200,1	13,8
482	250	175,45	12,1	174	12	175,45	12,1	175,45	12,1	175	12,1	175,45	12,1	175,45	12,1
572	300	147,9	10,2	147,9	10,2	147,9	10,2	147,9	10,2	148	10,2	147,9	10,2	147,9	10,2
617	325	134,85	9,3	134,85	9,3	134,85	9,3	134,85	9,3	135	9,3	134,85	9,3	134,85	9,3
662	350	121,8	8,4	121,8	8,4	121,8	8,4	121,8	8,4	122	8,4	121,8	8,4	121,8	8,4
707	375	107,3	7,4	107,3	7,4	107,3	7,4	107,3	7,4	107	7,4	107,3	7,4	107,3	7,4
752	400	94,25	6,5	81,2	5,6	94,25	6,5	94,25	6,5	94	6,5	94,25	6,5	94,25	6,5
797	425	79,75	5,5	79,75	5,5	/	/	79,75	5,5	80	5,5	79,75	5,5	79,75	5,5
842	450	66,7	4,6	66,7	4,6	/	/	66,7	4,6	67	4,6	/	/	/	/
887	475	53,65	3,7	53,65	3,7	/	/	53,65	3,7	54	3,7	/	/	/	/
932	500	40,6	2,8	40,6	2,8	/	/	40,6	2,8	41	2,8	/	/	/	/
1000	538	20,3	1,4	20,3	1,4	/	/	20,3	1,4	20	1,4	/	/	/	/
1022	550	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	/	/
1067	575	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	/	/
1112	600	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	/	/
1157	625	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	/	/
1202	650	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	/	/
1247	675	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	/	/
1292	700	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	/	/
1337	725	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	/	/
1382	750	20 (a)	1,4 (a)	20 (a)	1,3 (a)	/	/	17 (a)	1,2 (a)	20 (a)	1,4 (a)	/	/	/	/
1427	775	20 (a)	1,4 (a)	15 (a)	1 (a)	/	/	12 (a)	0,9(a)	17 (a)	1,2 (a)	/	/	/	/
1472	800	20 (a)	1,2 (a)	11 (a)	0,8 (a)	/	/	11 (a)	0,8	12 (a)	0,9(a)	/	/	/	/
1501	816	20 (a)	1 (a)	10 (a)	0,7 (a)	/	/	10 (a)	0,7 (a)	10 (a)	0,7 (a)	/	/	/	/
Shell test		413,3	28,5	413,3	28,5	435,0	30,0	413,3	28,5	387,2	26,7	435,0	30,0	435,0	30,0
Seat test		303,1	20,9	303,1	20,9	319,0	22,0	303,1	20,9	283,9	19,6	319,0	22,0	319,0	22,0

General Notes:

Materials shall not be used beyond temperature limits specified in the governing Code.

(1) Permissible, but not recommended for prolonged usage above about 425°C / 800°F.

(2) Permissible, but not recommended for prolonged usage above about 470°C / 875°F.

(3) Permissible, but not recommended for prolonged usage above about 595°C / 1100°F.

(4) Not to be used over 345°C / 650°F.

(5) Not to be used over 425°C / 800°F.

(6) Not to be used over 538°C / 1000°F.

(7) Not to be used over 595°C / 1103°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

Group 3.5		Group 3.8		Group 3.12		Group 3.15		Group 3.17	
				CN3MN (13)		HASTC (6) (13)		CN7M (13)	
						N12MV (6) (13)			
IN600 (13)		IL8825 (13) (6)							
		IN625 (13) (10)							
PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
290	20	290	20	258	17,8	231	15,9	231	15,9
282,75	19,5	283	19,5	254	17,5	226	15,6	223	15,4
256,65	17,7	257	17,7	236	16,3	210	14,5	196	13,5
229,1	15,8	229	15,8	223	15,4	199	13,7	178	12,3
200,1	13,8	200	13,8	200	13,8	189	13	164	11,3
175,45	12,1	175	12,1	175	12,1	175	12,1	151	10,4
147,9	10,2	148	10,2	148	10,2	148	10,2	141	9,7
134,85	9,3	135	9,3	135	9,3	135	9,3	135	9,3
121,8	8,4	122	8,4	122	8,4	122	8,4	/	/
107,3	7,4	107	7,4	107	7,4	107	7,4	/	/
94,25	6,5	94	6,5	94	6,5	94	6,5	/	/
79,75	5,5	80	5,5	94	6,5	80	5,5	/	/
66,7	4,6	67	4,6	/	/	67	4,6	/	/
53,65	3,7	54	3,7	/	/	54	3,7	/	/
40,6	2,8	41	2,8	/	/	41	2,8	/	/
20,3	1,4	20	1,4	/	/	20	1,4	/	/
20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)	/	/
20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)	/	/
20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)	/	/
20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)	/	/
20 (a)	1,4 (a)	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)	/	/
/	/	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)	/	/
/	/	20 (a)	1,4 (a)	/	/	20 (a)	1,4 (a)	/	/
/	/	/	/	/	/	20 (a)	1,4 (a)	/	/
/	/	/	/	/	/	20 (a)	1,4 (a)	/	/
/	/	/	/	/	/	20 (a)	1,4 (a)	/	/
/	/	/	/	/	/	20 (a)	1,4 (a)	/	/
435,0	30,0	435,0	30,0	387,2	26,7	345,8	23,9	345,8	23,9
319,0	22,0	319,0	22,0	283,9	19,6	253,6	17,5	253,6	17,5

(8) Not to be used over 315°C / 599°F.

(9) Not to be used over 455°C / 851°F.

(10) Not to be used over 645°C / 1193°F.

(11) At temperatures above 538°C / 1000°F use only when the carbon content is 0.04% or higher.

(12) Use normalized and tempered material only.

(13) Only use solution annealed material.

(14) At temperatures above 538°C, use only if the material is heat treated by heating to a minimum temperature of 1095°F.

(a) Flanged-end valve ratings terminate at 538°C / 1000°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

CLASS 300

		Group 1.1		Group 1.2		Group 1.3		Group 1.5		Group 1.7		Group 1.9		Group 1.10	
CAST		WCB(1)		LC2 (4)		WC1 (2) (12)				WC4 (6) (12)		WC6 (7) (12)		WC9 (7) (12)	
				LC3 (4)		LCB (4)				WC5 (12)					
				LCC (4)		LC1 (4)									
				WCC (1)											
FORGED		A105 (1)		A106-C (5)				F1 (2)		F2 (6)		F11-cl2 (3) (12)		F22-cl3 (3)	
		LF2 (1)													
		LF3 (4)													
		GR70 (1)													
TEMP:°F	TEMP:°C	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
-20 to 100	-29 to 38	741	51,1	750	51,7	696	48,0	696	48	750	51,7	750	51,7	750	51,7
122	50	726	50,1	750	51,7	689	47,5	696	48	750	51,7	750	51,7	750	51,7
212	100	676	46,6	747	51,5	657	45,3	695	47,9	747	51,5	747	51,5	747	51,5
302	150	654	45,1	728	50,2	637	43,9	686	47,3	729	50,3	721	49,7	729	50,3
392	200	635	43,8	705	48,6	616	42,5	664	45,8	705	48,6	696	48,0	705	48,6
482	250	608	41,9	671	46,3	592	40,8	645	44,5	671	46,3	671	46,3	671	46,3
572	300	577	39,8	622	42,9	561	38,7	622	42,9	622	42,9	622	42,9	622	42,9
617	325	561	38,7	600	41,4	545	37,6	600	41,4	600	41,4	600	41,4	600	41,4
662	350	545	37,6	580	40,0	528	36,4	584	40,3	584	40,3	584	40,3	584	40,3
707	375	528	36,4	548	37,8	508	35,0	564	38,9	564	38,9	564	38,9	564	38,9
752	400	503	34,7	503	34,7	473	32,6	529	36,5	529	36,5	529	36,5	529	36,5
797	425	418	28,8	418	28,8	396	27,3	510	35,2	510	35,2	510	35,2	510	35,2
842	450	334	23,0	334	23,0	313	21,6	489	33,7	489	33,7	489	33,7	489	33,7
887	475	252	17,4	248	17,1	228	15,7	460	31,7	460	31,7	460	31,7	460	31,7
932	500	171	11,8	168	11,6	161	11,1	349	24,1	387	26,7	373	25,7	409	28,2
1000	538	86	5,9	86	5,9	86	5,9	164	11,3	202	13,9	216	14,9	267	18,4
1022	550	/	/	/	/	/	/	/	/	183	12,6	184	12,7	226	15,6
1067	575	/	/	/	/	/	/	/	/	104	7,2	128	8,8	152	10,5
1112	600	/	/	/	/	/	/	/	/	/	/	88	6,1	100	6,9
1157	625	/	/	/	/	/	/	/	/	/	/	62	4,3	65	4,5
1202	650	/	/	/	/	/	/	/	/	/	/	41	2,8	41	2,8
1247	675	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1292	700	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1337	725	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1382	750	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1427	775	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1472	800	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1501	816	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Shell test		1.111,4	76,7	1.111,4	76,7	1.111,4	76,7	1.111,4	76,7	1.124,5	77,6	1.124,5	77,6	1.124,5	77,6
Seat test		815,1	56,2	824,6	56,9	765,6	52,8	765,6	52,8	824,6	56,9	824,6	56,9	824,6	56,9

General Notes:

Materials shall not be used beyond temperature limits specified in the governing Code.

(1) Permissible, but not recommended for prolonged usage above about 425°C / 800°F.

(2) Permissible, but not recommended for prolonged usage above about 470°C / 875°F.

(3) Permissible, but not recommended for prolonged usage above about 595°C / 1100°F.

(4) Not to be used over 345°C / 650°F.

(5) Not to be used over 425°C / 800°F.

(6) Not to be used over 538°C / 1000°F.

(7) Not to be used over 595°C / 1103°F.

