WALWORTH®

Since 1842

CAST STEEL

CATALOG

www.walworthvalves.com

For more detailed information, please visit our website:
www.walworthvalves.com

UNITED STATES

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MEXICO

Industrial de Válvulas, S.A. de C.V.
Av. de la Industria Lote 16, Fracc. Industrial El Trébol,
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Introduction

Cast Steel Gate, Globe and Swing Check Valves

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YARMOUTH RESEARCH AND TECHNOLOGY

QMS REGISTERED ISO 9001 Certificate Number: 0038

WALWORTH COMPANY

The WALWORTH Company is one of the world´s most dominant and comprehensive industrial valve manufacturers. Founded in 1842 by James Walworth, the Company has consistently dedicated itself to the design and manufacture of an array of valves exceptionally suited for the world´s fluid control sector. We satisfy all end use industries and comprehensive customer requirements by adhering to the most demanding quality standards.

WALWORTH relies on its broad experience in supplying valves to the petrochemical, oil & gas, petroleum, power generation, pulp and paper, cryogenic and geothermal industries, among others.

Over the years, the Company has produced more than 40,000 different types of products and serves as a global supplier to varied markets utilizing the expertise of over 500 trained employees.

Our manufacturing system includes utilization of Company-directed raw material warehouses; up-to-date specialized machinery; welding processes such as SMAW, GMAW, SAW, PAW; assembly testing for low pressure, high pressure, at low or high temperature; painting processes; crating and shipment.

With Company-directed facilities and stocks in the United States and Mexico, WALWORTH is capable of providing the world´s most comprehensive industrial valve line to the North American, Central American, South American, European and African markets. WALWORTH is proud to meet the ultimate demands of customer satisfaction, especially in quality, cost, effectiveness and services in all parts of the world.

WALWORTH VALUES

MISSION

To satisfy the needs of Customers in terms of quality and service and comply with expectations of employees, suppliers and share holders.

VISION

To maintain our good reputation in terms of service, delivery and quality which has been the main goal during mor than 167 years, positioning the **WALWORTH** brand as a reliable Company in the market that continues developing new products according to the needs of the industry in terms of technology, environment and quality.

WALWORTH also offers a complete service that includes technical support and personal attention in order to mantain our Customer confidence.

WALWORTH ENGINEERING CONTROL

WALWORTH products are manufactured following strictly the most recognized international standards all over the world, such as API, ANSI, ASME, ASTM, MSS, NACE, AWWA, BSI, CSA, among others. Our Engineering team is always studying the new updates of these standards to incorporate any changes that may affect the design, regulations or performance of our products, being leaders in the new developments achieved.

Design is made using the most advanced technology and equipment, using finite elements and CAD system programs to ensure the proper assembly and performance of products since the concept, calculation and detailed drawings for manufacturing. WALWORTH is a leader in the development of new products according to valve market current needs.

WALWORTH QUALITY SYSTEM

Throughout the years, WALWORTH has developed its Quality System which is an integral part of our manufacturing policy. Our primary goal is to provide products that meet and exceed market standards. In this sense, WALWORTH is an ISO-9001 Audited and Certified Company that has achieved major certifications worldwide. Our system consists of a rigorous quality control as well as the selection of raw materials from approved vendors. Control over our manufacturing process is vital. Serial numbers allow WALWORTH to monitor and trace fabrication processes along with the materials of components.


Certificate of Authority to use the Official API Monogram
License Number: 6D-0097
WALWORTH
Avenida de la Industria Lote 16
Fraccionamiento Industrial El Trebol
Tepotzotlan
Mexico
American Petroleum Institute
Effective Date: APRIL 4, 2008
Expiration Date: OCTOBER 13, 2011

Certificate API-6D No. 6D-0097 issued by American Petroleum Institute to apply on Gate valves, Plug valves, Ball valves and Check valves manufactured in accordance with API-6D specification.


Certificate of Authority to use the Official API Monogram
License Number: 6A-0234
WALWORTH
Avenida de la Industria Lote 16
Fraccionamiento Industrial El Trebol
Tepotzotlan
Mexico
American Petroleum Institute
Effective Date: APRIL 4, 2008
Expiration Date: OCTOBER 13, 2011

Certificate API-6A No. 6A-0234 from American Petroleum Institute to apply on valves at PSI, 1 through 4.

QMS REGISTERED

Certificate of Registration

0038

WALWORTH
Avenida de la Industria Lote 16
Fraccionamiento Industrial El Trebol
Tepotzotlan
Mexico

ISO 9001:2000

Design and Manufacture of Valves

No Exclusions Identified as Applicable

Effective Date: October 13, 2008
Expiration Date: October 13, 2011
Registered Since: April 5, 1999

Certificate ISO-9001 No. 038 issued by American Petroleum Institute since April 1999.

Certificate

Quality-Assurance System
acc. to Directive 97/23/EC

CE 0035

Design and Manufacturing of industrial valves in accordance with the attached Scope of Validity.

Valid until: April 07, 2013

Cologne, April 08, 2010

TÜVRheinland®
Precisely Right.

Certificate as per PED 97/23/EC Module H to stamp CE products.

CFE
LAPEM
LABORATORIO DE PRUEBAS DE EQUIPOS Y MATERIALES
SALVADOR CISNEROS CHAVEZ

CONSTANCIA DE CALIFICACIÓN DE PROVEEDOR

Certificate of Reliable Supplier No. 199/07 issued by CFE in accordance with ISO-9001 Quality Assurance System.

PETROLEOS MEXICANOS
GRUPO TECNICO DE EVALUACION DE PROVEEDORES E INSPECCION DE BIENES

CONSTANCIA DE PROVEEDOR CONFIABLE

INDUSTRIAL DE VALVULAS, S.A. DE C.V. (101-I-439)
AV. INDUSTRIA, LOTE 16
FRACC. INDUSTRIAL EL TREBOL
TEPOTZOTLAN, EDO. DE MEX. C.P. 54600
TEL. 5899 1700

FABRICANTE DE VALVULAS DE ACERO FUNDIDO COMPUERTA API 6D, GLOBO ASME B16.34, RETENCION, COMPUERTA, BOLA, MACHO API 6D, VALVULAS DE ACERO FORJADO COMPUERTA, GLOBO RETENCION API 602, MARIPOSA AWWA C504, SEGURIDAD Y ALIVIO.

FECHA DE EMISION: JUNIO / 2007
FECHA DE EXPIRACION: JUNIO / 2009

LIC. JAIME CORTES ZEPEDA
PRESIDENTE

SECRETARIO EJECUTIVO

SECRETARIO TECNICO

Certificate NMX-CC-9001 (Mexican Standards ISO-9001) No. 0552/2007 issued by PEMEX in accordance with ISO-9001 Quality Assurance System.

Besides the Quality System Certifications, WALWORTH has achieved the following specific product certifications:

TÜVRheinland®
Precisely Right.

CERTIFICATE

Certificate No.: 01 202 USA-TA-09-79768

Concerning the Agreement with the Technical Requirements in:

TA-Luft 2002, VDI 2440 Nov. 2000, Sec. 3.3.1.3

Test report: 209140 Datum: 03 December, 2009

Client: Industrial de Valvulas, S.A. de C.V.

Manufacturer's Address: Av. De la Industria Lote 16 Fracc. Industrial El Trebol, Tepotzotlan, Edo. De Mexico, CP 54600

The stem sealing system and internal flange connection have been successfully tested to meet the tightness criteria of ≤ 10⁻⁶ mbar x l/(s x m) with a helium mass spectrometer under the following conditions. The BFV Valve with the examined mechanical shaft seals fulfills the requirements of Section 5.2.6.4 of The German Clean Air Act, (TA-Luft). (Leakage Verification) in accordance with Section 3.3.1.3 of VDI 2440 (Nov. 2000).

Kind of Valve:	Walworth API 600 Gate Valve	
Valve Type:	4 Inch, Class 300, Figure 5200F WCB Body / CR 13 Stem & Disc / HF Seat	
Sealing System:	Graphite Seals	
Nominal Size, Nominal Pressure:	4 Inch, ANSI 300	
Inspection Media/Pressure:	Helium / 51 Bars	Temperature = Ambient
Switching Cycles: (2/min):	0 Cycles	Total Cycles 500
Leakage Rate [mbar - l / sec]	5.2e-7 (mbar – l/sec)	3.7e-6 (mbar – l/sec)
Testing Method:	Helium Leak Test – VDI 2440, Appendix A	

Testing Laboratory: Yarmouth Research and Technology
Matthew J Wasielewski PE
484 Walnut Hill Road, N. Yarmouth, ME USA
www.yarmouthresearch.com

TÜV Rheinland North America, Inc.
Industrial Services Division, Newtown, CT., USA
Kasuma J. Santos, Jr. – Examiner

TA Luft Certificate (Fugitive Emission) Approval ISO-5211 Top Flange, Anti-Static Device.

YARMOUTH RESEARCH AND TECHNOLOGY

PROJECT SUMMARY

Project Number: 99069

Customer: The Walworth Company

Contact: David Cornelsen

Date(s) of Test: 12/8/99 – 12/20/99

Product(s) Tested: One 4" Class 300 Gate Valve with Empak-Max EAF-100-001 packing

Purpose of Test: The test was conducted to evaluate the valve's stem sealing performance at ambient and at 350° F as related to the 1990 Amendments to the Clean Air Act requirements. Leakage measurements were conducted in accordance with 40 CFR Part 60, Appendix A, Method 21.

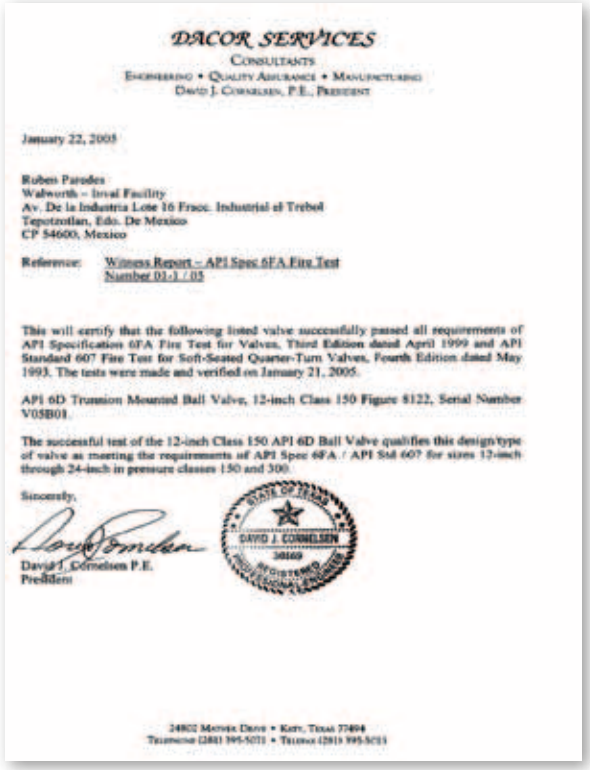
Conclusion: Three thermal cycles from ambient to 350 deg. F were conducted throughout 3000 operation cycles with the valve pressurized to 645 psig. The valve was cycled with a 40 RPM gear motor coupled to the handwheel. One packing nut adjustment was required at cycle number 300 to maintain leakage levels below 100 PPMv.

At cycle number 3000, the packing leakage was 25-28 PPMv with the stem static. The packing nuts were tightened from 12/14 ft-lb back to 28 ft-lb and leakage decreased to about 1 PPMv.

See the attached data sheets for more information.

Test Witness: Matthew J. Wasielewski, P. E., President
YARMOUTH RESEARCH AND TECHNOLOGY

Ultra Low Fugitive Emissions Certificate No. 20985-3, 8 & 16 in accordance with ISO-15848-1 "Industrial Valves"-Measurement, Test and Qualification Procedures for Fugitive Emissions" "Part 1: Classification System and Qualification Procedures for Type Testing of Valves".



DACOR SERVICES
CONSULTANTS
ENGINEERING • QUALITY ASSURANCE • MANUFACTURING
DAVID J. CORNELSEN, P.E., PRESIDENT

January 22, 2005

Ruben Parodes
Walworth – Inval Facility
Av. De la Industria Lote 16 Fracc. Industrial el Trebol
Tepotzotlan, Edo. De Mexico
CP 54600, Mexico

Reference: Witness Report – API Spec 6FA Fire Test
Number 03-1 / 05

This will certify that the following listed valve successfully passed all requirements of API Specification 6FA Fire Test for Valves, Third Edition dated April 1999 and API Standard 607 Fire Test for Soft-Seated Quarter-Turn Valves, Fourth Edition dated May 1993. The tests were made and verified on January 21, 2005.

API 6D Trunnion Mounted Ball Valve, 12-inch Class 150 Figure 8122, Serial Number V05B01.

The successful test of the 12-inch Class 150 API 6D Ball Valve qualifies this design/type of valve as meeting the requirements of API Spec 6FA / API Std 607 for sizes 12-inch through 24-inch in pressure classes 150 and 300.

Sincerely,

David J. Cornelsen P.E.
President

STATE OF TEXAS
DAVID J. CORNELSEN
30169
REGISTERED
PROFESSIONAL ENGINEER

24802 Mathis Drive • Katy, Texas 77494
Telephone (281) 395-5033 • Telefax (281) 395-5033

Fire Test Certificate No. 04/04 in accordance with API-6FA and API Standard API-607 for Trunnion Ball Valves in accordance with API-6D.

FUGITIVE EMISSION TEST CERTIFICATE

Emissions after 500 cycles at ambient and 350 °F issued by Yarmouth Research and Technology Lab for 3 inch Class 300 Gate Valve After 500 cycles the measurement result was less than 50 ppm.

Certificate of Authority to use the Official API Monogram

Certificate API-594 No. 594-0007 issued by American Petroleum Institute to apply on Check Valves-Type A; Check Valves Type Bmanufactured in accordance with API-594 specification.

FUGITIVE EMISSION TEST CERTIFICATE

Emissions after 500 cycles at ambient and 350 °F issued by Yarmouth Research and Technology Lab for 8 inch Class 300 Gate Valve After 500 cycles the measurement result was less than 50 ppm.

Certificate of Authority to use the Official API Monogram

API-600 Certificate No. 600-0109 issued by American Petroleum Institute to apply on Bolted Bonnet Steel Gate Valves manufactured in accordance with API-600 specification.

FUGITIVE EMISSION TEST CERTIFICATE

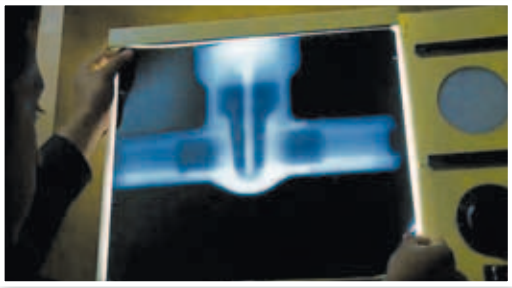
Emissions after 500 cycles at ambient and 350 °F issued by Yarmouth Research and Technology Lab for 8 inch Class 300 Gate Valve After 500 cycles the measurement result was less than 50 ppm.

Certificate of Authority to use the Official API Monogram

API-602 Certificate No. 602-0024 issued by American Petroleum Institute to apply on Compact Steel Gate Valves, Compact Steel Globe Valves, and Compact Steel Check Valves manufactured in accordance with API-602 specification.

QUALITY CONTROL EQUIPMENT

In order to assure that **WALWORTH** products comply with quality international standards, in-house equipments are kept for monitoring control, some of this equipment includes:



X-Ray Examination Equipment.- WALWORTH has its own Ir-92 source in-house for the radiographic examination (RT) of castings from 0.100" up to 2 1/2" wall thickness to verify the soundness of the casting raw material.

PMI Equipment.- New generation of Positive Material Identification Equipment gives WALWORTH the capability to perform quick chemical analysis on incoming raw materials and on pieces after assembly to certify that materials used were produced and assembled in accordance with WALWORTH and the Customer's specifications.

Magnetic Particle Test.- In a random basis for standard products or when a Customer request MT Certification, WALWORTH has Magnetic Particle Test Equipment to perform on ferromagnetic materials.

Penetrant Test Examination.- WALWORTH has the personnel and materials to perform PT examination by solvent removable or water washable techniques. The NDT personnel are ASNT Certified.

Test Loop. A complete Laboratory Test loop exists for design validation of WALWORTH products performing the test at maximum design pressure and cycling the valves from 3000 to 5000 cycles. The test expends more than 4 months to be finished.

Pressure Gradient Test Loop.- This test exposes Plug valves to the extremes of both positive and negative pressure gradients to verify that the plug in a balanced plug design will prevent lock-up into the body.

Metrology Laboratory.- WALWORTH developed a calibration and/or verification system in all the equipment used in its facilities to ensure the traceability of measurements to international standards. In this way, WALWORTH gets measurement control of its products to comply with international standards.

Fire Test Facilities.- Facilities to perform fire test in accordance to API requirements. The test exposes the valve to a fire flame at 1400 to 1800 °F (761 to 980 °C) to verify proper seal of the valve.

Low Fugitive Emissions Test.- When a Customer requires low fugitive emissions certification. The Lab has its own LFE Test Equipment capable to measure less than 20 ppm either in both static or Mechanical conditions at ambient temperature or thermal cycle operations.

Ultrasonic Testing Equipment.- Using ultrasonic techniques, we can detect sub surface flaws in materials and evaluate castings and forgings that cannot be radiographed. In addition we utilize these techniques to measure the wall thickness of castings and forgings.

Tensile Test Equipment.- To verify the mechanical properties of materials used for manufacturing, WALWORTH tests samples on a random basis even thought we receive MTR's from our suppliers and foundries.

Hardness Test Equipments.- Either lab or shop test, Walworth use hardness tester equipments as Rockwell B, C Brinell or Vickers to check compliance against specifications.

CAST STEEL GATE, GLOBE AND CHECK VALVES

CARBON STEEL; ALLOY STEEL; STAINLESS STEEL & EXOTIC ALLOY VALVES

This is the primary WALWORTH product line, manufactured in accordance with ANSI classes 150, 300, 600, 900, 1500 & 2500 # and sizes from 2" up to 72" nominal diameter, provides the end user a wide variety of valves to satisfy their needs. WALWORTH always keeps these valves in stock in the most common trims used in the industries. This product line is manufactured as per API-600 design requirements for gate valves; ASME B16.34 for globe valves and ASME B16.34 & API-6D for swing check valves.

One of the most important features of WALWORTH Cast Steel Valves is its guarantee to meet and exceed 50 ppm maximum low fugitive emissions leakage rate as furnished "off the shell" without a Customer's special order requirement.

WALWORTH valves were tested in accordance with API-591 RP and approved.

WALWORTH offers the majority of materials known and used for this product line, including but not limited to:

1. Carbon Steel like WCA, WCB, WCC, etc.
2. Low Carbon Steel like LCB, LCC, etc.
3. Low Alloy Steel like WC1, WC5, WC6, WC9, etc.
4. Low Carbon Low Alloy Steel like LC2, LC3, etc.
5. Medium Alloy Steel like C5, C12, C12A, etc.
6. Stainless Steel like CF8, CF8M, CF8C, CF10, CG8M, etc.
7. Low Carbon Stainless Steel like CF3, CF3M, CG3M, etc.
8. Super Stainless Steel like CN7M(Alloy 20), CN3M (Alloy 20 modified), CT15C, etc
9. Duplex Stainless Steel like CE8MN, CD6MN, CD3MN, etc.
10. High Nickel Alloys like Monel M30C, Monel M35-1, Monel CZ100, Inconel CY40 (Inconel 600), CW2M (Hastelloy C4), N12MV (Hastelloy B), CW12MW (Former Hastelloy C-276), CW6M (New Hastelloy C-276), CU5MCuC (Incoloy 825), N7M (Hastelloy B2), CW6MC (Incoloy 625), etc.
11. Super Duplex Stainless Steel like CE3MN, CD3MNWCuN, etc.
12. Aluminum Bronze like 95500,95600, 95800, etc.

Type	Size	Pressure class as per ASME B16.34	Ends
Gate	2" to 72"	150, 300, 600, 900, 1500 & 2500 #	RF, RTJ or BW
Globe	2" to 20"	150, 300, 600, 900, 1500 & 2500 #	RF, RTJ or BW
Swing Check	2" to 48"	150, 300, 600, 900, 1500 & 2500 #	RF, RTJ or BW

CAST STEEL BOLTED BONNET VALVES BODY MATERIALS

WALWORTH offers the standard product line of API 600 Cast Steel valves in a wide variety of carbon steel, low and medium allow materials, that can be used in combination with listed API-600 trims.

However, due to the actual requirements that the global market demands, WALWORTH offers now additional materials like stainless steel, nickel and exotic alloys using the heavy wall thickness patterns to meet those end user requirements which does not accept the light pattern design as per API-603.

Also, WALWORTH offers a new product line for valves with heavy wall thickness in Aluminum Bronze, either ASTM B148 grade 95500, 95600 or 95800.

* For those valves where light pattern design API-603 is accepted, please ask for our API-603 WALWORTH catalog.

Material suffix	Common designation	Forging specification	Wrought bar specification	Service recommendations (1)	Common trim for this base material	
					150 To 600 #	900 To 2500 #
ASTM A216 Grade WCB	Carbon Steel	A105	A105	Non-corrosive applications including water, oil and gases at temperatures between -20°F (-30°F)and +800°F (+425°C)	UT, 3HF, A	HF, 3HF+HF
ASTM A216 Grade WCC	Carbon Steel	A105N	A105N	Non-corrosive applications including water, oil and gases at temperatures between -20°F (-30°F) and +800°F (+425°C)	UT, 3HF, A	HF, 3HF+HF
ASTM A352 Grade LCB	Low Temp Carbon steel	A350 LF1	A350 LF1	Low temperature applications to -50 °F (-46°C).Not for use above + 650°F(+340°C).	UT, 3HF, A	HF, 3HF+HF
ASTM A352 Grade LCC	Low Temp Carbon steel	A350 LF2	A350 LF2	Low temperature applications to -50 °F (-46°C).Not for use above + 650°F(+340°C).	UT, 3HF, A	HF, 3HF+HF
ASTM A352 Grade LC3	3 1/2 % Nickel Steel	A350 LF3	A350 LF3	Low temperature applications to - 150°F (-101°C). Not for use above + 650°F(+340°C).	UT, 3HF, A	HF, 3HF+HF
ASTM A217 Grade WC1	C-1/2 Mo Low Alloy Steel	A182 F1	A182 F1	Non-corrosive applications including water, oil and gases at temperatures between -20°F (-30°C) and + 1100°F(+593°C).	UT, 3HF, A	HF, 3HF+HF
ASTM A217 Grade WC5	0.75% Ni; Mo; 0.75% Cr Low Alloy Steel	A182 F2	A182 F2	Non-corrosive applications including water, oil and gases at temperatures between -20°F (-30°C) and + 1100°F(+593°C).	UT, 3HF, A	HF, 3HF+HF
ASTM A217 Grade WC6	1 1/4% Chrome; 1/2% Moly Low Alloy Steel	A182 F11	A182 F11 Class 2	Non-corrosive applications including water, oil and gases at temperatures between -20°F (-30°C) and + 1100°F(+593°C).	UT, 3HF, A	HF, 3HF+HF
ASTM A217 Grade WC9	2 1/4 % Chrome Low Alloy Steel	A182 F22	A182 F11 Class 3	Non-corrosive applications including water, oil and gases at temperatures between -20°F (-30°C) and + 1100°F(+593°C).	UT, 3HF, A	HF, 3HF+HF
ASTM A217 Grade C5	5% Chrome; 1/2 % Moly, Medium Alloy Steel	A182 F5	A182 F5	Mild corrosive or erosive applications as well as non-corrosive applications at temperatures between- 20°F (-3O°C) and + 1200°F (+649°C).	UT, 3HF, A	HF, 3HF+HF
ASTM A217 Grade C12	9% Chrome; 1% Moly, Medium Alloy Steel	A182 F9	A182 F9	Mild corrosive or erosive applications as well as non-corrosive applications at temperatures between- 20°F (-3O°C) and + 1200°F (+649°C).	UT, 3HF, A	HF, 3HF+HF
ASTM A217 Grade C12-A	9% Chrome; 1% Moly; V-N, Medium Alloy Steel	A182 F91	A182 F91	Mild corrosive or erosive applications as well as non-corrosive applications at temperatures between- 20°F (-3O°C) and + 1200°F (+649°C).	UT, 3HF, A	HF, 3HF+HF

CAST STEEL BOLTED BONNET VALVES BODY MATERIALS

Material suffix	Common designation	Forging specification	Wrought bar Specification	Service recommendations (1)	Common trim for this base material	
					150 To 600 #	900 To 2500 #
ASTM A351 Grade CF8	18% Chrome; 8% Nickel; 0.08 % C Stainless Steel	ASTM A182 F304	ASTM A479 304	Corrosive or extremely high temperature non-corrosive serviceS between -450°F (- 268°C) and + 1200°F (+649°C). Above + 800°F (+ 425°C) specify carbon content of 0.04% or greater.	2, 4HF	4HF+HF
ASTM A351 Grade CF8M	18% Chrome; 12% Nickel; 2 % Mo; 0.08 % C Stainless Steel	ASTM A182 F316	ASTM A479 316	Corrosive or either extremely low or high temperature non-corrosive services between -450°F (-268°C) and + 1200°F (+ 649°C). Above +800°F (+ 425°C)specify carbon content of 0.04% or greater.	18-8smo, 3HF	3HF+HF
ASTM A351 Grade CF3	18% Chrome; 8% Nickel; 0.03 % C Low Carbon Stainless Steel	ASTM A182 304L	ASTM A479 304L	Brackish water, phosphate solutions, pressurized water @ 570 °F (299 °C), sea water, steam.	304L, 3HF	304L, 3HF+HF
ASTM A351 Grade CF3M	18% Chrome; 12% Nickel; 2 % Mo; 0.03 % C Low Carbon Stainless Steel	ASTM A182 F316L	ASTM A479 316L	Acetic acid, calcium carbonate, calcium lactate, potable water, sea water, steam, sulfites.	316L, 3HF	316L, 3HF+HF
ASTM A351 Grade CG3M	18% Chrome; 12% Nickel; 3 % Mo; 0.03 % C Low Carbon Stainless Steel	ASTM A182 F317L	ASTM A182 F317L	Corrosive or non corrosive services to + 800°F (+ 425°C)"	317L, 317LH	317L, 317LH
ASTM A351 Grade CF8C	18% Chrome; 10% Nickel; Cb; 0.08 % C Stainless Steel	ASTM A182 F347	ASTM A479 347	Primarily for high temperature, corrosive applications between -450°F (-268°C) and + 1200°F (+ 649°C). Above +1000°F (+540°C) specify carbon oontent of 0.04% or greater. Hydrogen service."	347H, 347HF	347H, 347HF
ASTM A351 Grade CF10	18% Chrome; 8% Nickel; 0.08 % C Stainless Steel	ASTM A182 F304H	ASTM A479 304H	Corrosive or extremely high temperature non-corrosive serviceS between -450°F (- 268°C) and + 1200°F (+649°C). Above + 800°F (+ 425°C) specify carbon content of 0.04% or greater.	310, 310HF	310HF
ASTM A351 Grade CF10M	18% Chrome; 8% Nickel; 2% Mo; 0.08 % C Stainless Steel	ASTM A182 F316H	ASTM A479 316H	Corrosive or extremely high temperature non-corrosive serviceS between -450°F (- 268°C) and + 1200°F (+649°C). Above + 800°F (+ 425°C) specify carbon content of 0.04% or greater.	310, 310HF	310HF
ASTM A351 Grade CG8M	18% Chrome; 10% Nickel; 3 % Mo; 0.08 % C Stainless Steel	ASTM A182 F317	ASTM A182 F317	Heavy water manufacturing, Nuclear, Petroleum, Pipe Line, Power, Pulp and paper, Printing Textile, Corrosive dye solutions, ink, sulfite liquor.	317H, 21HF	317H, 21HF
ASTM A351 Grade CK20	25% Chrome; 20% Nickel; 0.04 To 0.2 % C Super Stainless Steel	ASTM A182 F310H	ASTM A182 F310H	Aircraft, Chemical processing, Oil Refining, Pulp and Paper. Corrosives Hot products around 1200 °F (649 °C), sulfite liquor, sulfuric acid (dilute).	310, 310HF	310HF
ASTM A351 Grade CN7M	19% Chrome; 28% Nickel; Cu-Mo; 0.07 % C Super Stainless Steel	ASTM B462 N08020	ASTM B473 N08020	Acetic acid (hot), brines, caustic solutions, (strong, hot), hydrochloric acid (dilute), hydrofluoric acid and hydrofluosilicic acid (dilute), nitric acid, (strong, hot), nitric-hydrofluoric pickilng acids, sulfates and sulfites, sulfuric acid, (all concentrations to 150 °F (65.6 °C), sulfurus acid, phosphoric acid.	A20, A20H	A20, A20H
ASTM A351 Grade CN3MN	19% Chrome; 28% Nickel; Cu-Mo; 0.03 % C Super Stainless Steel	ASTM B462 N08020	ASTM B473 N08020	Acetic acid (hot), brines, caustic solutions, (strong, hot), hydrochloric acid (dilute), hydrofluoric acid and hydrofluosilicic acid (dilute), nitric acid, (strong, hot), nitric-hydrofluoric pickilng acids, sulfates and sulfites, sulfuric acid, (all concentrations to 150 °F (65.6 °C), sulfurus acid, phosphoric acid. Better weldability properties than CN7M	A20, A20H	A20, A20H
ASTM A351 Grade CK3MCuN	20% Chrome; 18% Nickel; 6% Mo; 0.25 % C Super Stainless Steel	ASTM A182 F44	ASTM A479 S31254	Acetic Acid, antibotics and drugs, bleaching compounds, formic acid, fruit and juices, hot air, hot water, hydrocarbons, hydrochloric acid, organic liquids and acids, nitric acid, organic salts, oxalic acid, phosphoric acid, sea water, sewage, sodium bisulfite, steam, sulfamic acid, 10 % sulfuric acid,	254HF	254HF
ASTM A351 Grade CT15C	19% Chrome; 32% Nickel; 0.05 to 0.15 % C Incoloy 800.	ASTM B564 N08810	ASTM B408 N08810		810T	810T

CAST STEEL BOLTED BONNET VALVES BODY MATERIALS

Material suffix	Common designation	Forging specification	Wrought bar specification	Service recommendations (1)	Common trim for This base material	
					150 to 600 #	900 to 2500 #
ASTM A351 Grade CD4MCu	25.5% Chrome; 5.5% Nickel; 2% Mo; 0.040% C Super Stainless Steel	N/A	ASTM A479 S32550	Concentrate brine, fatty acids, potable water, pulp water, pulp liquors at 220 °F (104 °C), sea water, stem, sulfuric acid (15-30% @ 140-160 °F (60-71 °C), sulfuric acid (35-40 % @185 °F (85 °C), plus 5 % organics).	32250H	32250H
ASTM A351 Grade CN2MCuN	21% Chrome; 25.5% Nickel; 4.5% Mo; 1.5%Cu; 0.02% C Super Stainless Steel	ASTM B469 8904	ASTM B625 8904		8904H	8904H
ASTM A487 Grade CA15	12% Chrome Steel	ASTM A182 F6	ASTM A276 410	Corrosive application at temperatures between -20°F (-30°C) and + 900°F (+482°C).	UT, HF	UT, HF
ASTM A487 Grade CA6NM	12% Chrome Steel	ASTM A182 F6	ASTM A276 410	Corrosive application at temperatures up to +1300°F (704°C). Boiler feed water 250 °F (115°C), sea water, steam sulfur.	UT, HF	UT, HF
ASTM A494 Grade M-35-1	67% Ni; 30% Cu, Monel	ASTM B564 N04400	ASTM B164 N04400	Weldable grade. Good resistance to corrosion by all common organic acids and salt water. Also highly resistant to most alkaline solutions to +7W°F (+400°C)	A, AHF	A, AHF
ASTM A494 Grade CZ100	95% Nickel	ASTM B160 N02200	ASTM B160 N02200	Chemical processing, mineral processing, food processing. Nicel is useful in handling hot concentrate alkaline or caustic solutions, reducing acids, certain food products, organic acids under certain conditions, dry chlorine and anhydrous ammonia. Cast nickel is not applicable in oxidizing acids and alkaline perchlorite.	2200	2200
ASTM A494 Grade CY-40	75% Nickel; 15% Cr; 8% Fe, Inconel 600	ASTM B564 N06600	ASTM B166 N06600	Very good for high temperature servive. Good resistance to strongly corrosive media and atmosphere to + 800°F (+425°C). Hot boiler feed water, hot caustics, hot concentrate alk water, elevated temperature oxidizing conditions.	600, 600HF	600, 600HF
ASTM A494 Grade CW6MC	60% Nickel; 22% Cr; 9% Mo; 3.5% Cb, Inconel 625	ASTM B564 N06625	ASTM B446 N06625	Very good for high temperature servive. Good resistance to strongly corrosive media and atmosphere to + 800°F (+425°C).	625, 625HF	625, 625HF
ASTM A494 Grade CU5MCuC	42% Nickel; 21.5% Cr; 3% Mo; 2.3% Cu, Incoloy 825	ASTM B425 N08825	ASTM B425 N08825		825, 23HF	825, 23HF
ASTM A494 Grade N12MV	62% Nickel; 28% Mo; 5% Fe, Hastelloy B	ASTM B335 N10001	ASTM B335 N10001		10001, HB	10001, HB
ASTM A494 Grade N7M	62% Nickel; 28% Mo; 2% Fe, Hastelloy B2	ASTM B335 N10665	ASTM B335 N10665		HB	HB
ASTM A494 Grade CW2M	61% Nickel; 16% Mo; 16% Cr, Hastelloy C4	ASTM B574 N06455	ASTM B574 N06455	Good resistance to strong oxidation conditions.Good properties at high temperatures, high resistance to formic, phosphoric, sulphurous and sulfuric acids to + 1200°F (+649°C)	6455H	6455H
ASTM A494 Grade CW12MW	56% Nickel; 18% Mo; 17% Cr; 6% Fe, Hastelloy C-276 (FORMER ALLOY)	ASTM B574 N10276	ASTM B574 N10276	Good resistance to strong oxidation conditions.Good properties at high temperatures, high resistance to formic, phosphoric, sulphurous and sulfuric acids to + 1200°F (+649°C)	HC, HCH	HC, HCH
ASTM A494 Grade CW6MC	56% Nickel; 19% Mo; 18% Cr; 16% Fe, Hastelloy C-276 (NEW ALLOY)	ASTM B574 N10276	ASTM B574 N10276	Good resistance to strong oxidation conditions.Good properties at high temperatures, high resistance to formic, phosphoric, sulphurous and sulfuric acids to + 1200°F (+649°C)	HC, HCH	HC, HCH

CAST STEEL BOLTED BONNET VALVES BODY MATERIALS

Material suffix	Common designation	Forging specification	Wrought bar specification	Service recommendations (1)	Common trim for This base material	
					150 to 600 #	900 to 2500 #
ASTM A995 Grade CD4MCu	25.5% Chrome; 5.5% Nickel; 2% Mo; 0.040% C Duplex Stainless Steel Grade 1A.	N/A	ASTM A479 S32550	Concentrate brine, fatty acids, potable water, pulp water, pulp liquors at 220 °F (104 °C), sea water, stem, sulfuric acid (15-30% @ 140-160 °F (60-71 °C), sulfuric acid (35-40 % @185 °F (85 °C), plus 5 % organics).	32250H	32250H
ASTM A995 Grade CE8MN	24% Chrome; 9.5% Nickel; 4% Mo; 0.080% C Duplex Stainless Steel Grade 2A.	ASTM A182 F51	ASTM A479 32750	Concentrate brine, fatty acids, potable water, pulp water, pulp liquors at 220 °F (104 °C), sea water, stem, sulfuric acid (15-30% @ 140-160 °F (60-71 °C), sulfuric acid (35-40 % @185 °F (85 °C), plus 5 % organics).	32750H, 31803H, 51H	32750H, 31803H, 51H
ASTM A995 Grade CD3MN	22% Chrome; 5% Nickel; 3% Mo; N; 0.030% C Duplex Stainless Steel Grade 4A.	ASTM A182 F51	ASTM A479 31803	Concentrate brine, fatty acids, potable water, pulp water, pulp liquors at 220 °F (104 °C), sea water, stem, sulfuric acid (15-30% @ 140-160 °F (60-71 °C), sulfuric acid (35-40 % @185 °F (85 °C), plus 5 % organics).	32750H, 31803H, 51H	32750H, 31803H, 51H
ASTM A995 Grade CeE3MN	25% Chrome; 7% Nickel; 4.5% Mo; N; 0.030% C Duplex Stainless Steel Grade 5A.	ASTM A182 F53	ASTM A182 F53	Concentrate brine, fatty acids, potable water, pulp water, pulp liquors at 220 °F (104 °C), sea water, stem, sulfuric acid (15-30% @ 140-160 °F (60-71 °C), sulfuric acid (35-40 % @185 °F (85 °C), plus 5 % organics). Useful where the Pitting Resistance Number (PREN) is required.	53H, 53HF	53H, 53HF
ASTM A995 Grade CD3MWCuN	25% Chrome; 7.5% Nickel; 3.5% Mo; N; 0.030% C Duplex Stainless Steel Grade 6A.	ASTM A182 F53	ASTM A182 F53	Concentrate brine, fatty acids, potable water, pulp water, pulp liquors at 220 °F (104 °C), sea water, stem, sulfuric acid (15-30% @ 140-160 °F (60-71 °C), sulfuric acid (35-40 % @185 °F (85 °C), plus 5 % organics). Useful where the Pitting Resistance Number (PREN) is required.	53H, 53HF	53H, 53HF
ASTM B148 Grade 95800	79% min Cupper; 4.5% Nickel; 9% Aluminum; 3-4.5% Fe; 0.03 % max Pb.	N/A	ASTM C63000	Sea water service.	BCE630	BCE630

(1) The above list of consuming industries and corrosive materials are useful as examples of typical applications where these materials can be used where they can be used as a guide; however, the responsability to choice the proper alloy is from the Engineering firm or End User.

NOMENCLATURE

Type	Class
ST6	STELLITE 6
13%Cr	STAINLESS STEEL 410
316	STAINLESS STEEL 316
304	STAINLESS STEEL 304
HC	HASTELLOY "C"
CN7M	CHROME-NICKEL STEEL
321	STAINLESS STEEL 321
ST21	STELLITE 21
A20	STAINLESS STEEL ALLOY 20
347	STAINLESS STEEL 347
321	STAINLESS STEEL 321
8810	STAINLESS STEEL 8810
625	INCONEL 625
410 T	STAINLESS 410 (HARDNESS 200-275 BHN)

Type	Class
316L	STAINLESS STEEL 316L
HB	HASTELLOY "B"
317L	STAINLESS STEEL 317L
17 4PH	STAINLESS STEEL 17 4PH
317	STAINLESS STEEL 317
825	INCOLOY 825
304L	STAINLESS STEEL 304L
K500	MONEL K500
31803	STAINLESS STEEL 31803
718	INCONEL 718
8367	STAINLESS STEEL 8367
TC	TUNGSTEN CARBIDE
W1	WALWELD-100
NUC	NUCALLOY

CAST STEEL VALVES TRIM ARRANGEMENTS

WALWORTH valves are available in the widest range of standard and special trims available in the Industry. The following table shows the most popular trims used for the valves offered these days by the Company.

Special trims as per Customer requirements are available upon request. Please contact your closest WALWORTH Distributor.

WALWORTH Trim Nr.	API-600 Trim Nr.	Seal material Type	Stem and other Trim parts (1)	Wedge/disc seat Surfaces	Body seat Surfaces (2)
AA	1	13Cr-0.75Ni-1Mn	SS-410 (200-275 HBN)	SS-410 (200 HBN)	SS-410 (250 HBN min)
18-8	2	19Cr-9.5Ni-2Mn-0.08C	SS-304	SS-304	SS-304
310	3	25Cr-20.5Ni-2Mn	SS-310	SS-310	SS-310
N/A	4	13Cr-0.75Ni-1Mn	SS-410 (200-275 HBN)	SS-410 (200-275 HBN)	SS-410 (275 HBN min)
HF	5 OR 5A	13Cr-0.5Ni-1Mn/Co-Cr-A	SS-410(200-275 HBN)	Stellite 6 (350 HBN min)	Stellite 6 (350 HBN min)
AAA	6	13Cr-0.5Ni-1Mn/Ni-Cu	SS-410(200-275 HBN)	SS-410(250 HBN min)	Monel 400 (175 HBN min)
N/A	7	13Cr-0.5Ni-1Mo/13Cr-0.5Ni-1Mo	SS-410(200-275 HBN)	SS-410(250 HBN min)	SS-410(750 HBN min)
UT	8 OR 8A	13Cr-0.75Ni-1Mn/1/2Co-Cr-A	SS-410 (200-275 HBN)	SS-410 (250 HBN min)	Stellite 6 (350 HBN min)
A	9	70Ni-30Cu	UN N04400 (Monel 400)	UN N04400 (Monel 400)	UN N04400 (Monel 400)
18-8smo	10	18Cr-12Ni-2.5Mo-2Mn	SS-316	SS-316	SS-316
AHF	11 OR 11A	70Ni-30Cu/1/2Co-Cr-A	UN N04400 (Monel 400)	UN N04400 (Monel 400)	Stellite 6 (350 HBN min)
3HF	12 OR 12A	18Cr-12Ni-2.5Mo-2Mn/1/2Co-Cr-A	SS-316	SS-316	Stellite 6 (350 HBN min)
A20	13	29Ni-19Cr-2.5Mo-0.07C	UNS N08020 (Alloy 20)	UNS N08020 (Alloy 20)	UNS N08020 (Alloy 20)
A20H	14 OR 14A	29Ni-19Cr-2.5Mo-0.07C/1/2Co-Cr-A	UNS N08020 (Alloy 20)	UNS N08020 (Alloy 20)	Stellite 6 (350 HBN min)
NUC	Not specified	13Cr-0.5Ni-1Mn/NUCALLOY	SS-410(200-275 HBN)	NUCALLOY	NUCALLOY
4HF	Not specified	19Cr-9.5Ni-2Mn-0.08C/1/2Co-Cr-A	SS-304	SS-304	Stellite 6 (350 HBN min)
4HF+HF	Not specified	19Cr-9.5Ni-2Mn-0.08C/Co-Cr-A	SS-304	Stellite 6 (350 HBN min)	Stellite 6 (350 HBN min)
304L	Not specified	19Cr-9.5Ni-2Mn-0.03C	SS-304L	SS-304L	SS-304L
1HF	Not specified	18Cr-12Ni-2.5Mo-2Mn/Co-Cr-Mo	SS-316	Stellite 21 (320 HBN min)	Stellite 21 (320 HBN min)
3HF+HF	Not specified	18Cr-12Ni-2.5Mo-2Mn/Co-Cr-A	SS-316	Stellite 6 (350 HBN min)	Stellite 6 (350 HBN min)
3TC (3)	Not specified	18Cr-8Ni-Mo/TgC	SS-316/Tungsten carbide	Tungsten Carbide	Stellite 6 (350 HBN min)
316L	Not specified	17Cr-12Ni-2.5Mo-2Mn0.03C	SS-316L	SS-316L	SS-316L
3LHF	Not specified	17Cr-12Ni-2.5Mo-2Mn0.03C/1/2Co-Cr-A	SS-316L	SS-316L	Stellite 6 (350 HBN min)
3HFL	Not specified	17Cr-12Ni-2.5Mo-2Mn0.03C/Co-Cr-A	SS-316L	Stellite 6 (350 HBN min)	Stellite 6 (350 HBN min)
21HF	Not specified	19Cr-11.5Ni-3.5Mo/Co-Cr-A	SS-317	Stellite 6 (350 HBN min)	Stellite 6 (350 HBN min)
317	Not specified	19Cr-11.5Ni-3.5Mo	SS-317	SS-317	SS-317

CAST STEEL VALVES TRIM ARRANGEMENTS

WALWORTH Trim Nr.	API-600 Trim Nr.	Seal material Type	Stem and other Trim parts (1)	Wedge/disc seat Surfaces	Body seat Surfaces (2)
317H	Not specified	19Cr-11.5Ni-3.5Mo/1/2Co-Cr-A	SS-317	SS-317	Stellite 6 (350 HBN min)
317LH	Not specified	19Cr-13Ni-3.5Mo/Co-Cr-A	SS-317L	Stellite 6 (350 HBN min)	Stellite 6 (350 HBN min)
317L	Not specified	19Cr-13Ni-3.5Mo-0.03C	SS-317L	SS-317L	SS-317L
317LS	Not specified	19Cr-13Ni-3.5Mo/1/2Co-Cr-A	SS-317L	SS-317L	Stellite 6 (350 HBN min)
2HF	Not specified	18Cr-10Ni-0.1N/Co-Cr-A	SS-321	SS-321	Stellite 6 (350 HBN min)
321F	Not specified	18.5Cr-11Ni-2Mn/Co-Cr-A	SS-321	Stellite 6 (350 HBN min)	Stellite 6 (350 HBN min)
321	Not specified	19Cr-11.5Ni-3.5Mo	SS-321	SS-321	SS-321
347HF	Not specified	18.5Cr-11Ni-2Mn-Co/Co-Cr-A	SS-347	Stellite 6 (350 HBN min)	Stellite 6 (350 HBN min)
347	Not specified	18.5Cr-11Ni-2Mn-Co	SS-347	SS-347	SS-347
347H	Not specified	18.5Cr-11Ni-2Mn-Co/1/2Co-Cr-A	SS-347	SS-347	Stellite 6 (350 HBN min)
254HF	Not specified	20Cr-18Ni-6.2Mo-0.02C-Cu+N	UNS S31254	Stellite 6 (350 HBN min)	Stellite 6 (350 HBN min)
51H	Not specified	22Cr-5.5Ni-3Mo-N-0.03C/Co-Cr-A	UNS S31803	Stellite 6 (350 HBN min)	Stellite 6 (350 HBN min)
31803H	Not specified	22Cr-5.5Ni-3Mo-N-0.03C/Co-Cr-A	UNS S31803	UNS S31803	Stellite 6 (350 HBN min)
T9	Not specified	16Cr-4Ni-4Cu-Nb+Ta/Co-Cr	17-4pH	Triballoy 900	Triballoy 900
HC	Not specified	55Ni-15.5Cr-16Mo-3Tg-4Fe	Hastelloy C-276	Hastelloy C-276	Hastelloy C-276
HCH	Not specified	55Ni-15.5Cr-16Mo-3Tg-4Fe/1/2Co-Cr-A	Hastelloy C-276	Hastelloy C-276	Stellite 6 (350 HBN min)
UOP	Not specified	63Ni-30Cu-Al+Ti/70Ni-30Cu	UN N05500 (Monel K-500)	UN N04400 (Monel 400)	UN N04400 (Monel 400)
625	Not specified	60Ni-22Cr-9Mo-3.5Cb	UNS N06625 (Incoloy 625)	UNS N06625 (Incoloy 625)	UNS N06625 (Incoloy 625)
625HF	Not specified	60Ni-22Cr-9Mo-3.5Cb/Co-Cr-A	UNS N06625 (Incoloy 625)	Stellite 6 (350 HBN min)	Stellite 6 (350 HBN min)
8367HF+HF	Not specified	25Ni-20Cr-6.5Mo-2Mn-0.03C/ Co-Cr-A	UNS N08367 (AL6XN)	Stellite 6 (350 HBN min)	Stellite 6 (350 HBN min)
810T	Not specified	33Ni-21Cr-39.5Fe-1.5Mn	UNS N08810 (Incoloy 800H)	UNS N08810 (Incoloy 800H)	UNS N08810 (Incoloy 800H)
825	Not specified	42Ni-21.5Cr-3Mo-Ti+Al-0.05C	UNS N08825 (Incoloy 825)	UNS N08825 (Incoloy 825)	UNS N08825 (Incoloy 825)
23HF	Not specified	42Ni-21.5Cr-3Mo/CO-Cr-Mo	UNS N08825 (Incoloy 825)	Stellite 21 (320 HBN min)	Stellite 21 (320 HBN min)
HB	Not specified	66Ni-28Mo-1Mn-0.02C	UNS N10665 (Hastelloy B2)	UNS N10665 (Hastelloy B2)	UNS N10665 (Hastelloy B2)
BCE630	Not specified	79Cu-4.5Ni-9Al-4Fe-0.03Pb	ASTMB B150 63000	ASTMB B150 63000	ASTM B150 63000
HB	NOT SPECIFIED	66Ni-28Mo-1Mn-0.02C	UNS N10665 (Hastelloy B2)	UNS N10665 (Hastelloy B2)	UNS N10665 (Hastelloy B2)

COMMON CONSTRUCTION MATERIALS COMBINATION

Following table shows the most common combination in between base material and trim. There are many other trims which can be combined with these base materials, please refer to other sections of this catalog for additional information.