ORION STEEL VALVES

Pressure Temperature Ratings

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Group 1.13		Group 1.14		Group 1.15		Group 1.17		Group 2.1		Group 2.2		Group 2.3		Group 2.4	
C5 (12)		C12 (12)		C12A				CF8 (11)		CF8M (11)					
								CF10		CG3M (9)					
								CF3 (5)		CG8M (6)					
										CF3M (5)					
F5A		F9				F5		304		316 (11)		304L (5)		321 (6)	
						F12-cl2 (3) (12)		304H (11)		316H		316L		321H (14)	
PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
750	51,7	750	51,7	750	51,7	750	51,7	719	49,6	719	49,6	600	41,4	719	49,6
750	51,7	750	51,7	750	51,7	747	51,5	693	47,8	697	48,1	580	40	705	48,6
747	51,5	747	51,5	747	51,5	731	50,4	593	40,9	612	42,2	505	34,8	641	44,2
729	50,3	729	50,3	729	50,3	699	48,2	537	37	558	38,5	455	31,4	595	41
705	48,6	705	48,6	705	48,6	671	46,3	500	34,5	518	35,7	423	29,2	555	38,3
671	46,3	671	46,3	671	46,3	650	44,8	471	32,5	484	33,4	399	27,5	522	36
622	42,9	622	42,9	622	42,9	622	42,9	448	30,9	458	31,6	378	26,1	494	34,1
600	41,4	600	41,4	600	41,4	600	41,4	438	30,2	448	30,9	370	25,5	483	33,3
584	40,3	584	40,3	584	40,3	584	40,3	429	29,6	439	30,3	364	25,1	473	32,6
564	38,9	564	38,9	564	38,9	564	38,9	421	29	434	29,9	360	24,8	464	32
529	36,5	529	36,5	529	36,5	529	36,5	412	28,4	426	29,4	352	24,3	458	31,6
510	35,2	510	35,2	510	35,2	510	35,2	406	28	422	29,1	347	23,9	451	31,1
489	33,7	489	33,7	489	33,7	489	33,7	397	27,4	418	28,8	339	23,4	447	30,8
405	27,9	460	31,7	460	31,7	405	27,9	390	26,9	416	28,7	/	/	442	30,5
310	21,4	409	28,2	409	28,2	310	21,4	384	26,5	409	28,2	/	/	409	28,2
199	13,7	254	17,5	365	25,2	199	13,7	354	24,4	365	25,2	/	/	365	25,2
174	12,0	218	15,0	363	25,0	174	12,0	342	23,6	363	25,0	/	/	363	25
129	8,9	152	10,5	348	24,0	128	8,8	302	20,8	348	24,0	/	/	348	24
90	6,2	104	7,2	283	19,5	88	6,1	245	16,9	289	19,9	/	/	294	20,3
58	4,0	73	5,0	212	14,6	58	4,0	200	13,8	229	15,8	/	/	229	15,8
35	2,4	51	3,5	144	9,9	35	2,4	164	11,3	184	12,7	/	/	183	12,6
/	/	/	/	/	/	/	/	135	9,3	149	10,3	/	/	144	9,9
/	/	/	/	/	/	/	/	116	8,0	122	8,4	/	/	115	7,9
/	/	/	/	/	/	/	/	99	6,8	102	7,0	/	/	91	6,3
/	/	/	/	/	/	/	/	84	5,8	86	5,9	/	/	73	5
/	/	/	/	/	/	/	/	67	4,6	67	4,6	/	/	58	4
/	/	/	/	/	/	/	/	51	3,5	51	3,5	/	/	45	3,1
/	/	/	/	/	/	/	/	41	2,8	41	2,8	/	/	38	2,6
1.124,5	77,6	1.124,5	77,6	1.124,5	77,6	1.124,5	77,6	1.078,8	74,4	1.078,8	74,4	1.111,4	76,7	1.078,8	74,4
824,6	56,9	824,6	56,9	824,6	56,9	824,6	56,9	791,1	54,6	791,1	54,6	660,3	45,5	791,1	54,6

(8) Not to be used over 315°C / 599°F.

(9) Not to be used over 455°C / 851°F.

(10) Not to be used over 645°C / 1193°F.

(11) At temperatures above 538°C / 1000°F use only when the carbon content is 0.04% or higher.

(12) Use normalized and tempered material only.

(13) Only use solution annealed material.

(14) At temperatures above 538°C, use only if the material is heat treated by heating to a minimum temperature of 1095°F.

(a) Flanged-end valve ratings terminate at 538°C / 1000°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

CLASS 300

		Group 2.5		Group 2.7		Group 2.8		Group 2.11		Group 2.12		Group 3.1		Group 3.4	
CAST		CF8C				CK3MCUN		CF8C (11)		CK20 (11)				M35-1 (13)	
FORGED		347H		310H		F51 (8)						IL20 (13)		M400 (13)	
		347 (6)				F53 (8)									
						F55									
						F44									
TEMP.°F	TEMP.°C	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
-20 to 100	-29 to 38	750	51,7	719	49,6	750	51,7	719	49,6	671	46,3	750	51,7	600	41,4
122	50	741	51,1	703	48,5	750	51,7	708	48,8	645	44,5	750	51,7	583	40,2
212	100	706	48,7	629	43,4	735	50,7	657	45,3	544	37,5	738	50,9	521	35,9
302	150	663	45,7	580	40	666	45,9	616	42,5	506	34,9	709	48,9	489	33,7
392	200	619	42,7	545	37,6	619	42,7	579	39,9	486	33,5	684	47,2	474	32,7
482	250	612	42,2	519	35,8	587	40,5	548	37,8	473	32,6	660	45,5	473	32,6
572	300	552	38,1	500	34,5	564	38,9	523	36,1	460	31,7	622	42,9	473	32,6
617	325	539	37,2	492	33,9	554	38,2	513	35,4	452	31,2	600	41,4	473	32,6
662	350	528	36,4	483	33,3	545	37,6	505	34,8	444	30,6	584	40,3	473	32,6
707	375	519	35,8	477	32,9	542	37,4	496	34,2	432	29,8	564	38,9	470	32,4
752	400	512	35,3	470	32,4	529	36,5	492	33,9	422	29,1	529	36,5	465	32,1
797	425	505	34,8	465	32,1	/	/	487	33,6	410	28,3	510	35,2	458	31,6
842	450	499	34,4	460	31,7	/	/	486	33,5	400	27,6	/	/	3.827	263,9
887	475	494	34,1	452	31,2	/	/	460	31,7	387	26,7	/	/	302	20,8
932	500	489	33,7	409	28,2	/	/	409	28,2	374	25,8	/	/	/	/
1000	538	421	29	365	25,2	/	/	365	25,2	338	23,3	/	/	/	/
1022	550	421	29,0	363	25,0	/	/	363	25	332	22,9	/	/	/	/
1067	575	415	28,6	322	22,2	/	/	348	24	315	21,7	/	/	/	/
1112	600	367	25,3	244	16,8	/	/	287	19,8	281	19,4	/	/	/	/
1157	625	287	19,8	181	12,5	/	/	202	13,9	244	16,8	/	/	/	/
1202	650	229	15,8	136	9,4	/	/	149	10,3	204	14,1	/	/	/	/
1247	675	178	12,3	104	7,2	/	/	116	8	167	11,5	/	/	/	/
1292	700	157	10,8	80	5,5	/	/	81	5,6	128	8,8	/	/	/	/
1337	725	129	8,9	62	4,3	/	/	58	4	91	6,3	/	/	/	/
1382	750	97	6,7	49	3,4	/	/	45	3,1	65	4,5	/	/	/	/
1427	775	73	5,0	39	2,7	/	/	36	2,5	45	3,1	/	/	/	/
1472	800	64	4,4	30	2,1	/	/	29	2	33	2,3	/	/	/	/
1501	816	48	3,3	26	1,8	/	/	28	1,9	28	1,9	/	/	/	/
Shell test		1.124,5	77,6	1.078,8	74,4	1.124,5	77,6	1.078,8	74,4	1.007,0	69,5	1.124,5	77,6	900,5	62,1
Seat test		824,6	56,9	791,1	54,6	824,6	56,9	791,1	54,6	738,5	50,9	824,6	56,9	660,3	45,5

General Notes:

Materials shall not be used beyond temperature limits specified in the governing Code.

(1) Permissible, but not recommended for prolonged usage above about 425°C / 800°F.

(2) Permissible, but not recommended for prolonged usage above about 470°C / 875°F.

(3) Permissible, but not recommended for prolonged usage above about 595°C / 1100°F.

(4) Not to be used over 345°C / 650°F.

(5) Not to be used over 425°C / 800°F.

(6) Not to be used over 538°C / 1000°F.

(7) Not to be used over 595°C / 1103°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

Group 3.5		Group 3.8		Group 3.12		Group 3.15		Group 3.17	
				CN3MN (13)		HASTC (6) (13)		CN7M (13)	
						N12MV (6) (13)			
IN600 (13)		IL8825 (13) (6)							
		IN625 (13) (10)							
PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
750	51,7	750	51,7	671	46,3	600	41,4	600	41,4
750	51,7	750	51,7	661	45,6	589	40,6	581	40,1
747	51,5	747	51,5	616	42,5	548	37,8	512	35,3
729	50,3	729	50,3	581	40,1	521	35,9	464	32
705	48,6	700	48,3	541	37,3	492	33,9	426	29,4
671	46,3	671	46,3	506	34,9	468	32,3	394	27,2
622	42,9	622	42,9	480	33,1	445	30,7	368	25,4
600	41,4	600	41,4	468	32,3	436	30,1	354	24,4
584	40,3	584	40,3	458	31,6	426	29,4	/	/
564	38,9	564	38,9	450	31	416	28,7	/	/
529	36,5	529	36,5	441	30,4	410	28,3	/	/
510	35,2	510	35,2	432	29,8	402	27,7	/	/
489	33,7	489	33,7	/	/	394	27,2	/	/
460	31,7	460	31,7	/	/	389	26,8	/	/
409	28,2	409	28,2	/	/	381	26,3	/	/
239	16,5	365	25,2	/	/	365	25,2	/	/
202	13,9	363	25	/	/	363	25	/	/
136	9,4	348	24	/	/	348	24	/	/
96	6,6	313	21,6	/	/	313	21,6	/	/
74	5,1	265	18,3	/	/	265	18,3	/	/
68	4,7	204	14,1	/	/	204	14,1	/	/
/	/	167	11,5	/	/	180	12,4	/	/
/	/	128	8,8	/	/	146	10,1	/	/
/	/	/	/	/	/	115	7,9	/	/
/	/	/	/	/	/	86	5,9	/	/
/	/	/	/	/	/	67	4,6	/	/
/	/	/	/	/	/	51	3,5	/	/
/	/	/	/	/	/	41	2,8	/	/
1.124,5	77,6	1.124,5	77,6	1.007,0	69,5	900,5	62,1	900,5	62,1
824,6	56,9	824,6	56,9	738,5	50,9	660,3	45,5	660,3	45,5

(8) Not to be used over 315°C / 599°F.

(9) Not to be used over 455°C / 851°F.

(10) Not to be used over 645°C / 1193°F.

(11) At temperatures above 538°C / 1000°F use only when the carbon content is 0.04% or higher.

(12) Use normalized and tempered material only.

(13) Only use solution annealed material.

(14) At temperatures above 538°C, use only if the material is heat treated by heating to a minimum temperature of 1095°F.

(a) Flanged-end valve ratings terminate at 538°C / 1000°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

CLASS 600

		Group 1.1		Group 1.2		Group 1.3		Group 1.5		Group 1.7		Group 1.9		Group 1.10	
CAST		WCB(1)		LC2 (4)		WC1 (2) (12)				WC4 (6) (12)		WC6 (7) (12)		WC9 (7) (12)	
				LC3 (4)		LCB (4)				WC5 (12)					
				LCC (4)		LC1 (4)									
				WCC (1)											
FORGED		A105 (1)		A106-C (5)				F1 (2)		F2 (6)		F11-cl2 (3) (12)		F22-cl3 (3)	
		LF2 (1)													
		LF3 (4)													
		GR70 (1)													
TEMP.°F	TEMP.°C	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
-20 to 100	-29 to 38	1.480	102,1	1.499	103,4	1.392	96,0	1.392	96	1.499	103,4	1.499	103,4	1.499	103,4
122	50	1.453	100,2	1.499	103,4	1.376	94,9	1.392	96	1.499	103,4	1.499	103,4	1.499	103,4
212	100	1.351	93,2	1.494	103,0	1.315	90,7	1.391	95,9	1.494	103,0	1.494	103,0	1.494	103,0
302	150	1.308	90,2	1.454	100,3	1.275	87,9	1.373	94,7	1.454	100,3	1.443	99,5	1.454	100,3
392	200	1.270	87,6	1.409	97,2	1.234	85,1	1.328	91,6	1.409	97,2	1.391	95,9	1.409	97,2
482	250	1.217	83,9	1.344	92,7	1.241	85,6	1.291	89,0	1.344	92,7	1.344	92,7	1.344	92,7
572	300	1.154	79,6	1.243	85,7	1.122	77,4	1.243	85,7	1.243	85,7	1.243	85,7	1.243	85,7
617	325	1.122	77,4	1.198	82,6	1.090	75,2	1.198	82,6	1.198	82,6	1.198	82,6	1.198	82,6
662	350	1.089	75,1	1.160	80,0	1.056	72,8	1.166	80,4	1.166	80,4	1.166	80,4	1.166	80,4
707	375	1.054	72,7	1.098	75,7	1.014	69,9	1.125	77,6	1.125	77,6	1.125	77,6	1.125	77,6
752	400	1.006	69,4	1.006	69,4	945	65,2	1.063	73,3	1.063	73,3	1.063	73,3	1.063	73,3
797	425	834	57,5	834	57,5	792	54,6	1.015	70,0	1.015	70,0	1.015	70,0	1.015	70,0
842	450	667	46,0	667	46,0	626	43,2	982	67,7	982	67,7	982	67,7	982	67,7
887	475	506	34,9	496	34,2	454	31,3	919	63,4	919	63,4	919	63,4	919	63,4
932	500	341	23,5	336	23,2	320	22,1	697	48,1	774	53,4	747	51,5	819	56,5
1000	538	171	11,8	171	11,8	171	11,8	329	22,7	405	27,9	432	29,8	535	36,9
1022	550	/	/	/	/	/	/	/	/	365	25,2	368	25,4	454	31,3
1067	575	/	/	/	/	/	/	/	/	209	14,4	255	17,6	306	21,1
1112	600	/	/	/	/	/	/	/	/	/	/	177	12,2	200	13,8
1157	625	/	/	/	/	/	/	/	/	/	/	123	8,5	129	8,9
1202	650	/	/	/	/	/	/	/	/	/	/	83	5,7	83	5,7
1247	675	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1292	700	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1337	725	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1382	750	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1427	775	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1472	800	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1501	816	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Shell test		2.221	153	2.249	155	2.088	144	2.088	144	2.249	155	2.249	155	2.249	155
Seat test		1.628	112	1.649	114	1.531	106	1.531	106	1.649	114	1.649	114	1.649	114

General Notes:

Materials shall not be used beyond temperature limits specified in the governing Code.

(1) Permissible, but not recommended for prolonged usage above about 425°C / 800°F.

(2) Permissible, but not recommended for prolonged usage above about 470°C / 875°F.

(3) Permissible, but not recommended for prolonged usage above about 595°C / 1100°F.

(4) Not to be used over 345°C / 650°F.

(5) Not to be used over 425°C / 800°F.

(6) Not to be used over 538°C / 1000°F.

(7) Not to be used over 595°C / 1103°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

Group 1.13		Group 1.14		Group 1.15		Group 1.17		Group 2.1		Group 2.2		Group 2.3		Group 2.4	
C5 (12)		C12 (12)		C12A				CF8 (11)		CF8M (11)					
								CF10		CG3M (9)					
								CF3 (5)		CG8M (6)					
										CF3M (5)					
F5A		F9				F5		304		316 (11)		304L (5)		321 (6)	
						F12-cl2 (3) (12)		304H (11)		316H		316L		321H (14)	
PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
1.499	103,4	1.499,3	103,4	1.499,3	103,4	1.499	103,4	1.440	99,3	1.440	99,3	1.199	82,7	1.440	99,3
1.499	103,4	1.499	103,4	1.499	103,4	1.494	103,0	1.386	95,6	1.395	96,2	1.160	80	1.408	97,1
1.494	103,0	1.494	103,0	1.494	103,0	1.463	100,9	1.185	81,7	1.224	84,4	1.009	69,6	1.283	88,5
1.454	100,3	1.454	100,3	1.454	100,3	1.398	96,4	1.073	74	1.117	77	911	62,8	1.189	82
1.409	97,2	1.409	97,2	1.409	97,2	1.341	92,5	1.001	69	1.034	71,3	845	58,3	1.111	76,6
1.344	92,7	1.344	92,7	1.344	92,7	1.299	89,6	943	65	969	66,8	796	54,9	1.044	72
1.243	85,7	1.243	85,7	1.243	85,7	1.243	85,7	896	61,8	916	63,2	755	52,1	990	68,3
1.198	82,6	1.198	82,6	1.198	82,6	1.198	82,6	876	60,4	896	61,8	740	51	966	66,6
1.166	80,4	1.166	80,4	1.166	80,4	1.166	80,4	860	59,3	880	60,7	726	50,1	945	65,2
1.125	77,6	1.125	77,6	1.125	77,6	1.125	77,6	842	58,1	867	59,8	718	49,5	929	64,1
1.063	73,3	1.063	73,3	1.063	73,3	1.063	73,3	825	56,9	854	58,9	705	48,6	916	63,2
1.015	70,0	1.015	70,0	1.015	70,0	1.015	70,0	812	56	845	58,3	692	47,7	903	62,3
982	67,7	982	67,7	982	67,7	982	67,7	795	54,8	837	57,7	679	46,8	895	61,7
808	55,7	919	63,4	919	63,4	808	55,7	782	53,9	831	57,3	/	/	886	61,1
621	42,8	819	56,5	819	56,5	621	42,8	769	53	819	56,5	/	/	819	56,5
397	27,4	508	35,0	725	50,0	397	27,4	709	48,9	725	50	/	/	725	50
349	24,1	435	30,0	722	49,8	349	24,1	683	47,1	722	49,8	/	/	722	49,8
258	17,8	303	20,9	695	47,9	255	17,6	213	14,7	695	47,9	/	/	695	47,9
181	12,5	209	14,4	566	39,0	175	12,1	490	33,8	577	39,8	/	/	587	40,5
116	8,0	144	9,9	423	29,2	116	8,0	400	27,6	458	31,6	/	/	458	31,6
68	4,7	103	7,1	289	19,9	68	4,7	326	22,5	367	25,3	/	/	367	25,3
/	/	/	/	/	/	/	/	271	18,7	299	20,6	/	/	287	19,8
/	/	/	/	/	/	/	/	233	16,1	244	16,8	/	/	229	15,8
/	/	/	/	/	/	/	/	196	13,5	203	14,0	/	/	184	12,7
/	/	/	/	/	/	/	/	168	11,6	170	11,7	/	/	145	10
/	/	/	/	/	/	/	/	131	9,0	131	9,0	/	/	116	8
/	/	/	/	/	/	/	/	102	7	102	7	/	/	91	6,3
/	/	/	/	/	/	/	/	86	5,9	86	5,9	/	/	75	5,2
2.249	155	2.249	155	2.249	155	2.249	155	2.160	149	2.160	149	1.799	124	2.160	149
1.649	114	1.649	114	1.649	114	1.649	114	1.584	109	1.584	109	1.319	91	1.584	109

(8) Not to be used over 315°C / 599°F.

(9) Not to be used over 455°C / 851°F.

(10) Not to be used over 645°C / 1193°F.

(11) At temperatures above 538°C / 1000°F use only when the carbon content is 0.04% or higher.

(12) Use normalized and tempered material only.

(13) Only use solution annealed material.

(14) At temperatures above 538°C, use only if the material is heat treated by heating to a minimum temperature of 1095°F.

(a) Flanged-end valve ratings terminate at 538°C / 1000°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

CLASS 600

		Group 2.5		Group 2.7		Group 2.8		Group 2.11		Group 2.12		Group 3.1		Group 3.4	
CAST		CF8C				CK3MCUN		CF8C (11)		CK20 (11)				M35-1 (13)	
FORGED		347H		310H		F51 (8)						IL20 (13)		M400 (13)	
		347 (6)				F53 (8)									
						F55									
						F44									
TEMP.°F	TEMP.°C	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
-20 to 100	-29 to 38	1.440	99,3	1.440	99,3	1.499	103,4	1.440	99,3	1.344	92,7	1.499	103,4	1.199	82,7
122	50	1.414	97,5	1.402	96,7	1.499	103,4	1.414	97,5	1.291	89,0	1.499	103,4	1.167	80,5
212	100	1.314	90,6	1.259	86,8	1.469	101,3	1.314	90,6	1.089	75,1	1.475	101,7	1.043	71,9
302	150	1.231	84,9	1.160	80	1.333	91,9	1.231	84,9	1.012	69,8	1.420	97,9	979	67,5
392	200	1.159	79,9	1.090	75,2	1.237	85,3	1.159	79,9	973	67,1	1.367	94,3	948	65,4
482	250	1.096	75,6	1.037	71,5	1.173	80,9	1.096	75,6	945	65,2	1.320	91,0	945	65,2
572	300	1.047	72,2	999	68,9	1.127	77,7	1.047	72,2	919	63,4	1.243	85,7	945	65,2
617	325	1.025	70,7	982	67,7	1.106	76,3	1.025	70,7	905	62,4	1.198	82,6	945	65,2
662	350	1.008	69,5	966	66,6	1.092	75,3	1.008	69,5	887	61,2	1.166	80,4	944	65,1
707	375	992	68,4	953	65,7	1.083	74,7	992	68,4	866	59,7	1.125	77,6	940	64,8
752	400	983	67,8	940	64,8	1.063	73,3	983	67,8	844	58,2	1.063	73,3	931	64,2
797	425	974	67,2	931	64,2	/	/	974	67,2	822	56,7	1.015	70,0	918	63,3
842	450	970	66,9	919	63,4	/	/	970	66,9	800	55,2	/	/	780	53,8
887	475	919	63,4	906	62,5	/	/	919	63,4	776	53,5	/	/	602	41,5
932	500	819	56,5	819	56,5	/	/	819	56,5	750	51,7	/	/	/	/
1000	538	725	50	725	50	/	/	725	50	676	46,6	/	/	/	/
1022	550	722	49,8	722	49,8	/	/	722	49,8	666	45,9	/	/	/	/
1067	575	695	47,9	644	44,4	/	/	695	47,9	628	43,3	/	/	/	/
1112	600	622	42,9	486	33,5	/	/	574	39,6	563	38,8	/	/	/	/
1157	625	531	36,6	363	25,0	/	/	402	27,7	489	33,7	/	/	/	/
1202	650	393	27,1	271	18,7	/	/	299	20,6	407	28,1	/	/	/	/
1247	675	365	25,2	210	14,5	/	/	231	15,9	334	23	/	/	/	/
1292	700	290	20,0	160	11,0	/	/	162	11,2	254	17,5	/	/	/	/
1337	725	223	15,4	126	8,7	/	/	116	8	184	12,7	/	/	/	/
1382	750	170	11,7	99	6,8	/	/	90	6,2	129	8,9	/	/	/	/
1427	775	131	9,0	77	5,3	/	/	71	4,9	91	6,3	/	/	/	/
1472	800	102	7	59	4,1	/	/	58	4	67	4,6	/	/	/	/
1501	816	86	5,9	51	3,5	/	/	55	3,8	55	3,8	/	/	/	/
Shell test		2.160	149	2.160	149	2.249	155	2.160	149	2.016	139	2.249	155	1.799	124
Seat test		1.584	109	1.584	109	1.649	114	1.584	109	1.479	102	1.649	114	1.319	91

General Notes:

Materials shall not be used beyond temperature limits specified in the governing Code.