Description	ASTM A216 WCB or WCC trim UT (API-600 nr. 8)	ASTM A217 WC6 Trim UT (API-600 nr. 8)	ASTM A21 WC9 Trim UT (API-600 nr. 8)	ASTM A217 C5 Trim UT (API-600 nr. 8)	ASTM A217 C12 Trim UT (API-600 nr. 8)	ASTM A352 LCB or LCC trim UT (API-600 nr. 8)
Body	ASTM A 216 GR WCB/ WCC	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C5	ASTM A 217 GR C12	ASTM A352 GR LCB/LCC
Bonnet	ASTM A 216 GR WCB/ WCC	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C5	ASTM A 217 GR C12	ASTM A352 GR LCB/LCC
Wedge/seating	ASTM A 216 GR WCB/ WCC+13% Cr.	ASTM A 217 GR WC6 + 13% Cr.	ASTM A 217 GR WC9 + 13% Cr.	ASTM A 217 GR C5 + 13% Cr.	ASTM A 217 GR C12 + 13% Cr.	ASTM A 352 GR LCB/LCC + 13% Cr.
Seat rings	ASTM A 515 GR 70 + ST 6	ASTM A 240 TYPE 410 + ST 6	ASTM A 240 TYPE 410 + ST 6	ASTM A 240 TYPE 410 + ST 6	ASTM A 240 TYPE 410 + ST 6	ASTM A 516 GR 65 + ST 6
Stem nut	ASTM A 439 TYPE D2 OR ASTM B 148 UNS C95600	ASTM A 439 TYPE D2 OR ASTM B 148 UNS C95600	ASTM A 439 TYPE D2 OR ASTM B 148 UNS C95600	ASTM A 439 TYPE D2 OR ASTM B 148 UNS C95600	ASTM A 439 TYPE D2 OR ASTM B 148 UNS C95600	ASTM A 439 TYPE D2 OR ASTM B 148 UNS C95600
Bonnet bushing	ASTM A 276 Type 410	ASTM A 276 Type 410	ASTM A 276 Type 410	ASTM A 276 Type 410	ASTM A 276 Type 410	ASTM A 276 Type 410
Bonnet stud	ASTM A 193 GR B7	ASTM A 193 GR B16	ASTM A 193 GR B16	ASTM A 193 GR B16	ASTM A 193 GR B16	ASTM A 193 GR L7
Bonnet stud nut	ASTM A 194 GR 2H	ASTM A 194 GR 7	ASTM A 194 GR 7	ASTM A 194 GR 7	ASTM A 194 GR 7	ASTM A 194 GR 7
Stem packing	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite
Bonnet gasket	Graphite/Stainless 316	Graphite/Stainless 316	Graphite/Stainless 316	Graphite/Stainless 316	Graphite/Stainless 316	Graphite/Stainless 316
Handwheel	ASTM A 197	ASTM A 197	ASTM A 197	ASTM A 197	ASTM A 197	ASTM A 197
Gear operator	As per WALWORTH design	As per WALWORTH design	As per WALWORTH design	As per WALWORTH design	As per WALWORTH design	As per WALWORTH design

CHEMICAL COMPOSITION AND MECHANICAL PROPERTIES

Following table shows the nominal chemical composition and mechanical properties for the most common materials supplied. Additional information can be requested from your closest WALWORTH Distributor for other steel, stainless steels or Nickel alloys.

Chemical composition and mechanical properties											
Elements and properties	Carbon steel		Low carbon steel		Low alloy steel		Medium alloy steel		Stainless steel		
	ASTM A 216		ASTM A 352		ASTM A217				ASTM A351		
	WCB	WCC	LCB	LCC	WC6	WC9	C5	C12	CF8	CF8M	CF8C
Carbon	0.30	0.25	0.30	0.25	0.05-0.20	0.05-0.18	0.20	0.20	0.08	0.08	0.08
Manganese	1	1.2	1	1.2	0.50-0.80	0.40-0.70	0.40-0.70	0.35-0.65	1.5	1.5	1.5
Phosphorus	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Sulphur	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.04	0.04	0.04
Silicon	0.6	0.6	0.6	0.6	0.6	0.6	0.75	1	2	1.5	2
Nickel	0.5	0.5	0.5	0.5	-	-	-	-	8.00-11.0	9.00-12.0	9.00-12.0
Chromium	0.5	0.5	0.5	0.5	1.00-1.50	2.00-2.75	4.00-6.50	8.00-10.0	18.00-21.0	18.00-21.0	18.00-21.0
Molybdenum	0.2	0.2	0.2	0.2	0.45-0.65	0.90-1.20	0.45-0.65	0.90-1.20	0.5	2.00-3.00	0.5
Copper	0.3	0.3	0.3	0.3	0.5	0.5	0.5	0.5	-	-	-
Columbium	-	-	-	-	-	-	-	-	-	-	(2)
Vanadium	0.03	0.03	0.03	0.03	-	-	-	-	-	-	-
Tensile Strength PSI minimum	70,000-95,000	70,000	65,000	70000-95,000	70,000	70,000	90,000-115,000	90,000-115,000	70,000	70,000	70,000
Yield Strength PSI minimum	36,000	40,000	35,000	40,000	40,000	40,000	60,000	60,000	30,000	30,000	30,000
Elongation In 2"% minimum	22	22	24	22	20	20	18	18	35	30	30
ReductionArea "% minimum	35	35	35	35	35	35	35	35	-	-	-
Hardness (HB) Maximum	185	185	190	200	200	200	237	237	-	-	-

Notes:
1. The percentage (%) shown on the elements is the maximum except where ranges are indicated.
2. Steel CF8C should have a Columbium content of not less than 8 times the carbon content, but not exceeding 1%.

CAST STEEL GATE VALVES CLASS 150

CAST STEEL GATE VALVES HANDWHEEL OR GEAR OPERATED, WITH RISING STEM AND OUT SIDE SCREW AND YOKE (OS&Y)

DESIGN FEATURES

- Gate valves design in accordance with API-600, solid, flexible or parallel slide wedge/Disc.
- Gate valves option in accordance with API-603 only for stainless steel & nickel alloys.
- Standard manufacturing wedge from 2" to 4" solid wedge design; 5" and up flexible wedge.
- Gate and Globe valves for Cryogenic service with gas column in accordance with BS-6364 upon request.
- Flange dimensions in accordance with ASME B16.5 for valves up to 24" nominal diameter.
- Hand-wheel, impact Hand-wheel, Chain-wheel, Gear operation, Electric, Pneumatic or Hydraulic Actuation as per Customer requirements.
- By-Pass, Lantern rings, grease injectors, special connections, etc.
- Low fugitive emissions control.
- NACE Service either MR-01-75 or MR-01-03.
- Test in accordance with API-598.

① Stem Nut, replaceable in line to avoid shut down of pipe line process.

② Rising stem with precision ACME single or double thread for quick operation. Surface finish suitable to seal properly to obtain low fugitive emissions.

③ Stem Packing is designed for optimum control of fugitive emissions leakage to the atmosphere. The ultra-low emission leakage rate is assured by the polished finish stem sealing area, the reduced diametrical clearances and the stem straightness control special designed packing. Live load packing arrangement available upon request.

④ Backseat, either threaded or welded designed to relieve back pressure on the stem packing when fully seated. Replacing stem packing under pressure is not recommended. Hard faced backseat available for severe service as per customer requirements.

⑤ Stem-Gate connection designed so that under severe applied loads (stuck gate), the stem will fail outside of the stuffing box pressure boundary.

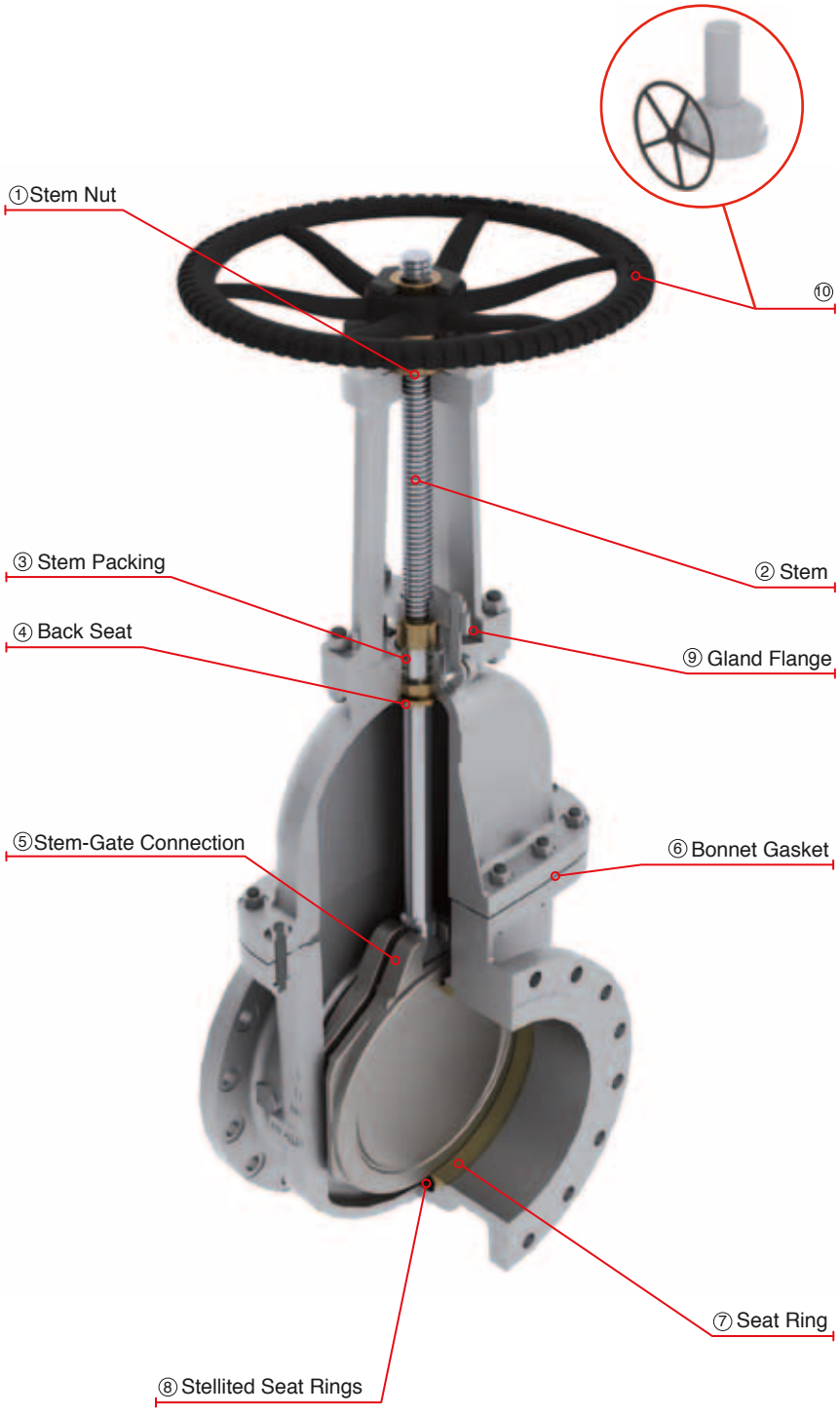
⑥ Body to Bonnet joint is designed to apply a uniform load to the gasket to assure a leak proof seal.

⑦ Seat rings are seal welded to provide a bubble tight joint.

⑧ Stellited Seat Rings provide increased resistance to wear, abrasion and erosion of the sealing surfaces.

⑨ Two pieces arrangement gland flange and stem packing bushing for self-alignment to avoid stem damage.

⑩ Gate valves supplied handwheel or gear operated.



CAST STEEL GATE VALVES, CLASS 150
(HANDWHEEL OPERATED)

Design Features

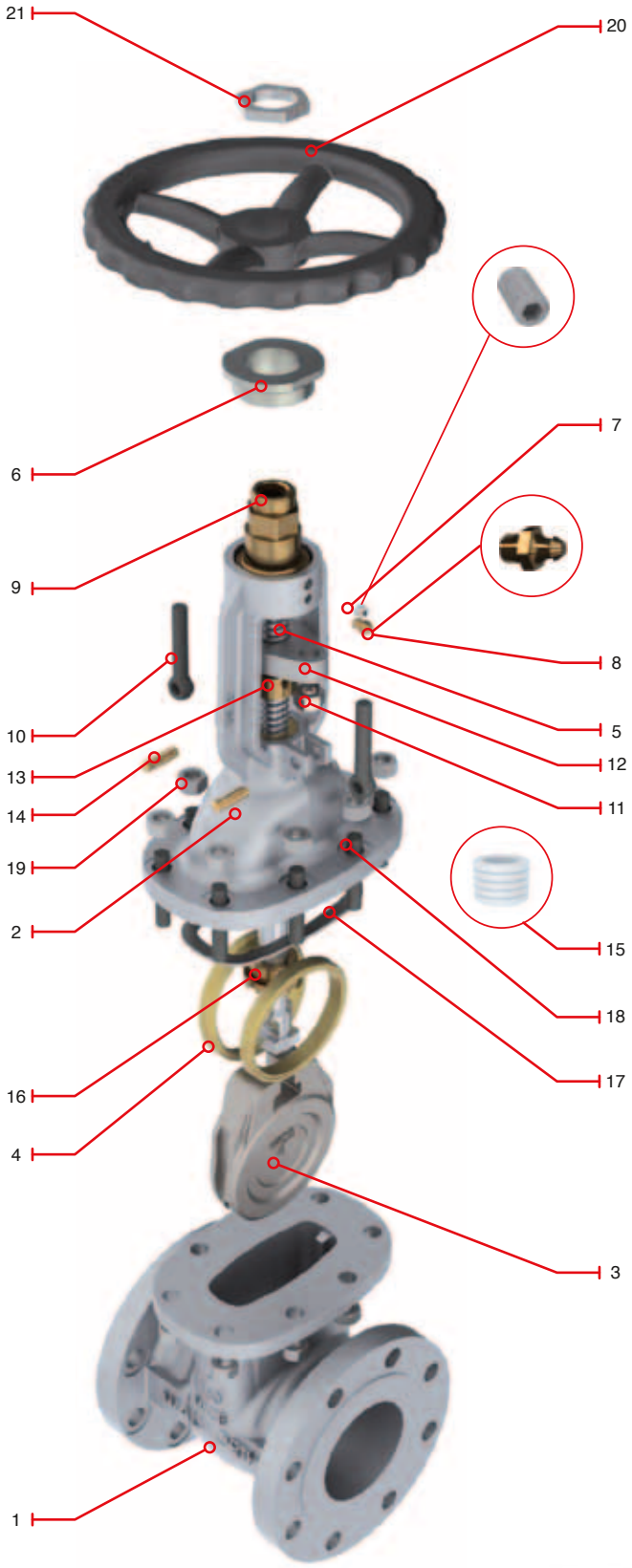
- Design in accordance with API - 600
- Outside Screw & Yoke (OS & Y)
- Solid Wedge: 2" to 4"
- Flexible Wedge: 5" and up
- From 2" to 24" Handwheel operated as Standard.
- Flange dimensions as per ASME B16.5
- End to end dimension as per ASME B16.10
- WE dimensions as per ASME B16.25
- Flange dimensions larger than 24" according to ASME B16.47 Series A as standard
- Flange dimensions as per ASME B16.47 Series B available upon request

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5202RF	5202F	Flanged Raised Face
5202RTJ	5202RJ	Flanged Ring Type Joint
5202WE	5202WE	Buttweld

Regular Bill of Materials

No.	Description	WCB Trim UT
1	Body	ASTM A 216 GR WCB
2	Bonnet	ASTM A 216 GR WCB
3	Wedge	ASTM A 216 GR WCB + 13% Cr.
4	Seat Ring	ASTM A 515 GR 70 + ST 6
5	Stem	ASTM A 276 Type 410
6	Stem Nut Retainer	ASTM A 108 GR 1020
7	Set Screw	Alloy Steel
8	Grease Fitting	Commercial Steel
9	Stem Nut	UNS C95600 or Ni-Resist
10	Eyebolt	Alloy Steel
11	Eyebolt Nut	ASTM A 307
12	Gland Flange	ASTM A 515 GR 70
13	Packing Bushing	ASTM A 108 GR 1020
14	Eyebolt Pin	Alloy Steel
15	Stem Packing	Graphite
16	Bonnet Bushing	ASTM A 276 Type 410
17	Bonnet Gasket	Graphite/Stainless 316
18	Bonnet Stud	ASTM A 193 GR B7
19	Bonnet Stud Nut	ASTM A 194 GR 2H
20	Handwheel	ASTM A 197
21	Handwheel Nut	ASTM A 108 GR 1020
*22	Set Screw	Alloy Steel
*23	Identification Plate	Stainless Steel

*Not shown

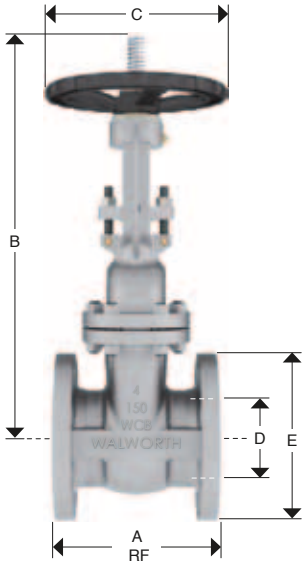


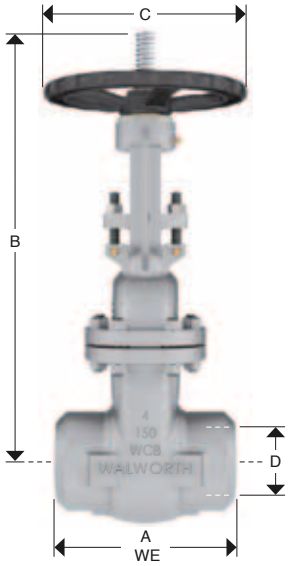
CAST STEEL GATE VALVES, CLASS 150
(HANDWHEEL OPERATED)

Design Features

- Design in accordance with API - 600
- Outside Screw & Yoke (OS & Y)
- Solid Wedge: 2" to 4"
- Flexible Wedge: 5" and up
- From 2" to 24" Handwheel operated as Standard.
- Flange Dimensions as per ASME B16.5
- End to end dimension as per ASME B16.10
- WE dimensions as per ASME B16.25

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5202RF	5202F	Flanged Raised Face
5202RTJ	5202RJ	Flanged Ring Type Joint
5202WE	5202WE	Buttweld





Dimensions and Weights

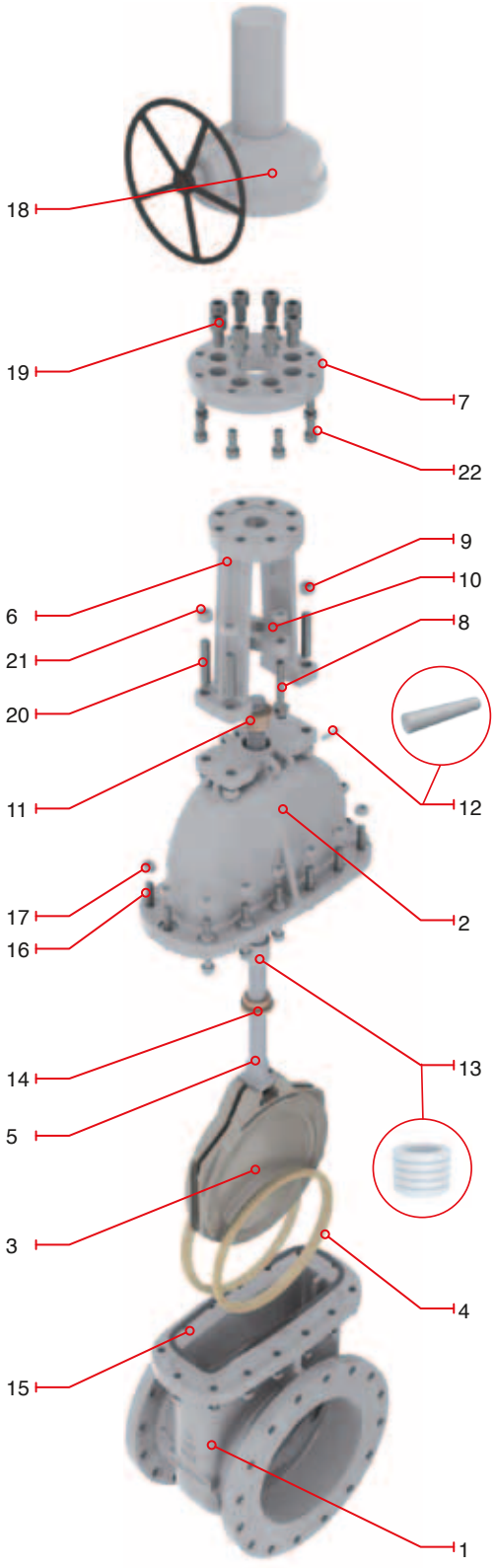
D Nominal Diameter	mm	51	64	76	102	127	152	203	254	305	356	406	457	508	610
	in	2	2 1/2	3	4	5	6	8	10	12	14	16	18	20	24
A	mm	178	191	203	229	254	267	292	330	356	381	406	432	457	508
(RF)	in	7	7 1/2	8	9	10	10 1/2	11 1/2	13	14	15	16	17	18	20
A	mm	216	241	283	305	381	403	419	457	502	572	610	660	711	813
(WE)	in	8 1/2	9 1/2	11 1/8	12	15	15 7/8	16 1/2	18	19 3/4	22 1/2	24	26	28	32
B	mm	478	483	552	675	813	830	1,062	1,253	1,461	1,661	1,835	2,027	2,265	2,711
	in	18 13/16	19	21 3/4	26 9/16	32	32 11/16	41 13/16	49 5/16	57 1/2	65 3/8	72 1/4	79 13/16	89 3/16	106 3/4
C	mm	203	178	254	254	305	305	356	406	508	559	660	711	762	864
	in	8	7	10	10	12	12	14	16	20	22	26	28	30	34
E	mm	152	178	191	229	254	279	343	406	483	533	597	635	699	813
	in	6	7	7 1/2	9	10	11	13 1/2	16	19	21	23 1/2	25	27 1/2	32
Weight	kg	19	30	32	48	71	77	132	199	271	449	541	724	1004	1522
5202RF	lb	42	66	70	106	156	169	290	438	596	988	1190	1593	2209	3348
Weight	kg	15	27	31	44	60	74	116	172	247	350	506	575	720	1130
5202WE	lb	33	59	68	97	132	163	255	378	543	770	1113	1265	1584	2486

CAST STEEL GATE VALVES, CLASS 150
(GEAR OPERATED)

Design Features

- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge: 5" and up
- Size 30" up to 72", supplied with GEAR BOX as standard
- Flange dimensions as per ASME B16.47 Series A. Series B available upon request
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5202RF	5202F	Flanged Raised Face
5202RTJ	5202RJ	Flanged Ring Type Joint
5202WE	5202WE	Buttweld



Regular Bill of Materials

No.	Description	WCB Trim UT
1	Body	ASTM A 216 GR WCB
2	Bonnet	ASTM A 216 GR WCB
3	Wedge	ASTM A 216 GR WCB + 13% Cr.
4	Seat Ring	ASTM A 515 GR 70 + ST 6
5	Stem	ASTM A 276 Type 410
6	Yoke	ASTM A 216 GR WCB
7	Stem Nut Retainer	ASTM A 36
8	Eyebolt / Gland Flange Studs	Alloy Steel
9	Eyebolt Nut	ASTM A 307
10	Gland	ASTM A 515 GR 70
11	Packing Bushing	ASTM A 108 GR 1020
12	Eyebolt Pin	Alloy Steel
13	Stem Packing	Graphite
14	Bonnet Bushing	ASTM A 276 Type 410
15	Bonnet Gasket	Graphite/Stainless 316
16	Bonnet Stud	ASTM A 193 GR B7
17	Bonnet Stud Nut	ASTM A 194 GR 2H
18	Gear Operator	as customer riquirements
19	Operator Bolts	Alloy Steel
20	Yoke Stud	Alloy Steel
21	Yoke Stud Nut	ASTM A 307
22	Retainer Bolt	Alloy Steel
*23	Identification Plate	Stainless Steel

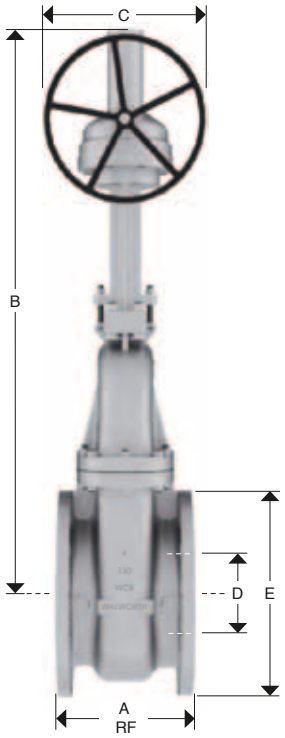
*Not shown

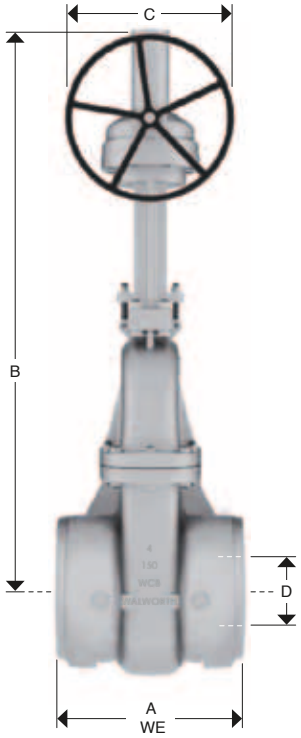
CAST STEEL GATE VALVES, CLASS 150
(GEAR OPERATED)

Design Features

- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge: 5" and up
- Size 30" up to 72", supplied with GEAR BOX as standard
- Flange dimensions as per ASME B16.47 Series A. Series B available upon request
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5202RF	5202F	Flanged Raised Face
5202RTJ	5202RJ	Flanged Ring Type Joint
5202WE	5202WE	Buttweld





Dimensions and Weights

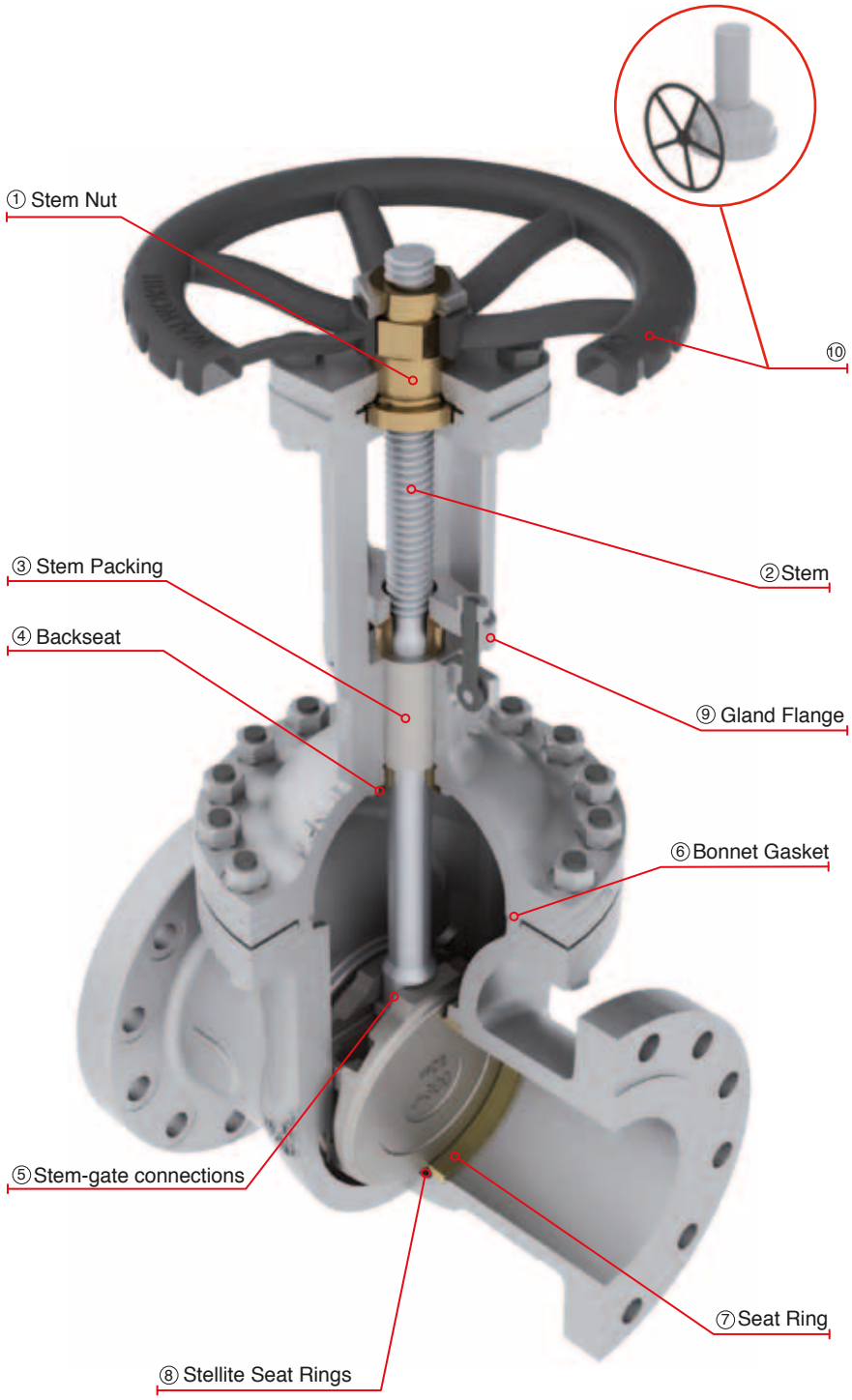
D Nominal Diameter	mm	762	914	1067	1219	1372	1524	1829
	in	30	36	42	48	54	60	72
A	mm	610	711	787	864	965	1067	1397
(RF)	in	24	28	31	34	38	42	55
A	mm	762	864	965	1016	1118	1219	1575
(WE)	in	30	34	38	40	44	48	62
B	mm	3,239	3,886	4,534	5,182	5,829	6,477	7,772
	in	127 1/2	153	178 1/2	204	229 1/2	255	306
C	mm	610	610	610	610	762	762	762
	in	24	24	24	24	30	30	30
E	mm	984	1168	1346	1511	1676	1854	2184
	in	38 3/4	46	53	59 1/2	66	73	86
Weight	kg	2242	3470	5300	7050	10310	14890	23200
5202RF	lb	4932	7634	11660	15510	22682	32758	51040
Weight	kg	1910	3198	4880	6490	9490	13700	21350
5202WE	lb	4202	7035.6	10736	14278	20878	30140	46970

CAST STEEL GATE VALVES CLASS 300

CAST STEEL GATE VALVES HANDWHEEL OR GEAR OPERATED, WITH RISING STEM AND OUT SIDE SCREW AND YOKE (OS&Y)

DESIGN FEATURES

- Gate valves design in accordance with API-600, solid, flexible or parallel slide wedge/Disc.
- Gate valves option in accordance with API-603 only for stainless steel & nickel alloys.
- Standard manufacturing wedge from 2" to 4" solid wedge design; 5" and up flexible wedge.
- Gate and Globe valves for Cryogenic service with gas column in accordance with BS-6364 upon request.
- Flange dimensions in accordance with ASME B16.5 for valves up to 24" nominal diameter.
- Hand-wheel, impact Hand-wheel, Chain-wheel, Gear operation, Electric, Pneumatic or Hydraulic Actuation as per Customer requirements.
- By-Pass, Lantern rings, grease injectors, special connections, etc.
- Low fugitive emissions control.
- NACE Service either MR-01-75 or MR-01-03.
- Test in accordance with API-598.



① Stem Nut, replaceable in line to avoid shut down of pipe line process.

② Rising stem with precision ACME single or double thread for quick operation. Surface finish suitable to seal properly to obtain low fugitive emissions.

③ Stem Packing is designed for optimum control of fugitive emissions leakage to the atmosphere. The ultra-low emission leakage rate is assured by the polished finish stem sealing area, the reduced diametrical clearances and the stem straightness control special designed packing. Live load packing arrangement available upon request.

④ Backseat, either threaded or welded designed to relieve back pressure on the stem packing when fully seated. Replacing stem packing under pressure is not recommended. Hard faced backseat available for severe service as per customer requirements.

⑤ Stem-Gate connection designed so that under severe applied loads (stuck gate), the stem will fail outside of the stuffing box pressure boundary.

⑥ Body to Bonnet joint is designed to apply a uniform load to the gasket to assure a leak proof seal.

⑦ Seat rings are seal welded to provide a bubble tight joint.

⑧ Stellited Seat Rings provide increased resistance to wear, abrasion and erosion of the sealing surfaces.

⑨ Two pieces arrangement gland flange and stem packing bushing for self-alignment to avoid stem damage.

⑩ Gate valves supplied handwheel or gear operated.

CAST STEEL GATE VALVES, CLASS 300
(HANDWHEEL OPERATED)

Design Features

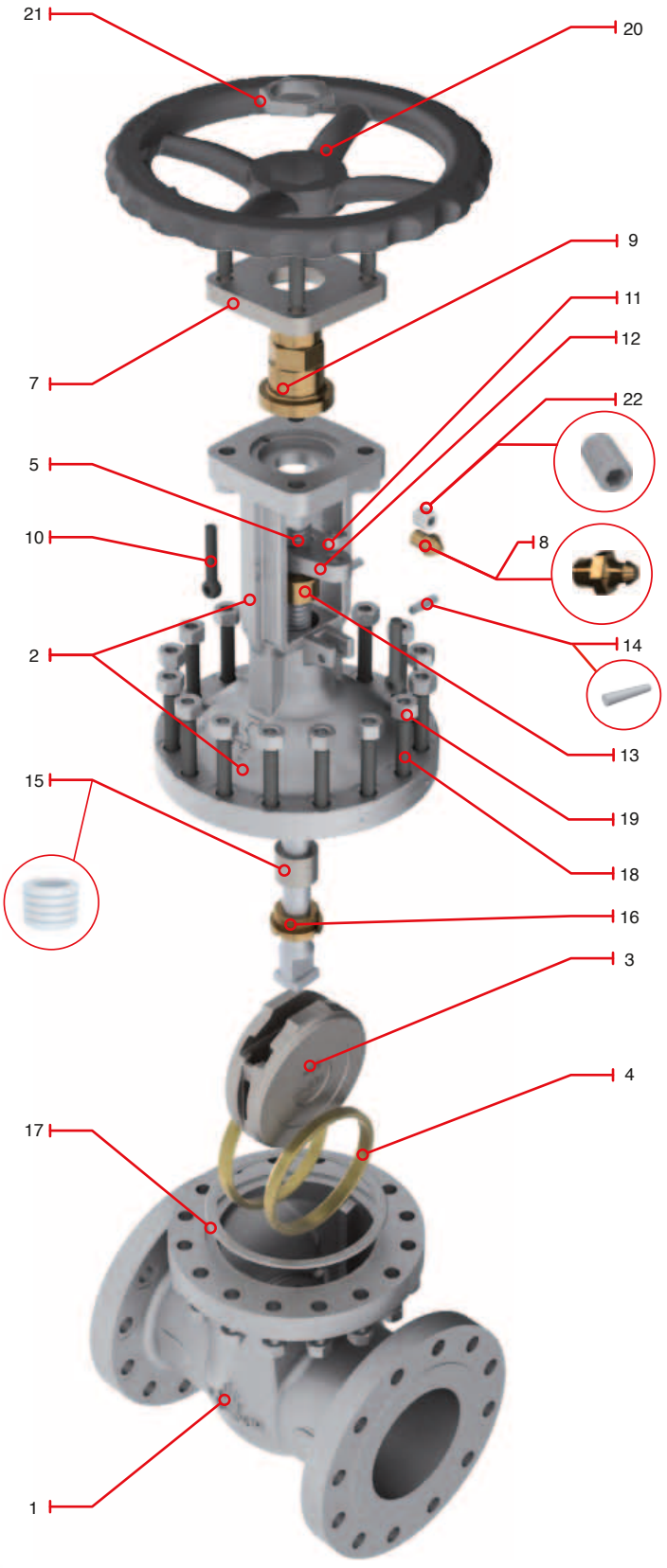
- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Solid Wedge: 2” to 4”
- Flexible Wedge : 5” and up
- From 2” to 24” Handwheel operated as Standard.
- Flange Dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25
- Flange dimensions larger than 24” according to ASME B16.47 Series A as standard
- Flange dimensions as per ASME B16.47 Series B available upon request

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5206RF	5206F	Flanged Raised Face
5206RTJ	5206RJ	Flanged Ring Type Joint
5206WE	5206WE	Buttweld

Regular Bill of Materials

No.	Description	STANDARD MATERIAL
1	Body	ASTM A 216 GR WCB
2	Yoke/Bonnet	ASTM A 216 GR WCB
3	Wedge	ASTM A 216 GR WCB + 13% Cr.
4	Seat Ring	ASTM A 515 GR 70
5	Stem	ASTM A 276 Type 410
*6	Stem Nut Retainer	ASTM A 108 GR 1020
7	Stem Retainer	Alloy Steel
8	Grease Fitting	Commercial Steel
9	Stem Nut	UNS C95600 or Ni-Resist
10	Eyebolt	Alloy Steel
11	Eyebolt Nut	ASTM A 307
12	Gland Flange	ASTM A 515 GR 70
13	Packing Bushing	ASTM A 108 GR 1020
14	Eyebolt Pin	Alloy Steel
15	Stem Packing	Graphite
16	Bonnet Bushing	ASTM A 276 Type 410
17	Bonnet Gasket	Spiral Stainless 304/Graphite
18	Bonnet Stud	ASTM A 193 GR B7
19	Bonnet Stud Nut	ASTM A 194 GR 2H
20	Handwheel	ASTM A 197
21	Handwheel Nut	ASTM A 108 GR 1020
22	Set Screw	Alloy Steel
*23	Identification Plate	Stainless Steel

*Not Shown

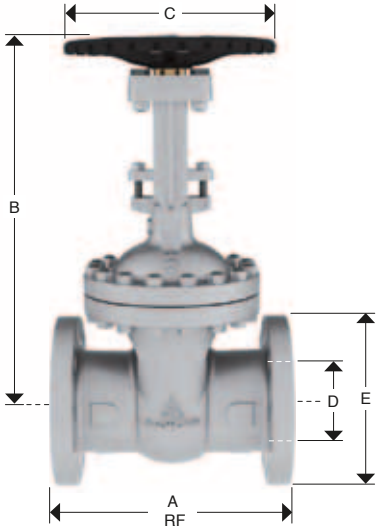


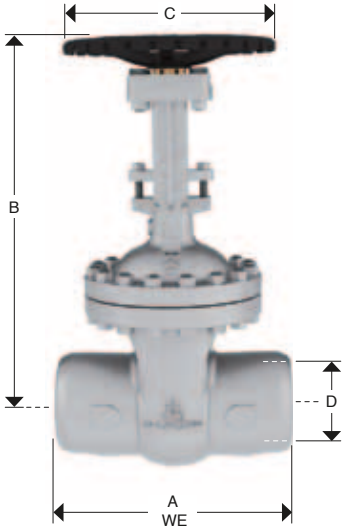
CAST STEEL GATE VALVES, CLASS 300
(HANDWHEEL OPERATED)

Design Features

- Design in accordance with API-600
- Solid Wedge: 2” to 4”
- Flexible wedge 5” and up
- From 2” to 24” Handwheel operated as Standard.
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5206RF	5206F	Flanged Raised Face
5206RTJ	5206RJ	Flanged Ring Type Joint
5206WE	5206WE	Buttweld





Dimensions and Weights

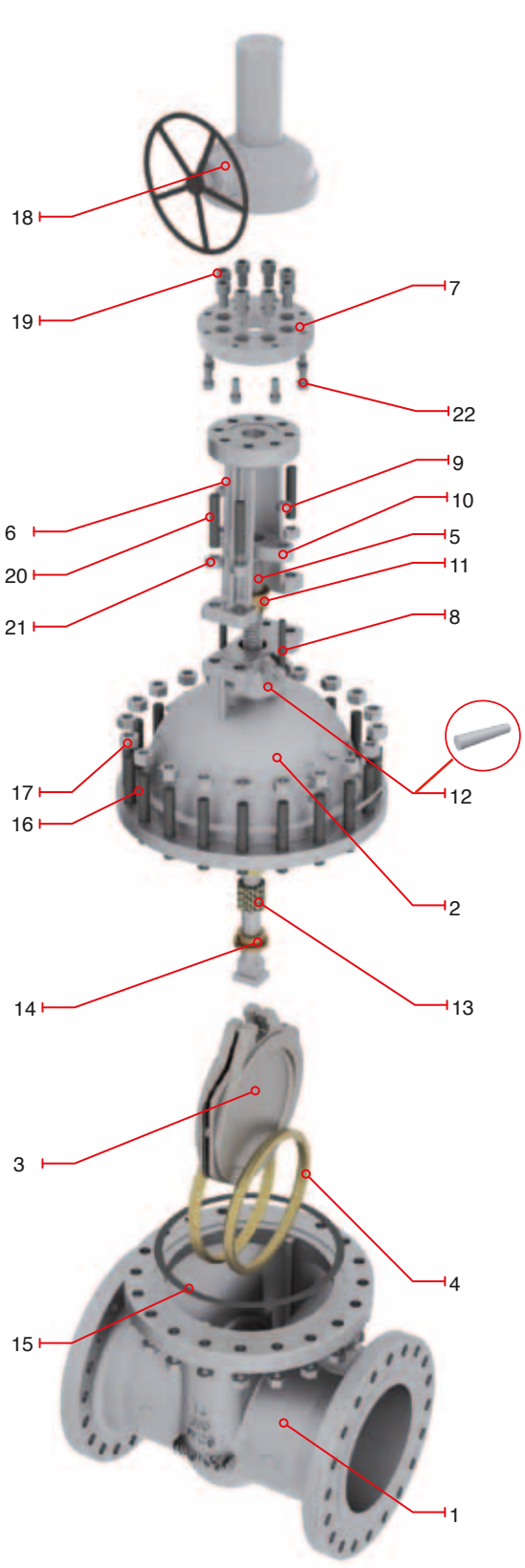
D Nominal Diameter	mm	51	64	76	102	127	152	203	254	305	356	406	457	508	610
	in	2	2 1/2	3	4	5	6	8	10	12	14	16	18	20	24
A	mm	216	241	283	305	381	403	419	457	502	762	838	914	991	1143
(RF and WE)	in	8 1/2	9 1/2	11 1/8	12	15	15 7/8	16 1/2	18	19 3/4	30	33	36	39	45
B	mm	473	579	528	637	695	935	1083	1314	1594	1730	1924	2105	2334	2810
	in	18 5/8	22 13/16	20 25/32	25 1/16	27 3/8	36 13/16	42 5/8	51 3/4	62 3/4	68 1/8	75 3/4	82 7/8	91 7/8	110 5/8
C	mm	203	203	254	254	300	356	406	508	508	660	711	864	864	864
	in	8	8	10	10	11 13/16	14	16	20	20	26	28	34	34	34
E	mm	165	191	210	254	279	318	381	445	521	584	648	711	775	914
	in	6 1/2	7 1/2	8 1/4	10	11	12 1/2	15	17 1/2	20 1/2	23	25 1/2	28	30 1/2	36
Weight	kg	25	39	43	70	92	137	222	322	470	760	1202	1633	2064	2268
5206RF	lb	55	86	95	154	202	301	488	708	1034	1672	2644	3593	4541	4990
Weight	kg	20	38	33	51	78	129	194.6	299.9	407.3	669	1043	1383	1864	1950
5206WE	lb	44	83.6	72.6	112.2	172.04	283.8	428.12	659.78	896.06	1471.36	2294.6	3042.6	4100.8	4290

CAST STEEL GATE VALVES, CLASS 300
(GEAR OPERATED)

Design Features

- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge : 5" and up
- Size 30" and up to 42", supplied with GEAR operator as standard.
- Flange dimensions as per ASME B16.47 Series A. Series B available upon request.
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5206RF	5206F	Flanged Raised Face
5206RTJ	5206RJ	Flanged Ring Type Joint
5206WE	5206WE	Buttweld



Regular Bill of Materials

No.	Description	WCB Trim UT
1	Body	ASTM A 216 GR WCB
2	Bonnet	ASTM A 216 GR WCB
3	Wedge	ASTM A 216 GR WCB + 13% Cr.
4	Seat Ring	ASTM A 515 GR 70 + ST 6
5	Stem	ASTM A 276 Type 410
6	Yoke	ASTM A 216 GR WCB
7	Stem Nut Retainer	ASTM A 36
8	Eyebolt / Gland Flange Studs	Alloy Steel
9	Eyebolt Nut	ASTM A 307
10	Gland Flange	ASTM A 515 GR 70
11	Packing Bushing	ASTM A 108 GR 1020
12	Eyebolt Pin	Alloy Steel
13	Stem Packing	Graphite
14	Bonnet Bushing	ASTM A 276 Type 410
15	Bonnet Gasket	Graphite/Stainless 316
16	Bonnet Stud	ASTM A 193 GR B7
17	Bonnet Stud Nut	ASTM A 194 GR 2H
18	Gear Operator	as customer riquirements
19	Operator Bolts	Alloy Steel
20	Yoke Stud	Alloy Steel
21	Yoke Stud Nut	ASTM A 307
22	Retainer Bolt	Alloy Steel
*23	Identification Plate	Stainless Steel

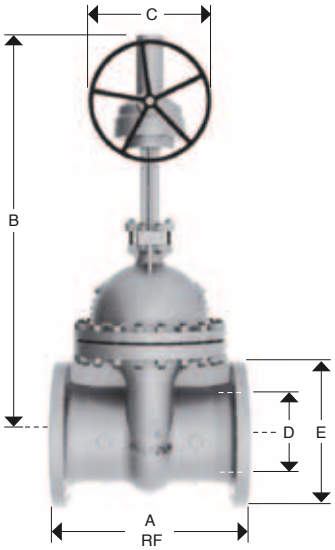
*Not Shown

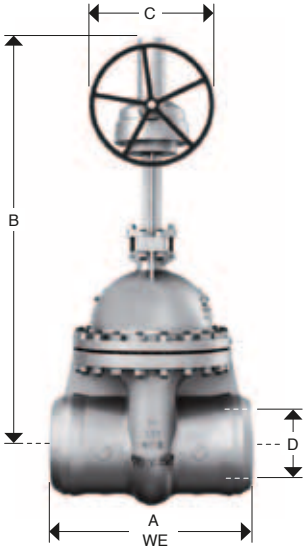
CAST STEEL GATE VALVES, CLASS 300
(GEAR OPERATED)

Design Features

- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge : 5" and up
- Size 30" and up to 42", supplied with GEAR operator as standard.
- Flange dimensions as per ASME B16.47 Series A. Series B available upon request.
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5206RF	5206F	Flanged Raised Face
5206RTJ	5206RJ	Flanged Ring Type Joint
5206WE	5206WE	Buttweld





Dimensions and Weights

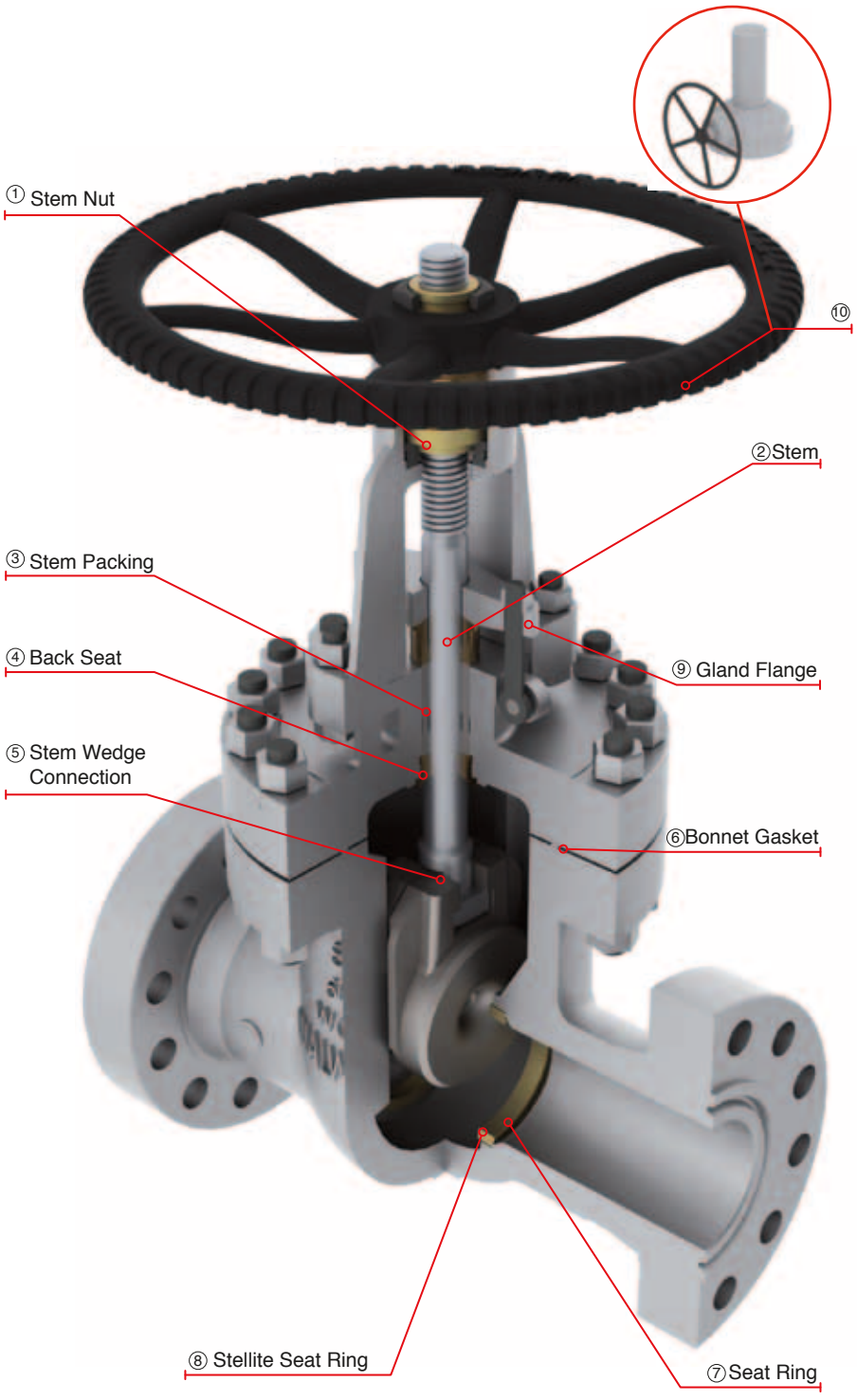
D Nominal Diameter	mm	762	914	1067
	in	30	36	42
A	mm	1397	1727	2172
(RF and WE)	in	55	68	85 1/2
B	mm	3277	3932	4481
	in	129	154 13/16	176 7/16
C	mm	762	762	762
	in	30	30	30
E	mm	1092	1270	1291
	in	43	50	50 13/16
Weight	kg	3680	6500	11405
5206RF	lb	8096	14300	25091
Weight	kg	3128	5525	9494
5206WE	lb	6882	12155	20887

CAST STEEL GATE VALVES CLASS 600

CAST STEEL GATE VALVES HANDWHEEL OR GEAR OPERATED, WITH RISING STEM AND OUT SIDE SCREW AND YOKE (OS&Y)

DESIGN FEATURES

- Gate valves design in accordance with API-600, solid, flexible or parallel slide wedge/Disc.
- Gate valves option in accordance with API-603 only for stainless steel & nickel alloys.
- Gate and Globe valves for Cryogenic service with gas column in accordance with BS-6364 upon request.
- Flange dimensions in accordance with ASME B16.5 for valves up to 24" nominal diameter.
- Hand-wheel, impact Hand-wheel, Chain-wheel, Gear operation, Electric, Pneumatic or Hydraulic Actuation as per Customer requirements.
- By-Pass, Lantern rings, grease injectors, special connections, etc.
- Low fugitive emissions control.
- NACE Service either MR-01-75 or MR-01-03.
- Test in accordance with API-598.
- Standard manufacturing flexible wedge from 2" and up



① Stem Nut, replaceable in line to avoid shut down of pipe line process.

② Rising stem with precision ACME single or double thread for quick operation. Surface finish suitable to seal properly to obtain low fugitive emissions.

③ Stem Packing is designed for optimum control of fugitive emissions leakage to the atmosphere. The ultra-low emission leakage rate is assured by the polished finish stem sealing area, the reduced diametrical clearances and the stem straightness control special designed packing. Live load packing arrangement available upon request.

④ Backseat, either threaded or welded designed to relieve back pressure on the stem packing when fully seated. Replacing stem packing under pressure is not recommended. Hard faced backseat available for severe service as per customer requirements.

⑤ Stem-Gate connection designed so that under severe applied loads (stuck gate), the stem will fail outside of the stuffing box pressure boundary.

⑥ Body to Bonnet ring type joint is designed to apply a uniform load to the gasket to assure a leak proof seal.

⑦ Seat rings are seal welded to provide a bubble tight joint.

⑧ Stellited Seat Rings provide increased resistance to wear, abrasion and erosion of the sealing surfaces.

⑨ Two pieces arrangement gland flange and stem packing bushing for self-alignment to avoid stem damage.

⑩ Gate valves supplied handwheel or gear operated.

CAST STEEL GATE VALVES, CLASS 600
(HANDWHEEL OPERATED)

Design Features

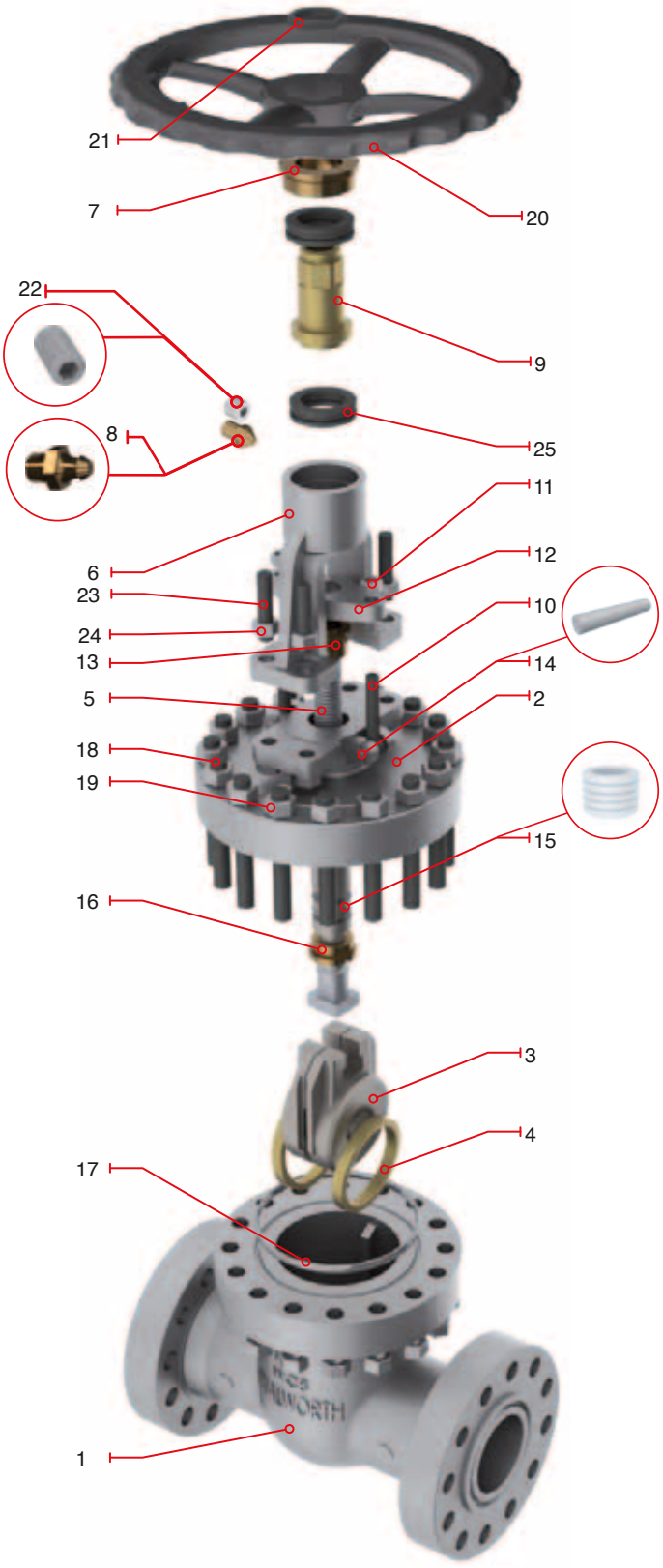
- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge
- From 2" to 20" Handwheel operated as Standard.
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25
- Flange dimensions larger than 24" according to ASME B16.47 Series A as standard
- Flange dimensions as per ASME B16.47 Series B available upon request

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5232RF	5232F	Flanged Raised Face
5232RTJ	5232RJ	Flanged Ring Type Joint
5232WE	5232WE	Buttweld

Regular Bill of Materials

No.	Description	WCB Trim UT
1	Body	ASTM A 216 GR WCB
2	Bonnet	ASTM A 216 GR WCB
3	Wedge	ASTM A 216 GR WCB + 13% Cr.
4	Seat Ring	ASTM A 515 GR 70 + ST6
5	Stem	ASTM A 276 Type 410
6	Yoke	ASTM A 216 GR WCB
7	Stem Nut Retainer	ASTM A 36
8	Grease Fitting	Commercial Steel
9	Stem Nut	UNS C95600 or Ni-Resist
10	Eyebolt / Gland Flange Studs	Alloy Steel
11	Eyebolt Nut	ASTM A 307
12	Gland Flange	ASTM A 515 GR 70
13	Packing Bushing	ASTM A 108 GR 1020
14	Eye Lug Bolt / Eyebolt Pin	Alloy Steel
15	Stem Packing	Graphite
16	Bonnet Bushing	ASTM A 276 Type 410
17	Ring Type Joint Gasket	ASTM A 108 GR 1010
18	Bonnet Stud	ASTM A 193 GR B7
19	Bonnet Stud Nut	ASTM A 194 GR 2H
20	Handwheel	ASTM A 197
21	Handwheel Nut	ASTM A 108 GR 1020
22	Set Screw	Alloy Steel
23	Yoke Bolt	Alloy Steel
24	Yoke Bolt Nut	ASTM A 307
25	Stem Nut Bearing	Commercial Steel
*26	Stem Nut Oil Seal	Rubber/Commercial Steel
*27	Identification Plate	Stainless Steel

*Not Shown

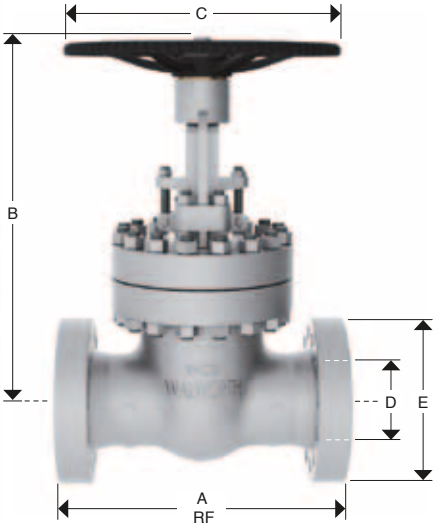


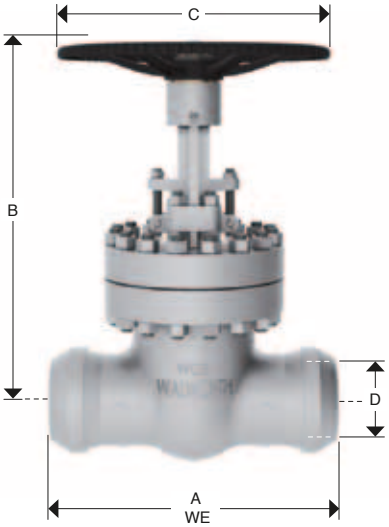
CAST STEEL GATE VALVES, CLASS 600
(HANDWHEEL OPERATED)

Design Features

- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge
- From 2" to 20" Handwheel operated as Standard.
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5232RF	5232F	Flanged Raised Face
5232RTJ	5232RJ	Flanged Ring Type Joint
5232WE	5232WE	Buttweld





Dimensions and Weights

D Nominal Diameter	mm	51	64	76	102	152	203	254	305	356	406	457
	in	2	2 1/2	3	4	6	8	10	12	14	16	18
A (RF and WE)	mm	292	330	356	432	559	660	787	838	889	991	1,092
	in	11 1/2	13	14	17	22	26	31	33	35	39	43
A	mm	295	333	359	435	562	663	790	841	892	994	1095
(RTJ)	in	11 5/8	13 1/8	14 1/8	17 1/8	22 1/8	26 1/8	31 1/8	33 1/8	35 1/8	39 1/8	43 1/8
B	mm	432	495	546	673	845	1105	1283	1461	1676	1803	1956
	in	17	19 1/2	21 1/2	26 1/2	33 1/4	43 1/2	50 1/2	57 1/2	66	71	77
C	mm	254	254	254	305	457	508	660	660	711	711	914
	in	10	10	10	12	18	20	26	26	28	28	36
E	mm	165	191	210	273	356	419	508	559	603	686	743
	in	6 1/2	7 1/2	8 1/4	10 3/4	14	16 1/2	20	22	23 3/4	27	29 1/4
Weight	kg	37	53	65	115	224	440	653	863	1141	1565	2560
5232RF/RTJ	lb	80.3	116.6	143	253	492.8	968	1436.6	1898.6	2510.2	3443	5632
Weight 5232WE	kg	35	41	63	100	195	429	568	751	993	1362	2086
	lb	77	90.2	138.6	220.11	428.736	943.8	1249.842	1651.782	2183.874	2995.41	4589.2

CAST STEEL GATE VALVES, CLASS 600
(GEAR OPERATED)

Design Features

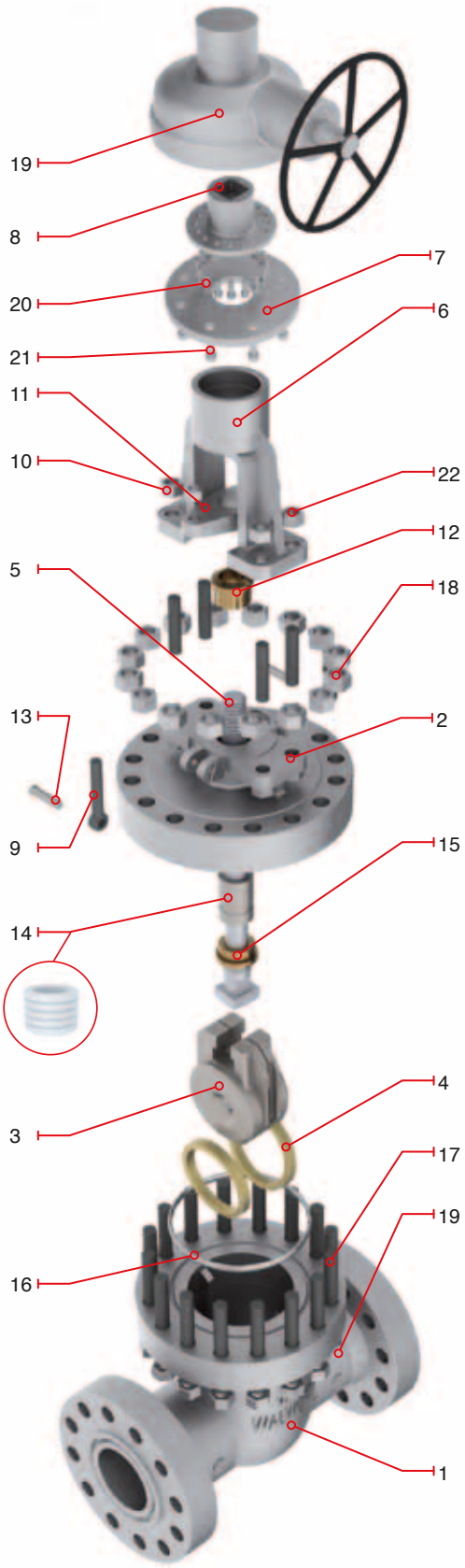
- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge
- Size 24" and up to 36", supplied with gear operated as standard.
- Stem Nut with bearings 6" and up
- Flange dimensions for 24" as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25
- Flange dimensions larger than 24" in accordance with ASME B16.47 Series A
- Flange dimensions as per ASME B16.47 Series B available upon request

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5232RF	5232F	Flanged Raised Face
5232RTJ	5232RJ	Flanged Ring Type Joint
5232WE	5232WE	Buttweld

Regular Bill of Materials

No.	Description	WCB Trim UT
1	Body	ASTM A 216 GR WCB
2	Bonnet	ASTM A 216 GR WCB
3	Wedge	ASTM A 216 GR WCB + 13% Cr.
4	Seat Ring	ASTM A 515 GR 70 + ST6
5	Stem	ASTM A 276 Type 410
6	Yoke	ASTM A 216 GR WCB
7	Stem Nut Retainer	ASTM A 36
8	Stem Nut	ASTM B 148 UNS C95600
9	Eyebolt / Gland Flange Studs	Alloy Steel
10	Eyebolt Nut	ASTM A 307
11	Gland Flange	ASTM A 515 GR 70
12	Packing Bushing	ASTM A 108 GR 1020
13	Eye Lug Bolt / Eye Bolt Pin	Alloy Steel
14	Stem Packing	Graphite
15	Bonnet Bushing	ASTM A 276 Type 410
16	Ring Type Joint Gasket	ASTM A 108 GR 1010
17	Bonnet Stud	ASTM A 193 GR B7
18	Bonnet Stud Nut	ASTM A 194 GR 2H
19	Gear Operator	as customer requirements
20	Operator Bolts	Alloy Steel
21	Yoke Bolts	Alloy Steel
*22	Yoke Bolt Nut	ASTM A 307
*23	Identification Plate	Stainless Steel

*Not Shown

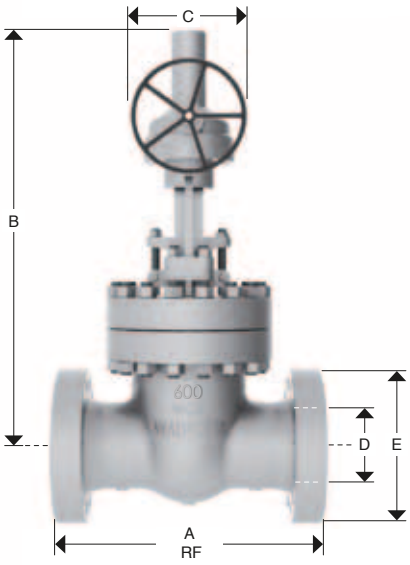


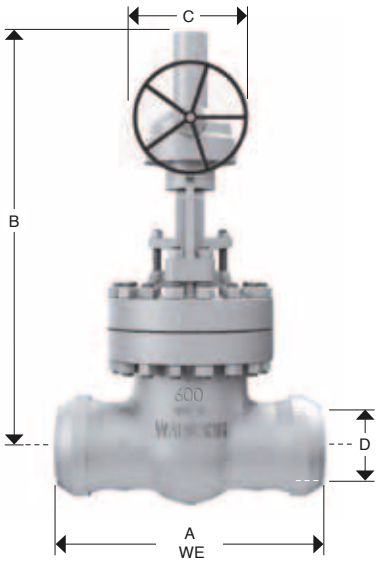
CAST STEEL GATE VALVES, CLASS 600
(GEAR OPERATED)

Design Features

- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge
- Size 24” and 36”, supplied with gear operator as standard.
- Flange Dimensios for 24” as per ASME B16.5
- Flange dimensions larger than 24” according to ASME B16.47 Series A as standard
- Flange dimensions as per ASME B16.47 Series B available upon request

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5232RF	5232F	Flanged Raised Face
5232RTJ	5232RJ	Flanged Ring Type Joint
5232WE	5232WE	Buttweld





Dimensions and Weights

D Nominal Diameter	mm / in	508 / 20	610 / 24	762 / 30	914 / 36
A (RF and WE)	mm	1,194	1,397	1,651	2,083
	in	47	55	65	82
A (RTJ)	mm	1200	1,407	1,664	2,099
	in	47 1/4	55 3/8	65 1/2	82 5/8
B	mm	2286	2743	3429	4115
	in	90	108	135	162
C	mm	914	762	762	762
	in	36	30	30	30
E	mm	813	940	1130	1315
	in	32	37	44 1/2	51 3/4
Weight 5232RF/RTJ	kg	3000	4300	9890	14000
	lb	6600	9460	21758	30800
Weight 5232WE	kg	2705	3901	8406	11900
	lb	5951	8582	18493	26180

CAST STEEL GATE VALVES CLASS 900

CAST STEEL GATE VALVES HANDWHEEL OR GEAR OPERATED, WITH RISING STEM AND OUT SIDE SCREW AND YOKE (OS&Y)

DESIGN FEATURES

- Gate valves design in accordance with API-600, solid, flexible or parallel slide wedge/Disc.
- Gate valves option in accordance with API-603 only for stainless steel & nickel alloys.
- Gate and Globe valves for Cryogenic service with gas column in accordance with BS-6364 upon request.
- Flange dimensions in accordance with ASME B16.5 for valves up to 24" nominal diameter.
- Hand-wheel, impact Hand-wheel, Chain-wheel, Gear operation, Electric, Pneumatic or Hydraulic Actuation as per Customer requirements.
- By-Pass, Lantern rings, grease injectors, special connections, etc.
- Low fugitive emissions control.
- NACE Service either MR-01-75 or MR-01-03.
- Test in accordance with API-598.
- Standard manufacturing flexible wedge from 2" and up

① Stem Nut, replaceable in line to avoid shut down of pipe line process.

② Rising stem with precision ACME single or double thread for quick operation. Surface finish suitable to seal properly to obtain low fugitive emissions.

③ Stem Packing is designed for optimum control of fugitive emissions leakage to the atmosphere. The ultra-low emission leakage rate is assured by the polished finish stem sealing area, the reduced diametrical clearances and the stem straightness control special designed packing. Live load packing arrangement available upon request.

④ Backseat, either threaded or welded designed to relieve back pressure on the stem packing when fully seated. Replacing stem packing under pressure is not recommended. Hard faced backseat available for severe service as per customer requirements.

⑤ Stem-Gate connection designed so that under severe applied loads (stuck gate), the stem will fail outside of the stuffing box pressure boundary.

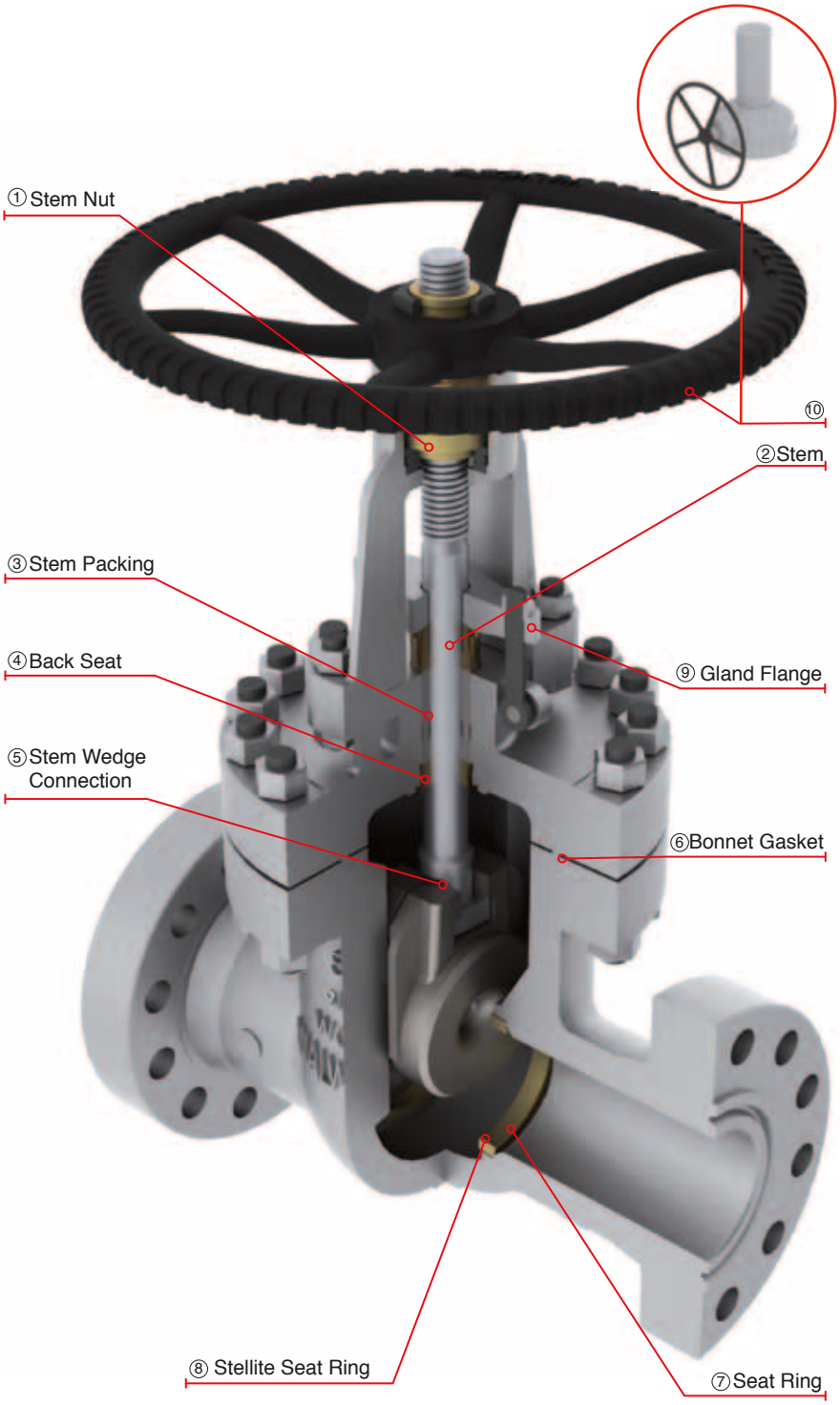
⑥ Body to Bonnet ring type joint is designed to apply a uniform load to the gasket to assure a leak proof seal.

⑦ Seat rings are seal welded to provide a bubble tight joint.

⑧ Stellited Seat Rings provide increased resistance to wear, abrasion and erosion of the sealing surfaces.

⑨ Two pieces arrangement gland flange and stem packing bushing for self-alignment to avoid stem damage.

⑩ Gate valves supplied handwheel or gear operated.



CAST STEEL GATE VALVES, CLASS 900
(HANDWHEEL OPERATED)

Design Features

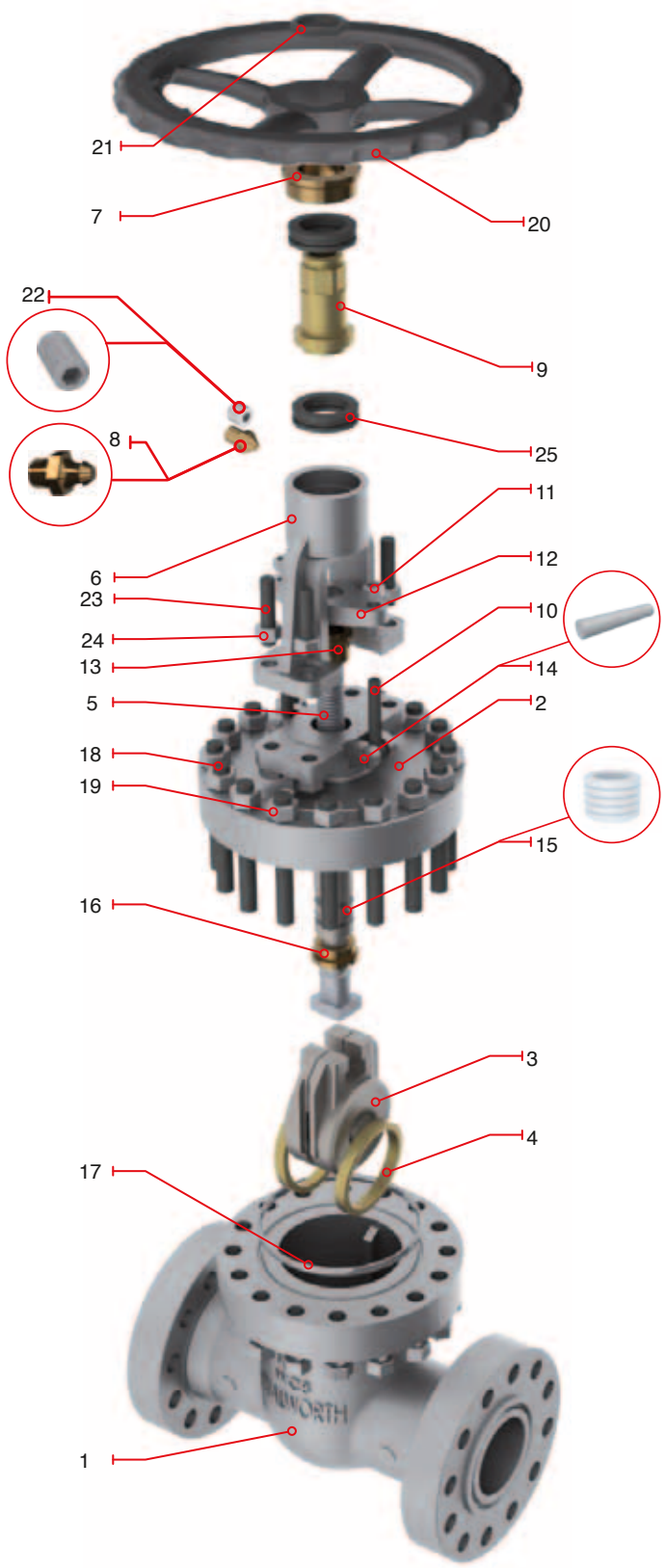
- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge.
- Size 2" and 16" supplied with Handwheel as standard
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25
- Stem Nut with Bearing: 4" and larger

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5247RF	5247F	Flanged Raised Face
5247RTJ	5247RJ	Flanged Ring Type Joint
5247WE	5247WE	Buttweld

Regular Bill of Materials

No.	Description	WCB Trim UT
1	Body	ASTM A 216 GR WCB
2	Bonnet	ASTM A 216 GR WCB
3	Wedge	ASTM A 216 GR WCB + 13% Cr.
4	Seat Ring	ASTM A 515 GR 70 + ST6
5	Stem	ASTM A 276 Type 410
6	Yoke	ASTM A 216 GR WCB
7	Stem Nut Retainer	ASTM A 36
8	Grease Fitting	Commercial Steel
9	Stem Nut	UNS C95600 or Ni-Resist
10	Eyebolt / Gland Flange Studs	Alloy Steel
11	Eyebolt Nut	ASTM A 307
12	Gland Flange	ASTM A 515 GR 70
13	Packing Bushing	ASTM A 108 GR 1020
14	Eye Lug Bolt /Eyebolt pin	Alloy Steel
15	Stem Packing	Graphite
16	Bonnet Bushing	ASTM A 276 Type 410
17	Ring Type Joint Gasket	ASTM A 108 GR 1010
18	Bonnet Stud	ASTM A 193 GR B7
19	Bonnet Stud Nut	ASTM A 194 GR 2H
20	Handwheel	ASTM A 197
21	Handwheel Nut	ASTM A 108 GR 1020
22	Set Screw	Alloy Steel
23	Yoke Bolt	Alloy Steel
24	Yoke Bolt Nut	ASTM A 307
25	Stem Nut Bearing	Commercial Steel
*26	Stem Nut Oil Seal	Rubber/Commercial Steel
*27	Identification Plate	Stainless Steel

*Not Shown

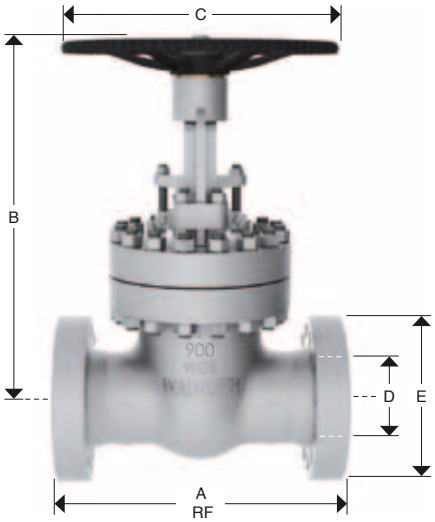


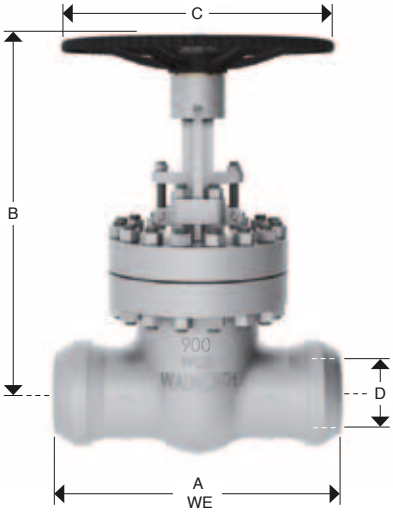
CAST STEEL GATE VALVES, CLASS 900
(HANDWHEEL OPERATED)

Design Features

- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge
- Size 2” to 16” supplied with Handwheel as standard
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25
- Stem Nut with Bearing: 4” and larger

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5247RF	5247F	Flanged Raised Face
5247RTJ	5247RJ	Flanged Ring Type Joint
5247WE	5247WE	Buttweld





Dimensions and Weights

D Nominal Diameter	mm	76	102	127	152	203	254	305
	in	3	4	5	6	8	10	12
A (RF and WE)	mm	381	457	559	610	737	838	965
	in	15	18	22	24	29	33	38
A (RTJ)	mm	384	460	562	613	740	841	968
	in	15 1/8	18 1/8	22 1/8	24 1/8	29 1/8	33 1/8	38 1/8
B	mm	578	641	829	970	1127	1365	1727
	in	22 3/4	25 1/4	32 5/8	38 3/16	44 3/8	53 3/4	68
C	mm	406	457	508	508	610	660	914
	in	16	18	20	20	24	26	36
E	mm	241	292	349	381	470	546	610
	in	9 1/2	11 1/2	13 3/4	15	18 1/2	21 1/2	24
Weight 5247 RF/RTJ	kg	106.5	153	367	352	542	905	1385
	lb	212	336.6	807.4	774.4	1192.4	1991	3047
Weight 5247 WE	kg	95	136	327	313	482	805	1233
	lb	209	300	719	689	1061	1772	2712

CAST STEEL GATE VALVES, CLASS 900
(GEAR OPERATED)

Design Features

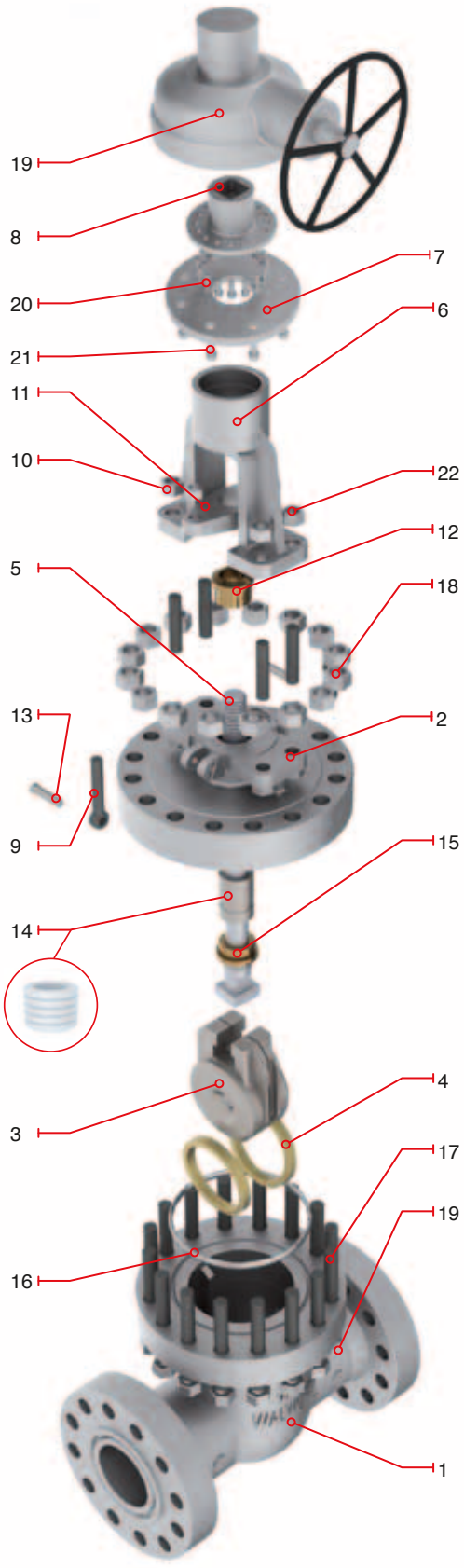
- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge
- Size 18" to 24" supplied with Gear operator as standard
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25
- Stem Nut with Bearing: 4" and larger

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5247RF	5247F	Flanged Raised Face
5247RTJ	5247RJ	Flanged Ring Type Joint
5247WE	5247WE	Buttweld

Regular Bill of Materials

No.	Description	WCB Trim UT
1	Body	ASTM A 216 GR WCB
2	Bonnet	ASTM A 216 GR WCB
3	Wedge	ASTM A 216 GR WCB + 13% Cr.
4	Seat Ring	ASTM A 515 GR 70 + ST6
5	Stem	ASTM A 276 Type 410
6	Yoke	ASTM A 216 GR WCB
7	Stem Nut Retainer	ASTM A 36
8	Stem Nut	ASTM B 148 UNS C95600
9	Eyebolt / Gland Flange Studs	Alloy Steel
10	Eyebolt Nut	ASTM A 307
11	Gland Flange	ASTM A 515 GR 70
12	Packing Bushing	ASTM A 108 GR 1020
13	Eye Lug Bolt / Eye Bolt Pin	Alloy Steel
14	Stem Packing	Graphite
15	Bonnet Bushing	ASTM A 276 Type 410
16	Ring Type Joint Gasket	ASTM A 108 GR 1010
17	Bonnet Stud	ASTM A 193 GR B7
18	Bonnet Stud Nut	ASTM A 194 GR 2H
19	Gear Operator	as customer requirements
20	Operator Bolts	Alloy Steel
21	Yoke Bolts	Alloy Steel
*22	Yoke Bolt Nut	ASTM A 307
*23	Identification Plate	Stainless Steel

*Not Shown

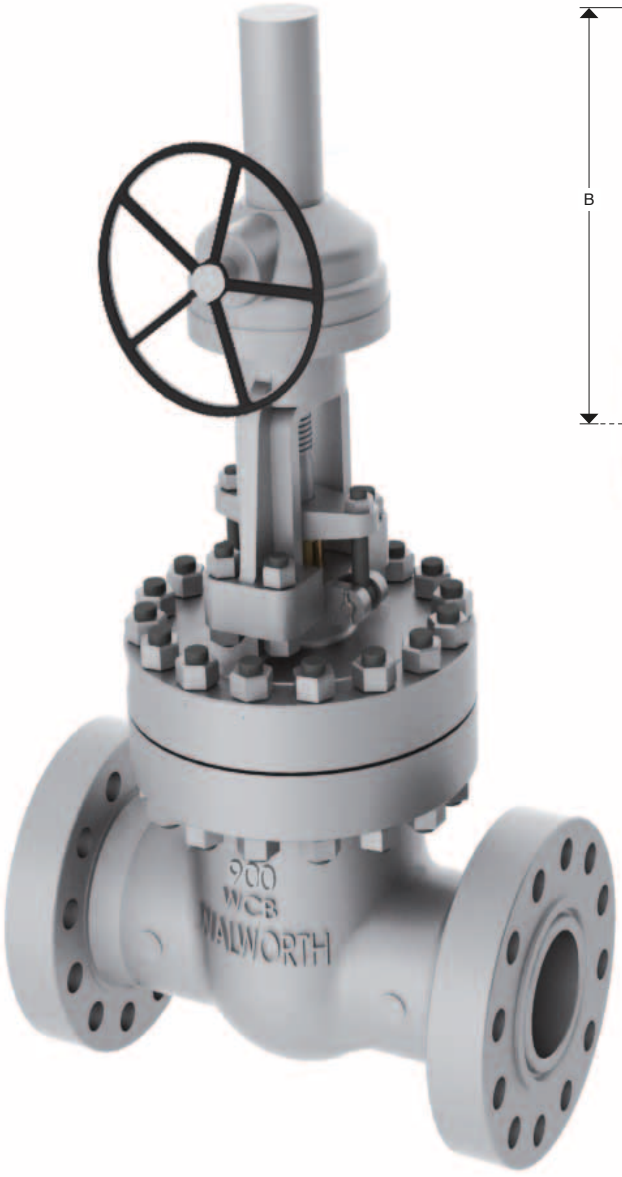


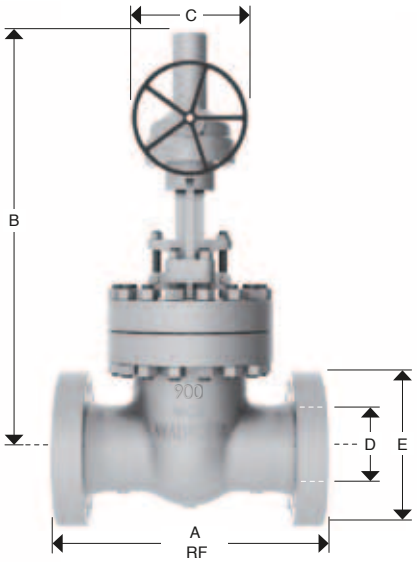
CAST STEEL GATE VALVES, CLASS 900
(GEAR OPERATED)

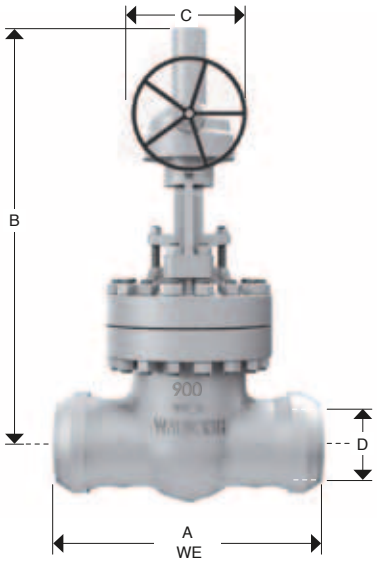
Design Features

- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge
- Size 18” to 24” supplied with Gear operator as standard
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25
- Stem Nut with Bearing: 4” and larger

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5247RF	5247F	Flanged Raised Face
5247RTJ	5247RJ	Flanged Ring Type Joint
5247WE	5247WE	Buttweld







Dimensions and Weights

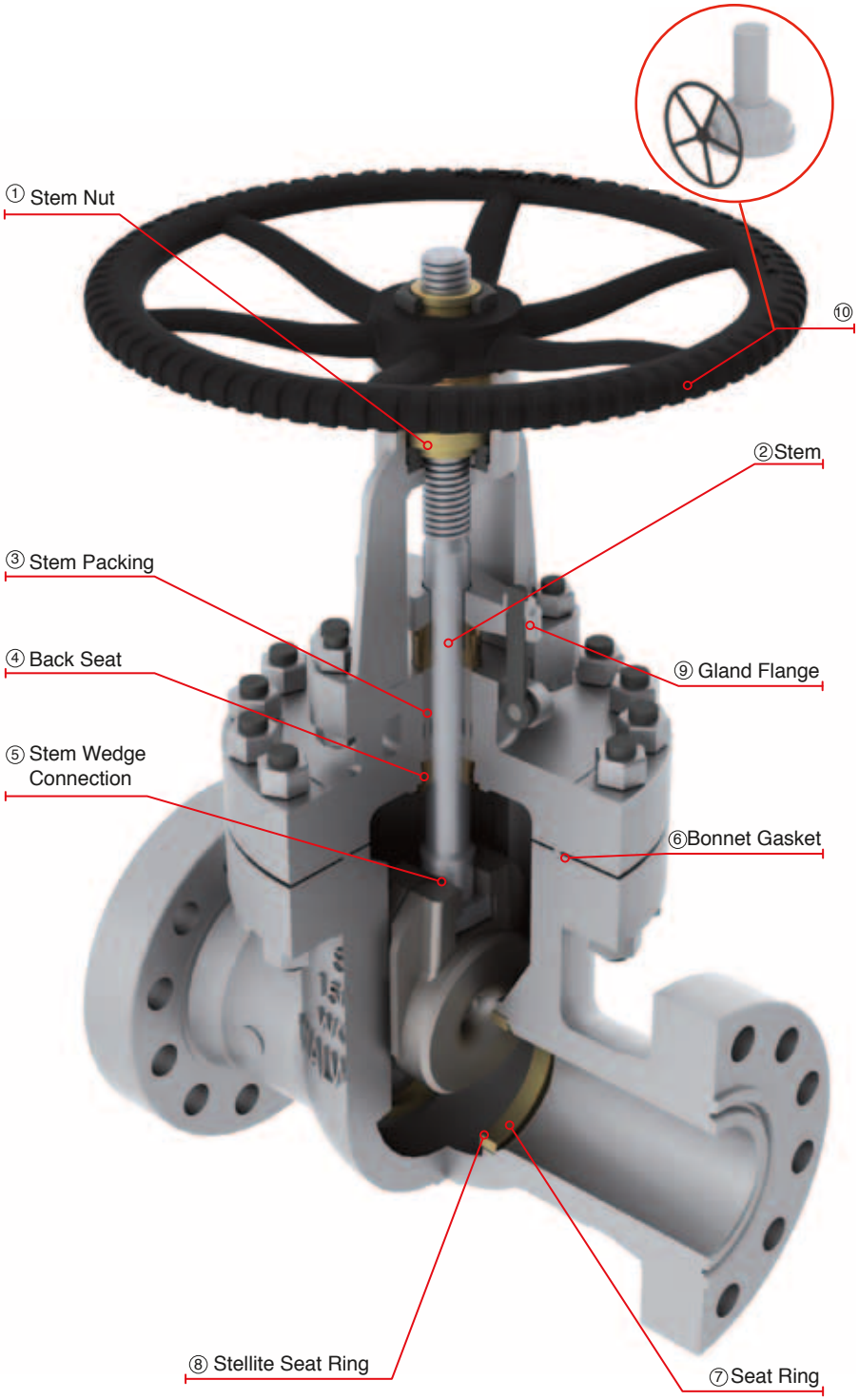
D Nominal Diameter	mm	356	406	457	508	610
	in	14	16	18	20	24
A (RF and WE)	mm	1029	1130	1219	1321	1549
	in	40 1/2	44 1/2	48	52	61
A (RTJ)	mm	1038	1140	1232	1334	1568
	in	40 7/8	44 7/8	48.5	52.5	61.75
B	mm	1972	2197	2057	2286	2743
	in	77 5/8	86 1/2	81	90	108
C	mm	914	914	762	762	762
	in	36	36	30	30	30
E	mm	641	705	787	857	1041
	in	25 1/4	27 3/4	31	33 3/4	41
Weight 5247RF/RTJ	kg	2778	3459	4370	6300	8410
	lb	6111.6	7609.8	9614	13860	18502
Weight 5247WE	kg	2472	3079	3889	5607	7485
	lb	5439	6773	8556	12335	16467

CAST STEEL GATE VALVES CLASS 1500

CAST STEEL GATE VALVES HANDWHEEL OR GEAR OPERATED, WITH RISING STEM AND OUT SIDE SCREW AND YOKE (OS&Y)

DESIGN FEATURES

- Gate valves design in accordance with API-600,solid, flexible or parallel slide wedge/Disc.
- Gate valves option in accordance with API-603 only for stainless steel & nickel alloys.
- Gate and Globe valves for Cryogenic service with gas column in accordance with BS-6364 upon request.
- Flange dimensions in accordance with ASME B16.5 for valves up to 24" nominal diameter.
- Hand-wheel, impact Hand-wheel, Chain-wheel, Gear operation, Electric, Pneumatic or Hydraulic Actuation as per Customer requirements.
- By-Pass, Lantern rings, grease injectors, special connections, etc.
- Low fugitive emissions control.
- NACE Service either MR-01-75 or MR-01-03.
- Test in accordance with API-598.
- Standard manufacturing flexible wedge from 2" and up



① Stem Nut, replaceable in line to avoid shut down of pipe line process.