(1) Permissible, but not recommended for prolonged usage above about 425°C / 800°F.

(2) Permissible, but not recommended for prolonged usage above about 470°C / 875°F.

(3) Permissible, but not recommended for prolonged usage above about 595°C / 1100°F.

(4) Not to be used over 345°C / 650°F.

(5) Not to be used over 425°C / 800°F.

(6) Not to be used over 538°C / 1000°F.

(7) Not to be used over 595°C / 1103°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

Group 3.5		Group 3.8		Group 3.12		Group 3.15		Group 3.17	
				CN3MN (13)		HASTC (6) (13)		CN7M (13)	
						N12MV (6) (13)			
IN600 (13)		IL8825 (13) (6)							
		IN625 (13) (10)							
PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
1.499	103,4	1499	103,4	1.344	92,7	1.199	82,7	1.199	82,7
1.499	103,4	1499	103,4	1.321	91,1	1.179	81,3	1.164	80,3
1.494	103,0	1494	103,0	1.234	85,1	1.096	75,6	1.024	70,6
1.454	100,3	1454	100,3	1.164	80,3	1.040	71,7	929	64,1
1.409	97,2	1402	96,7	1.082	74,6	985	67,9	851	58,7
1.344	92,7	1344	92,7	1.012	69,8	935	64,5	789	54,4
1.243	85,7	1243	85,7	960	66,2	892	61,5	737	50,8
1.198	82,6	1198	82,6	937	64,6	871	60,1	708	48,8
1.166	80,4	1166	80,4	916	63,2	853	58,8	/	/
1.125	77,6	1125	77,6	899	62	832	57,4	/	/
1.063	73,3	1063	73,3	882	60,8	819	56,5	/	/
1.015	70,0	1015	70,0	866	59,7	802	55,3	/	/
982	67,7	982	67,7	/	/	789	54,4	/	/
919	63,4	919	63,4	/	/	776	53,5	/	/
819	56,5	819	56,5	/	/	763	52,6	/	/
480	33,1	725	50,0	/	/	725	50	/	/
405	27,9	722	49,8	/	/	722	49,8	/	/
274	18,9	695	47,9	/	/	695	47,9	/	/
193	13,3	622	42,9	/	/	622	42,9	/	/
149	10,3	531	36,6	/	/	531	36,6	/	/
138	9,5	407	28,1	/	/	407	28,1	/	/
/	/	334	23	/	/	365	25,2	/	/
/	/	254	17,5	/	/	290	20	/	/
/	/	/	/	/	/	223	15,4	/	/
/	/	/	/	/	/	170	11,7	/	/
/	/	/	/	/	/	131	9	/	/
/	/	/	/	/	/	102	7	/	/
/	/	/	/	/	/	86	5,9	/	/
2.249	155	2.249	155	2.016	139	1.799	124	1.799	124
1.649	114	1.649	114	1.479	102	1.319	91	1.319	91

(8) Not to be used over 315°C / 599°F.

(9) Not to be used over 455°C / 851°F.

(10) Not to be used over 645°C / 1193°F.

(11) At temperatures above 538°C / 1000°F use only when the carbon content is 0.04% or higher.

(12) Use normalized and tempered material only.

(13) Only use solution annealed material.

(14) At temperatures above 538°C, use only if the material is heat treated by heating to a minimum temperature of 1095°F.

(a) Flanged-end valve ratings terminate at 538°C / 1000°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

CLASS 900

		Group 1.1		Group 1.2		Group 1.3		Group 1.5		Group 1.7		Group 1.9		Group 1.10	
CAST		WCB(1)		LC2 (4)		WC1 (2) (12)				WC4 (6) (12)		WC6 (7) (12)		WC9 (7) (12)	
				LC3 (4)		LCB (4)				WC5 (12)					
				LCC (4)		LC1 (4)									
				WCC (1)											
FORGED		A105 (1)		A106-C (5)				F1 (2)		F2 (6)		F11-cl2 (3) (12)		F22-cl3 (3)	
		LF2 (1)													
		LF3 (4)													
		GR70 (1)													
TEMP:°F	TEMP:°C	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
-20 to 100	-29 to 38	2.221	153,2	2.249	155,1	2.089	144,1	2.089	144,1	2.249	155,1	2.249	155,1	2.249	155,1
122	50	2.181	150,4	2.249	155,1	2.065	142,4	2.089	144,1	2.249	155,1	2.249	155,1	2.249	155,1
212	100	2.027	139,8	2.242	154,6	1.972	136,0	2.085	143,8	2.242	154,6	2.239	154,4	2.242	154,6
302	150	1.960	135,2	2.182	150,5	1.911	131,8	2.059	142,0	2.184	150,6	2.163	149,2	2.189	151,0
392	200	1.905	131,4	2.114	145,8	1.850	127,6	1.992	137,4	2.114	145,8	2.087	143,9	2.114	145,8
482	250	1.824	125,8	2.016	139,0	1.773	122,3	1.936	133,5	2.016	139,0	2.016	139,0	2.016	139,0
572	300	1.733	119,5	1.865	128,6	1.683	116,1	1.865	128,6	1.865	128,6	1.865	128,6	1.865	128,6
617	325	1.683	116,1	1.798	124,0	1.634	112,7	1.798	124,0	1.798	124,0	1.798	124,0	1.798	124,0
662	350	1.634	112,7	1.741	120,1	1.583	109,2	1.750	120,7	1.750	120,7	1.750	120,7	1.750	120,7
707	375	1.582	109,1	1.646	113,5	1.521	104,9	1.689	116,5	1.689	116,5	1.689	116,5	1.689	116,5
752	400	1.511	104,2	1.511	104,2	1.420	97,9	1.592	109,8	1.592	109,8	1.592	109,8	1.592	109,8
797	425	1.251	86,3	1.251	86,3	1.188	81,9	1.524	105,1	1.524	105,1	1.524	105,1	1.524	105,1
842	450	1.001	69,0	1.001	69,0	940	64,8	1.470	101,4	1.470	101,4	1.379	101,4	1.470	101,4
887	475	758	52,3	744	51,3	682	47,0	1.379	95,1	1.379	95,1	1.119	95,1	1.379	95,1
932	500	512	35,3	503	34,7	481	33,2	1.047	72,2	1.161	80,1	648	77,2	1.228	84,7
1000	538	257	17,7	257	17,7	257	17,7	493	34,0	606	41,8	552	44,7	802	55,3
1022	550	/	/	/	/	/	/	/	/	548	37,8	383	38,1	680	46,9
1067	575	/	/	/	/	/	/	/	/	312	21,5	265	26,4	458	31,6
1112	600	/	/	/	/	/	/	/	/	/	/	186	18,3	300	20,7
1157	625	/	/	/	/	/	/	/	/	/	/	123	12,8	194	13,4
1202	650	/	/	/	/	/	/	/	/	/	/	123	8,5	123	8,5
1247	675	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1292	700	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1337	725	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1382	750	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1427	775	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1472	800	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1501	816	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Shell test		3.332	230	3.373	233	3.134	216	3.134	216	3.373	233	3.373	233	3.373	233
Seat test		2.444	169	2.474	171	2.298	159	2.298	159	2.474	171	2.474	171	2.474	171

General Notes:

Materials shall not be used beyond temperature limits specified in the governing Code.

(1) Permissible, but not recommended for prolonged usage above about 425°C / 800°F.

(2) Permissible, but not recommended for prolonged usage above about 470°C / 875°F.

(3) Permissible, but not recommended for prolonged usage above about 595°C / 1100°F.

(4) Not to be used over 345°C / 650°F.

(5) Not to be used over 425°C / 800°F.

(6) Not to be used over 538°C / 1000°F.

(7) Not to be used over 595°C / 1103°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

Group 1.13		Group 1.14		Group 1.15		Group 1.17		Group 2.1		Group 2.2		Group 2.3		Group 2.4	
C5 (12)		C12 (12)		C12A				CF8 (11)		CF8M (11)					
								CF10		CG3M (9)					
								CF3 (5)		CG8M (6)					
										CF3M (5)					
F5A		F9				F5		304		316 (11)		304L (5)		321 (6)	
						F12-cl2 (3) (12)		304H (11)		316H		316L		321H (14)	
PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
2.249	155,1	2.249	155,1	2.249	155,1	2.249	155,1	2.159	148,9	2.159	148,9	1.799	124,1	2.159	148,9
2.249	155,1	2.249	155,1	2.249	155,1	2.240	154,5	2.081	143,5	2.092	144,3	1.741	120,1	2.113	145,7
2.242	154,6	2.242	154,6	2.242	154,6	2.194	151,3	1.778	122,6	1.836	126,6	1.514	104,4	1.924	132,7
2.184	150,6	2.184	150,6	2.184	150,6	2.095	144,5	1.610	111	1.675	115,5	1.366	94,2	1.782	122,9
2.114	145,8	2.114	145,8	2.114	145,8	2.013	138,8	1.499	103,4	1.552	107	1.269	87,5	1.666	114,9
2.016	139,0	2.016	139,0	2.016	139,0	1.950	134,5	1.414	97,5	1.451	100,1	1.195	82,4	1.567	108,1
1.865	128,6	1.865	128,6	1.865	128,6	1.865	128,6	1.344	92,7	1.376	94,9	1.134	78,2	1.485	102,4
1.798	124,0	1.798	124,0	1.798	124,0	1.798	124,0	1.315	90,7	1.344	92,7	1.108	76,4	1.449	99,9
1.750	120,7	1.750	120,7	1.750	120,7	1.750	120,7	1.289	88,9	1.320	91	1.090	75,2	1.418	97,8
1.689	116,5	1.689	116,5	1.689	116,5	2.414	166,5	1.263	87,1	1.299	89,6	1.077	74,3	1.393	96,1
1.592	109,8	1.592	109,8	1.592	109,8	1.592	109,8	1.237	85,3	1.280	88,3	1.057	72,9	1.375	94,8
1.524	105,1	1.524	105,1	1.524	105,1	1.524	105,1	1.218	84	1.267	87,4	1.038	71,6	1.354	93,4
1.470	101,4	1.470	101,4	1.470	101,4	1.470	101,4	1.192	82,2	1.254	86,5	1.018	70,2	1.341	92,5
1.212	83,6	1.379	95,1	1.379	95,1	1.212	83,6	1.172	80,8	1.247	86	/	/	1.328	91,6
929	64,1	1.228	84,7	1.228	84,7	929	64,1	1.153	79,5	1.228	84,7	/	/	1.228	84,7
596	41,1	761	52,5	1.090	75,2	596	41,1	1.063	73,3	1.090	75,2	/	/	1.090	75,2
523	36,1	653	45,0	1.085	74,8	523	36,1	1.025	70,7	1.085	74,8	/	/	1.085	74,8
387	26,7	455	31,4	1.041	71,8	383	26,4	906	62,5	1.041	71,8	/	/	1.041	71,8
271	18,7	312	21,5	848	58,5	264	18,2	734	50,6	866	59,7	/	/	882	60,8
174	12	216	14,9	635	43,8	174	12,0	600	41,4	687	47,4	/	/	687	47,4
103	7,1	154	10,6	432	29,8	103	7,1	490	33,8	551	38,0	/	/	550	37,9
/	/	/	/	/	/	/	/	406	28,0	450	31,0	/	/	429	29,6
/	/	/	/	/	/	/	/	349	24,1	364	25,1	/	/	344	23,7
/	/	/	/	/	/	/	/	294	20,3	305	21,0	/	/	276	19
/	/	/	/	/	/	/	/	251	17,3	255	17,6	/	/	218	15
/	/	/	/	/	/	/	/	199	13,7	199	13,7	/	/	173	11,9
/	/	/	/	/	/	/	/	152	10,5	152	10,5	/	/	136	9,4
/	/	/	/	/	/	/	/	125	8,6	125	8,6	/	/	113	7,8
3.373	233	3.373	233	3.373	233	3.373	233	3.239	223	3.239	223	2.699	186	3.239	223
2.474	171	2.474	171	2.474	171	2.474	171	2.375	164	2.375	164	1.979	137	2.375	164

(8) Not to be used over 315°C / 599°F.

(9) Not to be used over 455°C / 851°F.

(10) Not to be used over 645°C / 1193°F.

(11) At temperatures above 538°C / 1000°F use only when the carbon content is 0.04% or higher.

(12) Use normalized and tempered material only.

(13) Only use solution annealed material.

(14) At temperatures above 538°C, use only if the material is heat treated by heating to a minimum temperature of 1095°F.

(a) Flanged-end valve ratings terminate at 538°C / 1000°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

CLASS 900

		Group 2.5		Group 2.7		Group 2.8		Group 2.11		Group 2.12		Group 3.1		Group 3.4	
CAST		CF8C				CK3MCUN		CF8C (11)		CK20 (11)				M35-1 (13)	
FORGED		347H		310H		F51 (8)						IL20 (13)		M400 (13)	
		347 (6)				F53 (8)									
						F55									
						F44									
TEMP.°F	TEMP.°C	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
-20 to 100	-29 to 38	2.159	148,9	3.599	248,2	2.249	155,1	2.159	148,9	2.016	139	2.249	155,1	1.799	124,1
122	50	2.121	146,3	3.506	241,8	2.249	155,1	2.121	146,3	1.934	133,4	2.249	155,1	1.750	120,7
212	100	1.971	135,9	3.147	217	2.204	152	1.971	135,9	1.633	112,6	2.204	152	1.563	107,8
302	150	1.847	127,4	2.900	200	1.998	137,8	1.847	127,4	1.518	104,7	2.129	146,8	1.467	101,2
392	200	1.737	119,8	2.726	188	1.856	128	1.737	119,8	1.459	100,6	2.052	141,5	1.422	98,1
482	250	1.644	113,4	2.593	178,8	1.760	121,4	1.644	113,4	1.418	97,8	1.979	136,5	1.418	97,8
572	300	1.570	108,3	2.498	172,3	1.691	116,6	1.570	108,3	1.380	95,2	1.865	128,6	1.418	97,8
617	325	1.538	106,1	2.455	169,3	1.660	114,5	1.538	106,1	1.357	93,6	1.798	124	1.418	97,8
662	350	1.512	104,3	2.414	166,5	1.637	112,9	1.512	104,3	1.330	91,7	1.750	120,7	1.417	97,7
707	375	1.488	102,6	2.382	164,3	1.625	112,1	1.488	102,6	1.298	89,5	1.689	116,5	1.409	97,2
752	400	1.475	101,7	2.350	162,1	1.592	109,8	1.475	101,7	1.266	87,3	1.592	109,8	1.395	96,2
797	425	1.462	100,8	2.329	160,6	/	/	1.462	100,8	1.233	85	1.524	105,1	1.376	94,9
842	450	1.456	100,4	2.297	158,4	/	/	1.456	100,4	1.201	82,8	/	/	1.170	80,7
887	475	1.379	95,1	2.395	165,2	/	/	1.379	95,1	1.163	80,2	/	/	903	62,3
932	500	1.228	84,7	2.043	140,9	/	/	1.228	84,7	1.124	77,5	/	/	/	/
1000	538	1.090	75,2	1.820	125,5	/	/	1.090	75,2	1.015	70	/	/	/	/
1022	550	1.085	74,8	1.811	124,9	/	/	1.085	74,8	998	68,8	/	/	/	/
1067	575	1.041	71,8	1.608	110,9	/	/	1.041	71,8	943	65	/	/	/	/
1112	600	931	64,2	1.217	83,9	/	/	861	59,4	844	58,2	/	/	/	/
1157	625	796	54,9	906	62,5	/	/	603	41,6	732	50,5	/	/	/	/
1202	650	616	42,5	679	46,8	/	/	448	30,9	612	42,2	/	/	/	/
1247	675	545	37,6	525	36,2	/	/	345	23,8	502	34,6	/	/	/	/
1292	700	432	29,8	399	27,5	/	/	244	16,8	381	26,3	/	/	/	/
1337	725	336	23,2	313	21,6	/	/	173	11,9	276	19	/	/	/	/
1382	750	255	17,6	248	17,1	/	/	135	9,3	194	13,4	/	/	/	/
1427	775	199	13,7	193	13,3	/	/	107	7,4	136	9,4	/	/	/	/
1472	800	152	10,5	149	10,3	/	/	88	6,1	100	6,9	/	/	/	/
1501	816	125	8,6	129	8,9	/	/	83	5,7	83	5,7	/	/	/	/
Shell test		3.239	223	5.398	372	3.373	233	3.239	223	3.023	209	3.373	233	2.699	186
Seat test		2375	164	3.959	273	2.474	171	2.375	164	2.217	153	2.474	171	1.979	137

General Notes:

Materials shall not be used beyond temperature limits specified in the governing Code.

(1) Permissible, but not recommended for prolonged usage above about 425°C / 800°F.

(2) Permissible, but not recommended for prolonged usage above about 470°C / 875°F.

(3) Permissible, but not recommended for prolonged usage above about 595°C / 1100°F.

(4) Not to be used over 345°C / 650°F.

(5) Not to be used over 425°C / 800°F.

(6) Not to be used over 538°C / 1000°F.

(7) Not to be used over 595°C / 1103°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

Group 3.5		Group 3.8		Group 3.12		Group 3.15		Group 3.17	
				CN3MN (13)		HASTC (6) (13)		CN7M (13)	
						N12MV (6) (13)			
IN600 (13)		IL8825 (13) (6)							
		IN625 (13) (10)							
PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
2.249	155,1	2.249	155,1	2.016	139	1.799	124,1	1.799	124,1
2.249	155,1	2.249	155,1	1.982	136,7	1.768	121,9	1.746	120,4
2.242	154,6	2.242	154,6	1.850	127,6	1.644	113,4	1.536	105,9
2.184	150,6	2.184	150,6	1.746	120,4	1.560	107,6	1.393	96,1
2.114	145,8	2.103	145	1.624	112	1.476	101,8	1.277	88,1
2.016	139	2.016	139	1.518	104,7	1.404	96,8	1.185	81,7
1.865	128,6	1.865	128,6	1.440	99,3	1.337	92,2	1.103	76,1
1.798	124	1.798	124	1.407	97	1.308	90,2	1.063	73,3
1.750	120,7	1.750	120,7	1.375	94,8	1.280	88,3	/	/
1.689	116,5	1.689	116,5	1.349	93	1.250	86,2	/	/
1.592	109,8	1.592	109,8	1.324	91,3	1.230	84,8	/	/
1.524	105,1	1.524	105,1	1.298	89,5	1.204	83	/	/
1.470	101,4	1.470	101,4	/	/	1.185	81,7	/	/
1.379	95,1	1.379	95,1	/	/	1.164	80,3	/	/
1.228	84,7	1.228	84,7	/	/	1.146	79	/	/
719	49,6	1.090	75,2	/	/	1.090	75,2	/	/
606	41,8	1.085	74,8	/	/	1.085	74,8	/	/
410	28,3	931	64,2	/	/	1.041	71,8	/	/
289	19,9	796	54,9	/	/	931	64,2	/	/
223	15,4	612	42,2	/	/	796	54,9	/	/
203	14	502	34,6	/	/	616	42,5	/	/
/	/	381	26,3	/	/	545	37,6	/	/
/	/	/	/	/	/	432	29,8	/	/
/	/	/	/	/	/	336	23,2	/	/
/	/	/	/	/	/	255	17,6	/	/
/	/	/	/	/	/	199	13,7	/	/
/	/	/	/	/	/	152	10,5	/	/
/	/	/	/	/	/	125	8,6	/	/
3.373	233	3.373	233	3.023	209	2.699	186	2.699	186
2.474	171	2.474	171	2.217	153	1.979	137	1.979	137

(8) Not to be used over 315°C / 599°F.

(9) Not to be used over 455°C / 851°F.

(10) Not to be used over 645°C / 1193°F.

(11) At temperatures above 538°C / 1000°F use only when the carbon content is 0.04% or higher.

(12) Use normalized and tempered material only.

(13) Only use solution annealed material.

(14) At temperatures above 538°C, use only if the material is heat treated by heating to a minimum temperature of 1095°F.

(a) Flanged-end valve ratings terminate at 538°C / 1000°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

CLASS 1500

		Group 1.1		Group 1.2		Group 1.3		Group 1.5		Group 1.7		Group 1.9		Group 1.10	
CAST		WCB(1)		LC2 (4)		WC1 (2) (12)				WC4 (6) (12)		WC6 (7) (12)		WC9 (7) (12)	
				LC3 (4)		LCB (4)				WC5 (12)					
				LCC (4)		LC1 (4)									
				WCC (1)											
FORGED		A105 (1)		A106-C (5)				F1 (2)		F2 (6)		F11-cl2 (3) (12)		F22-cl3 (3)	
		LF2 (1)													
		LF3 (4)													
		GR70 (1)													
TEMP.°F	TEMP.°C	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
-20 to 100	-29 to 38	3.702	255,3	3.750	258,6	3.481	240,1	3.481	240,1	3.750	258,6	3.750	258,6	3.750	258,6
122	50	3.634	250,6	3.750	258,6	3.441	237,3	3.481	240,1	3.750	258,6	3.750	258,6	3.750	258,6
212	100	3.379	233,0	3.735	257,6	3.287	226,7	3.476	239,7	3.735	257,6	3.732	257,4	3.735	257,6
302	150	3.268	225,4	3.637	250,8	3.186	219,7	3.432	236,7	3.637	250,8	3.606	248,7	3.637	250,8
392	200	3.176	219,0	3.526	243,2	3.084	212,7	3.321	229,0	3.529	243,4	3.477	239,8	3.529	243,4
482	250	3.041	209,7	3.361	231,8	2.957	203,9	3.226	222,5	3.361	231,8	3.361	231,8	3.361	231,8
572	300	2.887	199,1	3.109	214,4	2.804	193,4	3.109	214,4	3.109	214,4	3.109	214,4	3.109	214,4
617	325	2.807	193,6	2.996	206,6	2.725	187,9	2.996	206,6	2.996	206,6	2.996	206,6	2.996	206,6
662	350	2.723	187,8	2.901	200,1	2.639	182,0	2.916	201,1	2.916	201,1	2.916	201,1	2.916	201,1
707	375	2.636	181,8	2.743	189,2	2.536	174,9	2.814	194,1	2.814	194,1	2.814	194,1	2.814	194,1
752	400	2.517	173,6	2.517	173,6	2.365	163,1	2.655	183,1	2.655	183,1	2.655	183,1	2.655	183,1
797	425	2.085	143,8	2.085	143,8	1.979	136,5	2.539	175,1	2.539	175,1	2.539	175,1	2.539	175,1
842	450	1.668	115,0	1.668	115,0	1.565	107,9	2.451	169,0	2.451	169,0	2.451	169,0	2.451	169,0
887	475	1.264	87,2	1.238	85,4	1.135	78,3	2.294	158,2	2.294	158,2	2.294	158,2	2.294	158,2
932	500	853	58,8	840	57,9	803	55,4	1.744	120,3	1.934	133,4	1.865	128,6	2.043	140,9
1000	538	428	29,5	428	29,5	428	29,5	822	56,7	1.011	69,7	1080	74,5	1.337	92,2
1022	550	/	/	/	/	/	/	/	/	914	63,0	921	63,5	1.134	78,2
1067	575	/	/	/	/	/	/	/	/	521	35,9	638	44,0	763	52,6
1112	600	/	/	/	/	/	/	/	/	/	/	442	30,5	499	34,4
1157	625	/	/	/	/	/	/	/	/	/	/	309	21,3	323	22,3
1202	650	/	/	/	/	/	/	/	/	/	/	206	14,2	206	14,2
1247	675	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1292	700	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1337	725	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1382	750	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1427	775	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1472	800	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1501	816	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Shell test		5.552,8	383,0	5.624,6	387,9	5.222,2	360,2	5.222,2	360,2	5.624,6	387,9	5.624,6	387,9	5.624,6	387,9
Seat test		4.072,0	280,8	4.124,7	284,5	3.829,6	264,1	3.829,6	264,1	4.124,7	284,5	4.124,7	284,5	4.124,7	284,5