② Rising stem with precision ACME single or double thread for quick operation. Surface finish suitable to seal properly to obtain low fugitive emissions.

③ Stem Packing is designed for optimum control of fugitive emissions leakage to the atmosphere. The ultra-low emission leakage rate is assured by the polished finish stem sealing area, the reduced diametrical clearances and the stem straightness control special designed packing. Live load packing arrangement available upon request.

④ Backseat, either threaded or welded designed to relieve back pressure on the stem packing when fully seated. Replacing stem packing under pressure is not recommended. Hard faced backseat available for severe service as per customer requirements.

⑤ Stem-Gate connection designed so that under severe applied loads (stuck gate), the stem will fail outside of the stuffing box pressure boundary.

⑥ Body to Bonnet ring type joint is designed to apply a uniform load to the gasket to assure a leak proof seal.

⑦ Seat rings are seal welded to provide a bubble tight joint.

⑧ Stellited Seat Rings provide increased resistance to wear, abrasion and erosion of the sealing surfaces.

⑨ Two pieces arrangement gland flange and stem packing bushing for self-alignment to avoid stem damage.

⑩ Gate valves supplied handwheel or gear operated.

CAST STEEL GATE VALVES, CLASS 1500
(HANDWHEEL OPERATED)

Design Features

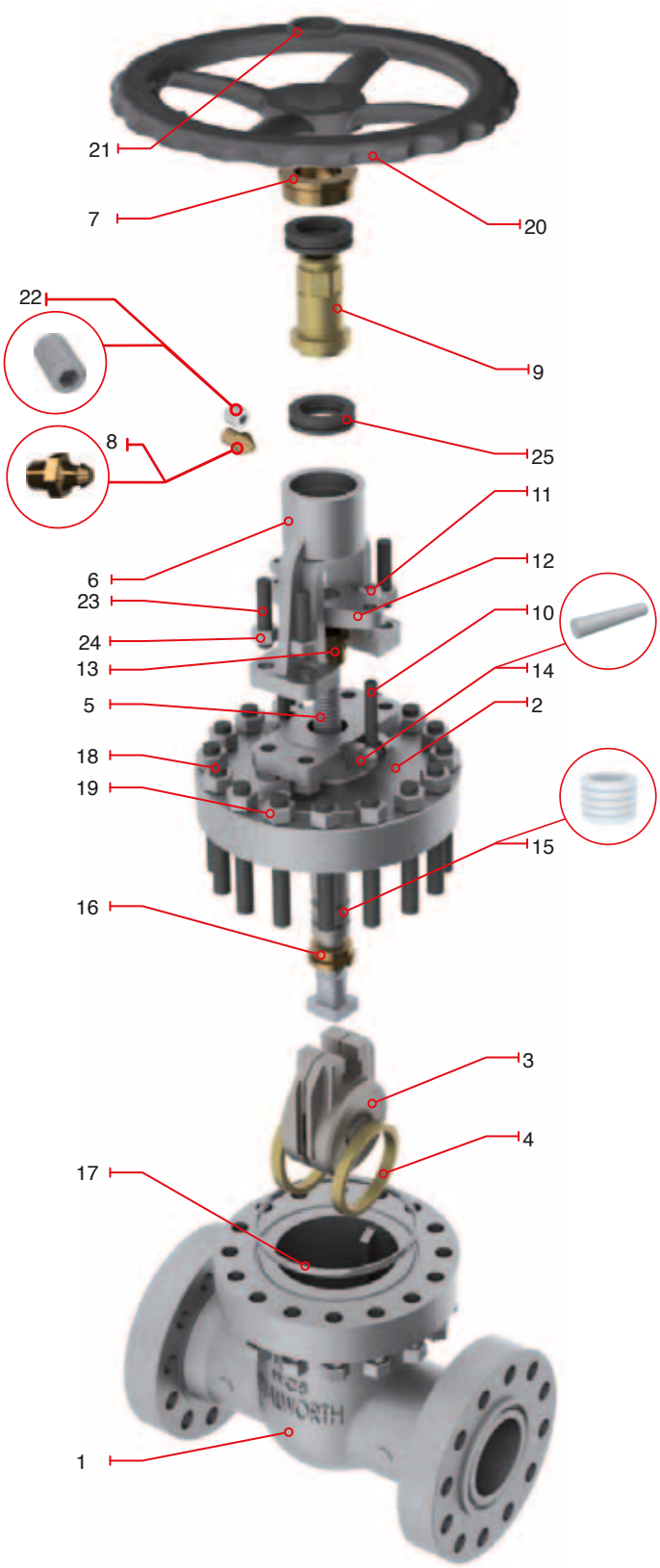
- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge
- Stem Nut with bearings -Size 4" and larger
- Size 2" to 16" Normally Supplied with Handwheel as standard
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5262RF	5262F	Flanged Raised Face
5262RTJ	5262RJ	Flanged Ring Type Joint
5262WE	5262WE	Buttweld

Regular Bill of Materials

No.	Description	WCB Trim UT
1	Body	ASTM A 216 GR WCB
2	Bonnet	ASTM A 216 GR WCB
3	Wedge	ASTM A 216 GR WCB + 13% Cr.
4	Seat Ring	ASTM A 515 GR 70 + ST6
5	Stem	ASTM A 276 Type 410
6	Yoke	ASTM A 216 GR WCB
7	Stem Nut Retainer	ASTM A 36
8	Grease Fitting	Commercial Steel
9	Stem Nut	UNS C95600 or Ni-Resist
10	Eyebolt / Gland Flange Studs	Alloy Steel
11	Eyebolt Nut	ASTM A 307
12	Gland Flange	ASTM A 515 GR 70
13	Packing Bushing	ASTM A 108 GR 1020
14	Eye Lug Bolt / Eye Bolt Pin	Alloy Steel
15	Stem Packing	Graphite
16	Bonnet Bushing	ASTM A 276 Type 410
17	Ring Type Joint Gasket	ASTM A 108 GR 1010
18	Bonnet Stud	ASTM A 193 GR B7
19	Bonnet Stud Nut	ASTM A 194 GR 2H
20	Handwheel	ASTM A 197
21	Handwheel Nut	ASTM A 108 GR 1020
22	Set Screw	Alloy Steel
23	Yoke Bolt	Alloy Steel
24	Yoke Bolt Nut	ASTM A 307
25	Stem Nut Bearing	Commercial Steel
*26	Stem Nut Oil Seal	Rubber/Commercial Steel
*27	Identification Plate	Stainless Steel

*Not Shown

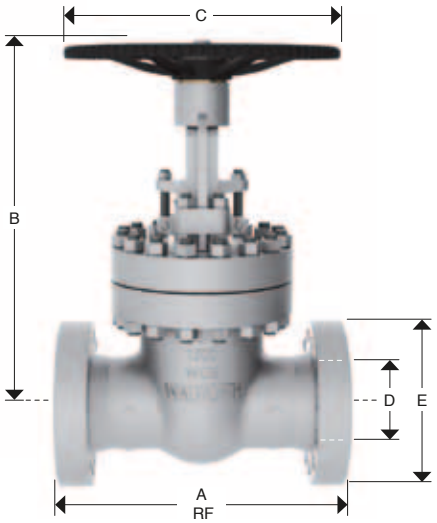


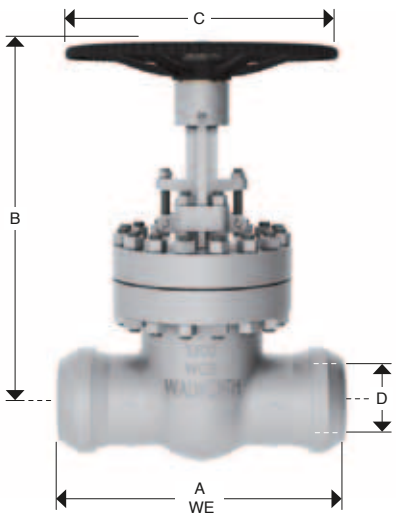
CAST STEEL GATE VALVES, CLASS 1500
(HANDWHEEL OPERATED)

Design Features

- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge
- Stem Nut with bearings: 4” and larger
- Size 2” to 16” Supplied with Handwheel as standard
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5262RF	5262F	Flanged Raised Face
5262RTJ	5262RJ	Flanged Ring Type Joint
5262WE	5262WE	Buttweld





Dimensions and Weights

D Nominal Diameter	mm	51	64	76	102	127	152	203	254	305
	in	2	2 1/2	3	4	5	6	8	10	12
A (RF and WE)	mm	368	419	470	546	673	705	832	991	1130
	in	14 1/2	16 1/2	18 1/2	21 1/2	26 1/2	27 3/4	32 3/4	39	44 1/2
A (RTJ)	mm	371	422	473	549	676	711	842	1000	1146
	in	14 5/8	16 5/8	18 5/8	21 5/8	26 5/8	28	33 1/8	39 3/8	45 1/8
B	mm	591	699	876	994	1080	1191	1435	1740	2054
	in	23 1/4	27 1/2	34 1/2	39 1/8	42 1/2	46 7/8	56 1/2	68 1/2	80 7/8
C	mm	356	406	457	508	559	559	660	914	914
	in	14	16	18	20	22	22	26	36	36
E	mm	216	244	267	311	375	394	483	584	673
	in	8 1/2	9 5/8	10 1/2	12 1/4	14 3/4	15 1/2	19	23	26 1/2
Weight 5262RF/RTJ	kg	78.5	99	140	209	510	523	893	2010	3080
	lb	173	218	308	460	1122	1151	1965	4422	6776
Weight 5262WE	kg	56	67	97	141	383	402	700	1685	2600
	lb	123	148	214	311	844	886	1543	3714	5732

CAST STEEL GATE VALVES, CLASS 1500
(GEAR OPERATED)

Design Features

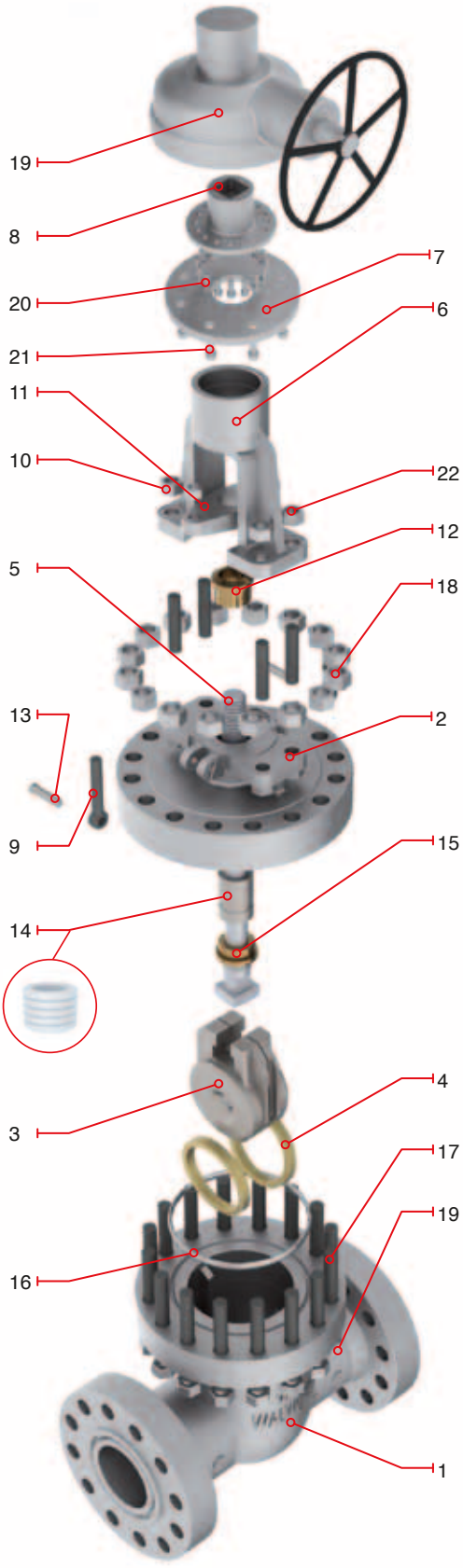
- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge.
- Size 18” to 24” Normally Supplied with gear box
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25
- Stem Nut with bearings: Size 4” and larger

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5262RF	5262F	Flanged Raised Face
5262RTJ	5262RJ	Flanged Ring Type Joint
5262WE	5262WE	Buttweld

Regular Bill of Materials

No.	Description	WCB Trim UT
1	Body	ASTM A 216 GR WCB
2	Bonnet	ASTM A 216 GR WCB
3	Wedge	ASTM A 216 GR WCB + 13% Cr.
4	Seat Ring	ASTM A 515 GR 70 + ST6
5	Stem	ASTM A 276 Type 410
6	Yoke	ASTM A 216 GR WCB
7	Stem Nut Retainer	ASTM A 36
8	Stem Nut	ASTM B 148 UNS C95600
9	Eyebolt /Gland Flange Studs	Alloy Steel
10	Eyebolt Nut	ASTM A 307
11	Gland Flange	ASTM A 515 GR 70
12	Packing Bushing	ASTM A 108 GR 1020
13	Eye Lug Bolt / Eye Bolt Pin	Alloy Steel
14	Stem Packing	Graphite
15	Bonnet Bushing	ASTM A 276 Type 410
16	Ring Type Joint Gasket	ASTM A 108 GR 1010
17	Bonnet Stud	ASTM A 193 GR B7
18	Bonnet Stud Nut	ASTM A 194 GR 2H
19	Gear Operator	as customer requirements
20	Operator Bolts	Alloy Steel
21	Yoke Bolts	Alloy Steel
*22	Yoke Bolt Nut	ASTM A 307
*23	Identification Plate	Stainless Steel

*Not Shown

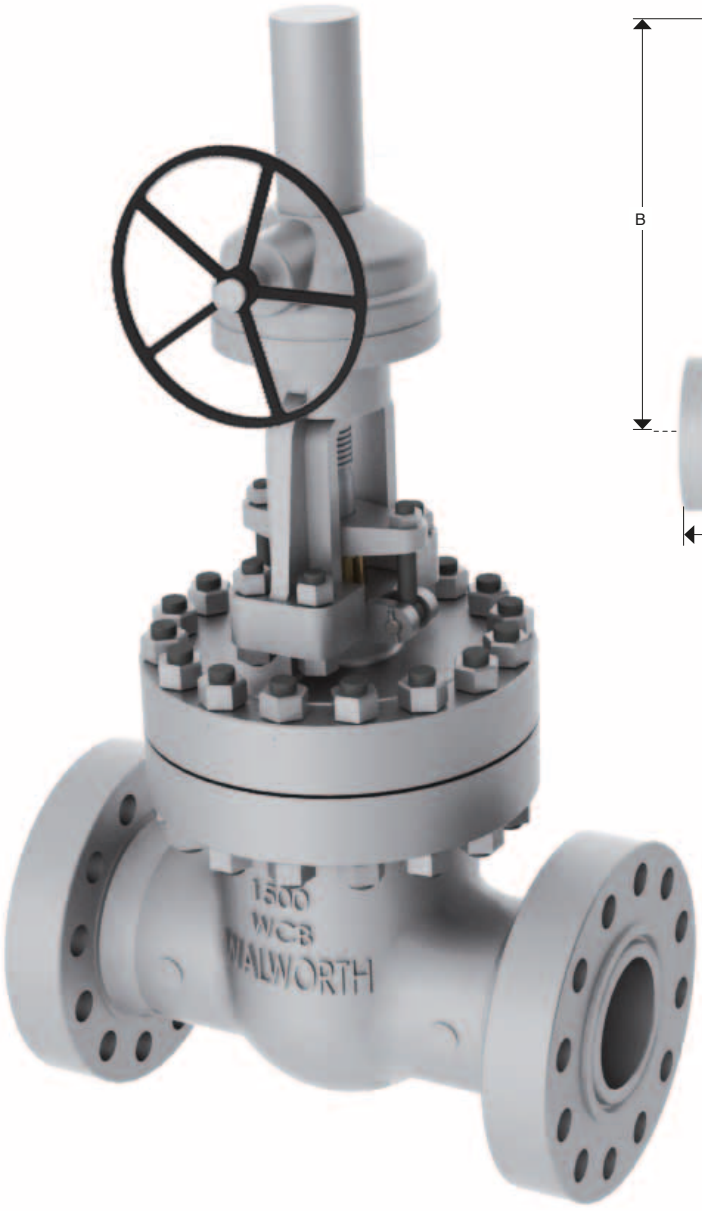


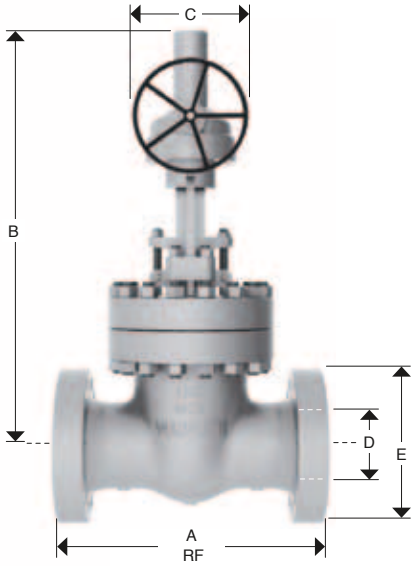
CAST STEEL GATE VALVES, CLASS 1500
(GEAR OPERATED)

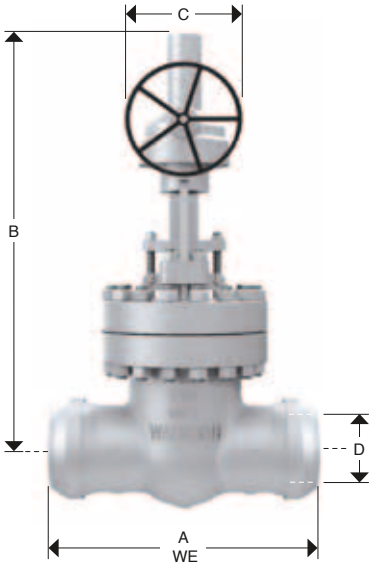
Design Features

- Design in accordance with API-600
- Outside Screw & Yoke (OS & Y)
- Flexible Wedge
- Size 18” to 24” Normally Supplied with gear box
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B16.25
- Stem Nut with bearings: Size 4” and larger

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5262RF	5262F	Flanged Raised Face
5262RTJ	5262RJ	Flanged Ring Type Joint
5262WE	5262WE	Buttweld







Dimensions and Weights

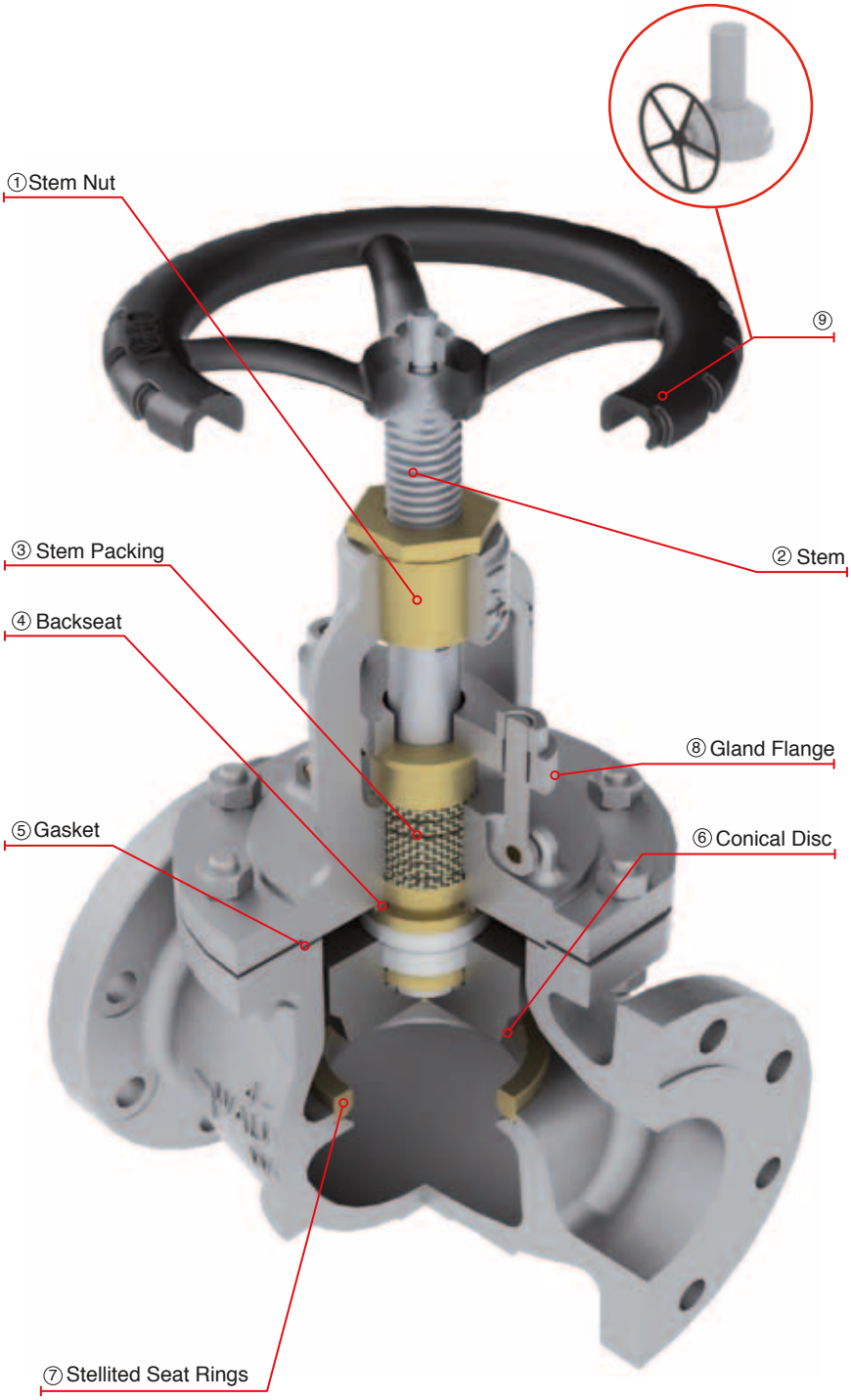
D Nominal Diameter	mm	356	406	457	508	610
	in	14	16	18	20	24
A (RF and WE)	mm	1257	1384	1537	1664	1943
	in	49 1/2	54 1/2	60 1/2	65 1/2	76 1/2
A (RTJ)	mm	1276	1407	1559	1686	1972
	in	50 1/4	55 3/8	61 3/8	66 3/8	77 5/8
B	mm	2172	2254	2057	2286	2743
	in	85 1/2	88 3/4	81	90	108
C	mm	914	914	762	762	762
	in	36	36	30	30	30
E	mm	749	826	914	984	1168
	in	29 1/2	32 1/2	36	38 3/4	46
Weight 5262RF	kg	4480	5110	7105	9000	11500
	lb	9856	11242	15631	19800	25300
Weight 5262WE	kg	3823	4270	5969	8100	10350
	lb	8428	9413	13132	17820	22770

CAST STEEL GLOBE VALVES CLASS 150

CAST STEEL GLOBE VALVES WITH RISING HANDWHEEL AND STEM.

DESIGN FEATURES

- Globe valves design in accordance with ASME B16.34
- Globe valves option in accordance with API-603 only for stainless steel & nickel alloys.
- Gate & globe valves for cryogenic service with gas column in accordance with BS-6364 upon request
- Flange dimensions in accordance with ASME B16.5 for valves up to 24" nominal diameter
- Handwheel, handwheel impact, chain wheel, gear operation, electric, pneumatic or hyydraulic actuation as per customer requirements
- By-pass, lantern rings, grease injectors, special connections, etc.
- Low fugitive emissions control
- NACE service either MR-01-75 or MR-01-03.
- Test in accordance with API-598
- Stop check design option available



① Stem Nut, replaceable in line to avoid shut down of pipe line process.

② Revolving rising stem with precision ACME single or double thread for quick operation. Surface finish suitable to seal properly to get low fugitive emissions.

③ Stem Packing is designed for optimum control of fugitive emissions leakage to the atmosphere. The ultra low emission leakage rate is assured by the fine finish in the stem, the reduced diametrical clearances and the stem straightness control special designed packing. Live load packing arrangement available upon request.

④ Backseat either threaded or welded, designed to relieve back pressure on the stem packing when fully seated. Replacing stem packing under pressure is not recommended. Hard faced backseat available for severe service as customer requirements

⑤ Body to Bonnet Joint designed to apply a uniform load to the gasket to assure a leak proof seal.

⑥ Conical Plug Type Disc, integrally guided to assure true alignment between disc and valve body. The loose disc design allows the disc and seat ring sealing surface to seat correctly without damage.

⑦ Stellited Seat Ring is seal welded to provide a increased resistance to wear, abrasion, and erosion of the sealing surfaces.

⑧ Two pieces arrangement gland flange and stem packing bushing for self-alignment to avoid stem damage.

⑨ Impact Handwheel, the mechanism is based on transmitting the momentum generated by the mass of the handwheel through the impact/ impulse generated during the snap closure action of the handwheel. This type of handwheel is used when a standard handwheel cannot create enough closing force to effect a seal. Gear operated is also available.

CAST STEEL GLOBE VALVES, CLASS 150
(HANDWHEEL OPERATED)

Design Features

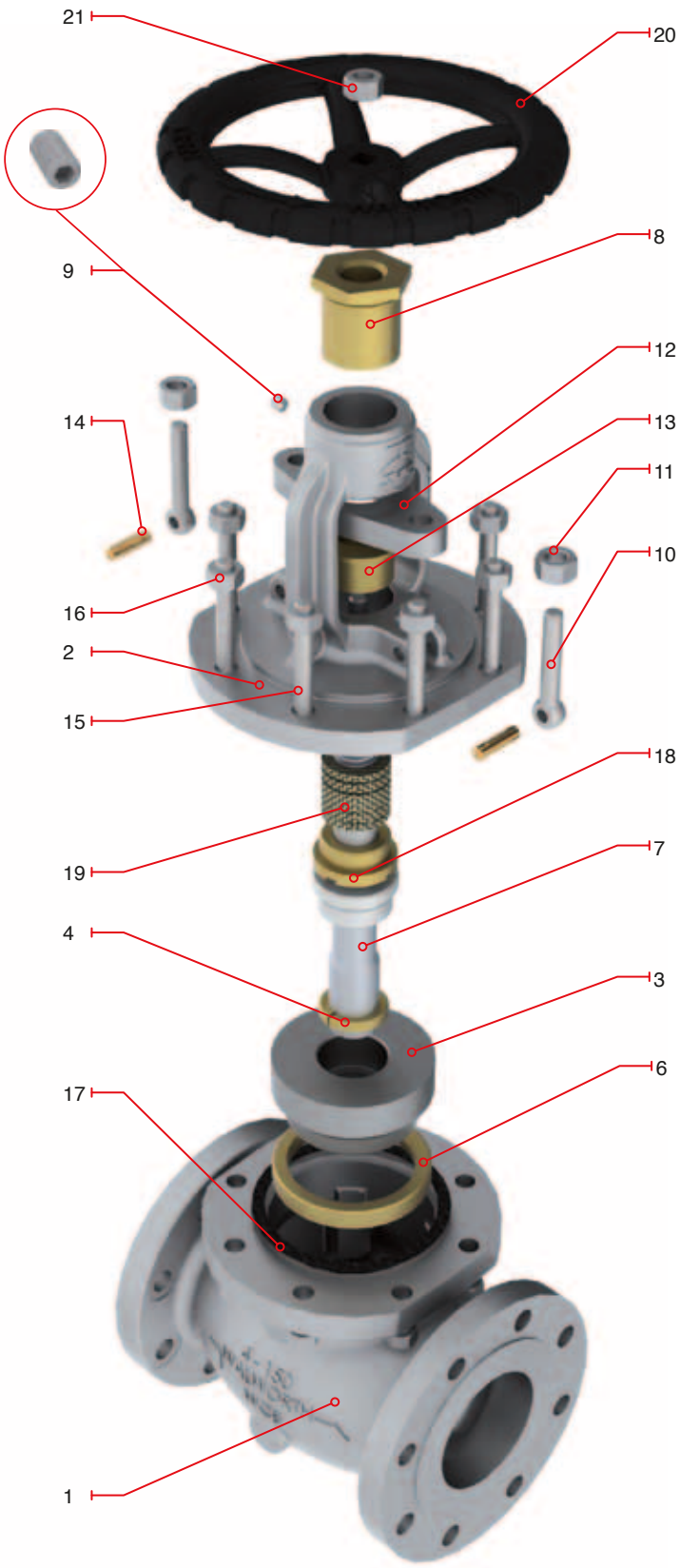
- Design in accordance with ASME B 16.34
- Rising Stem and Handwheel
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with Bearings: 14" and larger
- Size 2" to 12" Handwheel Operated as standard

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5275RF	5275F	Flanged Raised Face
5275RTJ	5275RJ	Flanged Ring Type Joint
5275WE	5275WE	Buttweld

Regular Bill of Materials

No.	Description	STANDARD MATERIAL
1	Body	ASTM A 216 GR WCB
2	Bonnet	ASTM A 216 GR WCB
3	Disc	ASTM A 276 Type 410
4	Disc Locknut	Alloy Steel
*5	Disc Washer	ASTM A 276 Type 410
6	Seat Ring	ASTM A 515 GR 70 + ST6
7	Stem	ASTM A 276 Type 410
8	Stem Nut	ASTM B 148 UNS C95600
9	Set Screw	Alloy Steel
10	Eyebolt	Alloy Steel
11	Eyebolt Nut	ASTM A 307
12	Gland Flange	ASTM A 515 GR 70
13	Packing Bushing	ASTM A 108 GR 1020
14	Eyebolt Pin	Alloy Steel
15	Bonnet Stud	ASTM A 193 GR B7
16	Bonnet Stud Nut	ASTM A 194 GR 2H
17	Bonnet Gasket	Graphite/Stainless Steel 316
18	Bonnet Bushing	ASTM A 276 Type 410
19	Stem Packing	Graphite
20	Handwheel	ASTM A 197
21	Handwheel Nut	ASTM A 307
*22	Handwheel Washer	Commercial Steel
*23	Identification Plate	Stainless Steel

*Not shown

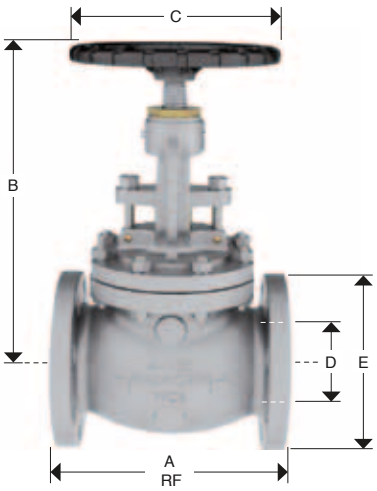


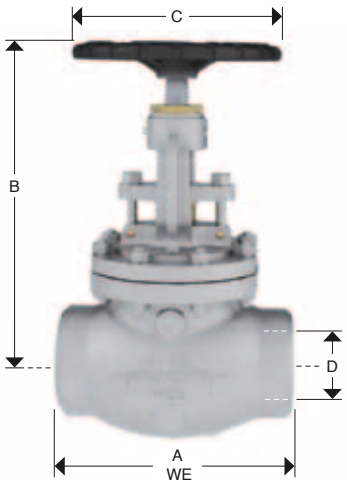
CAST STEEL GLOBE VALVES, CLASS 150
(HANDWHEEL OPERATED)

Design Features

- Design in accordance with ASME B 16.34
- Rising Stem and Handwheel 6” and smaller
- Rising stem and fixed handwheel 8” and up
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with Bearings: 14” and larger
- Size 2” to 12” Handwheel Operated as standard

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5275RF	5275F	Flanged Raised Face
5275RTJ	5275RJ	Flanged Ring Type Joint
5275WE	5275WE	Buttweld





Dimensions and Weights

D Nominal Diameter	mm	51	64	76	102	152	203	254	305
	in	2	2 1/2	3	4	6	8	10	12
A	mm	203	216	241	292	406	495	622	699
(RF and WE)	in	8	8 1/2	9 1/2	11 1/2	16	19 1/2	24 1/2	27 1/2
B	mm	329	386	354	432	513	643	668	830
	in	12 15/16	15 3/16	13.94	17	20 3/16	25 5/16	26 5/16	32 11/16
C	mm	203	203	203	254	356	406	457	610
	in	8	8	8	10	14	16	18	24
E	mm	152	178	191	229	279	343	406	483
	in	6	7	7 1/2	9	11	13 1/2	16	19
Weight	kg	18	29	34	55	100	186	267	399
5275RF	lb	40	64	75	121	220	409	587	878
Weight	kg	15	25	25	45	84	155	233	341
5275WE	lb	33	55	55	99	185	341	513	752

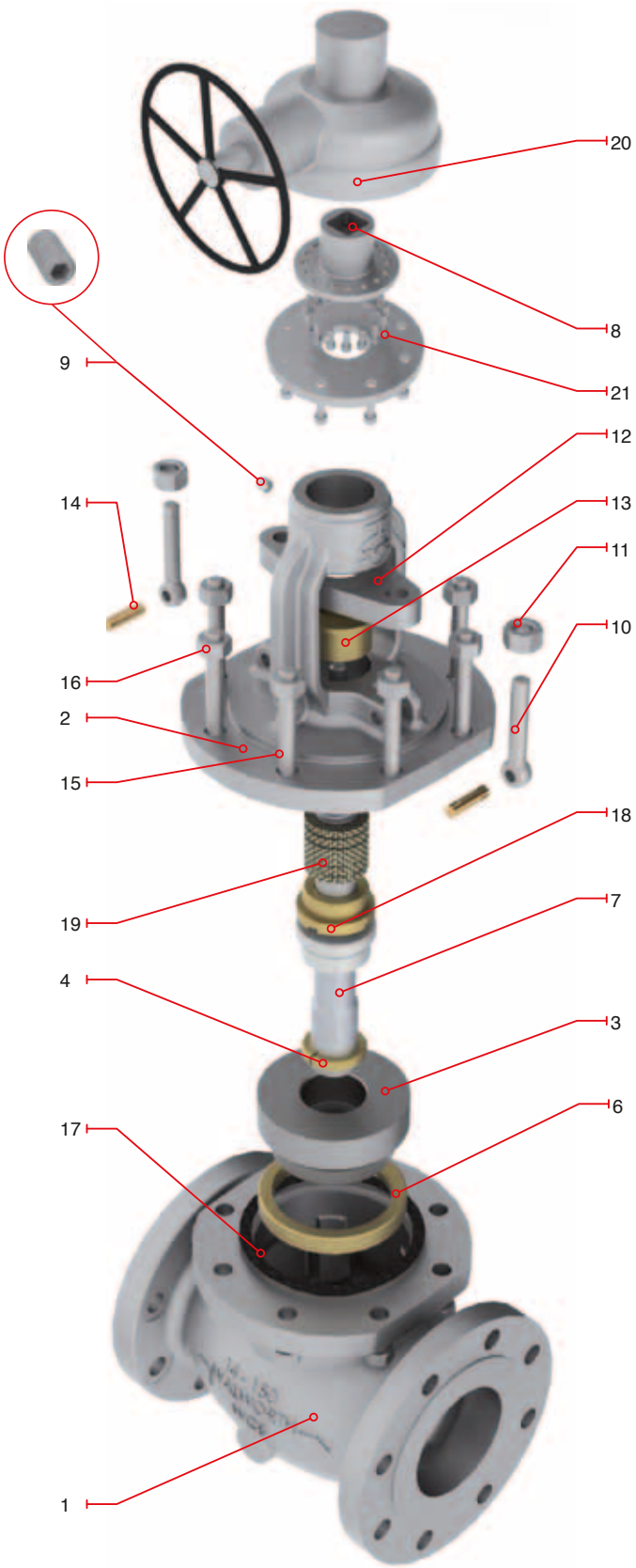
For size and dimensions not shown, please contact our Sales Department.

CAST STEEL GLOBE VALVES, CLASS 150
(GEAR OPERATED)

Design Features

- Design in accordance with ASME B 16.34
- Rising Stem and Handwheel 6" and smaller
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with Bearings: 14" and larger
- Size 2" to 12" Handwheel Operated as standard

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5275RF	5275F	Flanged Raised Face
5275RTJ	5275RJ	Flanged Ring Type Joint
5275WE	5275WE	Buttweld



Regular Bill of Materials

No.	Description	STANDARD MATERIAL
1	Body	ASTM A 216 GR WCB
2	Bonnet	ASTM A 216 GR WCB
3	Disc	ASTM A 276 Type 410
4	Disc Locknut	Alloy Steel
*5	Disc Washer	ASTM A 276 Type 410
6	Seat Ring	ASTM A 515 GR 70 + ST6
7	Stem	ASTM A 276 Type 410
8	Stem Nut	ASTM B 148 UNS C95600
9	Set Screw	Alloy Steel
10	Eyebolt	Alloy Steel
11	Eyebolt Nut	ASTM A 307
12	Gland Flange	ASTM A 515 GR 70
13	Packing Bushing	ASTM A 108 GR 1020
14	Eyebolt Pin	Alloy Steel
15	Bonnet Stud	ASTM A 193 GR B7
16	Bonnet Stud Nut	ASTM A 194 GR 2H
17	Bonnet Gasket	Graphite/Stainless Steel 316
18	Bonnet Bushing	ASTM A 276 Type 410
19	Stem Packing	Graphite
20	Gear Operator	as customer requirements
*21	Operator Bolts	Alloy Steel
*22	Identification Plate	Stainless Steel

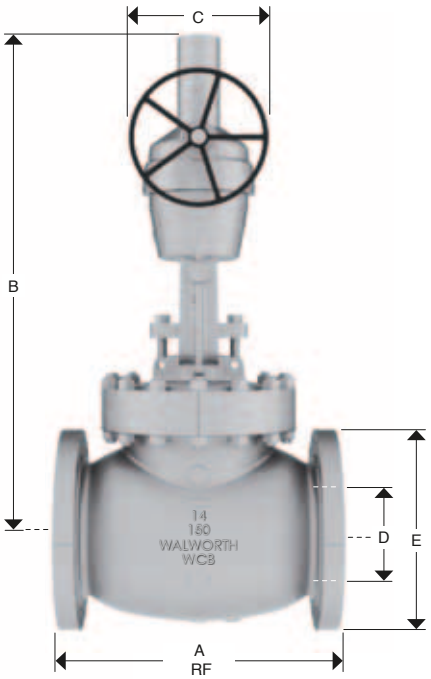
*Not shown

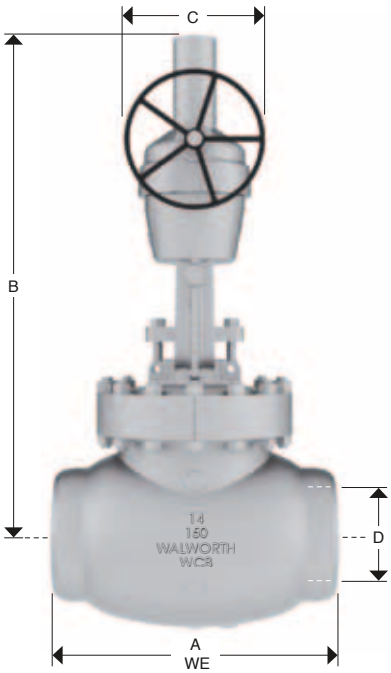
CAST STEEL GLOBE VALVES, CLASS 150
(GEAR OPERATED)

Design Features

- Design in accordance with ASME B 16.34
- Rising Stem and Handwheel 6" and smaller
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with Bearings: 14" and larger
- Size 14" and up gear operated as standard

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5275RF	5275F	Flanged Raised Face
5275RTJ	5275RJ	Flanged Ring Type Joint
5275WE	5275WE	Buttweld





Dimensions and Weights

D Nominal Diameter	mm	356	406	457	508	610
	in	14	16	18	20	24
A (RF and WE)	mm	787	914	978	978	1295
	in	31	36	38.5	38 1/2	51
B	mm	990	996	1327	1230	1500
	in	39	39 1/4	52 1/4	48 3/8	59
C	mm	560	640	720	530	600
	in	22	25	28	21	23 1/2
E	mm	533	597	635	699	813
	in	21	23 1/2	25	27 1/2	32
Weight 5275RF	mm	530	678	998	1097	1613
	in	1166	1492	2196	2413.4	3548.6
Weight 5275WE	kg	472	603	888	976	1436
	lb	1038	1328	1954	2148	3158

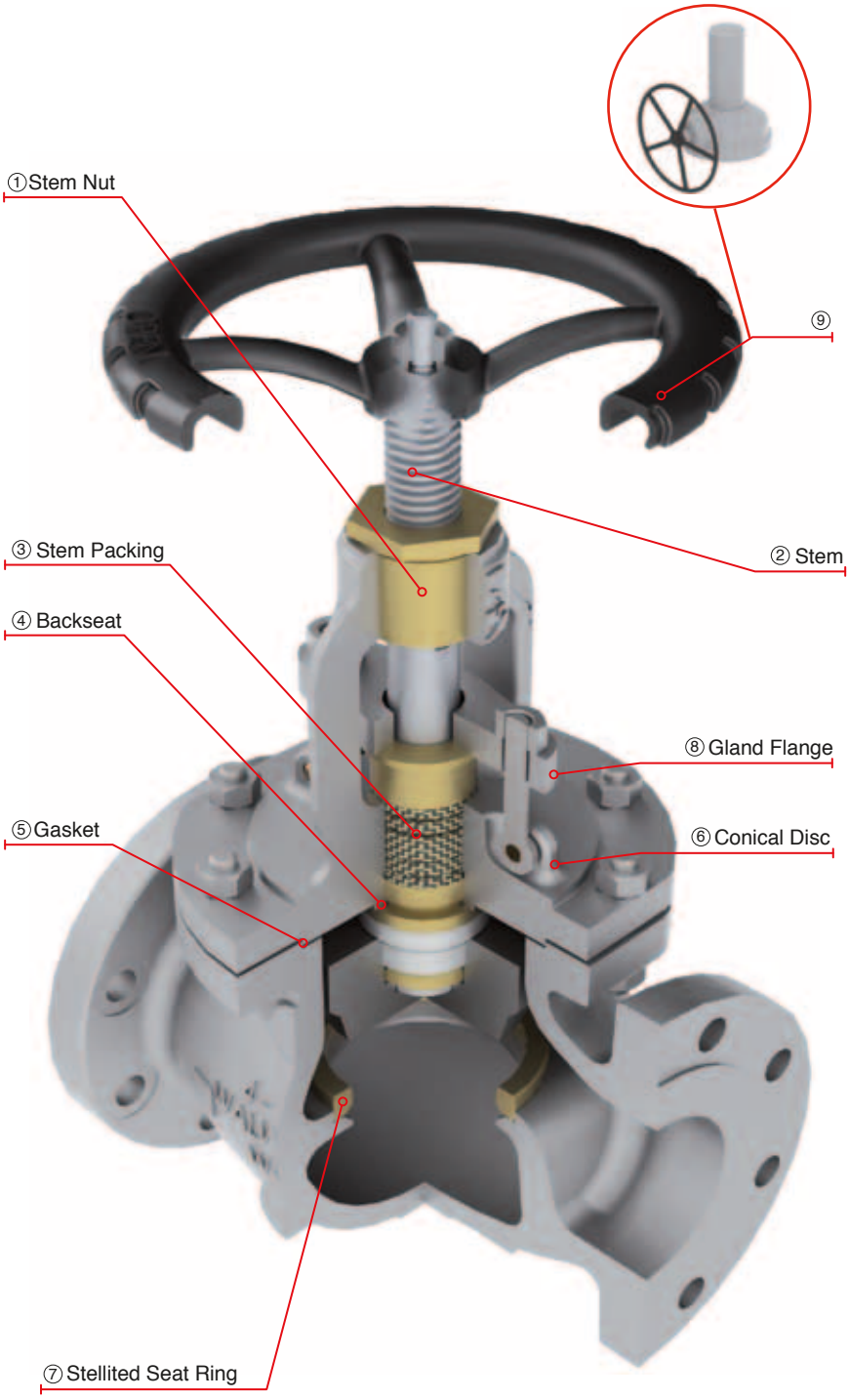
For size and dimensions not shown, please contact our Sales Department.