General Notes:

Materials shall not be used beyond temperature limits specified in the governing Code.

(1) Permissible, but not recommended for prolonged usage above about 425°C / 800°F.

(2) Permissible, but not recommended for prolonged usage above about 470°C / 875°F.

(3) Permissible, but not recommended for prolonged usage above about 595°C / 1100°F.

(4) Not to be used over 345°C / 650°F.

(5) Not to be used over 425°C / 800°F.

(6) Not to be used over 538°C / 1000°F.

(7) Not to be used over 595°C / 1103°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

Group 1.13		Group 1.14		Group 1.15		Group 1.17		Group 2.1		Group 2.2		Group 2.3		Group 2.4	
C5 (12)		C12 (12)		C12A				CF8 (11)		CF8M (11)					
								CF10		CG3M (9)					
								CF3 (5)		CG8M (6)					
										CF3M (5)					
F5A		F9				F5		304		316 (11)		304L (5)		321 (6)	
						F12-cl2 (3) (12)		304H (11)		316H		316L		321H (14)	
PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
3.750	258,6	3.750	258,6	3.750	258,6	3.750	258,6	3.599	248,2	3.599	248,2	2.999	206,8	3.599	248,2
3.750	258,6	3.750	258,6	3.750	258,6	3.734	257,5	3.467	239,1	3.489	240,6	2.901	200,1	3.521	242,8
3.735	257,6	3.735	257,6	3.735	257,6	3.657	252,2	2.962	204,3	3.060	211	2.522	173,9	3.207	221,2
3.637	250,8	3.637	250,8	3.637	250,8	3.493	240,9	2.683	185	2.791	192,5	2.277	157	2.971	204,9
3.529	243,4	3.529	243,4	3.529	243,4	3.354	231,3	2.500	172,4	2.585	178,3	2.114	145,8	2.777	191,5
3.361	231,8	3.361	231,8	3.361	231,8	3.249	224,1	2.355	162,4	2.420	166,9	1.991	137,3	2.611	180,1
3.109	214,4	3.109	214,4	3.109	214,4	3.109	214,4	2.242	154,6	2.292	158,1	1.889	130,3	2.475	170,7
2.996	206,6	2.996	206,6	2.996	206,6	2.996	206,6	2.191	151,1	2.239	154,4	1.847	127,4	2.414	166,5
2.916	201,1	2.916	201,1	2.916	201,1	2.916	201,1	2.147	148,1	2.198	151,6	1.818	125,4	2.364	163
2.814	194,1	2.814	194,1	2.814	194,1	2.814	194,1	2.105	145,2	2.166	149,4	1.795	123,8	2.323	160,2
2.655	183,1	2.655	183,1	2.655	183,1	2.655	183,1	2.062	142,2	2.134	147,2	1.762	121,5	2.290	157,9
2.539	175,1	2.539	175,1	2.539	175,1	2.539	175,1	2.030	140	2.113	145,7	1.730	119,3	2.258	155,7
2.451	169,0	2.451	169,0	2.451	169,0	2.451	169,0	1.987	137	2.091	144,2	1.698	117,1	2.236	154,2
2.020	139,3	2.294	158,2	2.294	158,2	2.020	139,3	1.953	134,7	2.079	143,4	/	/	2.214	152,7
1.550	106,9	2.043	140,9	2.043	140,9	1.550	106,9	1.920	132,4	2.043	140,9	/	/	2.043	140,9
995	68,6	1.269	87,5	1.820	125,5	995	68,6	1.770	122,1	1.820	125,5	/	/	1.820	125,5
873	60,2	1.088	75,0	1.811	124,9	873	60,2	1.708	117,8	1.811	124,9	/	/	1.811	124,9
644	44,4	758	52,3	1.736	119,7	638	44,0	1.511	104,2	1.736	119,7	/	/	1.736	119,7
452	31,2	521	35,9	1.414	97,5	439	30,3	1.224	84,4	1.385	95,5	/	/	1.469	101,3
290	20	360	24,8	1.059	73	290	20,0	999	68,9	1.147	79,1	/	/	1.147	79,1
171	11,8	257	17,7	719	49,6	171	11,8	816	56,3	918	63,3	/	/	916	63,2
/	/	/	/	/	/	/	/	677	46,7	748	51,6	/	/	716	49,4
/	/	/	/	/	/	/	/	581	40,1	608	41,9	/	/	573	39,5
/	/	/	/	/	/	/	/	490	33,8	506	34,9	/	/	460	31,7
/	/	/	/	/	/	/	/	419	28,9	425	29,3	/	/	363	25
/	/	/	/	/	/	/	/	331	22,8	331	22,8	/	/	289	19,9
/	/	/	/	/	/	/	/	252	17,4	252	17,4	/	/	226	15,6
/	/	/	/	/	/	/	/	204	14,1	204	14,1	/	/	189	13
5.624,6	387,9	5.624,6	387,9	5.624,6	387,9	5.624,6	387,9	5.398,4	372,3	5.398,4	372,3	4.497,9	310,2	5.398,4	372,3
4.124,7	284,5	4.124,7	284,5	4.124,7	284,5	4.124,7	284,5	3.958,8	273,0	3.958,8	273,0	3.298,5	227,5	3.958,8	273,0

(8) Not to be used over 315°C / 599°F.

(9) Not to be used over 455°C / 851°F.

(10) Not to be used over 645°C / 1193°F.

(11) At temperatures above 538°C / 1000°F use only when the carbon content is 0.04% or higher.

(12) Use normalized and tempered material only.

(13) Only use solution annealed material.

(14) At temperatures above 538°C, use only if the material is heat treated by heating to a minimum temperature of 1095°F.

(a) Flanged-end valve ratings terminate at 538°C / 1000°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

CLASS 1500

		Group 2.5		Group 2.7		Group 2.8		Group 2.11		Group 2.12		Group 3.1		Group 3.4	
CAST		CF8C				CK3MCUN		CF8C (11)		CK20 (11)				M35-1 (13)	
FORGED		347H		310H		F51 (8)						IL20 (13)		M400 (13)	
		347 (6)				F53 (8)									
						F55									
						F44									
TEMP.°F	TEMP.°C	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
-20 to 100	-29 to 38	3.599	248,2	3.599	248,2	3.750	258,6	3.599	248,2	3.360	231,7	3.750	258,6	2.999	206,8
122	50	3.535	243,8	3.506	241,8	3.750	258,6	3.535	243,8	325	22,4	3.750	258,6	2.917	201,2
212	100	3.284	226,5	3.147	217	3.673	253,3	3.284	226,5	2.722	187,7	3.689	254,4	2.606	179,7
302	150	3.080	212,4	2.900	200	3.329	229,6	3.080	212,4	2.529	174,4	3.548	244,7	2.446	168,7
392	200	2.896	199,7	2.726	188	3.093	213,3	2.896	199,7	2.432	167,7	3.419	235,8	2.371	163,5
482	250	2.87.550	19.831	2.593	178,8	2.933	202,3	2.742	189,1	2.365	163,1	3.299	227,5	2.364	163
572	300	2.616	180,4	2.498	172,3	2.817	194,3	2.616	180,4	2.300	158,6	3.109	214,4	2.364	163
617	325	2.564	176,8	2.455	169,3	2.767	190,8	2.564	176,8	2.263	156,1	2.996	206,6	2.364	163
662	350	2.520	173,8	2.414	166,5	2.729	188,2	2.520	173,8	2.217	152,9	2.916	201,1	2.361	162,8
707	375	2.480	171	2.382	164,3	2.709	186,8	2.480	171,0	2.163	149,2	2.814	194,1	2.348	161,9
752	400	2.458	169,5	2.350	162,1	2.655	183,1	2.458	169,5	2.110	145,5	2.655	183,1	326	160,4
797	425	2.437	168,1	2.329	160,6	/	/	2.437	168,1	2.055	141,7	2.539	175,1	2.294	158,2
842	450	2.426	167,3	2.297	158,4	/	/	2.426	167,3	2.001	138	/	/	1.950	134,5
887	475	2.294	158,2	2.265	156,2	/	/	2.294	158,2	1.939	133,7	/	/	1.505	103,8
932	500	2.043	140,9	2.043	140,9	/	/	2.043	140,9	1.873	129,2	/	/	/	/
1000	538	1.820	125,5	1.820	125,5	/	/	1.820	125,5	1.691	116,6	/	/	/	/
1022	550	1.811	124,9	1.811	124,9	/	/	1.811	124,9	1.663	114,7	/	/	/	/
1067	575	1.736	119,7	1.463	100,9	/	/	1.736	119,7	1.570	108,3	/	/	/	/
1112	600	1.552	107,0	1.217	83,9	/	/	1.436	99	1.417	97,7	/	/	/	/
1157	625	1.322	91,2	906	62,5	/	/	1.005	69,3	1.219	84,1	/	/	/	/
1202	650	1.025	70,7	679	46,8	/	/	747	51,5	1.021	70,4	/	/	/	/
1247	675	909	62,7	525	36,2	/	/	577	39,8	835	57,6	/	/	/	/
1292	700	721	49,7	399	27,5	/	/	407	28,1	635	43,8	/	/	/	/
1337	725	560	38,6	313	21,6	/	/	289	19,9	460	31,7	/	/	/	/
1382	750	429	29,6	248	17,1	/	/	225	15,5	323	22,3	/	/	/	/
1427	775	331	22,8	193	13,3	/	/	178	12,3	228	15,7	/	/	/	/
1472	800	252	17,4	149	10,3	/	/	146	10,1	165	11,4	/	/	/	/
1501	816	204	14,1	129	8,9	/	/	138	9,5	138	9,5	/	/	/	/
Shell test		5.398,4	372,3	5.398,4	372,3	5.624,6	387,9	5.398,4	372,3	5.039,5	347,6	5.624,6	387,9	4.497,9	310,2
Seat test		3.958,8	273,0	3.958,8	273,0	4.124,7	284,5	3.958,8	273,0	695,6	254,9	4.124,7	284,5	3.298,5	227,5

General Notes:

Materials shall not be used beyond temperature limits specified in the governing Code.