CAST STEEL GLOBE VALVES CLASS 300

CAST STEEL GLOBE VALVES WITH RISING HANDWHEEL AND STEM.

DESIGN FEATURES

- Globe valves design in accordance with ASME B16.34
- Globe valves option in accordance with API-603 only for stainless steel & nickel alloys.
- Gate & globe valves for cryogenic service with gas column in accordance with BS-6364 upon request
- Flange dimensions in accordance with ASME B16.5 for valves up to 24" nominal diameter
- Handwheel, handwheel impact, chain wheel, gear operation, electric, pneumatic or hyydraulic actuation as per customer requirements
- By-pass, lantern rings, grease injectors, special connections, etc.
- Low fugitive emissions control
- NACE service either MR-01-75 or MR-01-03.
- Test in accordance with API-598
- Stop check design option available



① Stem Nut, replaceable in line to avoid shut down of pipe line process.

② Revolving rising stem with precision ACME single or double thread for quick operation. Surface finish suitable to seal properly to get low fugitive emissions.

③ Stem Packing is designed for optimum control of fugitive emissions leakage to the atmosphere. The ultra low emission leakage rate is assured by the fine finish in the stem, the reduced diametrical clearances and the stem straightness control special designed packing. Live load packing arrangement available upon request.

④ Backseat either threaded or welded, designed to relieve back pressure on the stem packing when fully seated. Replacing stem packing under pressure is not recommended. Hard faced backseat available for severe service as customer requirements

⑤ Body to Bonnet Joint designed to apply a uniform load to the gasket to assure a leak proof seal.

⑥ Conical Plug type Disc, integrally guided to assure true alignment between disc and valve body. The loose disc design allows the disc and seat ring sealing surface to seat correctly without damage.

⑦ Stellited Seat Ring is seal welded to provide a increased resistance to wear, abrasion, and erosion of the sealing surfaces.

⑧ Two pieces arrangement gland flange and stem packing bushing for self-alignment to avoid stem damage.

⑨ Impact Handwheel, the mechanism is based on transmitting the momentum generated by the mass of the handwheel through the impact/impulse generated during the snap closure action of the handwheel. This type of handwheel is used when a standard handwheel cannot create enough closing force to effect a seal. Gear operated is also available.

CAST STEEL GLOBE VALVES, CLASS 300
(HANDWHEEL OPERATED)

Design Features

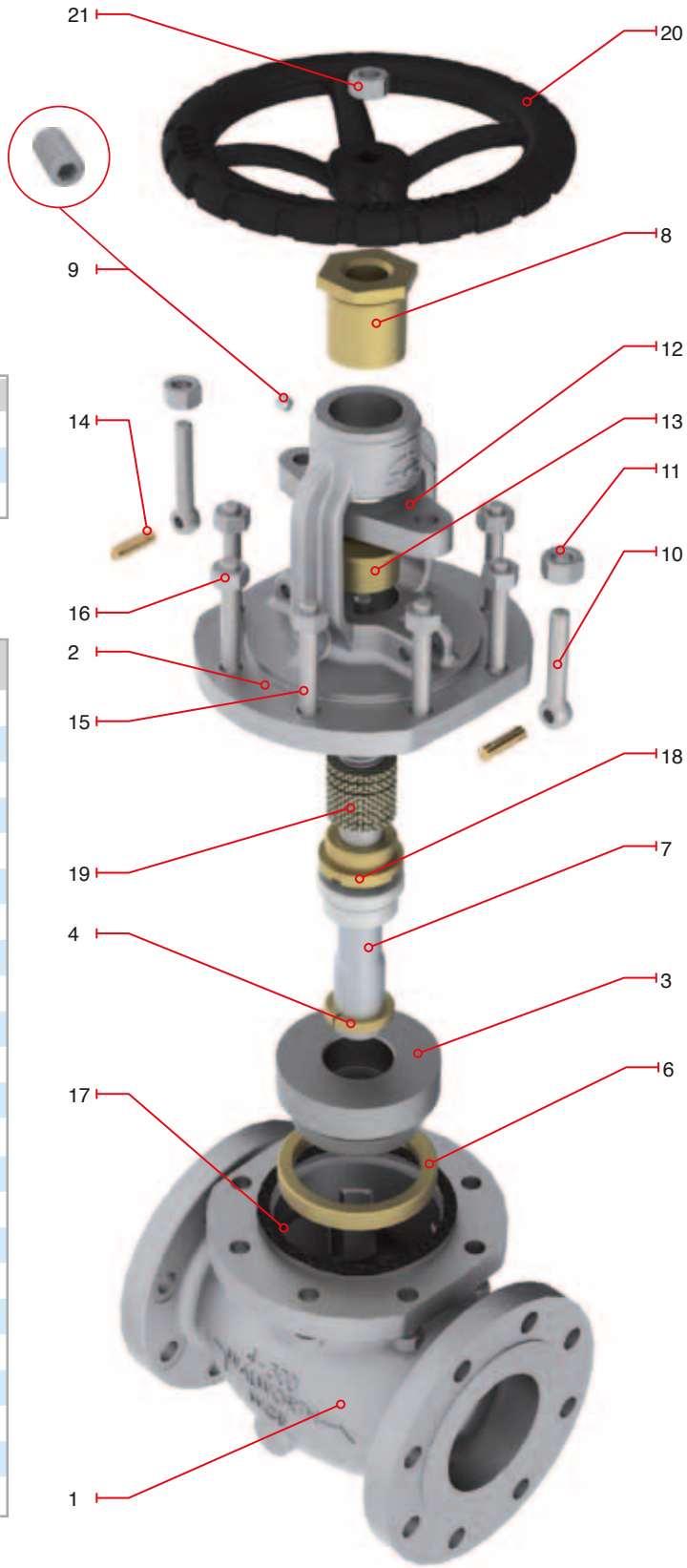
- Design in accordance with ASME B 16.34
- Rising Stem and Handwheel: 6” and smaller
- Rising Stem and Fixed Handwheel: 8” and up
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with Bearings: 8” and larger
- Size 2” to 12” Handwheel operated as standard

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5281RF	5281F	Flanged Raised Face
5281RTJ	5281RJ	Flanged Ring Type Joint
5281WE	5281WE	Buttweld

Regular Bill of Materials

No.	Description	STANDARD MATERIAL
1	Body	ASTM A 216 GR WCB
2	Bonnet	ASTM A 216 GR WCB
3	Disc	ASTM A 276 Type 410
4	Disc Lock Nut	Alloy Steel
*5	Disc Washer	ASTM A 276 Type 410
6	Seat Ring	ASTM A 515 GR 70 + ST6
7	Stem	ASTM A 276 Type 410
8	Stem Nut	ASTM B 148 UNS C95600
9	Screw	Alloy Steel
10	Eyebolt	Alloy Steel
11	Eyebolt Nut	ASTM A 307
12	Gland Flange	ASTM A 515 GR 70
13	Packing Bushing	ASTM A 108 GR 1020
14	Eyebolt Pin	Alloy Steel
15	Bonnet Stud	ASTM A 193 GR B7
16	Bonnet Stud Nut	ASTM A 194 GR 2H
17	Bonnet Gasket	Spiral Stainless 304/Graphite
18	Bonnet Bushing	ASTM A 276 Type 410
19	Stem Packing	Graphite
20	Handwheel	ASTM A 197
21	Handwheel Washer	Commercial Steel
22	Handwheel Nut	ASTM A 307
*23	Identification Plate	Stainless Steel

*Not Shown

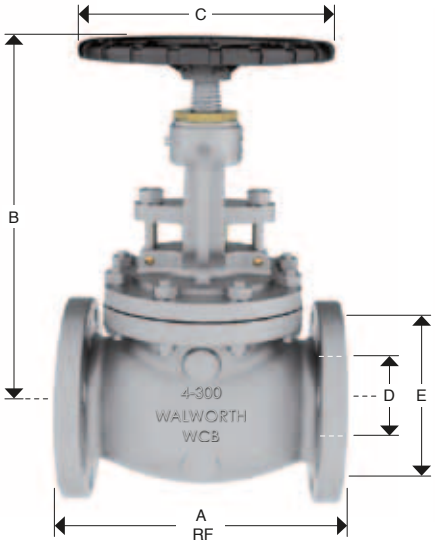


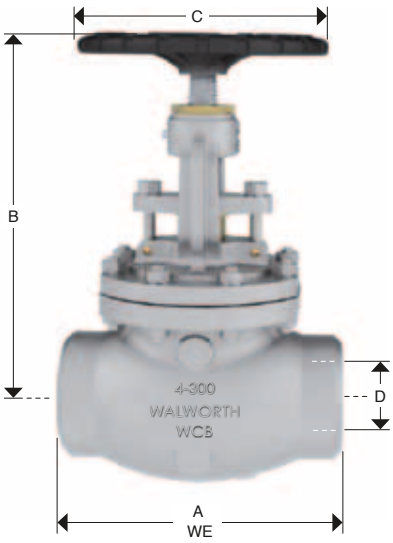
CAST STEEL GLOBE VALVES, CLASS 300
(HANDWHEEL OPERATED)

Design Features

- Design in accordance with ASME B 16.34
- Rising Stem and Handwheel: 6” and smaller
- Rising Stem and Fixed Handwheel: 8” and up
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with Bearings: 8” and larger
- Size 2” to 12” Handwheel operated as standard

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5281RF	5281F	Flanged Raised Face
5281RTJ	5281RJ	Flanged Ring Type Joint
5281WE	5281WE	Buttweld





Dimensions and Weights

D Nominal Diameter	mm	51	64	76	102	152	203	254	305
	in	2	2 1/2	3	4	6	8	10	12
A (RF and WE)	mm	267	292	318	356	445	559	622	711
	in	10 1/2	11 1/2	12 1/2	14	17 1/2	22	24 1/2	28
B	mm	360	505	418	511	621	854	1000	1180
	in	14 3/16	19 7/8	16 7/16	20 1/8	24 7/16	33 5/8	39 3/8	46 7/16
C	mm	203	254	254	356	457	610	762	965
	in	8	10	10	14	18	24	30	38
E	mm	165	191	210	254	318	381	445	521
	in	6 1/2	7 1/2	8 1/4	10	12 1/2	15	17 1/2	20 1/2
Weight 5281RF	kg	26	43	50	78	154	294	461	675
	lb	57.2	94.6	110	171.6	338.8	646.8	1014.2	1485
Weight 5281WE	kg	20	35	40	62	148	254	381	574
	lb	44	77	88	136	326	559	838	1262

For size and dimensions not shown, please contact our Sales Department.

CAST STEEL GLOBE VALVES, CLASS 300
(GEAR OPERATED)

Design Features

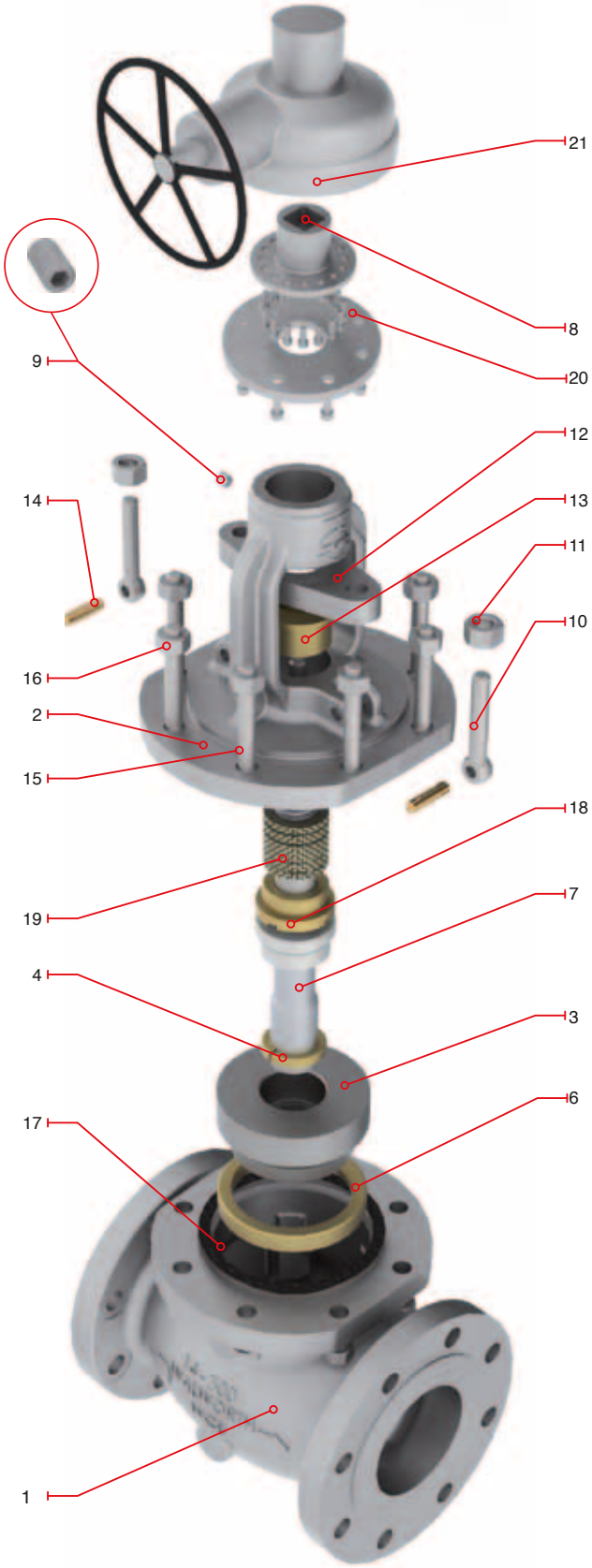
- Design in accordance with ASME B 16.34
- Rising Stem
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with Bearings: 8" and larger
- Size 14" and up Gear operated as standard

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5281RF	5281F	Flanged Raised Face
5281RTJ	5281RJ	Flanged Ring Type Joint
5281WE	5281WE	Buttweld

Regular Bill of Materials

No.	Description	STANDARD MATERIAL
1	Body	ASTM A 216 GR WCB
2	Bonnet	ASTM A 216 GR WCB
3	Disc	ASTM A 276 Type 410
4	Disc Locknut	Alloy Steel
*5	Disc Washer	ASTM A 276 Type 410
6	Seat Ring	ASTM A 515 GR 70 + ST6
7	Stem	ASTM A 276 Type 410
8	Stem Nut	ASTM B 148 UNS C95600
9	Set Screw	Alloy Steel
10	Eyebolt	Alloy Steel
11	Eyebolt Nut	ASTM A 307
12	Gland Flange	ASTM A 515 GR 70
13	Packing Bushing	ASTM A 108 GR 1020
14	Eyebolt Pin	Alloy Steel
15	Bonnet Stud	ASTM A 193 GR B7
16	Bonnet Stud Nut	ASTM A 194 GR 2H
17	Bonnet Gasket	Graphite/Stainless Steel 316
18	Bonnet Bushing	ASTM A 276 Type 410
19	Stem Packing	Graphite
20	Gear Operator	as customer requirements
21	Operator Bolts	Alloy Steel
*22	Identification Plate	Stainless Steel

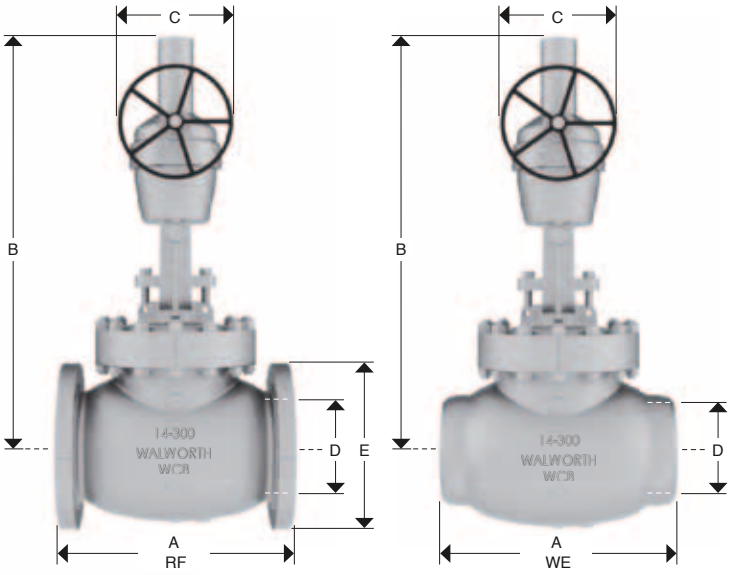
*Not Shown



CAST STEEL GLOBE VALVES, CLASS 300
(GEAR OPERATED)

Design Features
- Design in accordance with ASME B 16.34
- Rising Stem
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with Bearings: 8” and larger
- Size 14” and up Gear operated as standard

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5281RF	5281F	Flanged Raised Face
5281RTJ	5281RJ	Flanged Ring Type Joint
5281WE	5281WE	Buttweld



Dimensions and Weights

D Nominal Diameter	mm	356	406	457	508	610
	in	14	16	18	20	24
A (RF and WE)	mm	838	864	977	1016	1346
	in	33	34	38 1/2	40	53
B	mm	1037	1173	1135	1500	1730
	in	40 7/8	46 1/8	44 5/8	59	68 1/8
C	mm	640	640	600	600	600
	in	25	25	23 5/8	23 5/8	23 5/8
E	mm	584	648	711	775	914
	in	23	25 1/2	28	30 1/2	36
Weight 5281RF	kg	787	1097	1907	2119	2338
	lb	1731.4	2413.4	4195	4662	5144
Weight 5281WE	kg	669	932	1678	1865	2057
	lb	1472	2051	3692	4102	4526

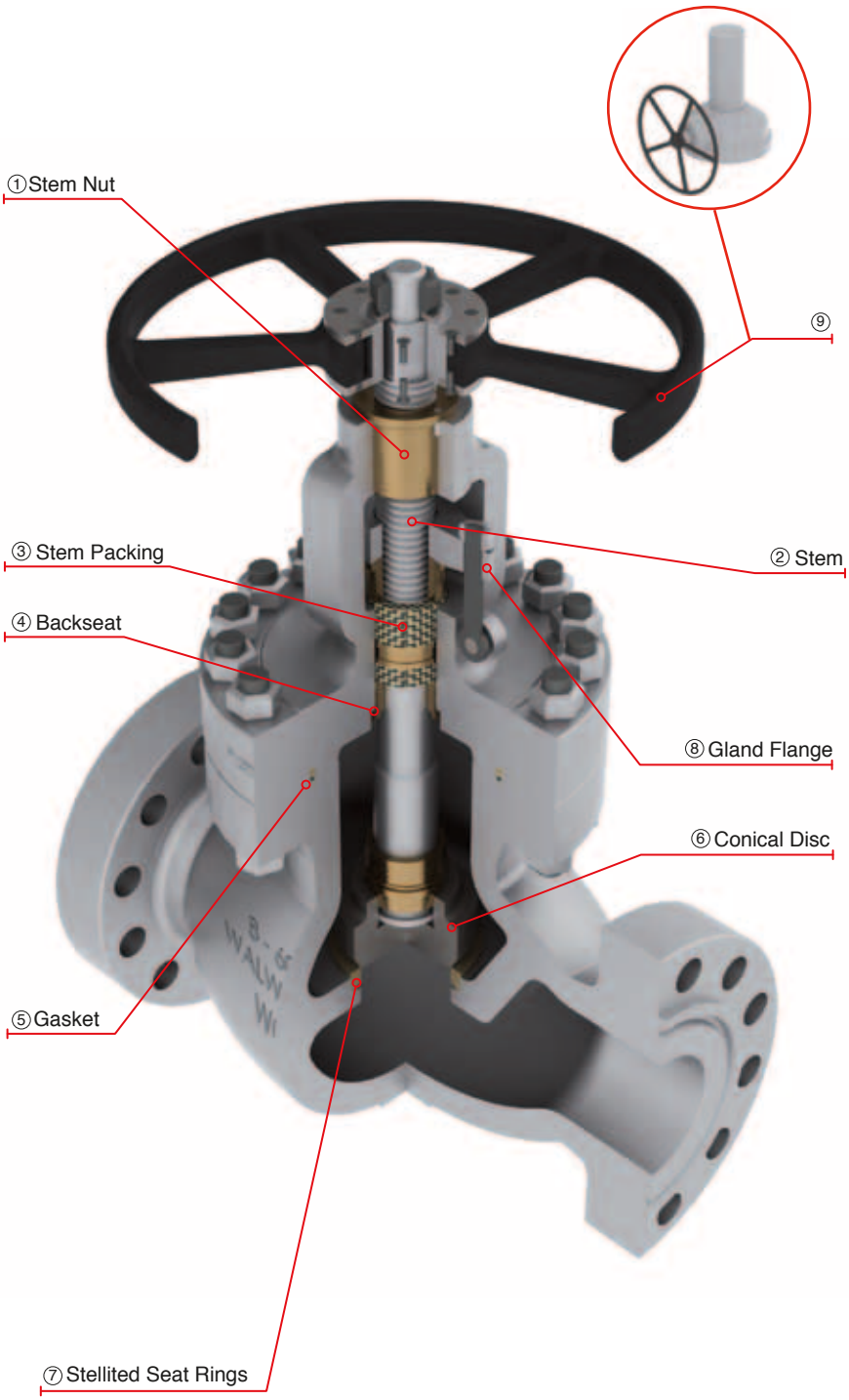
For size and dimensions not shown, please contact our Sales Department.

CAST STEEL GLOBE VALVES CLASS 600

CAST STEEL GLOBE VALVES WITH RISING HANDWHEEL AND STEM.

DESIGN FEATURES

- Globe valves design in accordance with ASME B16.34
- Globe valves option in accordance with API-603 only for stainless steel & nickel alloys.
- Gate & globe valves for cryogenic service with gas column in accordance with BS-6364 upon request
- Flange dimensions in accordance with ASME B16.5 for valves up to 24" nominal diameter
- Handwheel, handwheel impact, chain wheel, gear operation, electric, pneumatic or hyydraulic actuation as per customer requirements
- By-pass, lantern rings, grease injectors, special connections, etc.
- Low fugitive emissions control
- NACE service either MR-01-75 or MR-01-03.
- Test in accordance with API-598
- Stop check design option available



① Stem Nut, replaceable in line to avoid shut down of pipe line process.

② Revolving rising stem with precision ACME single or double thread for quick operation. Surface finish suitable to seal properly to get low fugitive emissions.

③ Stem Packing is designed for optimum control of fugitive emissions leakage to the atmosphere. The ultra low emission leakage rate is assured by the fine finish in the stem, the reduced diametrical clearances and the stem straightness control special designed packing. Live load packing arrangement available upon request.

④ Backseat either threaded or welded, designed to relieve back pressure on the stem packing when fully seated. Replacing stem packing under pressure is not recommended. Hard faced backseat available for severe service as customer requirements

⑤ Body to Bonnet Ring Type Joint designed to apply a uniform load to the gasket to assure a leak proof seal.

⑥ Conical Plug type Disc, integrally guided to assure true alignment between disc and valve body. The loose disc design allows the disc and seat ring sealing surface to seat correctly without damage.

⑦ Stellited Seat Ring is seal welded to provide a increased resistance to wear, abrasion, and erosion of the sealing surfaces.

⑧ Two pieces arrangement gland flange and stem packing bushing for self-alignment to avoid stem damage.

⑨ Impact Handwheel, the mechanism is based on transmitting the momentum generated by the mass of the handwheel through the impact/impulse generated during the snap closure action of the handwheel. This type of handwheel is used when a standard handwheel cannot create enough closing force to effect a seal. Gear operated is also available.

CAST STEEL GLOBE VALVES, CLASS 600
(HANDWHEEL OPERATED)

Design Features

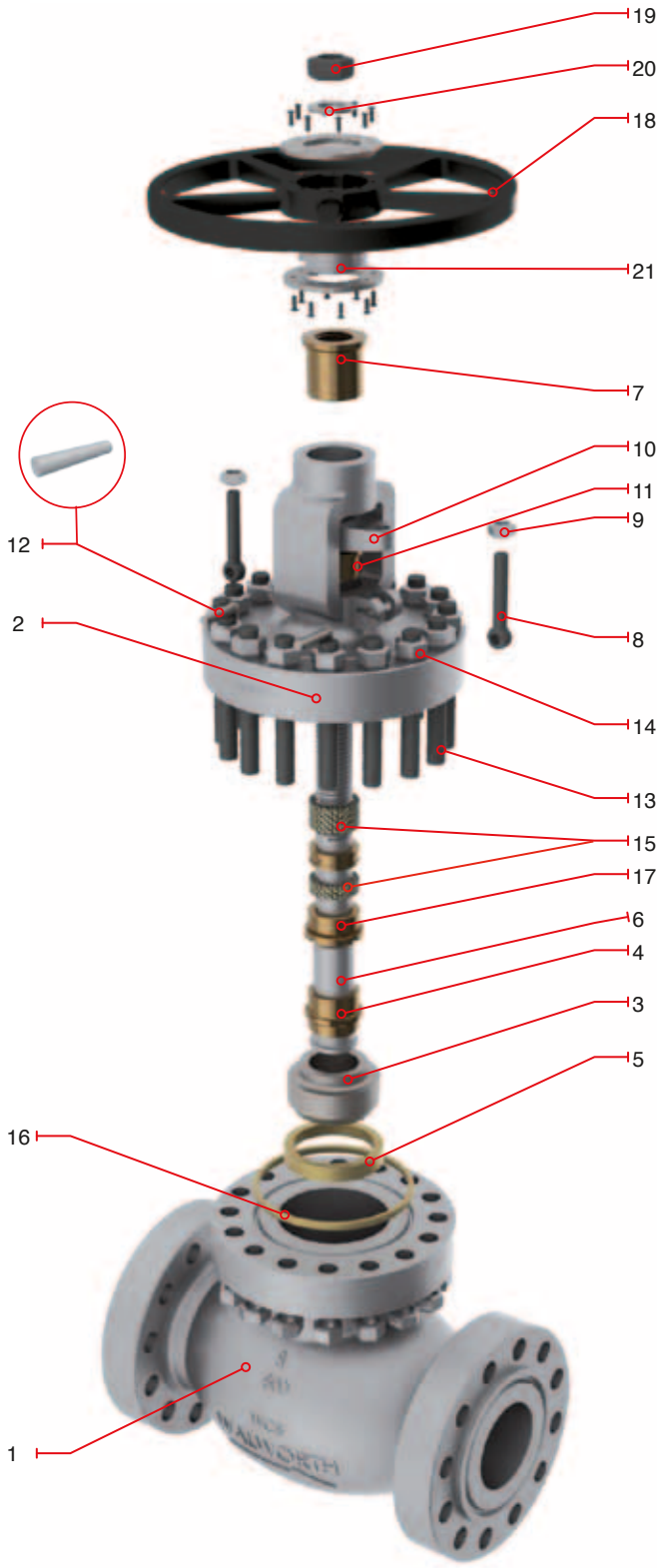
- Design in accordance with ASME B 16.34
- Rising Stem and Handwheel: 2” to 6”
- Rising Stem and fixed handwheel 8” and up
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with Bearings: 8” and larger
- Size 2” and 8” Handwheel operated as standard

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5295RF	5295F	Flanged Raised Face
5295RTJ	5295RJ	Flanged Ring Type Joint
5295WE	5295WE	Buttweld

Regular Bill of Materials

No.	Description	STANDARD MATERIAL
1	Body	ASTM A 216 GR WCB
2	Bonnet	ASTM A 216 GR WCB
3	Disc	ASTM A 276 Type 410
4	Disc Lock Nut	Alloy Steel
5	Seat Ring	ASTM A 515 GR 70 + ST6
6	Stem	ASTM A 276 Type 410
7	Stem Nut	ASTM B 148 UNS C95600
8	Eyebolt	Alloy Steel
9	Eyebolt Nut	ASTM A 307
10	Gland Flange	ASTM A 515 GR 70
11	Packing Bushing	ASTM A 108 GR 1020
12	Eyebolt Pin	Alloy Steel
13	Bonnet Stud	ASTM A 193 GR B7
14	Bonnet Stud Nut	ASTM A 194 GR 2H
15	Stem Packing	Graphite
16	Ring type Joint Gasket	ASTM A 108 GR 1010
17	Bonnet Bushing	ASTM A 276 Type 410
18	Handwheel	ASTM A 197
19	Handwheel Nut	ASTM A 307
20	Clamp	Commercial Steel
21	Impact Bushing	ASTM A 216 GR WCB
22*	Stem Nut Set Screw	Alloy Steel
23*	Identification Plate	Stainless Steel

*Not Shown

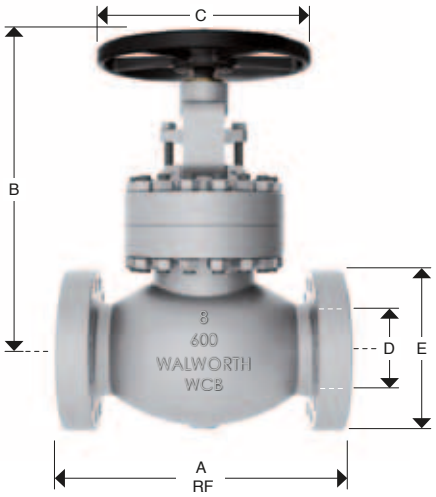


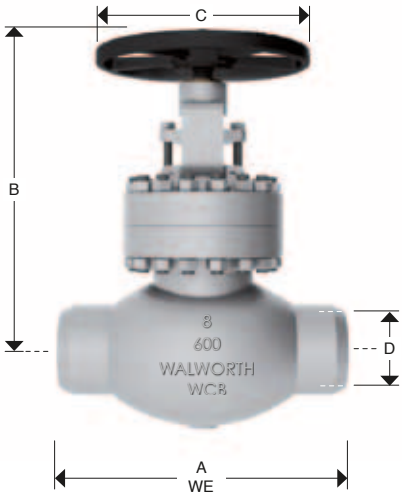
CAST STEEL GLOBE VALVES, CLASS 600
(HANDWHEEL OPERATED)

Design Features

- Design in accordance with ASME B 16.34
- Rising Stem and Handwheel: 2” to 6”
- Rising stem and fixed handwheel 8”
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with Bearings: 8” and larger
- Size 2” and 8” Handwheel operated as standard

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5295RF	5295F	Flanged Raised Face
5295RTJ	5295RJ	Flanged Ring Type Joint
5295WE	5295WE	Buttweld





Dimensions and Weights

D Nominal Diameter	mm	51	64	76	102	152	200
	in	2	2 1/2	3	4	6	8
A (RF and WE)	mm	292	330	356	432	559	660
	in	11 1/2	13	14	17	22	26
A* (RTJ)	mm	295	333	359	435	562	663
	in	11 5/8	13 1/8	14 1/8	17 1/8	22 1/8	26 1/8
B	mm	400	501	493	582	783	925
	in	15 3/4	19 3/4	19 1/2	22 7/8	30 7/8	36 3/8
C	mm	250	300	350	400	500	560
	in	10	12	14	16	20	22
E	mm	165	190	210	273	356	419
	in	6 1/2	7 1/2	8 1/4	10 3/4	14	16 1/2
Weight 5295RF	kg	36	63	66	120	278	429
	lb	79	139	145	264	611	944
Weight 5295WE	kg	30	52	55	102	236	365
	lb	66	115	121	224	519	802

For size and dimensions not shown, please contact our Sales Department.

CAST STEEL GLOBE VALVES, CLASS 600
(GEAR OPERATED)

Design Features

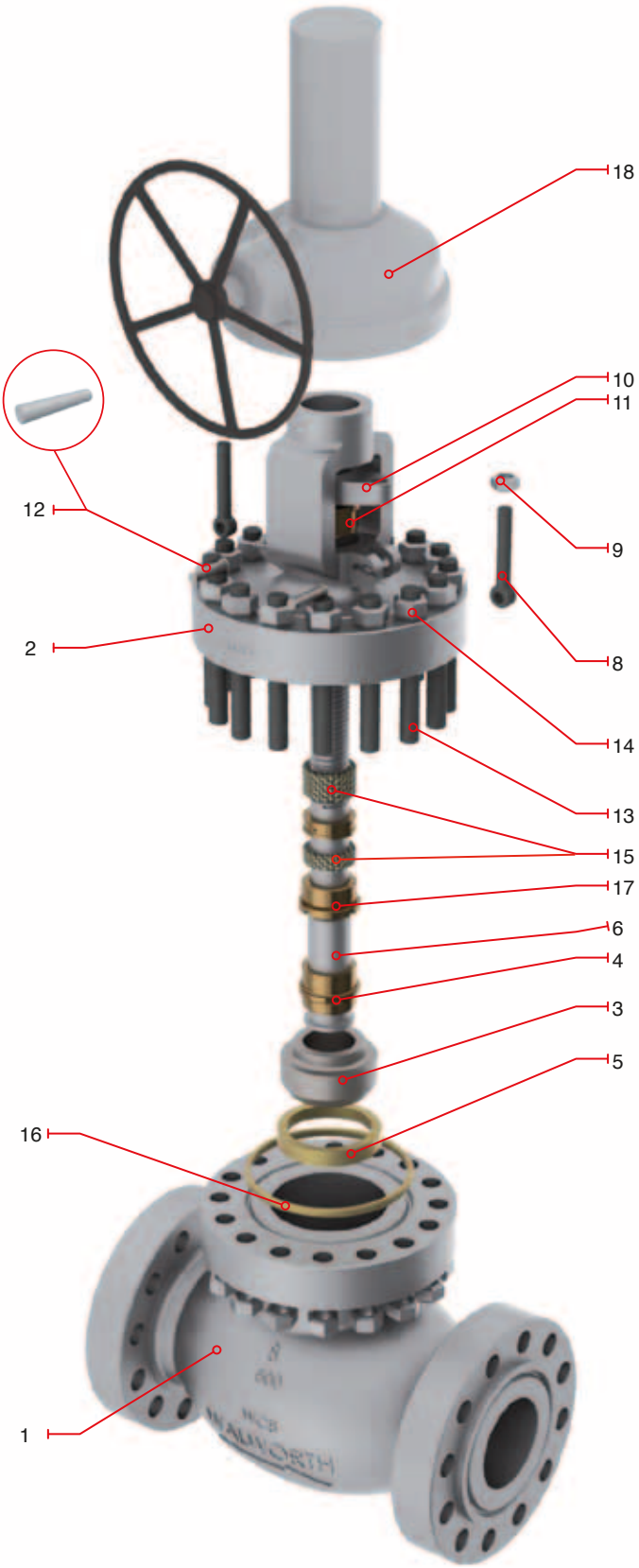
- Design in accordance with ASME B 16.34
- Rising stem
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with Bearings: 8” and larger
- Size 10” and up Gear operated as standard

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5295RF	5295F	Flanged Raised Face
5295RTJ	5295RJ	Flanged Ring Type Joint
5295WE	5295WE	Buttweld

Regular Bill of Materials

No.	Description	STANDARD MATERIAL
1	Body	ASTM A 216 GR WCB
2	Bonnet	ASTM A 216 GR WCB
3	Disc	ASTM A 276 Type 410
4	Disc Lock Nut	Alloy Steel
5	Seat Ring	ASTM A 515 GR 70 + ST6
6	Stem	ASTM A 276 Type 410
*7	Stem Nut	ASTM B 148 UNS C95600
8	Eyebolt	Alloy Steel
9	Eyebolt Nut	ASTM A 307
10	Gland Flange	ASTM A 515 GR 70
11	Packing Bushing	ASTM A 108 GR 1020
12	Eyebolt Pin	Alloy Steel
13	Bonnet Stud	ASTM A 193 GR B7
14	Bonnet Stud Nut	ASTM A 194 GR 2H
15	Stem Packing	Graphite
16	Rising type Joint Gasket	ASTM A 108 GR 1010
17	Bonnet Bushing	ASTM A 276 Type 410
18	Gear Operator	as customer requirements
*19	Operator Bolts	Alloy Steel
*20	Identification Plate	Stainless Steel

*Not Shown

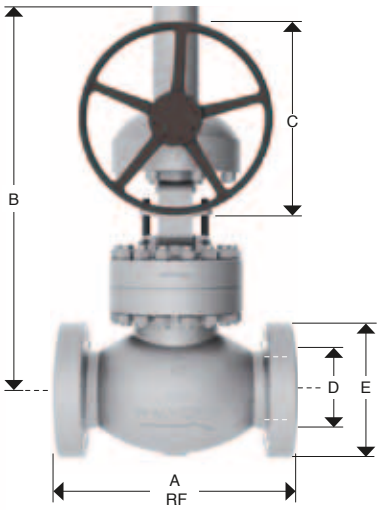


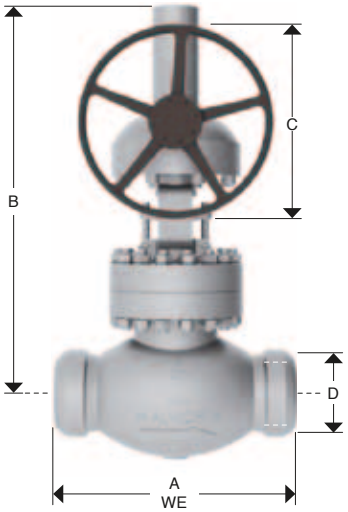
CAST STEEL GLOBE VALVES, CLASS 600
(GEAR OPERATED)

Design Features

- Design in accordance with ASME B 16.34
- Rising Stem
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with Bearings: 8” and larger
- Size 10” and up Gear operated as standard

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5295RF	5295F	Flanged Raised Face
5295RTJ	5295RJ	Flanged Ring Type Joint
5295WE	5295WE	Buttweld





Dimensions and Weights

D Nominal Diameter	mm	254	305	356	406	457	508	610
	in	10	12	14	16	18	20	24
A (RF and WE)	mm	787	838	889	991	PCR	PCR	PCR
	in	31	33	35	39	PCR	PCR	PCR
A* (RTJ)	mm	790	841	892	994	PCR	PCR	PCR
	in	31 1/8	33 1/8	35 1/8	39 1/8	PCR	PCR	PCR
B	mm	994	1122	1196	1327	PCR	PCR	PCR
	in	39 1/8	44 1/8	47 1/8	52 1/4	PCR	PCR	PCR
C	mm	640	700	600	600	PCR	PCR	PCR
	in	25	28	23 5/8	23 5/8	PCR	PCR	PCR
E	mm	508	559	603	686	745	815	940
	in	20	22	23 3/4	27	29 1/4	32	37
Weight 5295RF	kg	737	1194	1421	1899	PCR	PCR	PCR
	lb	1621	2627	3126	4178	PCR	PCR	PCR
Weight 5295WE	kg	649	1051	1322	1766	PCR	PCR	PCR
	lb	1427	2312	2907	3885	PCR	PCR	PCR

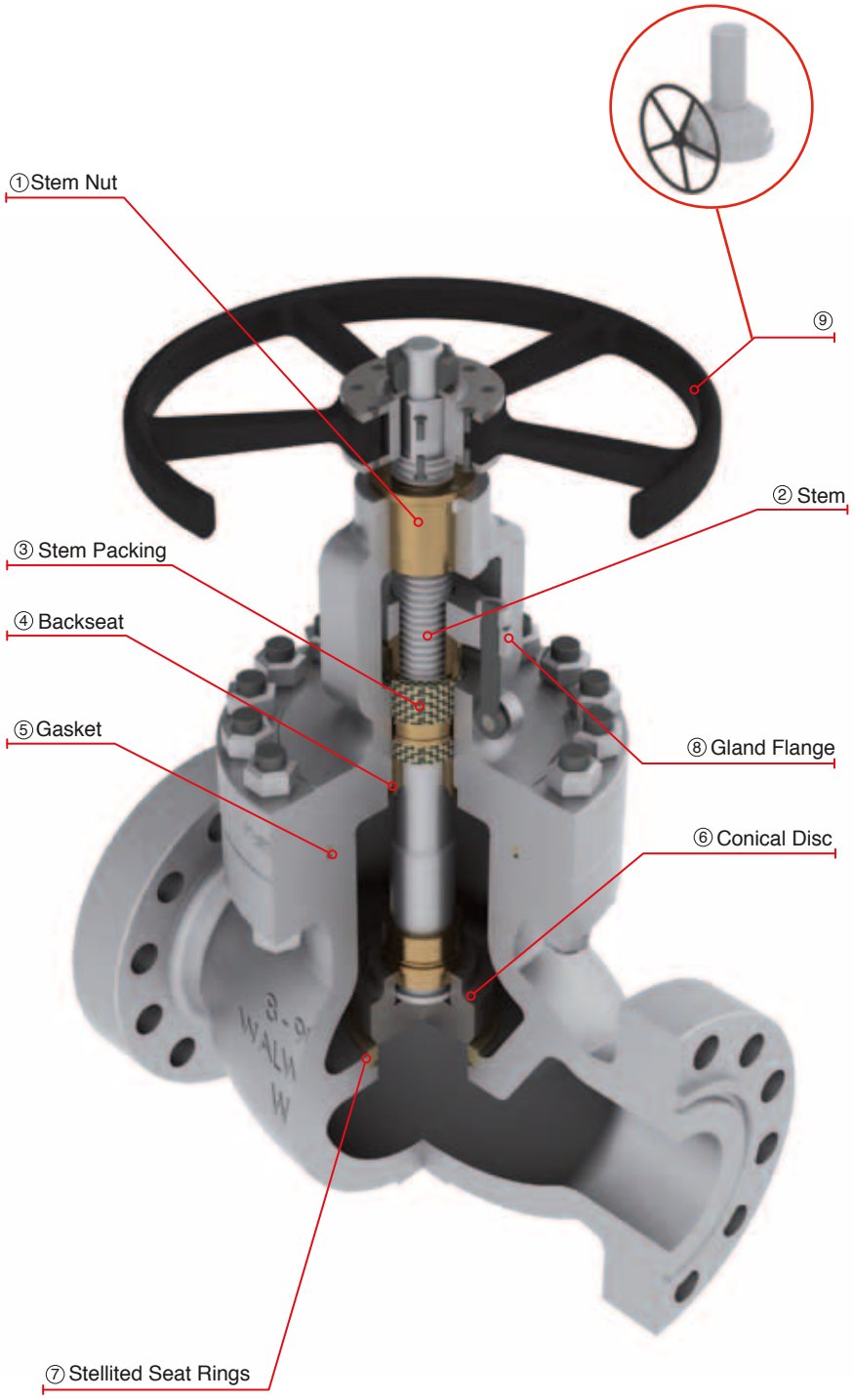
PCR = Per customer request

CAST STEEL GLOBE VALVES CLASS 900

CAST STEEL GLOBE VALVES WITH RISING HANDWHEEL AND STEM.

DESIGN FEATURES

- Globe valves design in accordance with ASME B16.34
- Globe valves option in accordance with API-603 only for stainless steel & nickel alloys.
- Gate & globe valves for cryogenic service with gas column in accordance with BS-6364 upon request
- Flange dimensions in accordance with ASME B16.5 for valves up to 24" nominal diameter
- Handwheel, handwheel impact, chain wheel, gear operation, electric, pneumatic or hyydraulic actuation as per customer requirements
- By-pass, lantern rings, grease injectors, special connections, etc.
- Low fugitive emissions control
- NACE service either MR-01-75 or MR-01-03.
- Test in accordance with API-598
- Stop check design option available



① Stem Nut, replaceable in line to avoid shut down of pipe line process.

② Revolving rising stem with precision ACME single or double thread for quick operation. Surface finish suitable to seal properly to get low fugitive emissions.

③ Stem Packing is designed for optimum control of fugitive emissions leakage to the atmosphere. The ultra low emission leakage rate is assured by the fine finish in the stem, the reduced diametrical clearances and the stem straightness control special designed packing. Live load packing arrangement available upon request.

④ Backseat either threaded or welded, designed to relieve back pressure on the stem packing when fully seated. Replacing stem packing under pressure is not recommended. Hard faced backseat available for severe service as customer requirements

⑤ Body to Bonnet Ring Type Joint designed to apply a uniform load to the gasket to assure a leak proof seal.

⑥ Conical Plug type Disc, integrally guided to assure true alignment between disc and valve body. The loose disc design allows the disc and seat ring sealing surface to seat correctly without damage.

⑦ Stellited Seat Ring is seal welded to provide a increased resistance to wear, abrasion, and erosion of the sealing surfaces.

⑧ Two pieces arrangement gland flange and stem packing bushing for self-alignment to avoid stem damage.

⑨ Impact Handwheel, the mechanism is based on transmitting the momentum generated by the mass of the handwheel through the impact/impulse generated during the snap closure action of the handwheel. This type of handwheel is used when a standard handwheel cannot create enough closing force to effect a seal. Gear operated is also available.

CAST STEEL GLOBE VALVES, CLASS 900
(HANDWHEEL OPERATED)

Design Features

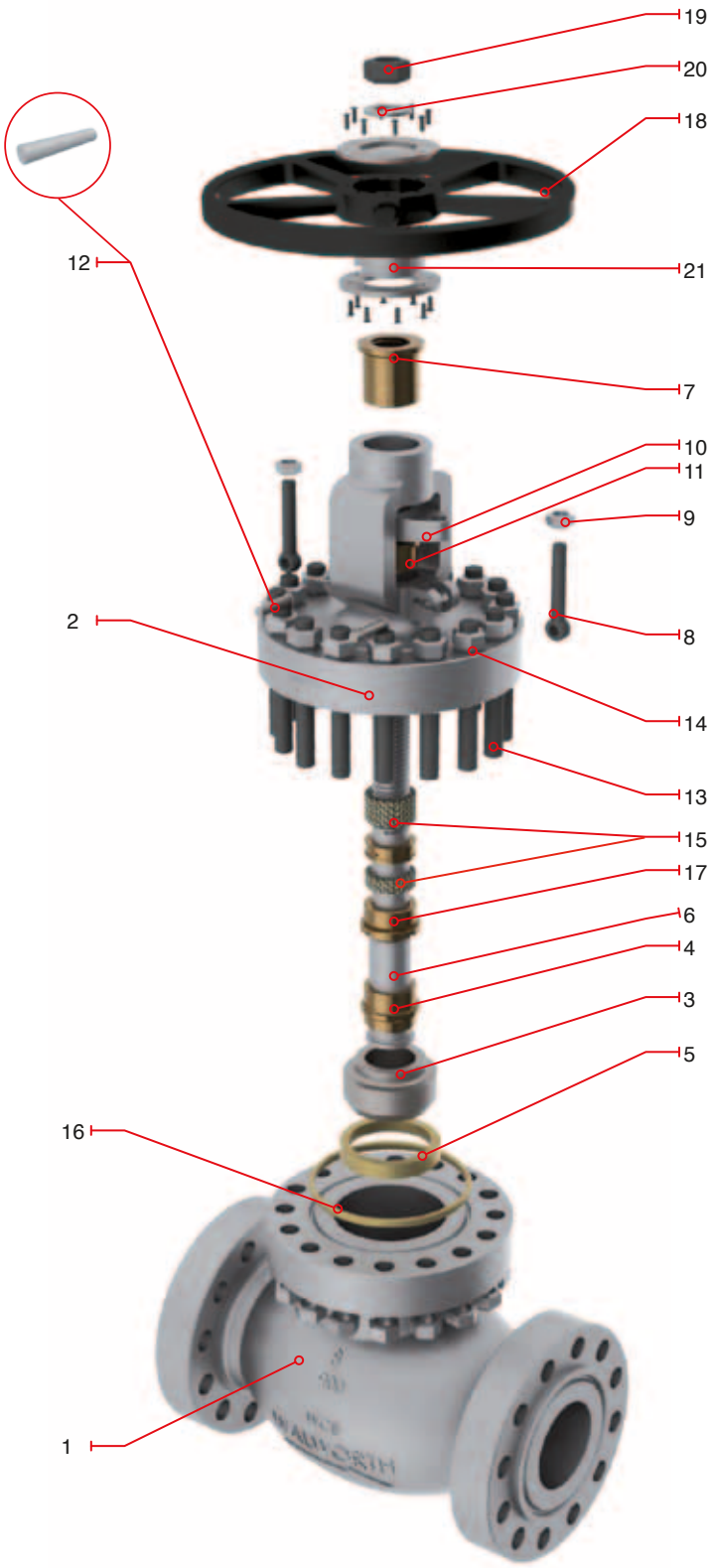
- Design in accordance with ASME B 16.34
- Rising Stem and Handwheel: 2" to 3"
- Rising Stem and Fixed Handwheel: 4" and up
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with bearings 4" and larger
- Size 2" to 6" Handwheel operated as standard

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5301RF	5301F	Flanged Raised Face
5301RTJ	5301RJ	Flanged Ring Type Joint
5301WE	5301WE	Buttweld

Regular Bill of Materials

No.	Description	STANDARD MATERIAL
1	Body	ASTM A 216 GR WCB
2	Bonnet	ASTM A 216 GR WCB
3	Disc	ASTM A 276 Type 410
4	Disc Lock Nut	Alloy Steel
5	Seat Ring	ASTM A 515 GR 70 + ST6
6	Stem	ASTM A 276 Type 410
7	Stem Nut	ASTM B 148 UNS C95600
8	Eyebolt	Alloy Steel
9	Eyebolt Nut	ASTM A 307
10	Gland Flange	ASTM A 515 GR 70
11	Packing Bushing	ASTM A 108 GR 1020
12	Eyebolt Pin	Alloy Steel
13	Bonnet Stud	ASTM A 193 GR B7
14	Bonnet Stud Nut	ASTM A 194 GR 2H
15	Stem Packing	Graphite
16	Ring type Joint Gasket	ASTM A 108 GR 1010
17	Bonnet Bushing	ASTM A 276 Type 410
18	Handwheel	ASTM A 197
19	Handwheel Nut	ASTM A 307
20	Clamp	Commercial Steel
21	Impact Bushing	ASTM A 216 GR WCB
22*	Stem Nut Set Screw	Alloy Steel
23*	Identification Plate	Stainless Steel

*Not Shown

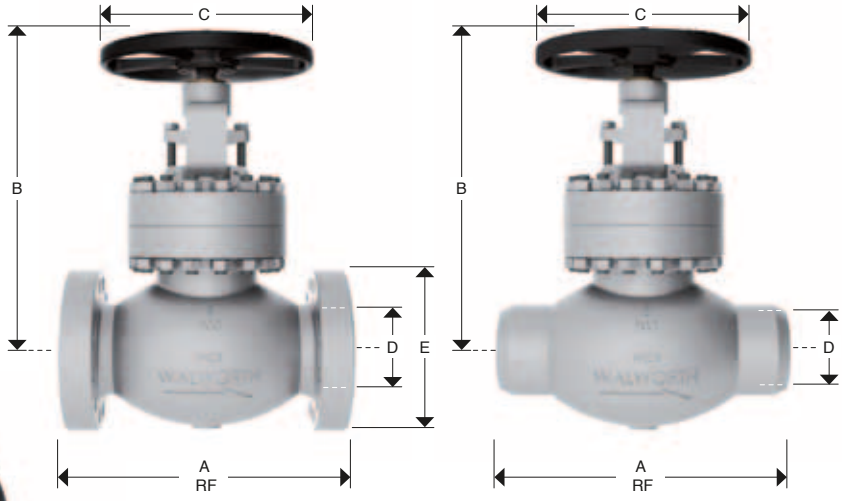


CAST STEEL GLOBE VALVES, CLASS 900
(HANDWHEEL OPERATED)

Design Features

- Design in accordance with ASME B 16.34
- Rising Stem and Handwheel: 2” to 3”
- Rising Stem and Fixed Handwheel: 4” and up
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Bonnet with bearings 4” and larger
- Size 2” to 6” Handwheel operated as standard

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5301RF	5301F	Flanged Raised Face
5301RTJ	5301RJ	Flanged Ring Type Joint
5301WE	5301WE	Buttweld



Dimensions and Weights

D Nominal Diameter	mm	76	102	152
	in	3	4	6
A (RF and WE)	mm	381	457	610
	in	15	18	24
A* (RTJ)	mm	384	460	613
	in	15 1/8	18 1/8	24 1/8
B	mm	573	738	854
	in	22 1/2	29	33 5/8
C	mm	400	450	560
	in	16	18	22
E	mm	241	292	381
	in	9 1/2	11 1/2	15
Weight 5301RF	kg	113	206	328
	lb	249	453	722
Weight 5301WE	kg	94	175	279
	lb	206	385	613

CAST STEEL GLOBE VALVES, CLASS 900
(GEAR OPERATED)

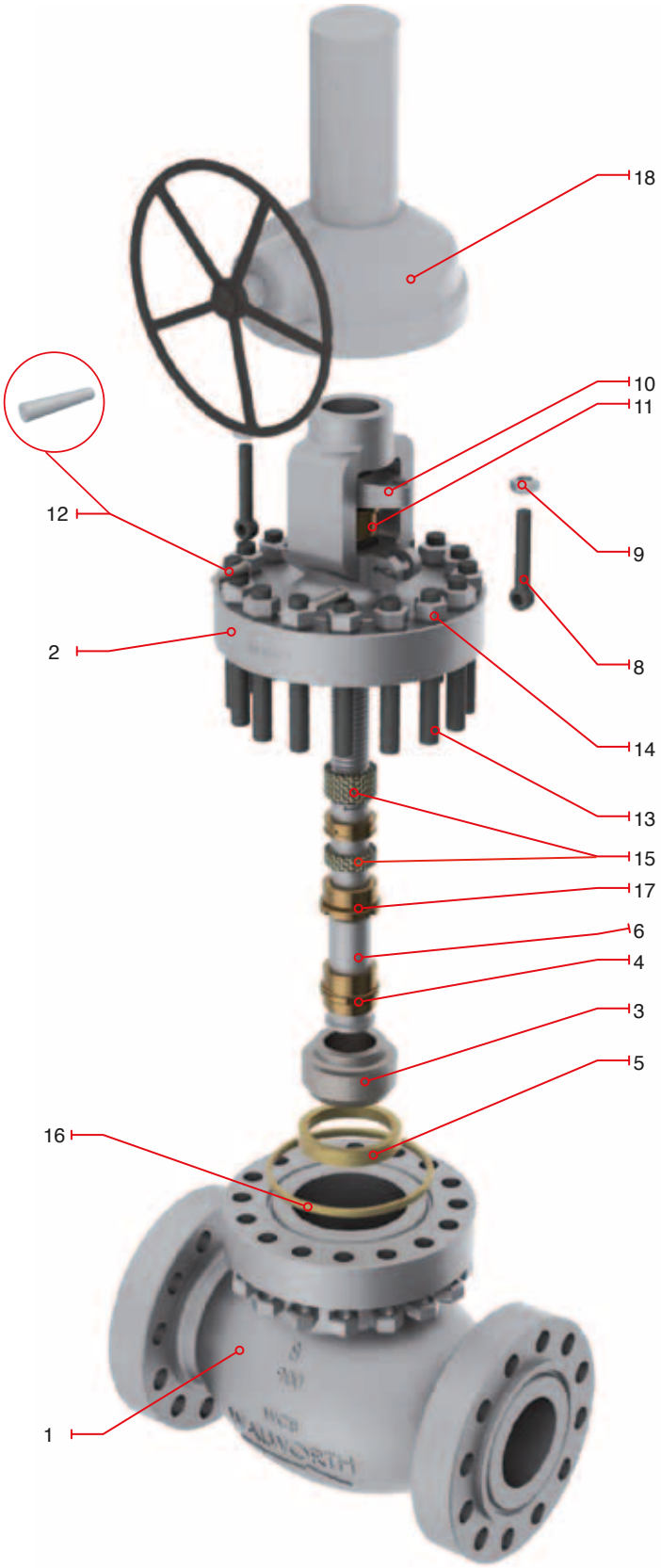
Design Features
- Design in accordance with ASME B16.34
- Rising stem
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Size 8" and up Gear operated as standard

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5301RF	5301F	Flanged Raised Face
5301RTJ	5301RJ	Flanged Ring Type Joint
5301WE	5301WE	Buttweld

Regular Bill of Materials

No.	Description	STANDARD MATERIAL
1	Body	ASTM A 216 GR WCB
2	Bonnet	ASTM A 216 GR WCB
3	Disc	ASTM A 276 Type 410
4	Disc Lock Nut	Alloy Steel
5	Seat Ring	ASTM A 515 GR 70 + ST6
6	Stem	ASTM A 276 Type 410
*7	Stem Nut	ASTM B 148 UNS C95600
8	Eyebolt	Alloy Steel
9	Eyebolt Nut	ASTM A 307
10	Gland Flange	ASTM A 515 GR 70
11	Packing Bushing	ASTM A 108 GR 1020
12	Eyebolt Pin	Alloy Steel
13	Bonnet Stud	ASTM A 193 GR B7
14	Bonnet Stud Nut	ASTM A 194 GR 2H
15	Stem Packing	Graphite
16	Ring type Joint Gasket	ASTM A 108 GR 1010
17	Bonnet Bushing	ASTM A 276 Type 410
18	Gear Operator	as customer requirements
*19	Operator Bolts	Alloy Steel
*20	Identification Plate	Stainless Steel

*Not Shown

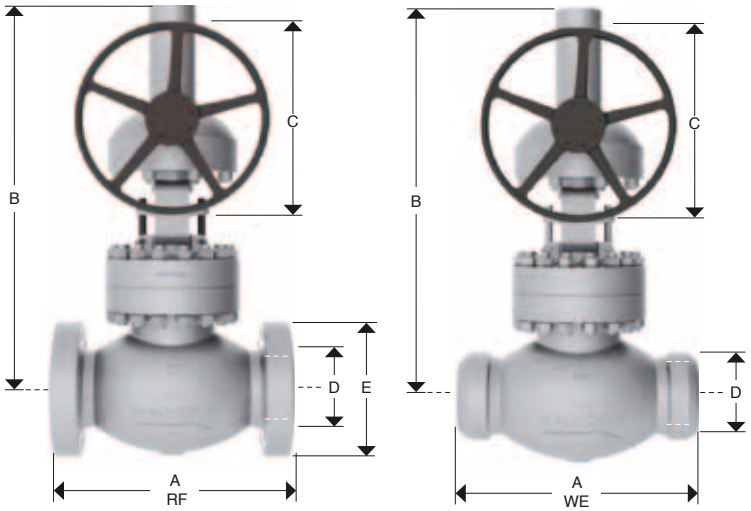


CAST STEEL GLOBE VALVES, CLASS 900
(GEAR OPERATED)

Design Features

- Design in accordance with ASME B16.34
- Rising stem
- Size 8” and up Gear operated as standard
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5301RF	5301F	Flanged Raised Face
5301RTJ	5301RJ	Flanged Ring Type Joint
5301WE	5301WE	Buttweld



Dimensions and Weights

D Nominal Diameter	mm	203	254	305	356	406	457	508	610
	in	8	10	12	14	16	18	20	24
A (RF and WE)	mm	737	838	965	1029	PCR	PCR	PCR	PCR
	in	29	33	38	40 1/2	PCR	PCR	PCR	PCR
A* (RTJ)	mm	740	841	968	1038	PCR	PCR	PCR	PCR
	in	29 1/8	33 1/8	38 1/8	40 7/8	PCR	PCR	PCR	PCR
B	mm	907	980	1286	2083	PCR	PCR	PCR	PCR
	in	35 3/4	38 5/8	50 5/8	82	PCR	PCR	PCR	PCR
C	mm	640	530	600	956	PCR	PCR	PCR	PCR
	in	25	20 7/8	23 5/8	38	PCR	PCR	PCR	PCR
E	mm	470	545	610	640	705	785	855	1040
	in	18 1/2	21 1/2	24	25 1/4	27 3/4	31	33 3/4	41
Weight 5301RF	kg	593	1850	2998	2900	PCR	PCR	PCR	PCR
	lb	1305	4070	6596	6380	PCR	PCR	PCR	PCR
Weight 5301WE	kg	504	1721	2788	2697	PCR	PCR	PCR	PCR
	lb	1109	3785	6134	5933	PCR	PCR	PCR	PCR

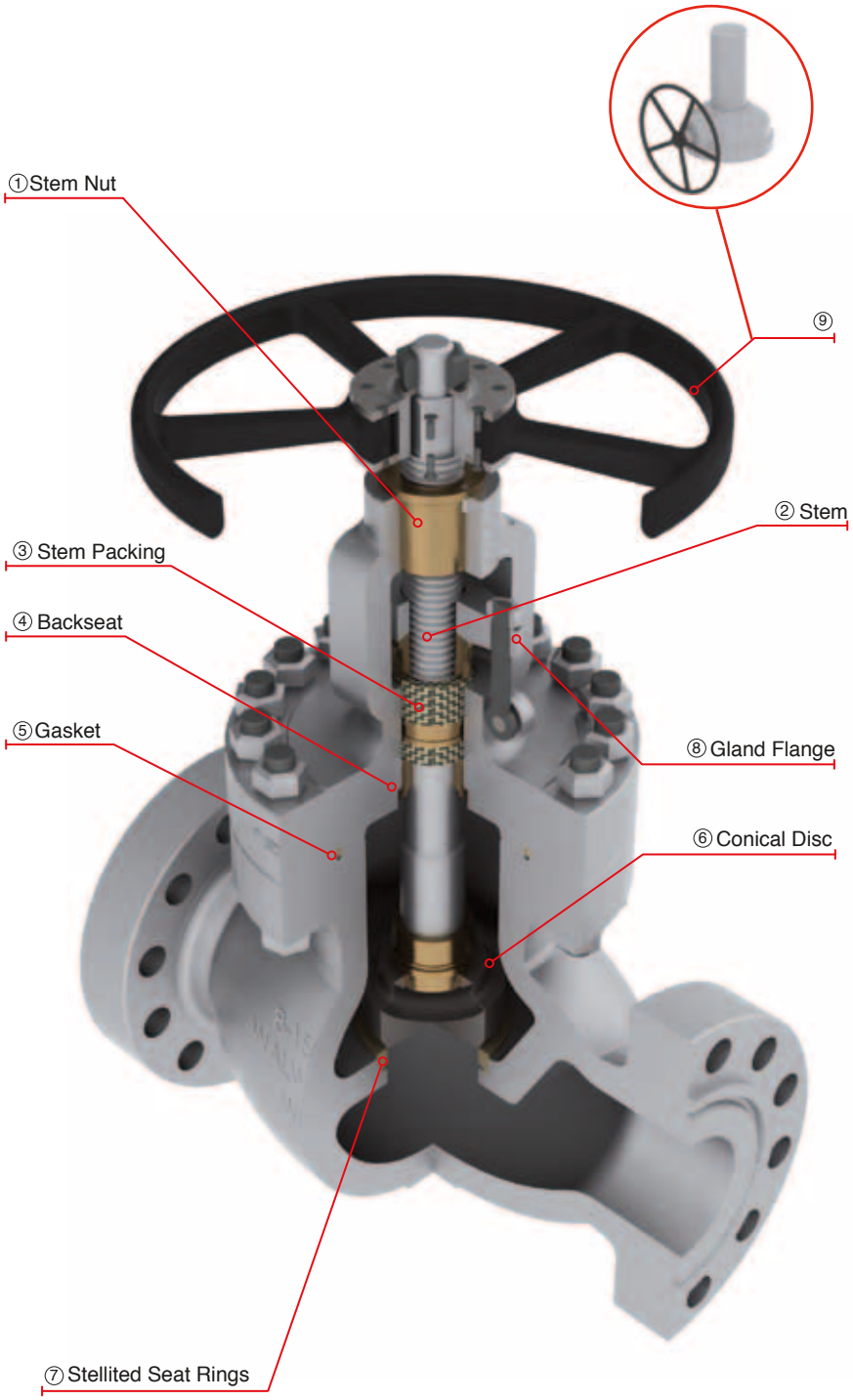
PCR = Per customer request

CAST STEEL GLOBE VALVES CLASS 1500

CAST STEEL GLOBE VALVES WITH RISING HANDWHEEL AND STEM.

DESIGN FEATURES

- Globe valves design in accordance with ASME B16.34
- Globe valves option in accordance with API-603 only for stainless steel & nickel alloys.
- Gate & globe valves for cryogenic service with gas column in accordance with BS-6364 upon request
- Flange dimensions in accordance with ASME B16.5 for valves up to 24" nominal diameter
- Handwheel, handwheel impact, chain wheel, gear operation, electric, pneumatic or hyydraulic actuation as per customer requirements
- By-pass, lantern rings, grease injectors, special connections, etc.
- Low fugitive emissions control
- NACE service either MR-01-75 or MR-01-03.
- Test in accordance with API-598
- Stop check design option available



① Stem Nut, replaceable in line to avoid shut down of pipe line process.

② Revolving rising stem with precision ACME single or double thread for quick operation. Surface finish suitable to seal properly to get low fugitive emissions.

③ Stem Packing is designed for optimum control of fugitive emissions leakage to the atmosphere. The ultra low emission leakage rate is assured by the fine finish in the stem, the reduced diametrical clearances and the stem straightness control special designed packing. Live load packing arrangement available upon request.

④ Backseat either threaded or welded, designed to relieve back pressure on the stem packing when fully seated. Replacing stem packing under pressure is not recommended. Hard faced backseat available for severe service as customer requirements

⑤ Body to Bonnet Joint designed to apply a uniform load to the gasket to assure a leak proof seal.

⑥ Conical Plug type Disc, integrally guided to assure true alignment between disc and valve body. The loose disc design allows the disc and seat ring sealing surface to seat correctly without damage.

⑦ Stellited Seat Ring is seal welded to provide a increased resistance to wear, abrasion, and erosion of the sealing surfaces.

⑧ Two pieces arrangement gland flange and stem packing bushing for self-alignment to avoid stem damage.

⑨ Impact Handwheel, the mechanism is based on transmitting the momentum generated by the mass of the handwheel through the impact/impulse generated during the snap closure action of the handwheel. This type of handwheel is used when a standard handwheel cannot create enough closing force to effect a seal. Gear operated is also available.

CAST STEEL GLOBE VALVES, CLASS 1500
(HANDWHEEL OPERATED)

Design Features

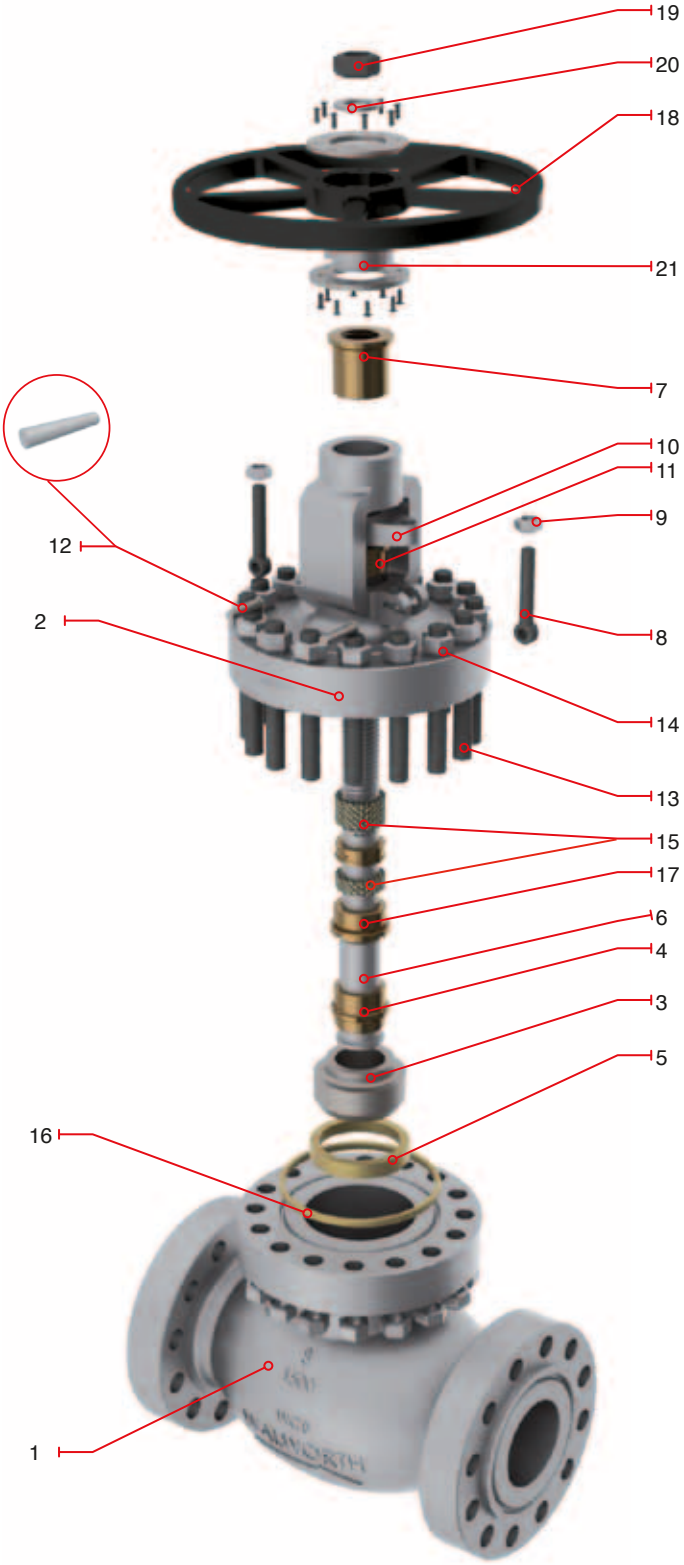
- Design in accordance with ASME B16.34
- Rising Stem and Handwheel: 2” and 2 1/2”
- Rising Stem and Fixed Handwheel: 3” and up
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Yoke with Bearings: 3” and larger
- Size 2” to 6” Handwheel operated as standard

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5308RF	5308F	Flanged Raised Face
5308RTJ	5308RJ	Flanged Ring Type Joint
5308WE	5308WE	Buttweld

Regular Bill of Materials

No.	Description	STANDARD MATERIAL
1	Body	ASTM A 216 GR WCB
2	Bonnet	ASTM A 216 GR WCB
3	Disc	ASTM A 276 Type 410
4	Disc Lock Nut	Alloy Steel
5	Seat Ring	ASTM A 515 GR 70 + ST6
6	Stem	ASTM A 276 Type 410
7	Stem Nut	ASTM B 148 UNS C95600
8	Eyebolt	Alloy Steel
9	Eyebolt Nut	ASTM A 307
10	Gland Flange	ASTM A 515 GR 70
11	Packing Bushing	ASTM A 108 GR 1020
12	Eyebolt Pin	Alloy Steel
13	Bonnet Stud	ASTM A 193 GR B7
14	Bonnet Stud Nut	ASTM A 194 GR 2H
15	Stem Packing	Graphite
16	Ring type Joint Gasket	ASTM A 108 GR 1010
17	Bonnet Bushing	ASTM A 276 Type 410
18	Handwheel	ASTM A 197
19	Handwheel Nut	ASTM A 307
20	Clamp	Commercial Steel
21	Impact Bushing	ASTM A 216 GR WCB
22*	Stem Nut Set Screw	Alloy Steel
23*	Identification Plate	Stainless Steel

*Not Shown

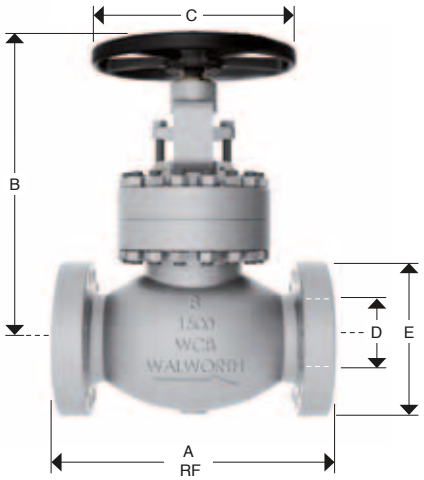


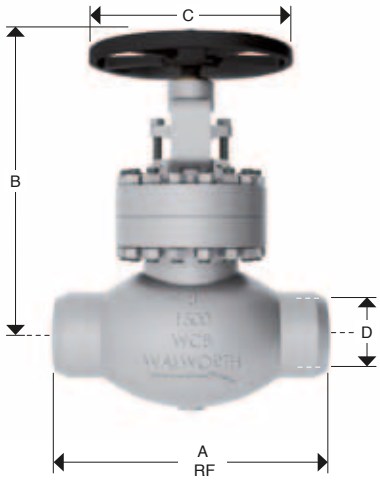
CAST STEEL GLOBE VALVES, CLASS 1500
(HANDWHEEL OPERATED)

Design Features

- Design in accordance with ASME B16.34
- Rising Stem and Handwheel: 2” and 2 1/2”
- Rising Stem and Fixed Handwheel: 3” and up
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Yoke with Bearings: 3” and larger
- Size 2” to 6” Handwheel operated as standard

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5308RF	5308F	Flanged Raised Face
5308RTJ	5308RJ	Flanged Ring Type Joint
5308WE	5308WE	Buttweld





Dimensions and Weights

D Nominal Diameter	mm	51	64	76	102	152
	in	2	2 1/2	3	4	6
A (RF and WE)	mm	368	419	470	546	705
	in	14 1/2	16 1/2	18 1/2	21 1/2	27 3/4
A* (RTJ)	mm	371	422	473	549	711
	in	14 5/8	16 5/8	18 5/8	21 5/8	28
B	mm	477	537	622	733	933
	in	18 3/4	21 1/4	24 1/2	28 7/8	36 3/4
C	mm	350	350	450	450	640
	in	14	14	18	18	25
E	mm	216	244	267	311	394
	in	8 1/2	9 5/8	10 1/2	12 1/4	15 1/2
Weight 5308RF	kg	82	121	161	252	574
	lb	180	266	354	554	1262
Weight 5308WE	kg	68	100	134	214	487
	lb	150	221	294	471	1072

CAST STEEL GLOBE VALVES, CLASS 1500
(GEAR OPERATED)

Design Features

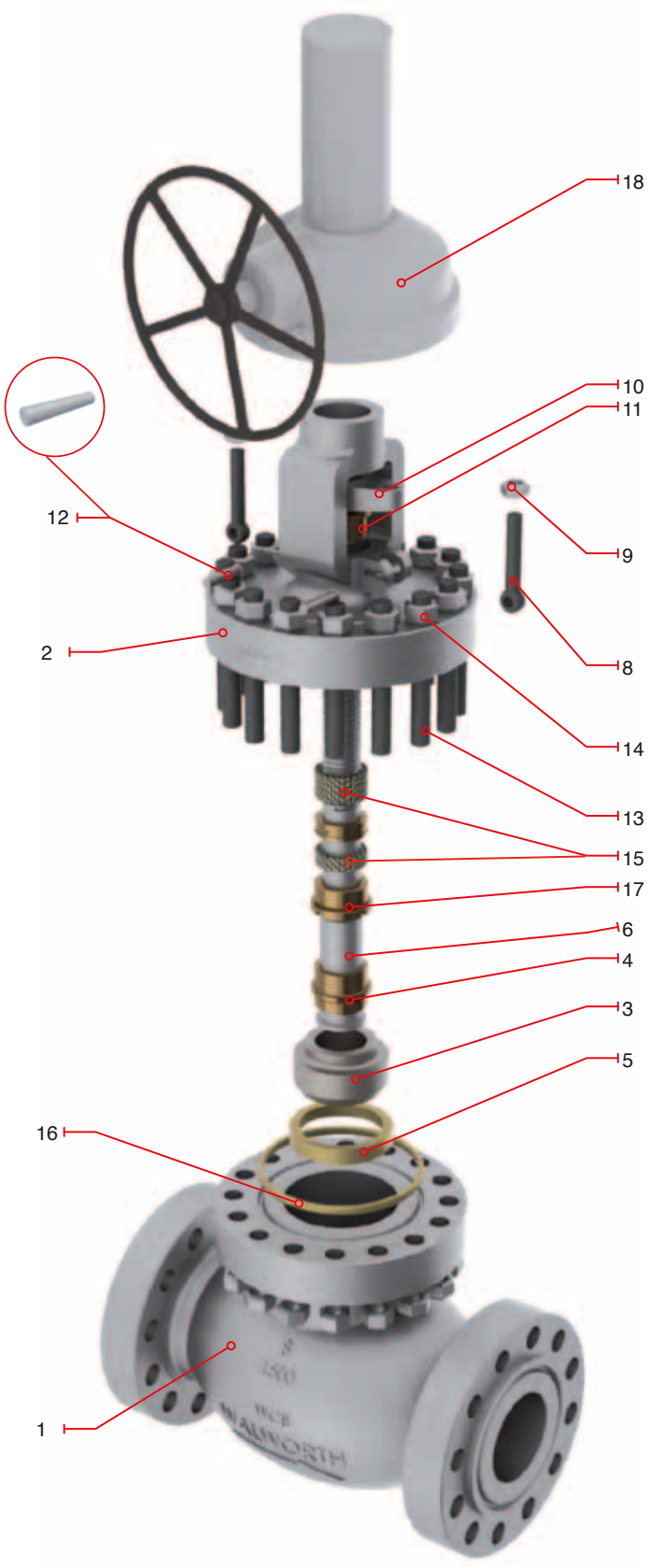
- Design in accordance with ASME B16.34
- Rising stem
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Yoke with Bearings: 3” and larger
- Size 8”and up Gear operated as standard

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5308RF	5308F	Flanged Raised Face
5308RTJ	5308RJ	Flanged Ring Type Joint
5308WE	5308WE	Buttweld

Regular Bill of Materials

No.	Description	STANDARD MATERIAL
1	Body	ASTM A 216 GR WCB
2	Bonnet	ASTM A 216 GR WCB
3	Disc	ASTM A 276 Type 410
4	Disc Lock Nut	Alloy Steel
5	Seat Ring	ASTM A 515 GR 70 + ST6
6	Stem	ASTM A 276 Type 410
*7	Stem Nut	ASTM B 148 UNS C95600
8	Eyebolt	Alloy Steel
9	Eyebolt Nut	ASTM A 307
10	Gland Flange	ASTM A 515 GR 70
11	Packing Bushing	ASTM A 108 GR 1020
12	Eyebolt Pin	Alloy Steel
13	Bonnet Stud	ASTM A 193 GR B7
14	Bonnet Stud Nut	ASTM A 194 GR 2H
15	Stem Packing	Graphite
16	Ring type Joint Gasket	ASTM A 108 GR 1010
17	Bonnet Bushing	ASTM A 276 Type 410
18	Gear Operator	as customer requirements
*19	Operator Bolts	Alloy Steel
*20	Identification Plate	Stainless Steel

*Not Shown

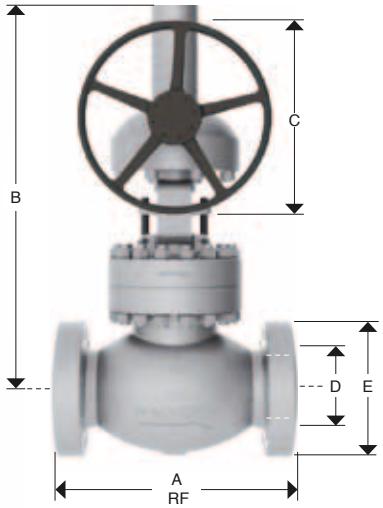


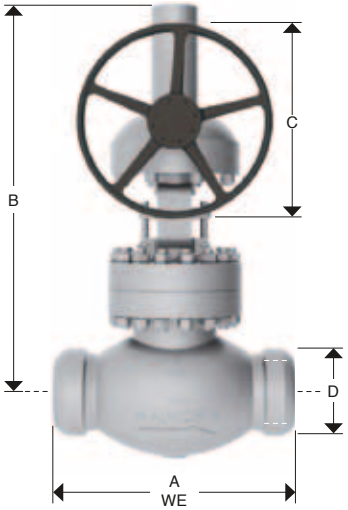
CAST STEEL GLOBE VALVES, CLASS 1500

Design Features

- Design in accordance with ASME B16.34
- Rising stem
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25 Yoke with Bearings:
- Yoke with Bearings: 3” and larger
- Size 8”and up to 24” Gear operated as standard

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5308RF	5308F	Flanged Raised Face
5308RTJ	5308RJ	Flanged Ring Type Joint
5308WE	5308WE	Buttweld





Dimensions and Weights

D Nominal Diameter	mm	203	254	305	356	406	457	508	610
	in	8	10	12	14	16	18	20	24
A (RF and WE)	mm	832	991	1130	1257	PCR	PCR	PCR	PCR
	in	32 3/4	39	44 1/2	49 1/2	PCR	PCR	PCR	PCR
A* (RTJ)	mm	842	1001	1146	1276	PCR	PCR	PCR	PCR
	in	33 1/8	39 3/8	45 1/8	50 1/4	PCR	PCR	PCR	PCR
B	mm	1029	1618	1675	1800	PCR	PCR	PCR	PCR
	in	40 1/2	63 3/4	66	70 3/4	PCR	PCR	PCR	PCR
C	mm	640	600	600	600	PCR	PCR	PCR	PCR
	in	25	23 5/8	23 5/8	23 5/8	PCR	PCR	PCR	PCR
E	mm	483	585	673	750	825	915	985	1170
	in	19	23	26 1/2	29 1/2	32 1/2	36	38 3/4	46
Weight 5308RF	kg	949	2238	3308	4678	PCR	PCR	PCR	PCR
	lb	2088	4924	7278	10292	PCR	PCR	PCR	PCR
Weight 5308WE	kg	807	2081	3076	4351	PCR	PCR	PCR	PCR
	lb	1775	4579	6768	9571	PCR	PCR	PCR	PCR

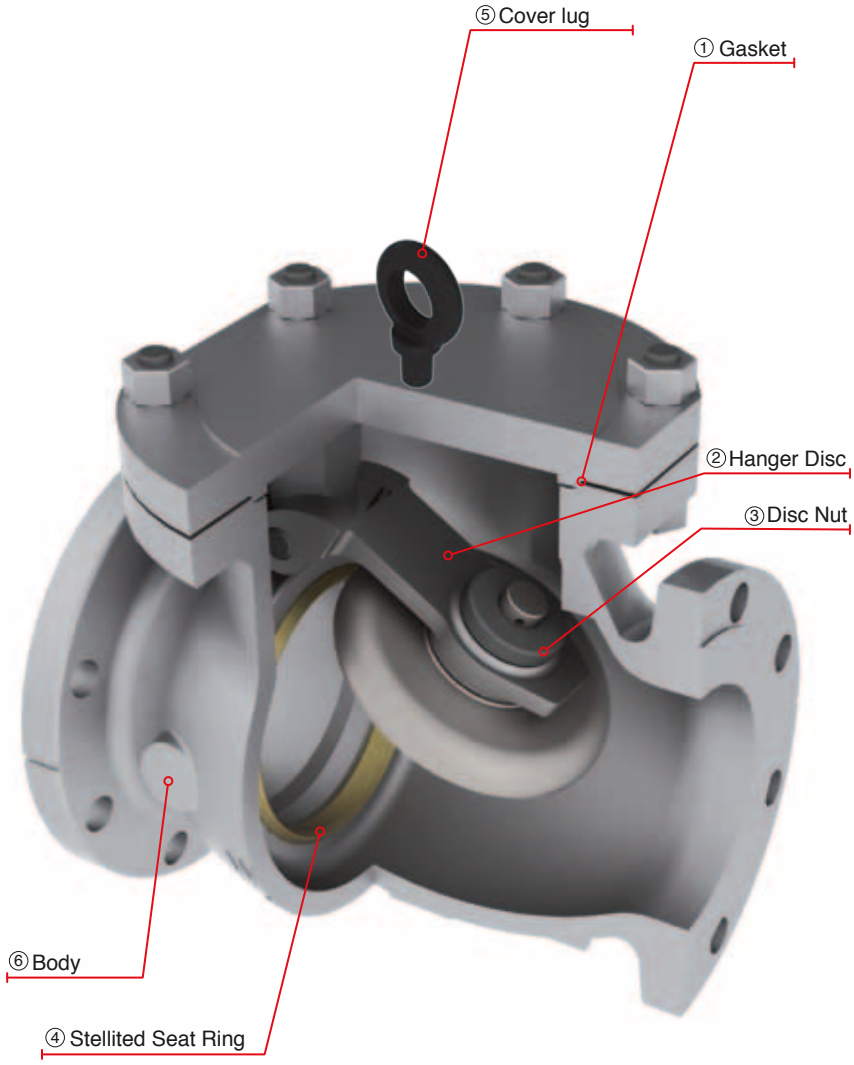
PCR = Per customer request

CAST STEEL SWING CHECK VALVES CLASS 150

CAST STEEL SWING CHECK VALVES

DESIGN FEATURES

- Swing check valves design in accordance with API-6D & ASME B16.34.
- Swing check valves option in accordance with API-603 only for stainless steel & Nickel alloys.
- Swing check valves for cryogenic service in accordance with BS-6364.
- Flange dimensions in accordance with ASME B16.5 for valves up to 24" nominal diameter.
- Damper & Counter weight options.
- Drain connections as per Customer request.
- Low fugitive emissions control.
- NACE service either MR-01-75 or MR-01-03.
- Test in accordance with API-598.



① Body to Cover Joint designed to apply a uniform load to the gasket to assure a leak proof seal.

② Disc to Hanger connection allows the disc a controlled movement independent of the hanger to assure proper disc alignment with the seat at closure.

③ The connection is secured by a welded disc nut to prevent disassembly due to vibration and closure impact.

④ Stellited Seat Ring provides increased resistance to wear abrasion and erosion of the sealing surface.

⑤ For 8" and up, WALWORTH check valves have cover lug for easy instalation

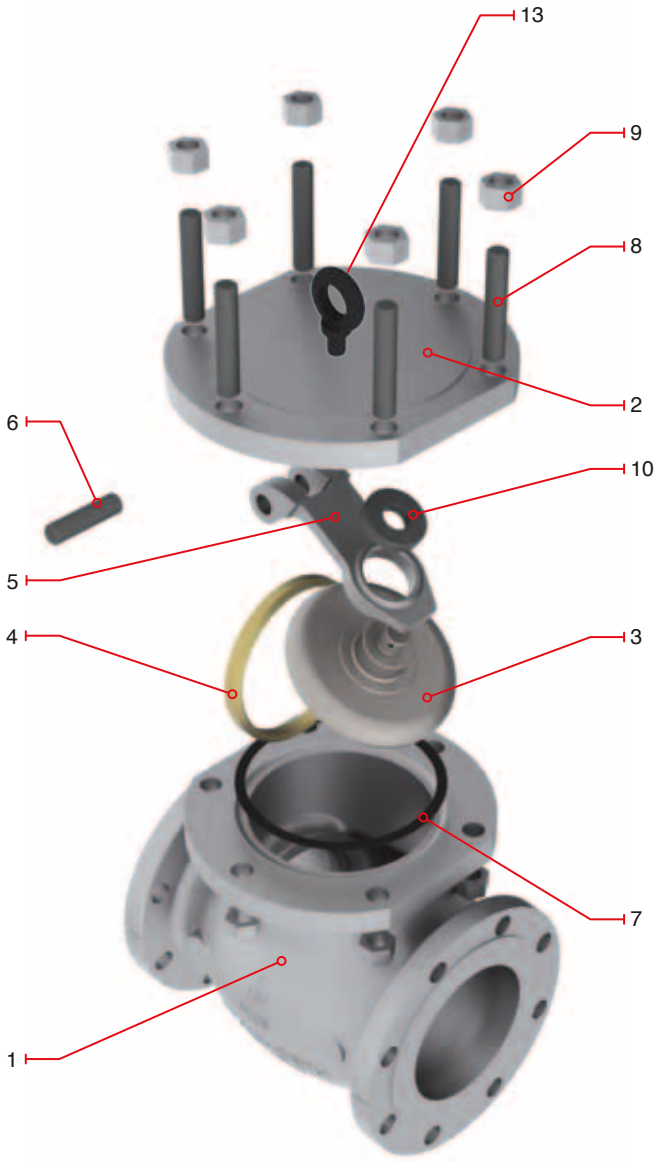
⑥ Body with heavy wall thickness as per ASME B16.34 for maximum service life. Provided with bosses for optional drains.