(1) Permissible, but not recommended for prolonged usage above about 425°C / 800°F.

(2) Permissible, but not recommended for prolonged usage above about 470°C / 875°F.

(3) Permissible, but not recommended for prolonged usage above about 595°C / 1100°F.

(4) Not to be used over 345°C / 650°F.

(5) Not to be used over 425°C / 800°F.

(6) Not to be used over 538°C / 1000°F.

(7) Not to be used over 595°C / 1103°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

Group 3.5		Group 3.8		Group 3.12		Group 3.15		Group 3.17	
				CN3MN (13)		HASTC (6) (13)		CN7M (13)	
						N12MV (6) (13)			
IN600 (13)		IL8825 (13) (6)							
		IN625 (13) (10)							
PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
3.750	258,6	3.750	258,6	3.360	231,7	2.999	206,8	2.999	206,8
3.750	258,6	3.750	258,6	3.303	227,8	2.946	203,2	2.910	200,7
3.735	257,6	3.735	257,6	3.084	212,7	2.871	198	2.559	176,5
3.637	250,8	3.637	250,8	2.910	200,7	2.600	179,3	2.323	160,2
3.529	243,4	3.505	241,7	2.706	186,6	2.459	169,6	2.129	146,8
3.361	231,8	3.361	231,8	2.530	174,5	2.339	161,3	1.973	136,1
3.109	214,4	3.109	214,4	2.400	165,5	2.229	153,7	1.840	126,9
2.996	206,6	2.996	206,6	2.343	161,6	2.179	150,3	1.770	122,1
2.916	201,1	2.916	201,1	2.292	158,1	2.133	147,1	/	/
2.814	194,1	2.814	194,1	2.249	155,1	2.082	143,6	/	/
2.655	183,1	2.655	183,1	2.205	152,1	2.049	141,3	/	/
2.539	175,1	2.539	175,1	2.162	149,1	2.007	138,4	/	/
2.451	169	2.451	169	/	/	1.973	136,1	/	/
2.294	158,2	2.294	158,2	/	/	1.942	133,9	/	/
2.043	140,9	2.043	140,9	/	/	1.908	131,6	/	/
1.199	82,7	1.820	125,5	/	/	1.820	125,5	/	/
1.011	69,7	1.811	124,9	/	/	1.811	124,9	/	/
684	47,2	1.736	119,7	/	/	1.736	119,7	/	/
481	33,2	1.552	107	/	/	1.552	107	/	/
373	25,7	1.322	91,2	/	/	1.322	91,2	/	/
342	23,6	1.021	70,4	/	/	1.025	70,7	/	/
/	/	835	57,6	/	/	909	62,7	/	/
/	/	635	43,8	/	/	721	49,7	/	/
/	/	/	/	/	/	560	38,6	/	/
/	/	/	/	/	/	429	29,6	/	/
/	/	/	/	/	/	331	22,8	/	/
/	/	/	/	/	/	252	17,4	/	/
/	/	/	/	/	/	204	14,1	/	/
5.624,6	387,9	5.624,6	387,9	5.039,5	347,6	44.97,9	310,2	4.497,9	310,2
4.124,7	284,5	4.124,7	284,5	3.695,6	254,9	3.298,5	227,5	3.298,5	227,5

(8) Not to be used over 315°C / 599°F.

(9) Not to be used over 455°C / 851°F.

(10) Not to be used over 645°C / 1193°F.

(11) At temperatures above 538°C / 1000°F use only when the carbon content is 0.04% or higher.

(12) Use normalized and tempered material only.

(13) Only use solution annealed material.

(14) At temperatures above 538°C, use only if the material is heat treated by heating to a minimum temperature of 1095°F.

(a) Flanged-end valve ratings terminate at 538°C / 1000°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

CLASS 2500

		Group 1.1		Group 1.2		Group 1.3		Group 1.5		Group 1.7		Group 1.9		Group 1.10	
CAST		WCB(1)		LC2 (4)		WC1 (2) (12)				WC4 (6) (12)		WC6 (7) (12)		WC9 (7) (12)	
				LC3 (4)		LCB (4)				WC5 (12)					
				LCC (4)		LC1 (4)									
				WCC (1)											
FORGED		A105 (1)		A106-C (5)				F1 (2)		F2 (6)		F11-cl2 (3) (12)		F22-cl3 (3)	
		LF2 (1)													
		LF3 (4)													
		GR70 (1)													
TEMP:°F	TEMP:°C	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
-20 to 100	-29 to 38	6.170	425,5	6.248	430,9	5.801	400,1	5.801	400,1	6.248	430,9	6.248	430,9	6.248	430,9
122	50	6.057	417,7	6.248	430,9	5.736	395,6	5.801	400,1	6.248	430,9	6.248	430,9	6.248	430,9
212	100	5.630	388,3	6.226	429,4	5.478	377,8	5.793	399,5	6.226	429,4	6.221	429,0	6.226	429,4
302	150	5.446	375,6	6.062	418,1	5.308	366,1	5.720	394,5	6.064	418,2	6.010	414,5	6.064	418,2
392	200	5.293	365,0	5.878	405,4	5.139	354,4	5.535	381,7	5.878	405,4	5.794	399,6	5.878	405,4
482	250	5.068	349,5	5.600	386,2	4.927	339,8	5.378	370,9	5.600	386,2	5.600	386,2	5.600	386,2
572	300	4.811	331,8	5.178	357,1	4.675	322,4	5.178	357,1	5.178	357,1	5.178	357,1	5.178	357,1
617	325	4.678	322,6	4.992	344,3	4.540	313,1	4.992	344,3	4.992	344,3	4.992	344,3	4.992	344,3
662	350	4.539	313,0	4.836	333,5	4.398	303,3	4.862	335,3	4.862	335,3	4.862	335,3	4.862	335,3
707	375	4.395	303,1	4.572	315,3	4.225	291,4	4.686	323,2	4.686	323,2	4.686	323,2	4.686	323,2
752	400	4.195	289,3	4.195	289,3	3.943	271,9	4.421	304,9	4.421	304,9	4.421	304,9	4.421	304,9
797	425	3.476	239,7	3.476	239,7	3.299	227,5	4.228	291,6	4.228	291,6	4.228	291,6	4.228	291,6
842	450	2.780	191,7	2.780	191,7	2.609	179,9	4.086	281,8	4.086	281,8	4.086	281,8	4.086	281,8
887	475	2.107	145,3	2.065	142,4	1.894	130,6	3.827	263,9	3.827	263,9	3.827	263,9	3.827	263,9
932	500	1.420	97,9	1.399	96,5	1.338	92,3	2.907	200,5	3.225	222,4	1.799	214,4	3.408	235,0
1000	538	713	49,2	713	49,2	713	49,2	1.372	94,6	1.685	116,2	1536	124,1	2.229	153,7
1022	550	/	/	/	/	/	/	/	/	1.523	105,0	1064	105,9	1.889	130,3
1067	575	/	/	/	/	/	/	/	/	867	59,8	738	73,4	1.272	87,7
1112	600	/	/	/	/	/	/	/	/	/	/	515	50,9	832	57,4
1157	625	/	/	/	/	/	/	/	/	/	/	342	35,5	539	37,2
1202	650	/	/	/	/	/	/	/	/	/	/	342	23,6	342	23,6
1247	675	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1292	700	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1337	725	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1382	750	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1427	775	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1472	800	/	/	/	/	/	/	/	/	/	/	/	/	/	/
1501	816	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Shell test		9.254,6	638,3	9.372,1	646,4	8.702,2	600,2	8.702,2	600,2	9.372,1	646,4	9.372,1	646,4	9.372,1	646,4
Seat test		6.786,7	468,1	6.872,9	474,0	6.381,6	440,1	6.381,6	440,1	6.872,9	474,0	6.872,9	474,0	6.872,9	474,0

General Notes:

Materials shall not be used beyond temperature limits specified in the governing Code.

(1) Permissible, but not recommended for prolonged usage above about 425°C / 800°F.

(2) Permissible, but not recommended for prolonged usage above about 470°C / 875°F.

(3) Permissible, but not recommended for prolonged usage above about 595°C / 1100°F.

(4) Not to be used over 345°C / 650°F.

(5) Not to be used over 425°C / 800°F.

(6) Not to be used over 538°C / 1000°F.

(7) Not to be used over 595°C / 1103°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