CAST STEEL SWING CHECK VALVES, CLASS 150

Design Features

- Design in accordance with API-6D & ASME B16.34
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Flange dimensions larger than 24" according to ASME B16.47 Series A as standard
- Flange dimensions as per ASME B16.47 Series B available upon request

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5341RF	5341F	Flanged Raised Face
5341RTJ	5341RJ	Flanged Ring Type Joint
5341WE	5341WE	Buttweld



Regular Bill of Materials

No.	Description	STANDARD MATERIAL
1	Body	ASTM A 216 GR WCB
2	Cover	ASTM A 216 GR WCB
3	Disc	A 216 GR WCB + 13% Cr.
4	Seat Ring	ASTM A 515 GR 70 + ST 6
5	Hanger	ASTM A 216 GR WCB
6	Hanger Pin	ASTM A 276 Type 410
7	Cover Gasket	Graphite/Stainless 316
8	Cover Stud	ASTM A 193 GR B7
9	Cover Stud Nut	ASTM A 194 GR 2H
10	Disc Nut	Alloy Steel
*11	Body Plug	Alloy Steel
*12	Identification Plate	Stainless Steel
**13	Coverlug	Commercial Steel

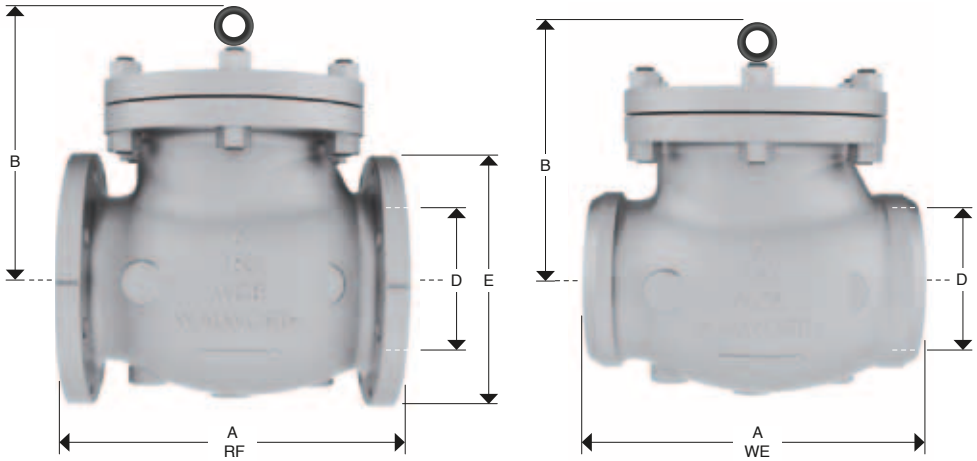
*Not shown **Only from 8" and up

CAST STEEL SWING CHECK VALVES, CLASS 150

Design Features

- Design in accordance with API-6D & ASME B16.34
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Flange dimensions larger than 24" according to ASME B16.47 Series A as standard
- Flange dimensions as per ASME B16.47 Series B available upon request

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5341RF	5341F	Flanged Raised Face
5341RTJ	5341RJ	Flanged Ring Type Joint
5341WE	5341WE	Buttweld



Dimensions and Weights

D Nominal Diameter	mm	51	64	76	102	152	203	254	305	356	406	457	508	610	762	914	1067	1219
	in	2	2 1/2	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48
A (RF and WE)	mm	203	216	241	292	356	495	622	699	787	864	978	978	1295	1524	1956	PCR	PCR
	in	8	8 1/2	9 1/2	11 1/2	14	19 1/2	24 1/2	27 1/2	31	34	38 1/2	38 1/2	51	60	77	PCR	PCR
B	mm	134	156	162	205	238	291	349	381	457	502	573	606	702	1003	1118	PCR	PCR
	in	5 9/32	6 1/8	6 3/8	8 1/16	9 3/8	11 7/16	13 3/4	15	18	19 3/4	22 9/16	23 7/8	27 5/8	39.5	44	PCR	PCR
C	mm	152	178	191	229	279	343	406	483	533	597	635	699	813	984	1168	1346	1511
	in	6	7	7 1/2	9	11	13 1/2	16	19	21	23 1/2	25	27 1/2	32	38.75	46	53	59.5
Weight 5341RF	kg	15	21	27	40	69	172	266	399	388	510	600	918	1160	1816	3632	PCR	PCR
	lb	33	46.2	59.4	88	151.8	378.4	585.2	877.8	853.6	1122	1320	2019.6	2552	4000	8000	PCR	PCR
Weight 5341WE	kg	13	19	17	36	64	132	210	305	318	418	492	753	951	1489	2978	PCR	PCR
	lb	28.6	41.8	37.4	79.2	140.8	290.4	462	671	700	920	1082	1656	2093	3276	6552	PCR	PCR

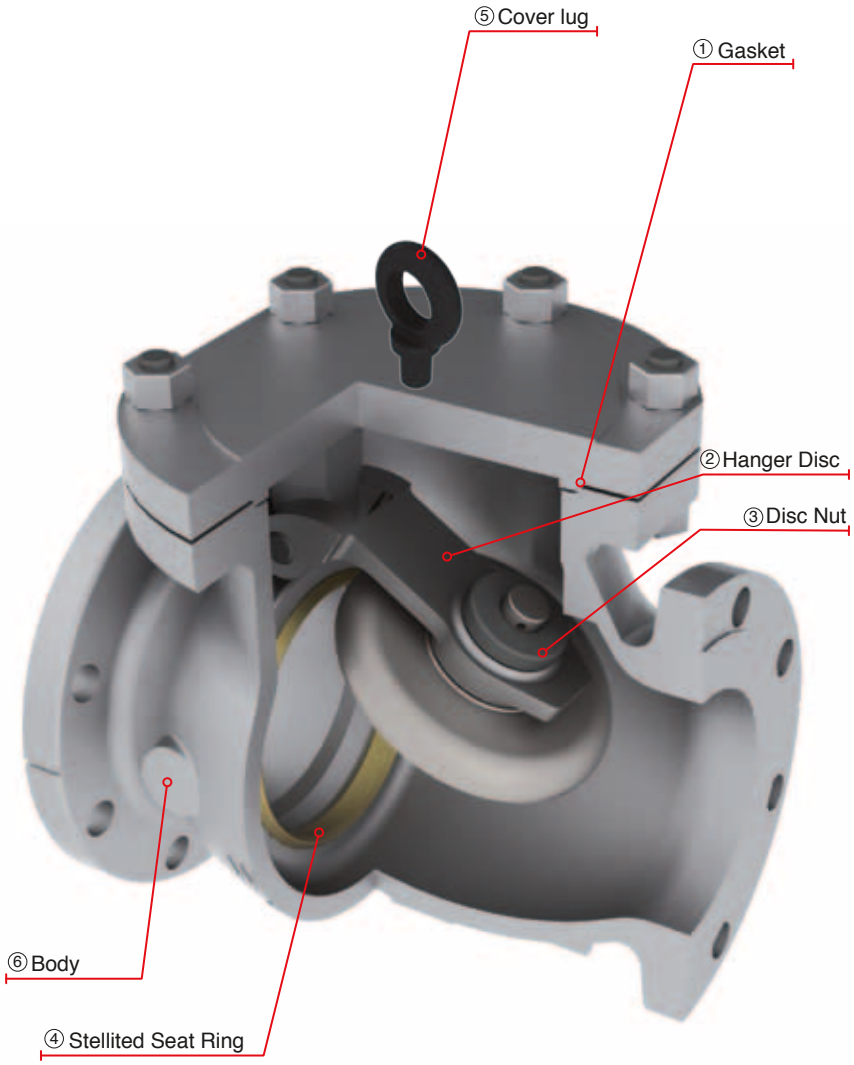
PCR = Per customer request

CAST STEEL SWING CHECK VALVES CLASS 300

CAST STEEL SWING CHECK VALVES

DESIGN FEATURES

- Swing check valves design in accordance with API-6D & ASME B16.34.
- Swing check valves option in accordance with API-603 only for stainless steel & Nickel alloys.
- Swing check valves for cryogenic service in accordance with BS-6364.
- Flange dimensions in accordance with ASME B16.5 for valves up to 24" nominal diameter.
- Damper & Counter weight options.
- Drain connections as per Customer request.
- Low fugitive emissions control.
- NACE service either MR-01-75 or MR-01-03.
- Test in accordance with API-598.



① Body to Cover Joint designed to apply a uniform load to the gasket to assure a leak proof seal.

② Disc to Hanger connection allows the disc a controlled movement independent of the hanger to assure proper disc alignment with the seat at closure.

③ The connection is secured by a welded disc nut to prevent disassembly due to vibration and closure impact.

④ Stellited Seat Ring provides increased resistance to wear abrasion and erosion of the sealing surface.

⑤ From 8" and up, WALWORTH check valves have coverlug for easy instalation

⑥ Body with heavy wall thickness as per ASME B16.34 for maximum service life. Provided with bosses for optional drains.

CAST STEEL SWING CHECK VALVES CLASS 300

Design Features

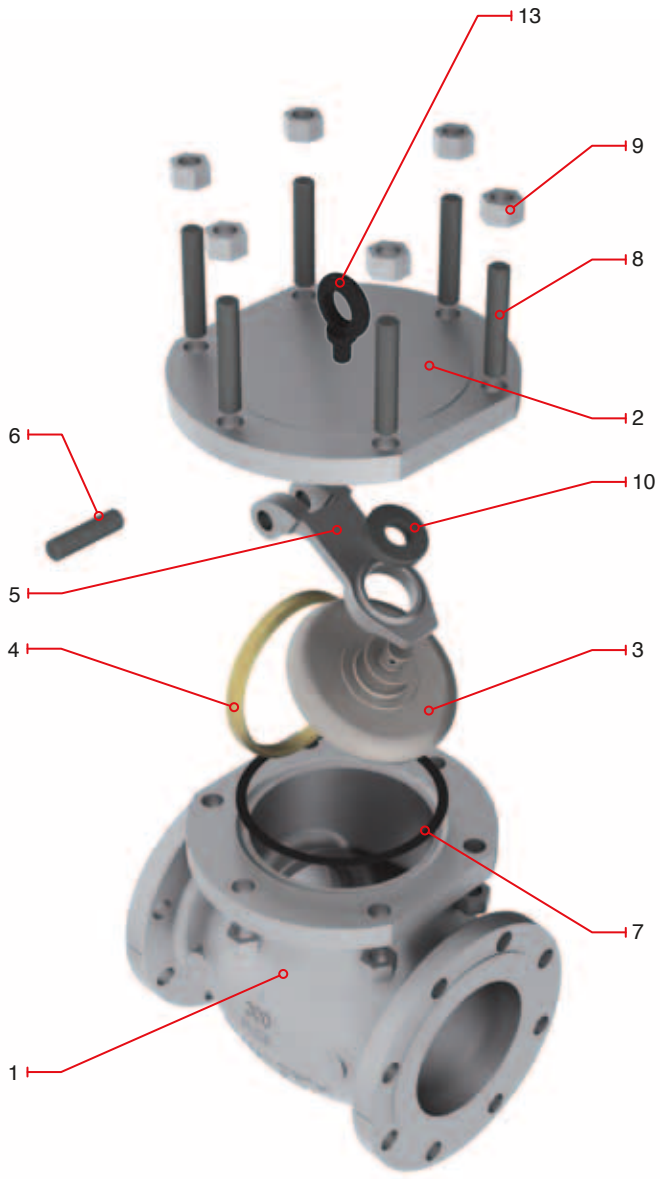
- Design in accordance with API-6D & ASME B16.34
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Flange dimensions larger than 24" according to ASME B16.47 Series A as standard
- Flange dimensions as per ASME B16.47 Series B available upon request

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5344RF	5344F	Flanged Raised Face
5344RTJ	5344RJ	Flanged Ring Type Joint
5344WE	5344WE	Buttweld

Regular Bill of Materials

No.	Description	STANDARD MATERIAL
1	Body	ASTM A 216 GR WCB
2	Cover	ASTM A 216 GR WCB
3	Disc	ASTM A 216 GR WCB + 13% Cr.
4	Seat Ring	ASTM A 515 GR 70 + ST 6
5	Hanger	ASTM A 216 GR WCB
6	Hanger Pin	ASTM A 276 Type 410
7	Cover Gasket	Spiral Stainless 304/Graphite
8	Cover Stud	ASTM A 193 GR B7
9	Cover Stud Nut	ASTM A 194 GR 2H
10	Disc Nut	Alloy Steel
*11	Body Plug	Alloy Steel
*12	Identification Plate	Stainless Steel
**13	Cover lug	Commercial Steel

*Not Shown ** Only from 8" an up

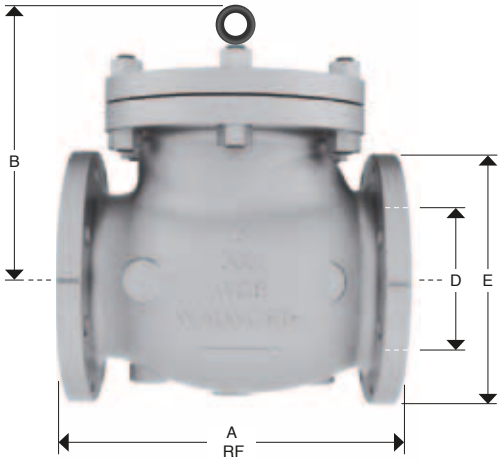


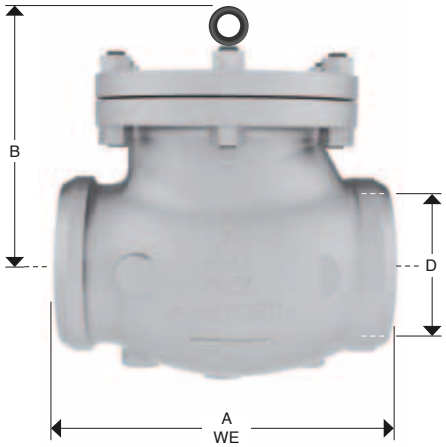
CAST STEEL SWING CHECK VALVES CLASS 300

Design Features

- Design in accordance with API-6D & ASME B16.34
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Flange dimensions larger than 24" according to ASME B16.47 Series A as standard
- Flange dimensions as per ASME B16.47 Series B available upon request

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5344RF	5344F	Flanged Raised Face
5344RTJ	5344RJ	Flanged Ring Type Joint
5344WE	5344WE	Buttweld





Dimensions and Weights

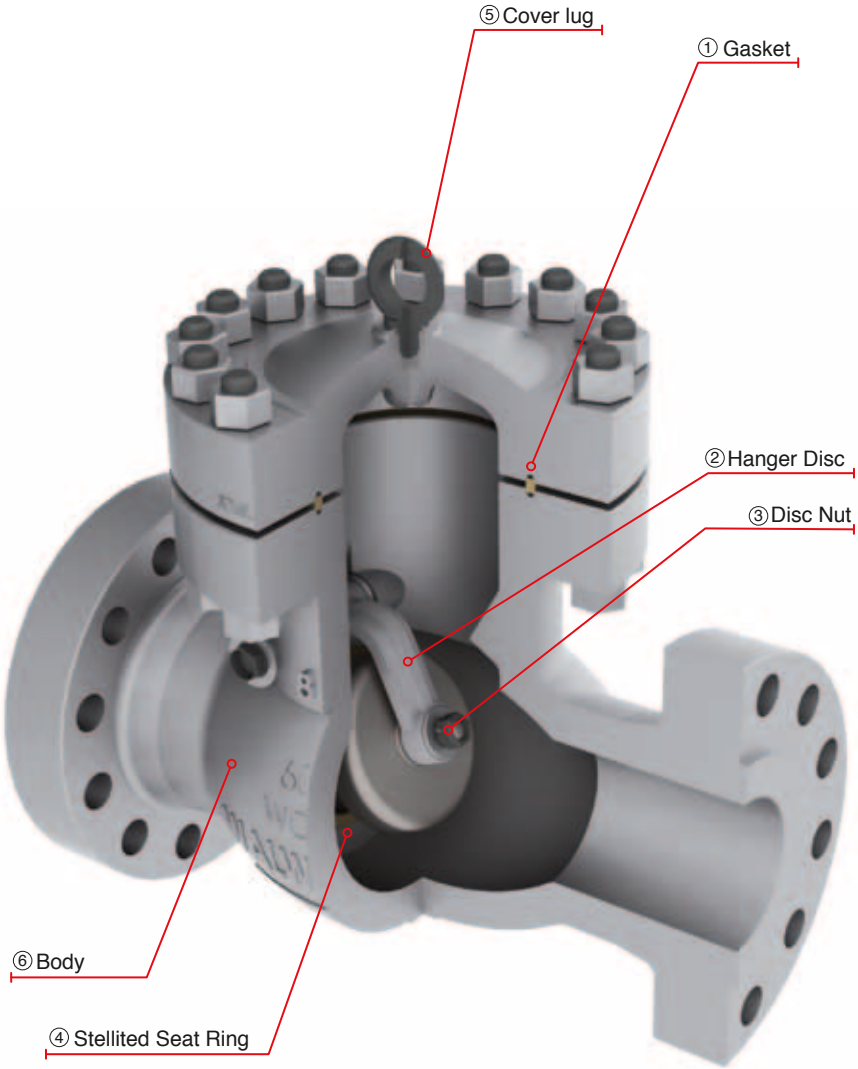
D Nominal Diameter	mm	51	64	76	102	152	203	254	305	356	406	457	508	610	762	914
	in	2	2 1/2	3	4	6	8	10	12	14	16	18	20	24	30	36
A (RF and WE)	mm	267	292	318	356	445	533	622	711	838	864	978	1016	1346	1594	2083
	in	10 1/2	11 1/2	12 1/2	14	17 1/2	21	24 1/2	28	33	34	38 1/2	40	53	62 3/4	82
B	mm	144	179	184	221	260	348	395	456	495	630	680	710	787	1029	1219
	in	5 11/16	7 1/16	7 1/4	8 11/16	10 1/4	13 11/16	15 9/16	17 15/16	19 1/2	24 13/16	26 3/4	27 15/16	31	40 1/2	48
C	mm	165	191	210	254	318	381	445	521	584	648	711	775	914	1092	1270
	in	6 1/2	7 1/2	8 1/4	10	12 1/2	15	17 1/2	20 1/2	23	25 1/2	28	30 1/2	36	43	50
Weight 5344RF	kg	22	27	42	63	129	235	358	544	577	768	990	1136	2180	3000	5400
	lb	48	59	92	139	284	517	788	1197	1269	1690	2178	2499	4796	6600	11880
Weight 5344WE	kg	19	25	31	58	95	159	305	470	531	707	911	1045	2006	2760	4968
	lb	41.8	54.648	68.2	127.6	209	349.8	671	1034	1168	1554	2004	2299	4412	6072	10930

CAST STEEL SWING CHECK VALVES CLASS 600

CAST STEEL SWING CHECK VALVES

DESIGN FEATURES

- Swing check valves design in accordance with API-6D & ASME B16.34.
- Swing check valves option in accordance with API-603 only for stainless steel & Nickel alloys.
- Swing check valves for cryogenic service in accordance with BS-6364.
- Flange dimensions in accordance with ASME B16.5 for valves up to 24" nominal diameter.
- Damper & Counter weight options.
- Drain connections as per Customer request.
- Low fugitive emissions control.
- NACE service either MR-01-75 or MR-01-03.
- Test in accordance with API-598.



① Body to Cover Joint designed to apply a uniform load to the gasket to assure a leak proof seal.

② Disc to Hanger connection allows the disc a controlled movement independent of the hanger to assure proper disc alignment with the seat at closure.

③ The connection is secured by a welded disc nut to prevent disassembly due to vibration and closure impact.

④ Stellited Seat Ring provides increased resistance to wear abrasion and erosion of the sealing surface.

⑤ From 8" and up, WALWORTH check valves have cover lug for easy instalation

⑥ Body with heavy wall thickness as per ASME B16.34 for maximum service life. Provided with bosses for optional drains.

CAST STEEL SWING CHECK VALVES CLASS 600

Design Features

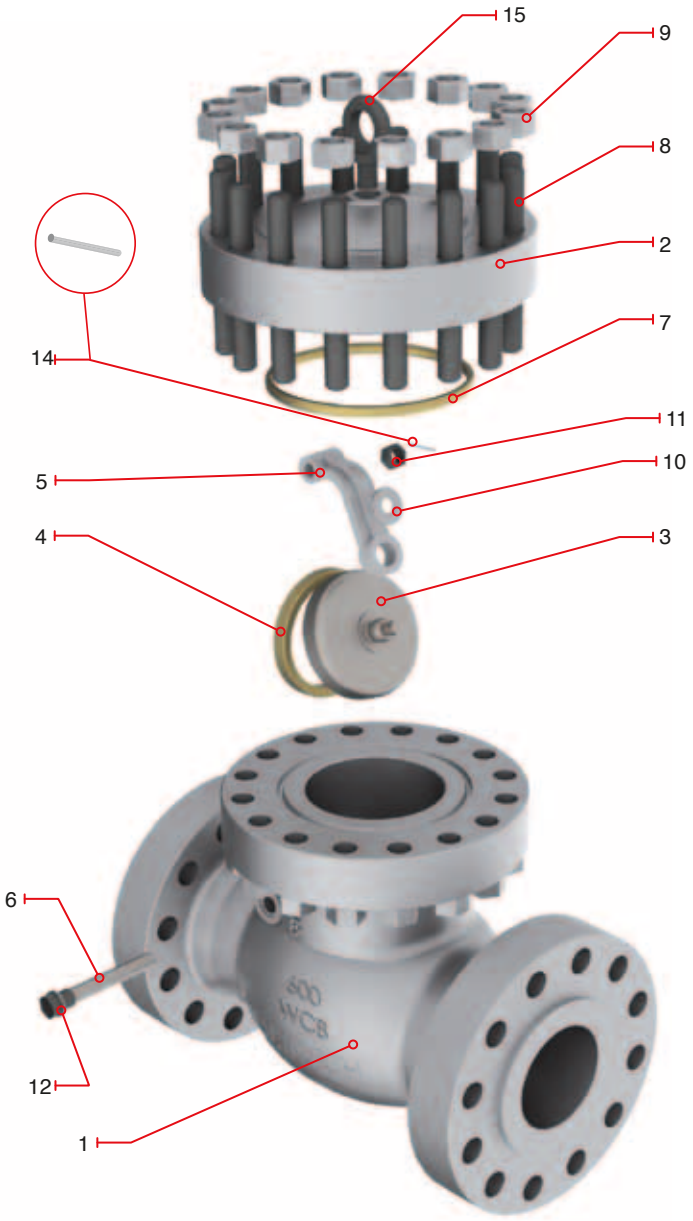
- Design in accordance with API-6D & ASME B16.34
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Flange dimensions larger than 24" according to ASME B16.47 Series A as standard
- Flange dimensions as per ASME B16.47 Series B available upon request

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5350RF	5350F	Flanged Raised Face
5350RTJ	5350RJ	Flanged Ring Type Joint
5350WE	5350WE	Buttweld

Regular Bill of Materials

No.	Description	WCB Trim UT
1	Body	ASTM A 216 GR WCB
2	Cover	ASTM A 216 GR WCB
3	Disc	ASTM A 216 GR WCB + 13% Cr.
4	Seat Ring	ASTM A 515 GR 70 + ST 6
5	Hanger	ASTM A 216 GR WCB
6	Hanger Pin	ASTM A 276 Type 410
7	Ring Type Joint Gasket	ASTM A 108 GR 1010
8	Cover Stud	ASTM A 193 GR B7
9	Cover Stud Nut	ASTM A 194 GR 2H
10	Disc Washer	ASTM A 276 Type 410
11	Disc Nut	Alloy Steel
12	Body Plug	Alloy Steel
*13	Identification Plate	Stainless Steel
14	Hanger retainer	Stainless Steel
15	Coverlug	Commercial Steel

*Not Shown

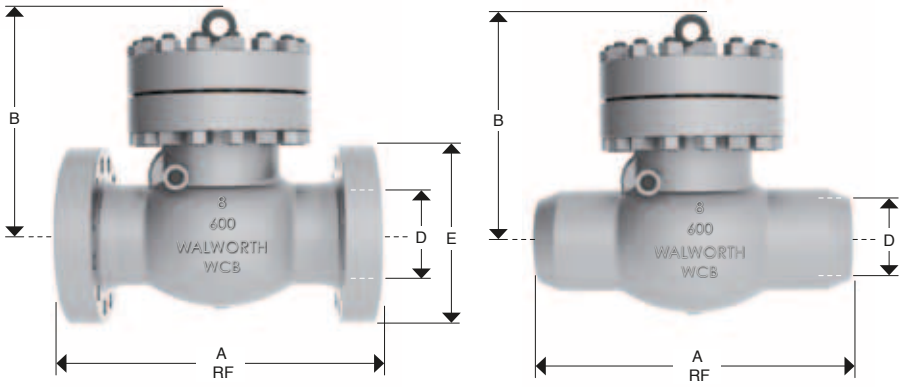


CAST STEEL SWING CHECK VALVES CLASS 600

Design Features

- Design in accordance with API-6D & ASME B16.34
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Flange dimensions larger than 24" according to ASME B16.47 Series A as standard
- Flange dimensions as per ASME B16.47 Series B available upon request

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5350RF	5350F	Flanged Raised Face
5350RTJ	5350RJ	Flanged Ring Type Joint
5350WE	5350WE	Buttweld



Dimensions and Weights

D Nominal Diameter	mm	51	64	76	102	152	203	254	305	356	406	457	508	610	762	914
	in	2	2 1/2	3	4	6	8	10	12	14	16	18	20	24	30	36
A (RF and WE)	mm	292	330	356	432	559	660	787	838	889	991	1092	1194	1397	1651	2083
	in	11 1/2	13	14	17	22	26	31	33	35	39	43	47	55	65	82
A* (RTJ)	mm	295	333	359	435	562	663	790	841	892	994	1095	1200	1407	1664	PCR
	in	11 5/8	13 1/8	14 1/8	17 1/8	22 1/8	26 1/8	31 1/8	33 1/8	35 1/8	39 1/8	43 1/8	47 1/4	55 3/8	65 1/2	PCR
B	mm	147	182	177	241	344	435	512	575	576	653	752	715	787	1092	1422
	in	5 3/4	7 3/16	6 15/16	9 1/2	13 9/16	17 1/8	20 3/16	22 5/8	22 11/16	25 11/16	29 5/8	28 1/8	31	43	56
C	mm	165	191	210	273	356	419	508	559	603	686	743	813	940	1130	1314
	in	6 1/2	7 1/2	8 1/4	10 3/4	14	16 1/2	20	22	23 3/4	27	29 1/4	32	37	44 1/2	51 3/4
Weight 5350RF	kg	25	40	46	85	173	383	567	770	1250	1735	2006	2780	4310	5800	10500
	lb	55	88	101.2	187	380.6	842.6	1247.4	1694	2750	3817	4413.2	6116	9482	12760	23100
Weight 5350WE	kg	21	34	39	72	147	337	499	678	1125	1562	1805	2502	3879	5220	9450
	lb	47	75	86	159	324	741	1098	1491	2475	3435	3972	5504	8534	11484	20790

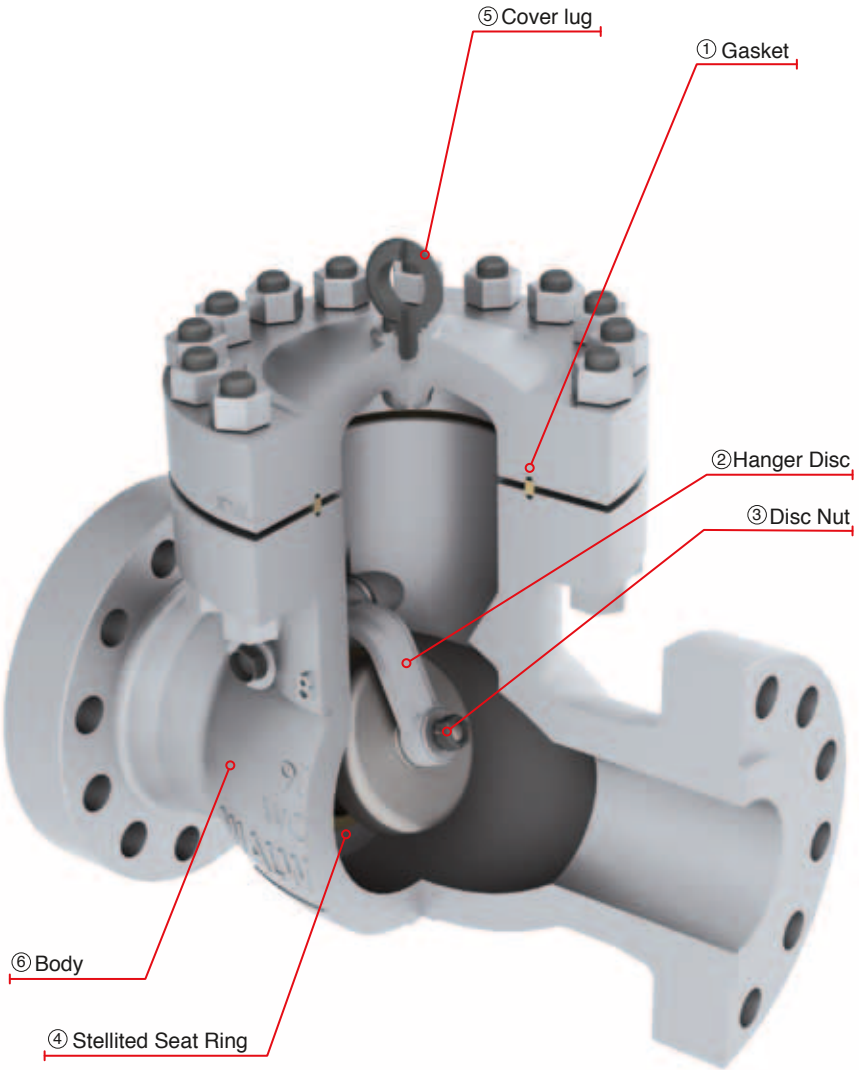
PCR = Per customer request

CAST STEEL SWING CHECK VALVES CLASS 900

CAST STEEL SWING CHECK VALVES

DESIGN FEATURES

- Swing check valves design in accordance with API-6D & ASME B16.34.
- Swing check valves option in accordance with API-603 only for stainless steel & Nickel alloys.
- Swing check valves for cryogenic service in accordance with BS-6364.
- Flange dimensions in accordance with ASME B16.5 for valves up to 24" nominal diameter.
- Damper & Counter weight options.
- Drain connections as per Customer request.
- Low fugitive emissions control.
- NACE service either MR-01-75 or MR-01-03.
- Test in accordance with API-598.



① Body to Cover Joint designed to apply a uniform load to the gasket to assure a leak proof seal.

② Disc to Hanger connection allows the disc a controlled movement independent of the hanger to assure proper disc alignment with the seat at closure.

③ The connection is secured by a welded disc nut to prevent disassembly due to vibration and closure impact.

④ Stellited Seat Ring provides increased resistance to wear abrasion and erosion of the sealing surface.

⑤ From 8" and up, WALWORTH check valves have coverlug for easy instalation

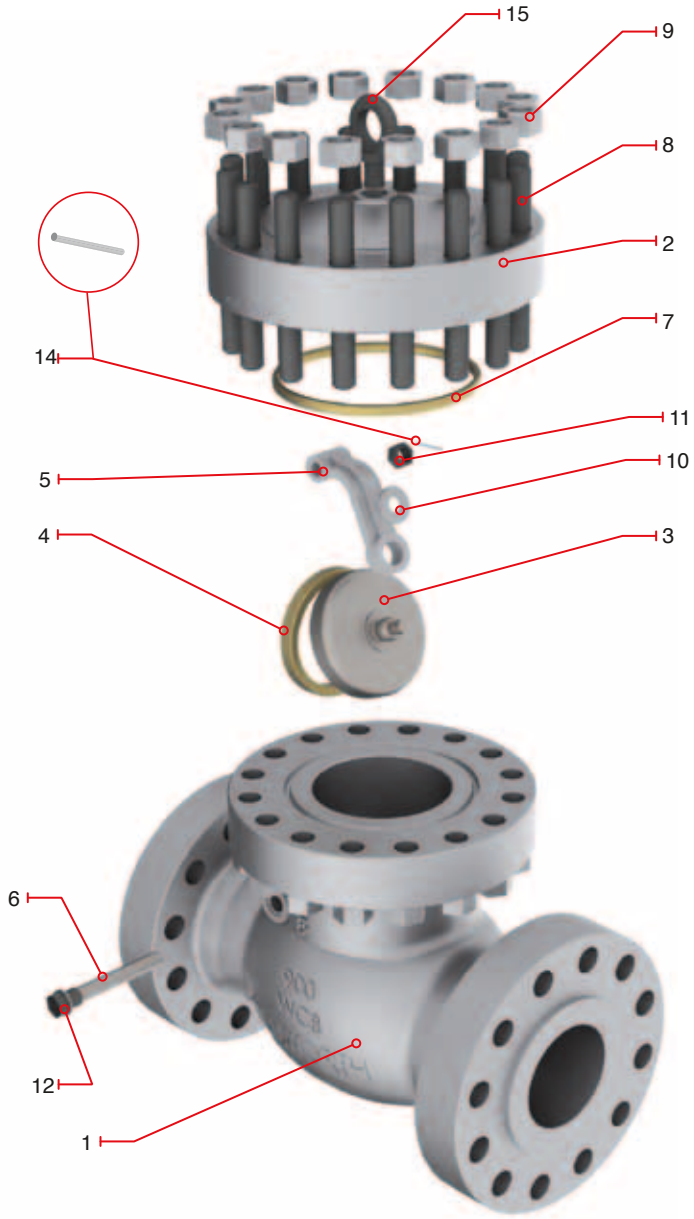
⑥ Body with heavy wall thickness as per ASME B16.34 for maximum service life. Provided with bosses for optional drains.

CAST STEEL SWING CHECK VALVES CLASS 900

Design Features

- Design in accordance with API-6D & ASME B16.34
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Flange dimensions larger than 24" according to ASME B16.47 Series A as standard
- Flange dimensions as per ASME B16.47 Series B available upon request

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5353RF	5353F	Flanged Raised Face
5353RTJ	5353RJ	Flanged Ring Type Joint
5353WE	5353WE	Buttweld



Regular Bill of Materials

No.	Description	WCB Trim UT
1	Body	ASTM A 216 GR WCB
2	Cover	ASTM A 216 GR WCB
3	Disc	ASTM A 216 GR WCB + 13% Cr.
4	Seat Ring	ASTM A 515 GR 70 + ST 6
5	Hanger	ASTM A 216 GR WCB
6	Hanger Pin	ASTM A 276 Type 410
7	Ring Type Joint Gasket	ASTM A 108 GR 1010
8	Cover Stud	ASTM A 193 GR B7
9	Cover Stud Nut	ASTM A 194 GR 2H
10	Disc Washer	ASTM A 276 Type 410
11	Disc Nut	Alloy Steel
12	Body Plug	Alloy Steel
*13	Identification Plate	Stainless Steel
14	Hanger retainer	Stainless Steel
15	Cover lug	Commercial Steel

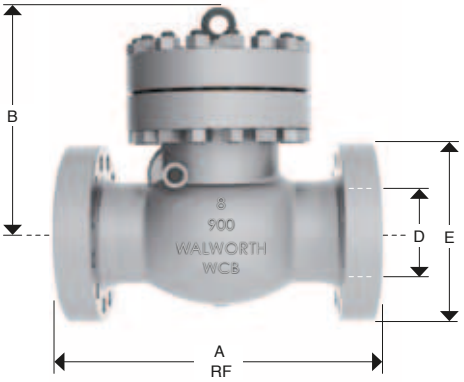
*Not Shown

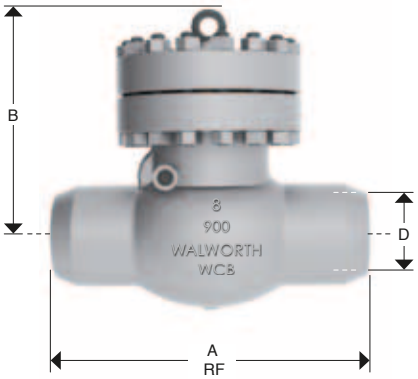
CAST STEEL SWING CHECK VALVES CLASS 900

Design Features

- Design in accordance with API-6D & ASME B16.34
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Flange dimensions larger than 24" according to ASME B16.47 Series A as standard
- Flange dimensions as per ASME B16.47 Series B available upon request

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5353RF	5353F	Flanged Raised Face
5353RTJ	5353RJ	Flanged Ring Type Joint
5353WE	5353WE	Buttweld





Dimensions and Weights

D Nominal Diameter	mm	51	76	102	152	203	254	305	356	406	457	508	610
	in	2	3	4	6	8	10	12	14	16	18	20	24
A (RF and WE)	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1549
	in	14 1/2	15	18	24	29	33	38	40 1/2	44 1/2	48	52	61
A* (RTJ)	mm	371	384	460	613	740	841	968	1038	1140	1232	1334	1568
	in	14 5/8	15 1/8	18 1/8	24 1/8	29 1/8	33 1/8	38 1/8	40 7/8	44 7/8	48 1/2	52 1/2	61 3/4
B	mm	255	266	292	396	545	528	595	635	PCR	PCR	PCR	PCR
	in	10	10 1/2	11 1/2	15 9/16	21 7/16	20 13/16	23 7/16	25	PCR	PCR	PCR	PCR
C	mm	216	241	292	381	470	546	610	641	705	787	857	1041
	in	8 1/2	9 1/2	11 1/2	15	18 1/2	21 1/2	24	25 1/4	27 3/4	31	33 3/4	41
Weight 5353RF		64	93	127	263	505	1235	1450	1480	PCR	PCR	PCR	PCR
	kg	141	205	279	579	1111	2717	3190	3256	PCR	PCR	PCR	PCR
Weight 5353WE	kg	54	79	108	224	429	1087	1276	1285	PCR	PCR	PCR	PCR
	lb	120	174	237	492	944	2391	2807	2827	PCR	PCR	PCR	PCR

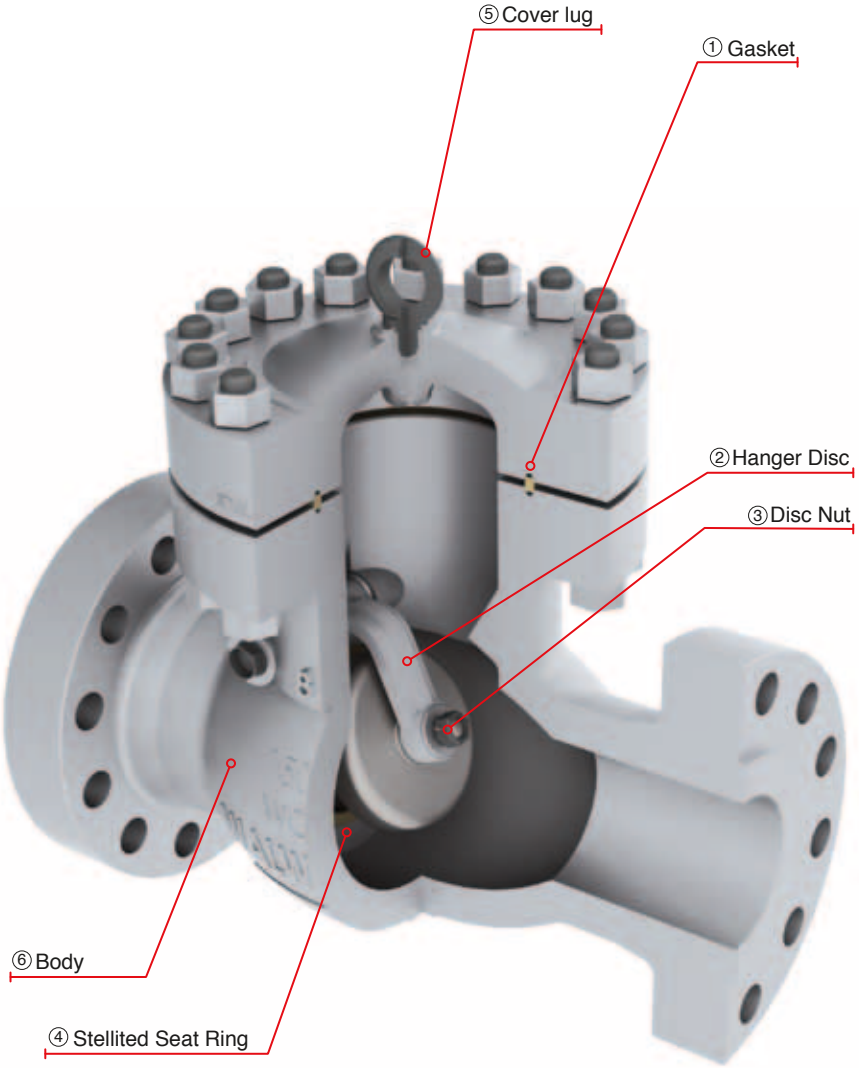
PCR = Per customer request

CAST STEEL SWING CHECK VALVES CLASS 1500

CAST STEEL SWING CHECK VALVES

DESIGN FEATURES

- Swing check valves design in accordance with API-6D & ASME B16.34.
- Swing check valves option in accordance with API-603 only for stainless steel & Nickel alloys.
- Swing check valves for cryogenic service in accordance with BS-6364.
- Flange dimensions in accordance with ASME B16.5 for valves up to 24" nominal diameter.
- Damper & Counter weight options.
- Drain connections as per Customer request.
- Low fugitive emissions control.
- NACE service either MR-01-75 or MR-01-03.
- Test in accordance with API-598.



① Body to Cover Joint designed to apply a uniform load to the gasket to assure a leak proof seal.

② Disc to Hanger connection allows the disc a controlled movement independent of the hanger to assure proper disc alignment with the seat at closure.

③ The connection is secured by a welded disc nut to prevent disassembly due to vibration and closure impact.

④ Stellited Seat Ring provides increased resistance to wear abrasion and erosion of the sealing surface.

⑤ From 8" and up, WALWORTH check valves have coverlug for easy instalation

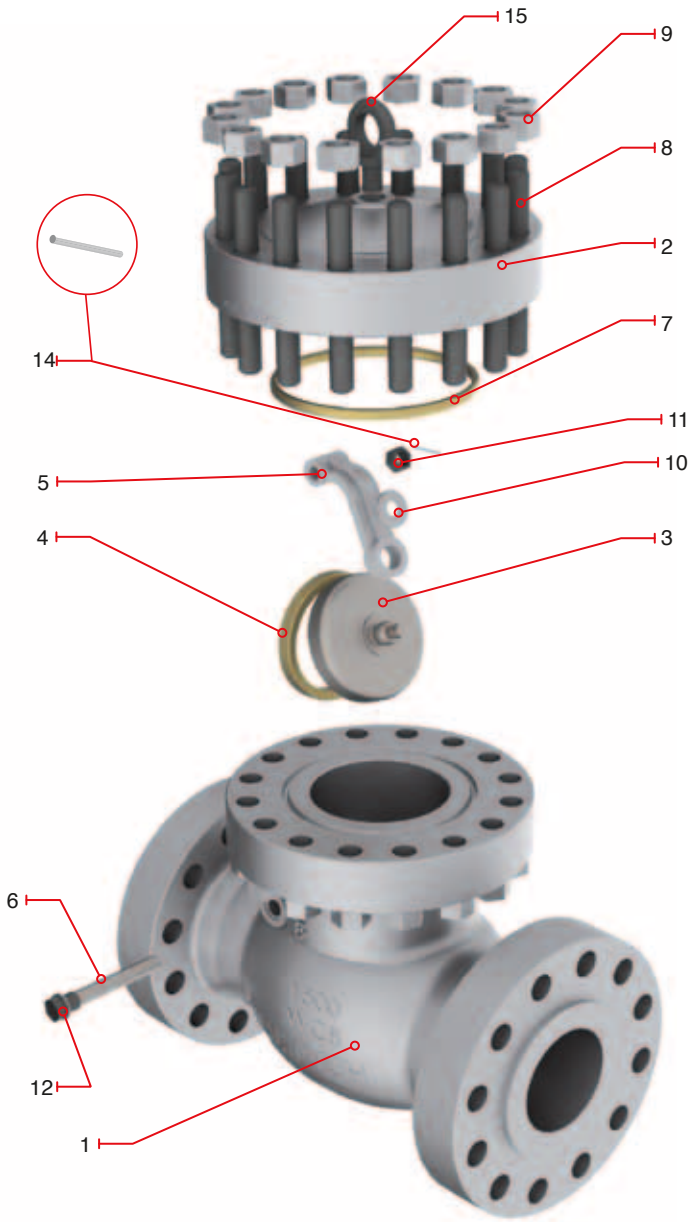
⑥ Body with heavy wall thickness as per ASME B16.34 for maximum service life. Provided with bosses for optional drains.

CAST STEEL SWING CHECK VALVES CLASS 1500

Design Features

- Design in accordance with API-6D & ASME B16.34.
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25
- Flange dimensions larger than 24" according to ASME B16.47 Series A as standard
- Flange dimensions as per ASME B16.47 Series B available upon request

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5356RF	5356F	Flanged Raised Face
5356RTJ	5356RJ	Flanged Ring Type Joint
5356WE	5356WE	Buttweld



Regular Bill of Materials

No.	Description	WCB Trim UT
1	Body	ASTM A 216 GR WCB
2	Cover	ASTM A 216 GR WCB
3	Disc	ASTM A 216 GR WCB + 13% Cr.
4	Seat Ring	ASTM A 515 GR 70 + ST 6
5	Hanger	ASTM A 216 GR WCB
6	Hanger Pin	ASTM A 276 Type 410
7	Ring Type Joint Gasket	ASTM A 108 GR 1010
8	Cover Stud	ASTM A 193 GR B7
9	Cover Stud Nut	ASTM A 194 GR 2H
10	Disc Washer	ASTM A 276 Type 410
11	Disc Nut	Alloy Steel
12	Body Plug	Alloy Steel
*13	Identification Plate	Stainless Steel
14	Hanger retainer	Stainless Steel
15	Cover lug	Commercial Steel

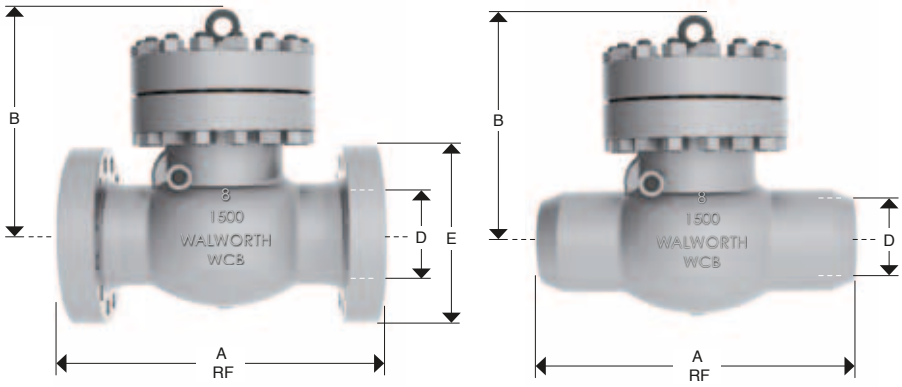
*Not Shown

CAST STEEL SWING CHECK VALVES, CLASS 1500

Design Features

- Design in accordance with API-6D & ASME B16.34
- Flange dimensions as per ASME B16.5
- End to end dimensions as per ASME B16.10
- WE dimensions as per ASME B 16.25

Catalog Figure No.	ID Plant Figure No.	Type of Ends
5356RF	5356F	Flanged Raised Face
5356RTJ	5356RJ	Flanged Ring Type Joint
5356WE	5356WE	Buttweld



Dimensions and Weights

D Nominal Diameter	mm	51	64	76	102	152	203	508	305	356	406	457	508	610
	in	2	2 1/2	3	4	6	8	10	12	14	16	18	20	24
A	mm	368	419	470	546	705	832	991	1130	1257	1384	1537	1664	1943
(RF and WE)	in	14 1/2	16 1/2	18 1/2	21 1/2	27 3/4	32 3/4	39	44 1/2	49 1/2	54 1/2	60 1/2	65 1/2	76 1/2
A*	mm	371	422	473	549	711	842	1000	1146	1276	1407	1559	1686	1972
(RTJ)	in	14 5/8	16 5/8	18 5/8	21 5/8	28	33 1/8	39 3/8	45 1/8	50 1/4	55 3/8	61 3/8	66 3/8	77 5/8
B	mm	255	297	297	336	328	563	605	730	857	883	1022	1162	PCR
	in	10	11 11/16	11 11/16	13 1/4	12 15/16	22 3/16	23 13/16	28 3/4	33 3/4	34 3/4	40 1/4	45 3/4	PCR
C	mm	216	244	267	311	394	483	584	673	749	826	914	984	1168
	in	8 1/2	9 5/8	10 1/2	12 1/4	15 1/2	19	23	26 1/2	29 1/2	32 1/2	36	38 3/4	46
Weight	kg	64	127	127	211	418	777	1550	2100	2358	3400	4350	5500	PCR
5356RF	lb	141	279	279	464	920	1709	3410	4620	5188	7480	9570	12100	PCR
Weight	kg	54	108	108	179	355	660	1318	1785	2004	2890	3698	4675	PCR
5356WE	lb	120	237	237	395	782	1453	2899	3927	4409	6358	8135	10285	PCR

PCR = Per customer request

TECHNICAL INFORMATION

WEDGE DESIGNS

Flexible wedge characteristics:

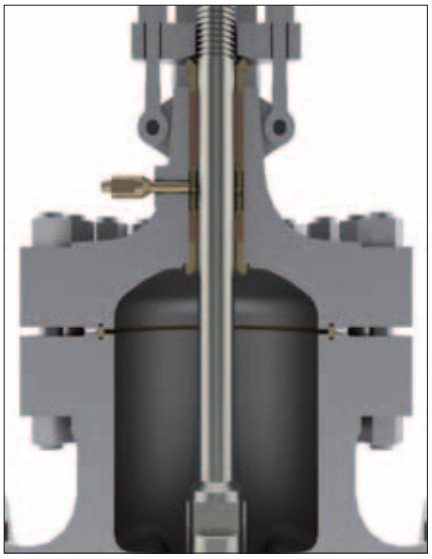
- Provides resistance to possible wedge/seat sticking from high temperature to low temperature fluctuations by compensating for the resulting small body/seat movement.
- Facilitates seating and sealing and assures a long wear life.
- Susceptible to build-up when used with fluids having high solids content.

Solid wedge characteristics:

- More susceptible to wedge/seat “sticking” and difficulty in opening when closed hot and allowed to cool due to the resulting small body/seat movement.
- Less able to compensate for the normal wedge/seat wear over the long term.
- Will handle fluids with high solids content without difficulty.