Group 1.13		Group 1.14		Group 1.15		Group 1.17		Group 2.1		Group 2.2		Group 2.3		Group 2.4	
C5 (12)		C12 (12)		C12A				CF8 (11)		CF8M (11)					
								CF10		CG3M (9)					
								CF3 (5)		CG8M (6)					
										CF3M (5)					
F5A		F9				F5		304		316 (11)		304L (5)		321 (6)	
						F12-cl2 (3) (12)		304H (11)		316H		316L		321H (14)	
PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
6.248	430,9	6.248	430,9	6.248	430,9	6.248	430,9	5.999	413,7	5.999	413,7	4.998	344,7	5.999	413,7
6.248	430,9	6.248	430,9	6.248	430,9	6.223	429,2	5.778	398,5	5.813	400,9	4.836	333,5	5.867	404,6
6.226	429,4	6.226	429,4	6.226	429,4	6.096	420,4	4.936	340,4	5.098	351,6	4.204	289,9	5.346	368,7
6.064	418,2	6.064	418,2	6.064	418,2	5.822	401,5	4.472	308,4	4.652	320,8	3.793	261,6	4.952	341,5
5.878	405,4	5.878	405,4	5.878	405,4	5.591	385,6	4.166	287,3	4.309	297,2	3.524	243	4.627	319,1
5.600	386,2	5.600	386,2	5.600	386,2	5.416	373,5	3.925	270,7	4.032	278,1	3.319	228,9	4.353	300,2
5.178	357,1	5.178	357,1	5.178	357,1	5.178	357,1	3.735	257,6	3.821	263,5	3.149	217,2	4.127	284,6
4.992	344,3	4.992	344,3	4.992	344,3	4.992	344,3	3.653	251,9	3.732	257,4	3.078	212,3	4.025	277,6
4.862	335,3	4.862	335,3	4.862	335,3	4.862	335,3	3.580	246,9	3.664	252,7	3.029	208,9	3.940	271,7
4.686	323,2	4.686	323,2	4.686	323,2	4.686	323,2	3.508	241,9	3.611	249	2.991	206,3	3.870	266,9
4.421	304,9	4.421	304,9	4.421	304,9	4.421	304,9	3.437	237	3.557	245,3	2.936	202,5	3.816	263,2
4.228	291,6	4.228	291,6	4.228	291,6	4.228	291,6	3.383	233,3	3.522	242,9	2.883	198,8	3.763	259,5
4.086	281,8	4.086	281,8	4.086	281,8	4.086	281,8	3.312	228,4	3.486	240,4	2.829	195,1	3.725	256,9
3.351	231,1	3.827	263,9	3.827	263,9	3.365	232,1	3.255	224,5	3.464	238,9	/	/	3.689	254,4
2.584	178,2	3.408	235,0	3.408	235,0	2.584	178,2	3.200	220,7	3.408	235	/	/	3.408	235
1.657	114,3	2.114	145,8	3.029	208,9	1.657	114,3	2.952	203,6	3.029	208,9	/	/	3.029	208,9
1.456	100,4	1.813	125,0	3.016	208,0	1.456	100,4	2.846	196,3	3.016	208,0	/	/	3.016	208
1.073	74,0	1.263	87,1	2.893	199,5	1.064	73,4	2.519	173,7	2.893	199,5	/	/	2.893	199,5
753	51,9	867	59,8	2.356	162,5	731	50,4	2.040	140,7	2.406	165,9	/	/	2.449	168,9
483	33,3	600	41,4	1.765	121,7	483	33,3	1.666	114,9	1.911	131,8	/	/	1.911	131,8
286	19,7	428	29,5	1.199	82,7	286	19,7	1.360	93,8	1.530	105,5	/	/	1.528	105,4
/	/	/	/	/	/	/	/	1.130	77,9	1.247	86,0	/	/	1.193	82,3
/	/	/	/	/	/	/	/	970	66,9	1.012	69,8	/	/	956	65,9
/	/	/	/	/	/	/	/	816	56,3	844	58,2	/	/	766	52,8
/	/	/	/	/	/	/	/	697	48,1	709	48,9	/	/	605	41,7
/	/	/	/	/	/	/	/	551	38,0	551	38,0	/	/	481	33,2
/	/	/	/	/	/	/	/	423	29,2	423	29,2	/	/	378	26,1
/	/	/	/	/	/	/	/	345	23,8	345	23,8	/	/	315	21,7
9.372,1	646,4	9.372,1	646,4	9.372,1	646,4	9.372,1	646,4	8.998,0	620,6	8.998,0	620,6	7.497,2	517,1	8.998,0	620,6
6.872,9	474,0	6.872,9	474,0	6.872,9	474,0	6.872,9	474,0	6.598,5	455,1	6.598,5	455,1	5.498,0	379,2	6.598,5	455,1

(8) Not to be used over 315°C / 599°F.

(9) Not to be used over 455°C / 851°F.

(10) Not to be used over 645°C / 1193°F.

(11) At temperatures above 538°C / 1000°F use only when the carbon content is 0.04% or higher.

(12) Use normalized and tempered material only.

(13) Only use solution annealed material.

(14) At temperatures above 538°C, use only if the material is heat treated by heating to a minimum temperature of 1095°F.

(a) Flanged-end valve ratings terminate at 538°C / 1000°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

CLASS 2500

		Group 2.5		Group 2.7		Group 2.8		Group 2.11		Group 2.12		Group 3.1		Group 3.4	
CAST		CF8C				CK3MCUN		CF8C (11)		CK20 (11)				M35-1 (13)	
FORGED		347H		310H		F51 (8)						IL20 (13)		M400 (13)	
		347 (6)				F53 (8)									
						F55									
						F44									
TEMP.°F	TEMP.°C	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
-20 to 100	-29 to 38	5.999	413,7	5.999	413,7	6.248	430,9	5.999	413,7	5.598	386,1	6.248	430,9	4.998	344,7
122	50	5.893	406,4	5.845	403,1	6.248	430,9	5.893	406,4	5.374	370,6	6.248	430,9	4.862	335,3
212	100	5.472	377,4	5.243	361,6	6.122	422,2	5.472	377,4	4.536	312,8	6.147	423,9	4.343	299,5
302	150	5.132	353,9	4.833	333,3	5.549	382,7	5.132	353,9	4.215	290,7	5.913	407,8	4.076	281,1
392	200	4.826	332,8	4.544	313,4	5.153	355,4	4.826	332,8	4.053	279,5	5.697	392,9	3.950	272,4
482	250	4.569	315,1	4.322	298,1	4.889	337,2	4.569	315,1	3.941	271,8	5.498	379,2	3.940	271,7
572	300	4.360	300,7	4.164	287,2	4.695	323,8	4.360	300,7	3.832	264,3	5.178	357,1	3.940	271,7
617	325	4.272	294,6	4.092	282,2	4.611	318	4.272	294,6	3.771	260,1	4.992	344,3	3.940	271,7
662	350	4.199	289,6	4.025	277,6	4.549	313,7	4.199	289,6	3.695	254,8	4.862	335,3	3.934	271,3
707	375	4.134	285,1	3.970	273,8	4.514	311,3	4.134	285,1	3.605	248,6	4.686	323,2	3.914	269,9
752	400	4.098	282,6	3.918	270,2	4.421	304,9	4.098	282,6	3.515	242,4	4.421	304,9	3.877	267,4
797	425	4.061	280,1	3.882	267,7	/	/	4.061	280,1	3.425	236,2	4.228	291,6	3.822	263,6
842	450	4.043	278,8	3.828	264	/	/	4.043	278,8	3.335	230	/	/	3.251	224,2
887	475	3.827	263,9	3.770	260	/	/	3.827	263,9	331	22,8	/	/	2.509	173
932	500	3.408	235	3.408	235	/	/	3.408	235	3.122	215,3	/	/	/	/
1000	538	3.029	208,9	3.029	208,9	/	/	3.029	208,9	2.819	194,4	/	/	/	/
1022	550	3.016	208,0	3.016	208	/	/	3.016	208	2.772	191,2	/	/	/	/
1067	575	2.893	199,5	2.680	184,8	/	/	2.893	199,5	2.616	180,4	/	/	/	/
1112	600	2.588	178,5	2.027	139,8	/	/	2.394	165,1	2.346	161,8	/	/	/	/
1157	625	2.204	152,0	1.511	104,2	/	/	1.675	115,5	2.033	140,2	/	/	/	/
1202	650	1.707	117,7	1.131	78,0	/	/	1.244	85,8	1.701	117,3	/	/	/	/
1247	675	1.515	104,5	874	60,3	/	/	961	66,3	1.392	96	/	/	/	/
1292	700	1.204	83,0	666	45,9	/	/	679	46,8	1.059	73	/	/	/	/
1337	725	934	64,4	522	36,0	/	/	480	33,1	767	52,9	/	/	/	/
1382	750	712	49,1	412	28,4	/	/	374	25,8	539	37,2	/	/	/	/
1427	775	551	38,0	320	22,1	/	/	296	20,4	380	26,2	/	/	/	/
1472	800	423	29,2	249	17,2	/	/	245	16,9	277	19,1	/	/	/	/
1501	816	345	23,8	215	14,8	/	/	229	15,8	229	15,8	/	/	/	/
Shell test		8.998,0	620,6	8.998,0	620,6	9.372,1	646,4	8.998,0	620,6	8.397,7	579,2	9.372,1	646,4	7.497,2	517,1
Seat test		6.598,5	455,1	6.598,5	455,1	6.872,9	474,0	6.598,5	455,1	6.158,3	424,7	6.872,9	474,0	5.498,0	379,2

General Notes:

Materials shall not be used beyond temperature limits specified in the governing Code.

(1) Permissible, but not recommended for prolonged usage above about 425°C / 800°F.

(2) Permissible, but not recommended for prolonged usage above about 470°C / 875°F.

(3) Permissible, but not recommended for prolonged usage above about 595°C / 1100°F.

(4) Not to be used over 345°C / 650°F.

(5) Not to be used over 425°C / 800°F.

(6) Not to be used over 538°C / 1000°F.

(7) Not to be used over 595°C / 1103°F.

ORION STEEL VALVES

Pressure Temperature Ratings

ASME B16.34 - 2013

Group 3.5		Group 3.8		Group 3.12		Group 3.15		Group 3.17	
				CN3MN (13)		HASTC (6) (13)		CN7M (13)	
						N12MV (6) (13)			
IN600 (13)		IL8825 (13) (6)							
		IN625 (13) (10)							
PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR	PSI	BAR
6.248	430,9	6.248	430,9	5.598	386,1	4.998	344,7	4.998	344,7
6.248	430,9	6.248	430,9	5.506	379,7	4.911	338,7	4.849	334,4
6.226	429,4	6.226	429,4	5.140	354,5	4.568	315	4.266	294,2
6.064	418,2	6.064	418,2	4.852	334,6	4.334	298,9	3.872	267
5.878	405,4	5.841	402,8	4.510	311	4.099	282,7	3.548	244,7
5.600	386,2	5.600	386,2	4.217	290,8	3.899	268,9	3.290	226,9
5.178	357,1	5.178	357,1	4.001	275,9	3.715	256,2	3.067	211,5
4.992	344,3	4.992	344,3	3.905	269,3	3.632	250,5	2.951	203,5
4.862	335,3	4.862	335,3	3.819	263,4	3.555	245,2	/	/
4.686	323,2	4.686	323,2	3.748	258,5	3.471	239,4	/	/
4.421	304,9	4.421	304,9	3.676	253,5	3.416	235,6	/	/
4.228	291,6	4.228	291,6	3.603	248,5	3.344	230,6	/	/
4.086	281,8	4.086	281,8	/	/	3.289	226,8	/	/
3.827	263,9	3.827	263,9	/	/	3.235	223,1	/	/
3.408	235	3.408	235	/	/	3.181	219,4	/	/
2.000	137,9	3.029	208,9	/	/	3.029	208,9	/	/
1.685	116,2	3.016	208	/	/	3.016	208	/	/
1.140	78,6	2.893	199,5	/	/	2.893	199,5	/	/
802	55,3	2.588	178,5	/	/	2.588	178,5	/	/
621	42,8	2.204	152	/	/	2.204	152	/	/
571	39,4	1.701	117,3	/	/	1.707	117,7	/	/
/	/	1.392	96	/	/	1.515	104,5	/	/
/	/	1.059	73	/	/	1.204	83	/	/
/	/	/	/	/	/	934	64,4	/	/
/	/	/	/	/	/	712	49,1	/	/
/	/	/	/	/	/	551	38	/	/
/	/	/	/	/	/	423	29,2	/	/
/	/	/	/	/	/	345	23,8	/	/
9.372,1	646,4	9.372,1	646,4	8.397,7	579,2	7.497,2	517,1	7.497,2	517,1
6.872,9	474,0	6.872,9	474,0	6.158,3	424,7	5.498,0	379,2	5.498,0	379,2

(8) Not to be used over 315°C / 599°F.

(9) Not to be used over 455°C / 851°F.

(10) Not to be used over 645°C / 1193°F.

(11) At temperatures above 538°C / 1000°F use only when the carbon content is 0.04% or higher.

(12) Use normalized and tempered material only.

(13) Only use solution annealed material.

(14) At temperatures above 538°C, use only if the material is heat treated by heating to a minimum temperature of 1095°F.

(a) Flanged-end valve ratings terminate at 538°C / 1000°F.

ORION STEEL VALVES
Notes



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Aflas	Ashi Glass Corporation.
Kalrez	E.I. DuPont De Nemours & Company



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Last update: April 2015