TECHNICAL INFORMATION

LANTERN RING-CONDENSING CHAMBER



WALWORTH API 600 valves can be provided with a stem packing/lantern ring combination of packing above and below the lantern ring to provide the ability to condense/vent material being processed.

The system can be utilized to lubricate the packing or to drain/purge the stem area to a leakage recovery system when liquids/gasses cannot be released to the atmosphere.

NACE SERVICE VALVES

The National Association of Corrosion Engineers (NACE) establishes standards for materials resistant to Sulfide Stress Cracking (SSC) to be used in hydrogen sulfide (H2S) bearing hydrocarbon service.

NACE standard MR0175 defines a sulfide stress cracking region based on the relationship of H2S present to the total operating pressure.

This must be considered when specifying valves for service where H2S is present as proper selection of materials is a customer responsibility.

Sulfide stress cracking in materials not suitable for H2S service can result in a sudden failure with damage to equipment and harm to personnel.

Important considerations when specifying NACE service

1. Hydrogen ion concentration (Ph).
2. Concentration and total pressure of the hydrogen sulfide (H2S).
3. Concentration of water, carbon dioxide (CO2) and chlorides.
4. Service temperature.

The customer can select valves made of alloy/carbon steel material with controlled hardness and/or a stainless steel material depending on the severity of the fluid. Valves having a body/bonnet with a controlled hardness of Rc 22 and studs/nuts of B7M/2HM can be combined with a customer selected trim and manufactured to meet NACE MR0175 requirements.

TECHNICAL INFORMATION

STEM PACKING

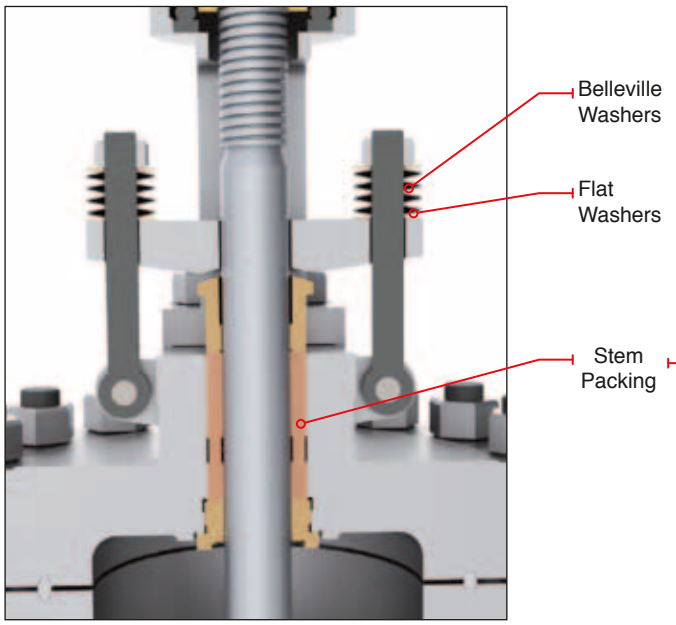
WALWORTH valves are designed, manufactured and tested to meet 50 PPM VOC fugitive emission leak rate as a standard off the shelf valve. This applies to all gate and globe valves, both Cast Steel and Forged Steel, without a requirement for a “special order”.

WALWORTH uses a stem packing of flexible graphite incorporating a passive corrosion inhibitor in a combination of high and low density sealing rings with anti-extrusion end rings reinforced with Inconel wire.

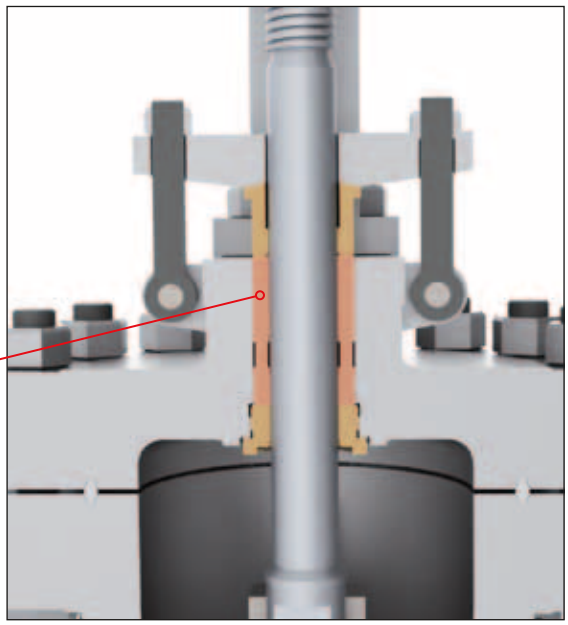
The long term low emission stem sealing ability of WALWORTH packing is enhanced by reduced diametral clearances and close control of stem straightness and packing sealing surface finish.

WALWORTH can also provide gate and globe valves with a stem packing live loading system for installations requiring frequent valve operation and/or having large variations in temperature/pressure or where it is desirable to eliminate the need for occasional adjustment of the packing to compensate for the variations in operation. Live loading will provide a constant compression against the packing to maintain the optimum seal over a long period of time and variations in the operating conditions.

WALWORTH can also supply valves with stem packing of different types and materials to meet the customer requirements.



Live Loading Stem Packing System



Standard Stem Packing System

TECHNICAL INFORMATION

BODY AND BONNET JOINT SEAL GASKETS

WALWORTH cast steel standard valves are supplied with the types of body/bonnet gaskets shown in the table.
For special service conditions, WALWORTH valves can also be supplied with special shapes on joints and special materials, to comply with specific require-ments of the customer.

VALVE	CLASS				
	150	300	600	900	1500
GATE	1	2	3	3	3
GLOBE	1	2	3	3	3
CHECK	1	2	3	3	3

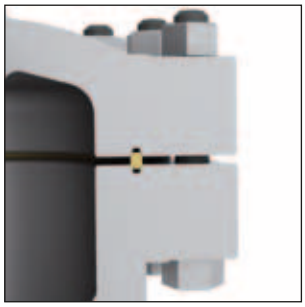
FLAT GASKET

1.- FLAT GASKET: Graphite with 316 Stainless Steel Core

SPIROLASTIC GASKET

1.- SPIROLASTIC GASKET: Stainless Steel / Graphite Filled

RING GASKET



1.- FLAT GASKET: Oval or Octagonal shape. Soft or Stainless Steel

TECHNICAL INFORMATION

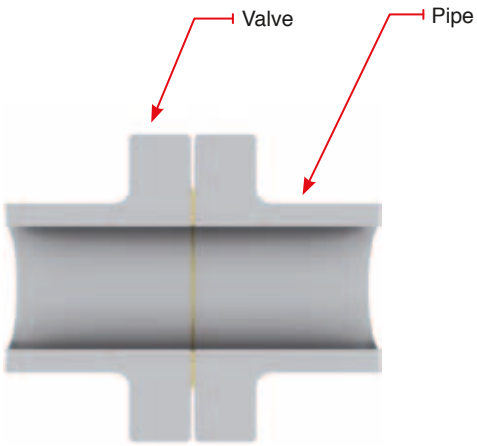
TYPES OF END CONNECTIONS

WALWORTH cast steel valves can be supplied with flanged ends in raised face, flat faces or ring joint type as well as in welding ends (buttweld). They can also be supplied with combined ends, such as flanged by weld, in accordance to customer requirements.

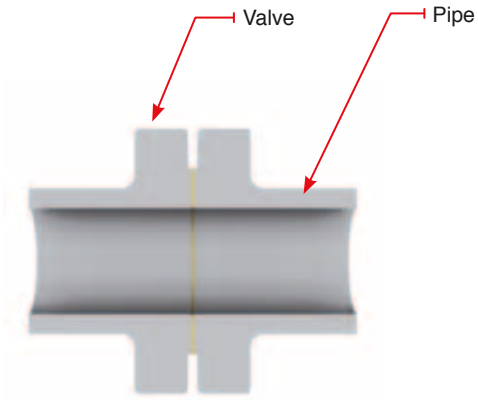
The buttweld ends in standard valves are machined in accordance with ASME B 16.25 and are supplied to meet the following pipe schedules:

Valve Pressure Class	Weld End Pipe Schedule
150/300	Schedule 40 – 2" to 10" Standard Wall – 12" to 24"
600	Schedule 80
900	Schedule 160 – 2" to 3" Schedule 120 – 4" and Larger
1500	Schedule 160

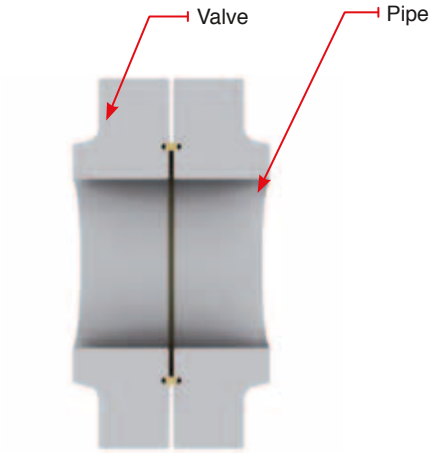
The customer must clearly specify the pipe wall thickness and type of pipe to be welded to the valves for schedules different than the above.



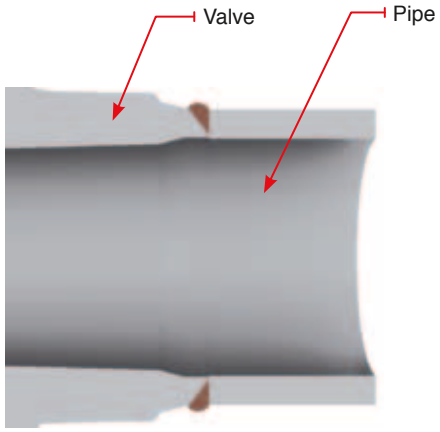
Flanged Ends
Flat Face



Flanged Ends
Raised Face



Flanged Ends
Ring Type Joint



Weld Ends Buttweld

TECHNICAL INFORMATION

TYPE OF OPERATIONS

The WALWORTH standard cast steel product line includes many different valves designed to meet most applications.

Special adaptations can be made to meet specific customer requirements. Valves can be supplied with manual handwheel/ gear operation, chain wheel, as well as electric, pneumatic and hydraulic actuators.

This makes it possible for WALWORTH to furnish valves adapted to the customers special needs such as controlled opening/ closing and remote installation.

Valves can also be supplied with a bypass, drain or vent connection, stem extension, position indicators, floor stand mounting as well as a lever and weight system for swing check valves.

Gear Operators

A manual gear operator is designed with a bevel gear and pinion ratio sized to transmit the required opening/closing torque with normal operator effort on the handwheel. They can be supplied as waterproof units and/or for underground installation with a square operating nut.

Chain Wheel Operation

Chain Wheels are designed for operating valves installed in remote or inaccessible locations. They can (PHOTO)be furnished with roller guides to prevent the chain from jumping off the wheel. Impact type chain wheels are also available to assist in unseating a tightly closed valve

Actuators

Valves can be furnished with either electric, pneumatic or hydraulic actuators. The actuators can be furnished as either waterproof and/or explosion proof. The customer must specify such things as open-close speed, maximum differential pressure, service temperature, type of voltage-phase-frequency, air or gas pressure for pneumatic actuators and flow characteristics for hydraulic actuators to be assured of correct performance.

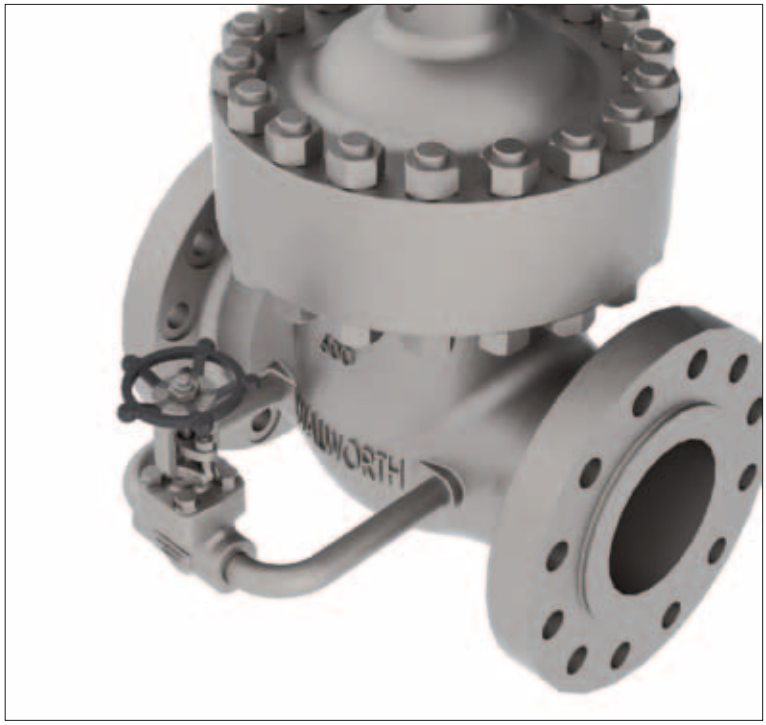
TECHNICAL INFORMATION

ACCESORIES

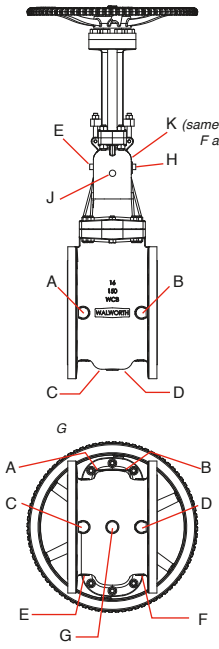
Bypass, Drain and Vent Connections

A bypass line can be furnished with WALWORTH cast steel valves for equalizing pressure around the main valve or for warming up the line before opening the main valve. Drain connections are normally located in the valve body to drain the valve when internal inspection or maintenance is required.

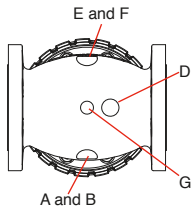
A vent connection can be located in the valve bonnet to relieve an over-pressure that could occur due to an expansion of trapped liquid. MSS SP-45 lists the standard locations and connection sizes for gate, globe and check valves

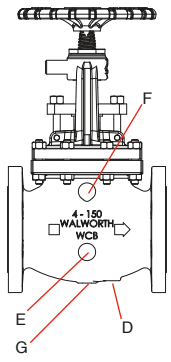


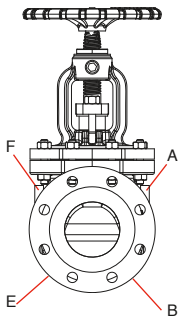
Nominal Size of Valve	2" to 4"	6" to 8"	10" and larger
Size of Bypass-Drain-Vent	1/2"	3/4"	1"



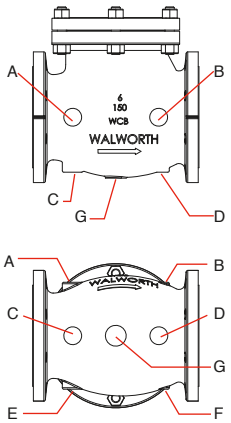
Gate Valve







Globe Valve



Check Valve

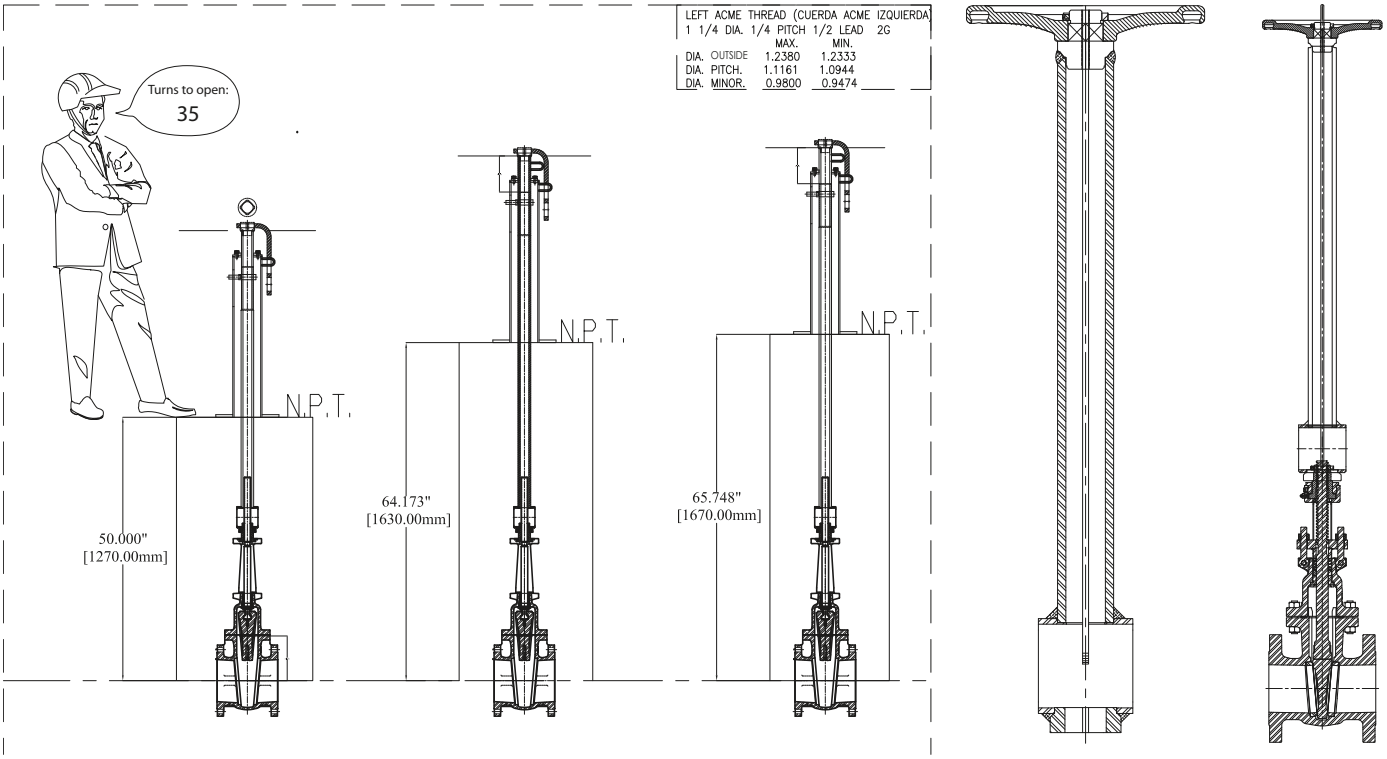
Bosses and drain connection positions in accordance with MSS-SP-45 & ASME B16.34 Standards

TECHNICAL INFORMATION

ACCESORIES

Stem Extensions and Floor Stands

Stem extensions and floor stands are used to facilitate operation of a valve installed either underground, in a vault, or on a platform. These arrangements are available for either handwheel, chainwheel or gear operation. The distance from the center of the valve port to the top of the stem or center line of the gear operator must be specified for stem extensions. The distance from the center of the valve port to the floor level must be specified for a floor stand mounting.



Lever and Counter Weight

A lever and counter weight is used on a swing check valve to help control the valve opening under variable flow conditions to prevent disc flutter and also to assist/control the disc closing under a rapid flow reversal condition to prevent disc/seat damage. A spring can also be used with a lever to provide a more rapid closing as can a dash pot or snubber to soften the closing seat contact during a flow reversal.

PRESSURE-TEMPERATURE RATINGS

CAST STEEL ASTM A 216 GR WCB

Temperature		Maximum allowable non-shock working pressure in PSIG by class					
°F	°C	150	300	600	900	1500	2500
-20 to 100	-29 to 38	285	740	1480	2220	3705	6170
200	93	260	680	1360	2035	3395	5655
300	149	230	655	1310	1965	3270	5450
400	204	200	635	1265	1900	3170	5280
500	260	170	605	1205	1810	3015	5025
600	316	140	570	1135	1705	2840	4730
650	343	125	550	1100	1650	2745	4575
700	371	110	530	1060	1590	2665	4425
750	399	98	505	1015	1520	2535	4230
800	427	80	410	825	1235	2055	3430
850	454	65	320	640	955	1595	2655
900	482	50	230	460	690	1150	1915
950	510	35	135	275	410	685	1145
1000	538	20	85	170	255	430	715

Note: Upon prolonged exposure to temperatures above 800°F, the carbide phase of steel may be converted to graphite. Permissible, but not recommended for prolonged use above 800°F.

CAST STEEL ASTM A 217 GR WC6

Temperature		Maximum allowable non-shock working pressure in PSIG by class					
°F	°C	150	300	600	900	1500	2500
-20 to 100	-29 to 38	290	750	2600	2250	3750	6250
200	93	260	750	1500	2250	3750	6250
300	149	230	720	1445	2165	3610	6015
400	204	200	695	1385	2080	3465	5775
500	260	170	665	1330	1995	3325	5540
600	316	140	605	1210	1815	3025	5040
650	343	125	590	1175	1765	2940	4905
700	371	110	570	1135	1705	2840	4730
750	399	95	530	1065	1595	2660	4430
800	427	80	510	1015	1525	2540	4230
850	454	65	485	975	1460	2435	4060
900	482	50	450	900	1350	2245	3745
950	510	35	320	640	955	1595	2655
1,000	538	20	215	430	650	1080	1800
1,050	566	20(*)	145	290	430	720	1200
1,100	593	20(*)	95	190	290	480	800
1,150	621	20(*)	65	130	95	325	545
1,200	649	15(*)	40	80	125	205	345

Notes:

- Use normalized and tempered material only.
- Not to be used over 1,100°F.

(a) Flanged-end valve ratings terminate at 1,000°F (538°C).

PRESSURE-TEMPERATURE RATINGS

CAST STEEL ASTM A 217 GR WC9

Temperature		Maximum allowable non-shock working pressure in PSIG by class					
°F	°C	150	300	600	900	1500	2500
-20 to 100	-29 to 38	290	750	2600	2250	3750	6250
200	93	260	750	1500	2250	3750	6250
300	149	230	720	1445	2165	3610	6015
400	204	200	695	1385	2080	3465	5775
500	260	170	665	1330	1995	3325	5540
600	316	140	605	1210	1815	3025	5040
650	343	125	590	1175	1765	2940	4905
700	371	110	570	1135	1705	2840	4730
750	399	95	530	1065	1595	2660	4430
800	427	80	510	1015	1525	2540	4230
850	454	65	485	975	1460	2435	4060
900	482	50	450	900	1350	2245	3745
950	510	35	385	755	1160	1930	3220
1,000	538	20	265	535	800	1335	2230
1,050	566	20(*)	175	350	525	875	1455
1,100	593	20(*)	110	220	330	550	915
1,150	621	20(*)	70	135	205	345	570
1,200	649	15(*)	40	80	125	205	345

Notes:
- Use normalized and tempered material only.
- Not to be used over 1,100°F.

(a) Flanged-end valve ratings terminat at 1,000°F.

CAST STEEL ASTM A 217 GR C5

Temperature		Maximum allowable non-shock working pressure in PSIG by class					
°F	°C	150	300	600	900	1500	2500
-20 to 100	-29 to 38	290	750	1500	2250	3750	6250
200	93	260	750	1500	2250	3750	6250
300	149	230	730	1455	2175	3640	6070
400	204	200	705	1410	2115	3530	5880
500	260	170	665	1330	1995	3325	5540
600	316	140	605	1210	1815	3025	5040
650	343	125	590	1175	1765	2940	4905
700	371	110	570	1135	1705	2840	4730
750	399	95	530	1065	1595	2660	4430
800	427	80	510	1015	1525	2540	4230
850	454	65	485	975	1460	2435	4060
900	482	50	375	745	1120	1870	3115
950	510	35	275	550	825	1370	2285
1000	538	20	200	400	595	995	1655
1050	566	20(*)	145	290	430	720	1200
1100	593	20(*)	100	200	300	495	830
1150	621	20(*)	60	125	185	310	515
1200	649	15(*)	35	70	105	170	285

Notes:
- Use normalized and tempered material only.

(a) For welding ends valves only. Flanged ends ratings terminate at 1000°F (538°C).

PRESSURE-TEMPERATURE RATINGS

CAST STEEL ASTM A 217 GR C12

Temperature		Maximum allowable non-shock working pressure in PSIG by class					
°F	°C	150	300	600	900	1500	2500
-20 to 100	-29 to 38	290	750	1500	2250	3750	6250
200	93	260	750	1500	2250	3750	6250
300	149	230	730	1455	2185	3640	6070
300	204	200	705	1410	2115	3530	5880
500	260	170	665	1330	1995	3325	5540
600	316	140	605	1210	1815	3025	5040
650	343	125	590	1175	1765	2940	4905
700	371	110	570	1135	1705	2840	4730
700	399	95	530	1065	1595	2660	4430
800	427	80	510	1015	1525	2540	4230
850	454	65	485	975	1460	2435	4060
900	482	50	450	900	1350	2245	3745
950	510	35	375	755	1130	1885	3145
1000	538	20	255	505	760	1270	2115
1050	566	20(*)	170	345	515	855	1430
1100	593	20(*)	115	225	340	565	945
1150	621	20(*)	75	150	225	375	630
1200	649	20(*)	50	105	155	255	430

Notes:
- Use normalized and tempered material only.

(a) For welding ends valves only. Flanged ends ratings terminate at 1000°F (538°C).

CAST STEEL ASTM A 351 GR CF8

Temperature		Maximum allowable non-shock working pressure in PSIG by class					
°F	°C	150	300	600	900	1500	2500
-20 to 100	-29 to 38	275	720	1440	2160	3600	6000
200	93	230	600	1200	1800	3000	5000
300	149	205	540	1075	16154	2690	4480
400	204	190	495	995	1490	2485	4140
500	260	170	465	9320	1395	2330	3880
600	316	140	440	885	1325	2210	3680
650	343	125	430	865	1295	2160	3600
700	371	110	420	845	1265	2110	3520
750	399	95	415	825	1240	2065	3440
800	427	80	405	710	1215	2030	3380
850	454	65	395	790	1190	1980	3300
900	482	50	390	780	1165	1945	3240
950	510	35	380	765	1145	1910	3180
1000	538	20	355	710	1065	1770	2950
1050	566	20(*)	325	650	975	1630	2715
1100	593	20(*)	255	515	770	1285	2145
1150	621	20(*)	205	410	615	1030	1715
1200	649	20(*)	165	330	495	825	1370
1250	677	20(*)	135	265	400	970	1115
1300	704	20(*)	115	225	340	565	945
1350	732	20(*)	95	185	280	465	770
1400	760	20(*)	75	150	225	380	630
1450	788	20(*)	60	115	175	290	485
1500	816	15(*)	40	85	125	205	345

Notes:
- At temperatures over 1,000°F, use only when the carbon content is 0.04% or higher.

(a) For welding ends valves only. Flanged ends ratings terminate at 1000°F (538°C).

PRESSURE-TEMPERATURE RATINGS

CAST STEEL ASTM A 351 GR CF8 M

Temperature		Maximum allowable non-shock working pressure in PSIG by class					
°F	°C	150	300	600	900	1500	2500
-20 to 100	-29 to 38	275	720	1440	2160	3600	6000
200	93	235	620	1240	1860	3095	5160
300	149	215	560	1120	1680	2795	4660
400	204	195	515	1025	1540	2570	4280
500	260	170	480	955	1435	2390	3980
600	316	140	450	900	1355	2255	3760
650	343	125	440	885	1325	2210	3680
700	371	110	435	870	1305	2170	3620
750	399	95	425	855	1280	2135	3560
800	427	80	420	745	1265	2110	3520
850	454	65	420	735	1255	2090	3480
900	482	50	415	730	1245	2075	3460
950	510	35	385	775	1160	1930	3220
1000	538	20	365	725	1090	1820	3030
1050	566	20	360	720	1080	1800	3000
1100	593	20(*)	305	610	915	1525	2545
1150	621	20(*)	235	475	710	1185	1970
1200	649	20(*)	185	370	555	925	1545
1250	677	20(*)	145	295	440	735	1230
1300	704	20(*)	115	235	350	585	970
1350	732	20(*)	95	190	290	480	800
1400	760	20(*)	75	150	225	380	630
1450	788	20(*)	60	115	175	290	475
1500	816	15(*)	40	85	125	205	345

Notes:

- At temperatures over 1,000°F, use only when the carbon content is 0.04% or higher.

(a) For welding ends valves only. Flanged ends ratings terminate at 1000°F (538°C).

CAST STEEL ASTM A 352 GR LCB

Temperature		Maximum allowable non-shock working pressure in PSIG by class					
°F	°C	150	300	600	900	1500	2500
-20 to 100	-29 to 38	265	695	1395	2090	3480	5805
200	93	255	660	1320	1980	3300	5505
300	149	230	640	1275	1915	3190	5315
400	204	200	615	1230	1845	3075	5125
500	260	170	585	1175	1760	2930	4885
600	316	140	550	1105	1655	2755	455
650	343	125	535	1065	1600	2665	4440
700	371	110	510	1025	1535	2560	4270
750	399	95	475	955	1430	2385	3970
800	427	80	390	780	1175	1955	3255
850	454	65	300	595	895	1490	2485
900	482	50	200	405	605	1010	1685
950	510	35	135	275	410	685	1145
1000	538	20	85	170	255	430	715

Notes:
Not to be used over 650°F.

DESIGN BASIS

All of WALWORTH's Valve Designs, when applicable, follow one or more of the following standards.

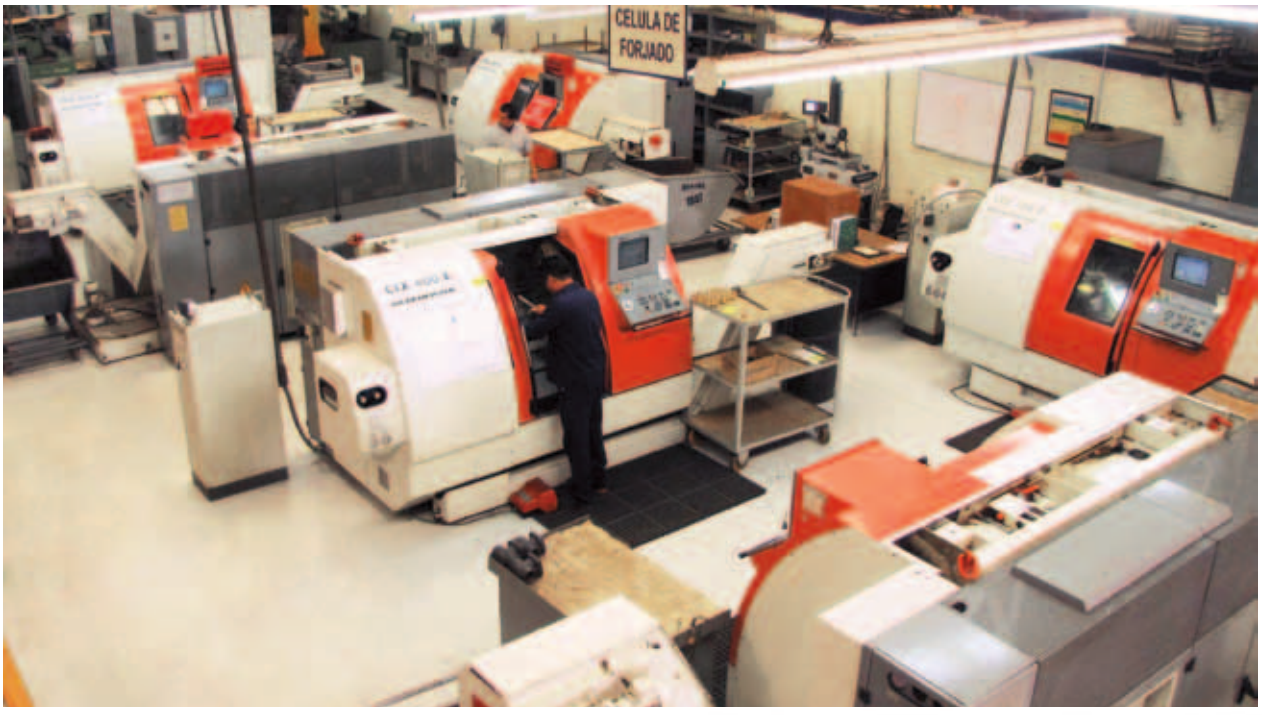
API American Petroleum Institute.
6D Steel gate, ball and plug valves for pipeline service.
6FA Specification for Fire Test for Valves.

ASME/ANSI American National Standard Institute:
B2.1 Pipe threads.
B16.5 Steel pipe Flanges and flanged fittings.
B16.10 Length of ferrous flanged and welding end valves.
B16.25 Butt-welding ends.
B18.2 Square and hexagon bolts and nuts.
B16.47 Large Diameter Steel Flanges

ASTM American Society for Testing and Materials:
A-193 Alloy steel bolting material for high temperature service.
A-194 Carbon and alloy steel nuts for high pressure and high temperature service, class2.
A-216 Standard specification for steel castings, Carbon, Suitable for Fusion Welding, for High-temperature Service.

MSS Manufactures Standardization Society of the Valve and Fittings:
SP-25 Standard marking system for valves,fittings,flanges and unions.
SP-44 Steel pipe line flanges.
SP-47 Limiting dimensions of raised face flange gaskets.
SP-61 Pressure testing of steel valves.

ASME American Society of Mechanical Engineers:
Section II Part A,B and C.
Section V Non-destructive Tests.
Section VIII Boiler and Pressure Vessel Code for Unfired Pressure Vessels, Divisions 1 and 2.
Section IX Welding Qualifications.



HOW TO ORDER

WALWORTH valves are designed by a catalog figure number which describe their main characteristics. The valve identification system shown herein is intended to assist our Customers to specify the valve required and avoid mistakes during manufacturing.

10”-5202-RF-UT-WCB-GO-NACEMR01-75

- SUPPLEMENTARY REQUIREMENTS
- TYPE OF OPERATION
- BASE MATERIAL
- TRIM ARRANGEMENT
- TYPE OF ENDS
- TYPE OF VALVE & PRESSURE CLASS AS PER FIGURE NUMBER
- SIZE OF THE VALVE IN INCHES

SIZE (In)	TYPE OF VALVE & PRESSURE CLASS	ENDS
2"	5202= GATE 150#	RF= RAISED FACE
2 1/2"	5206= GATE 300#	RTJ= RING TYPE JOINT
3"	5232= GATE 600#	WE=BUTTWELD
4"	5247= GATE 900#	
5"	5262= GATE 1500#	
6"	5275= GLOBE 150#	
8"	5281= GLOBE 300#	
10"	5295= GLOBE 600#	
12"	5301= GLOBE 900#	
14"	5308= GLOBE 1500#	
16"	5341= CHECK 150#	
18"	5344= CHECK 300#	
20"	5350= CHECK 600#	
22"	5353= CHECK 900#	
24"	5356= CHECK 1500#	
28"		
30"		
36"		
42"		
48"		
54"		
60"		
72"		

SUPPLEMENTARY REQUIREMENTS
GO= Gear operator.
CW=Chainwheel operator.
BS=Bare stem prepared for actuator.
MOV= Motor operated valve.
POV= Pneumatic operated valve.
LD= Locking device.
NACEMR-01-75.
NACEMR-01-03
SP= Special Paint.
SG= Special gasket.
SPK= Special packing.
VOC= Cerification of volatile organic compounds.
BP=By-Pass
LL=Live Load Packing
LR=Lantern Ring
LCW=Lever & Counter Weight
SE=Stem extensions
FS=Floor atands
XX= Additional requirements.

TRIM ARRANGEMENTS	BASE MATERIAL ASTM
18-8= API No. 2	CARBON STEELS:
310= API No. 3	A216-WCB (C-Si)
HF= API No. 5	A216-WCC (C-Si)
AAA= API No. 6	LOW ALLOY STEELS:
UT= API No. 8	A217-WC1 (C-1/2Mo)
A= API No. 9	A217-WC5 (Cr-Mo)
18-8smo= API No. 10	A217-WC6 (1 1/4%Cr-1/2Mo)
AHF= API No. 11	ASTM A217-WC9(2 1/4 % Cr-1%Mo)
3HF= API No. 12	ASTM A217-C5(5% Cr-1/2Mo)
A20= API No. 13	ASTM A217-C12(9%Cr-1%Mo)
A20H= API No. 14	ASTM A217-C12-A(9%Cr-1%Mo-V-N)
NUC= 410 + NUCALLOY	LOW CARBON AUSTENITIC STAINLESS STEELS:
4HF= 304+304+ST6	ASTM A351-CF3(18%Cr-8%Ni-0.03%C)
4HF+HF= 304+ST6+ST6	ASTM A351-CF3M(18%Cr-12%Ni-2%Mo-0.03%C)
304L= 304L+304L+304L	ASTM A351-CG3M(18%Cr-12%Ni-3%Mo-0.03%C)
1HF= 316+ST21+ST21	AUSTENITIC STAINLESS STEELS:
3HF+HF= 316+ST6+ST6	ASTM A351-CF8(18%Cr-8%Ni-0.08%C)
3TC= 316/TC+TC+ST6 NOTE: TC= Tungsten Carbide.	ASTM A351-CF8M(18%Cr-12%Ni-2%Mo-0.08%C)
316L= 316+316+316	ASTM A351-CF10(18%Cr-8%Ni-0.08%C)
3LHF= 316L+316L+ST6	ASTM A351-CG8M(19%Cr-10%Ni-3%Mo-0.08%C)
3HFL= 316L+ST6+ST6	ASTM A351-CF8C(18%Cr-10%Ni-Cb-0.08%C)
21HF= 317+ST6+ST6	ASTM A351-CT15C(19%Cr-32%Ni-0.05A 0.15%C)
317= 317+317+317	SUPER AUSTENITIC STAINLESS STEELS:
317H= 317+317+ST6	ASTM A351-CK20(25%Cr-20%Ni-0.04A 0.2%C)
31L= 317L+317L+317L	ASTM A351-CN7M(28%Ni-19%Cr-Cu-Mo- 0.7%C)
317LS= 317L+317L+ST6	ASTM A351-CN3M(21%Cr-24.5%Ni-6.5%Mo)
2HF= 321+321+ST6	ASTM A351-CN3MN(24%Ni-21%Cr-6%Mo-Cu-N-0.03%C)
321F= 321+ST6+ST6	ASTM A351-CD4MCu(25.5%Cr-5.5%Ni-2%Mo)
321= 321+321+321	ASTM A351-CN2MCuN(.02C;19-23Cr;23-28Ni;4-5Mo;1-2Cu)
347HF= 347+ ST6+ST6	LOW TEMPERATURE SERVICE CARBON STEELS:
347= 347+347+347	ASTM A352-LCB(0.03%C-0.6%Si-1%Mn)
347= 347+347+ST6	ASTM A352-LCC(0.025%C-0.6%Si-1%Mn)
254HF= 31254+ST6+ST6	LOW TEMPERATURE SERVICE LOW ALLOYS STEELS:
51H= 31803+ST6+ST6	ASTM A352-LC2(0.025%C-2.5%Ni-0.65%Mn)
31803H= 31803+31803+ST6	ASTM A352-LC3(0.15%C-3.5%Ni-0.65%Mn)
T9= 17-4pH+TRIBALLOY 900+ TRIBALLOY 900	MARTENSITIC STAINLESS STEELS:
HC= Hc-276+Hc-276+Hc-276	ASTM A487-CA6NM(12.75%Cr-4%Ni-0.7%Mo
HCH= Hc-276+Hc-276+ST6	ASTM A487-CA15(12.75%Cr-1%Ni-1%Mo
UOP= MONELK500+MONEL 400+MONEL 400	NICKEL ALLOYS:
625= INCONEL 625+INCONEL 625+INCONEL 625	ASTM A494-M30C(67%Ni-30%Cu)
625HF= INCONEL 625+ST6+ST6	ASTM A494-M35-1(67%Ni-30%Cu)
8367HF+HF= AL6XN+ST6+ST6	ASTM A494-CZ100(95%Ni)
810T= INCOLOY 800H+INCOLOY 800H+INCOLOY800H	ASTM A494-CY40(75%Ni-15%Cr-8%Fe)
825= INCOLOY 825+INCOLOY825+INCOLOY 825	ASTM A494-CW2M(61%Ni-16%Mo-16%Cr)
23HF= INCOLOY 825+ST6+ST6	ASTM A494-N12MV(62%Ni-28%Mo-5%Fe)
HB= HASTELLOY B2+HASTELLOB2+HASTELLOY B2	ASTM A494-CW12MW(56%Ni-18%Mo-17%Cr-6%Fe)
HB= HASTELLOY B2+HASTELLOB2+HASTELLOY B2	ASTM A494-CW6M(56%Ni-19%Mo-18%Cr-2%Fe)
NOTE: ADDITIONAL BASE MATERIALS & TRIMS ARE	ASTM A494-CU5MCuC(42%Ni-21.5%Cr-3%Mo-2.3%Cu)
AVAILABLE UPON REQUEST.	ASTM A494-N7M(65%Ni-28%Mo-2%Fe)
	ASTM A494-CW6MC(60%Ni-22%Cr-9%Mo-3.5%Cb)
	DUPLEX STAINLESS STEELS:
	ASTM A351-CD7MCuN(20.5%Cr-29%Ni-2.5%Mo)
	ASTM A890 1A; CD4MCu(25.5%Cr-5.5%Ni-2%Mo)
	ASTM A890 2A; CE8MN(24%Cr-9.5%Ni-4%Mo)
	ASTM A890 3A; CD6MN(25.5%Cr-5%Ni-2.25%Mo)
	ASTM A890 3A; CD3MN(22%Cr-5%Ni-3%Mo-N)

THE WALWORTH COMPANY GENERAL TERMS AND CONDITIONS

ACCEPTANCE: All quotations are for acceptance within 30 days from date of quotation unless extended in writing. In the event a purchase order is placedafter this period of time. The Walworth Company reserves the right to requote base prices of all valves offered. All orders and contracts are subject to credit approval and acceptance by the Walworth Company.

FREIGHT: When prices are f.o.b. point of shipment –no freight allowance, we will attempt to route shipments in the method which will result in the lowest cost unless otherwise instructed. All shipments will be freight charges collect except when stipulated on the purchase order, in which case you will be invoiced for all transportation charges. Delivery of material to a common carrier shall be considered to be delivery to Buyer and shall be at Buyr's risk thereafter. Claims of loss of or damage to material in transit shall be filed by the Buyer directly with the carrier.

PRICES: There will be added to all prices quoted sales, use, occupation or any other excise or similar tax which Seller may be required to pay or collect on or in connection with the sale. Seller shall be established by Federal, State or other goverment regulation with respect to the product(s) Tapaed by the order which shall be lower than the price(s) specified in the order.

ESCALATION TERMS: Prices shown in this price schedule reflect the costs in effect at the time of publication. These prices will remain firm on all products with a quoted delivery of twenty–six (26) weeks or less. On products which have a scheduled delivery of more than twenty-six (26) weeks, the goods will be invoiced based on the applicable price sheet in effect at the time of shipment. In no event will the invoiced price be less than the price originally quoted.

PURCHASED COMPONENTS: (i.e. motors, gearing, etc.) Prices are quoted on supplier price in effect at time of quotation. Actual invoice Price will be adjusted in accordance with the supplier's escalation policy.

DEFFERED SHIPMENTS: If for any reason the customer desires to delay shipments more than 30 days after manufacturing is complete or to place a hold or stop to the order during the manufacturing cycle, The Walworth Company reserves the right to consider the order cancelled and to invoke cancellation charges per the schedule bellow.

CANCELLATION: After order acceptance by Walworth, items or completed orders may be cancelled and buyer will be charged for work perfomed, based on the following schedule:

- Five (5%) percent of prices of stock items.
- Ten (10%) percent of price of stock items ordered in quantities which exceed normal inventory levels.
- Five (5%) percent of prices prior to drawing submittal on made-to-order items.
- 15% after drawing approval, but prior to the start of castings.
- 30% to 50% during casting cycle, depending on the state of completion.
- 55% to 75% during machining and assembly operations, depending on the state of completion.
-100% after final assembly and test.

REMITTANCES: Remittances must be made to the address indicated on the invoice.

CREDIT TERMS: As quoted. Invoices on balances overdure will be subject to a service charge of 11/2 % per month on such indebtedness.

DELIVERIES: Shipments and deliveries shall at all times be subject to the approval of Seller's Credit Department. If the Buyer shall fail to make any payments according to the terms of the contract, Seller may, in addition to and not in limitation of its other rights and remedies, at its option, cancel all or any part of Buyer's incomplete contracts with Seller or may defer shipments of deliveries under Buyer's contracts with Seller except upon receipt of satisfactory security or for cash shipment.
All schedule of shipments are estimated as closely as possible and Seller will use its best efforts to ship within the time scheduled, but does not guarantee to do so. Schedules commence with the date Seller receives authorization to proceed with order, subject to the provisions of the next sentence. The order will not be released for manufacture until complete specifications and approved drawings (if drawing approval is required) are received at the plant of manufacture and the estimated shedule of shipment will commence with the date of such receipt.
Seller shall not be liable for any direct, indirect or consequential damage or loss caused by any delay in delivery, regardless of the cause of delay.
Without limiting the generality of the foregoing, Seller assumes no responsability for delays in delivery resulting from fire, flood, accidents, riots, strikes, transportation delays, labor or material shortages, existing or future laws, acts of any governmental authority, or any other cause beyond Seller's control. Items offered from stock are subject to prior sale.

INSPECTION: Final inspection and acceptance of products must be made at the plant of manufacture, unless otherwise provided in the order and/ or in agreed upon specifications. Prices do not include charges for special tests or inspections performed at the request of the Buyer, unless called for in the order and/or in agreed upon specifications.

RETURNS: Permission in writing and return tagging instructions must be obtained from Seller before any goods returned for credit or adjustment wiil be acceptance. Where returned goods are accepted, a minimun charge of 25% of the invoice price will be made, plus freight from both directions and costs of reconditioning the material for resale as new.

WARRANTY: Seller will replace without charge or refund the purchase price of products manufactured by Seller which prove to be defective in the material or workmanship , provided in each case that the product is properly installed and is used in the service for which Seller recommends it and that written claim, specifying the alleged defect, is presented to Seller shall in no event be responsible for (a) claims for labor, expenses or other damages occasioned by defective products or (b) for consequences or secundary damages. THE WARRANTY STATED IN THIS PARAGRAPH IS IN LIEU OF ALL OTHER WARRANTIES, EITHER EXPRESSED OR IMPLIED. WITH RESPECT TO WARRANTIES THIS PARAGRAPH STATES BUYER'S EXCLUSIVE REMEDY AND SELLER'S EXCLUSIVE LIABILITY.

DESIGN, ETC: Seller reserves the right to change design, materials or specifications without notice. There will be a charge for modifying an order after it has been entered when such change or modification results in additional engineering or clerical work for either The Walworth Company or our suppliers.

MINIMUM CHARGE: Orders totaling less than $100.00 net will be billed at a minimum charge of %100.00. Repair parts will be billed at a mínimum charge of $50.00.

NOTE: We reserve the right to correct obvious clerical errors in quotations, invoices, and other contracts.

www.walworthvalves.com

WALWORTH®

Since 1842

Visit our website for more detailed information

www.walworthvalves.com

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